RADCLIFFE-BROWN LECTURE IN SOCIAL ANTHROPOLOGY

The Geography of Descent

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> Two persons who are kin are related in one or other of two ways: either one is descended from the other, or they are both descended from a common ancestor. It is to be remembered that 'descent' here refers to the social relationship of parents and children, not to the physical relation. Kinship is thus based on descent, and what first determines the character of a kinship system is the way in which descent is recognized and reckoned. (A. R. Radcliffe-Brown, 'Introduction', *African Systems of Kinship and Marriage* (1950), p. 13)
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> I believe this element of descent is the hidden bond of connexion which naturalists have sought under the term of the Natural System. . . . genealogical in its arrangement, with the grades of difference between the descendants from a common parent, expressed by the terms genera, families, orders, &c. . . . (Charles Darwin, *On the Origin of Species* (1859), p. 433)
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> In several cases we have seen, the tribesmen believe themselves to be descended from the Totem, and in every case to be, nominally at least, of its breed or species. (J. F. McLennan, 'The Worship of Animals and Plants', *The Fortnightly Review*, 6 (1869–70), p. 427)
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> Pigeons have been watched, and tended with the utmost care, and loved by many people. They have been domesticated for thousands of years in several quarters of the world. (Charles Darwin, *On the Origin of Species* (1859), p. 27)

RADCLIFFE-BROWN PROPOSED in 1937 to make social anthropology into 'a natural science of society'.[1] His proposal was and remains controversial, especially in the study of kinship and descent with which he is so

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[1] So Radcliffe-Brown entitled the series of lectures he gave in 1937 in the Social Science Division of the University of Chicago. The university issued a mimeographed transcript in 1948, which was published, with a foreword by Fred Eggan in 1957, after Radcliffe-Brown's death.

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closely associated. Anthropology originated in part to explain Darwin's *Descent of Man* (1871) in social terms, raising questions about the social and biological dimensions of human behaviour that perplex us to this day. The purpose of this lecture is to use Radcliffe-Brown's insights to do an ethnography of the science and popular culture of descent in the fertile decades of the mid-nineteenth century. I will focus on Darwin's work with people outside scholarly circles as then defined: tradespeople and artisans who bred birds and flowers in and about their homes. Silk weavers in London's East End were among the 'odd specimens of the Human species, who fancy Pigeons', as Darwin described them to an American geologist and zoologist, James Dwight Dana, in 1856 (*Corres.* 6: 236). Darwin drew on the breeders' expertise as a model of nature's scrutinising eye, while rejecting what they called 'the art of propagating life', which seemed to suggest a grand design. More attention to the silk-weavers' art and trade, their birds, and their places in the radically changing political ecology of Great Britain and beyond, may help to illuminate complexities of descent evident not only in the anthropological study of kinship, but also in the persistence of design-oriented bioengineering despite Darwin's emphasis on the randomness of evolution, echoed in Radcliffe-Brown's (1937: 155) conviction that 'A social system is not purposive'.

Paradoxes of descent

Radcliffe-Brown's 'natural science of society' presents us with a paradox. Anthropology should be modelled after 'natural sciences' in a search for general laws, yet it should focus solely on social phenomena having nothing to do with biological or any other 'natural' processes. He is most explicit about this in his discussions of kinship and descent, for example, in defining the connection between the two in *African Systems of Kinship and Marriage* (1950: 13), as in the epigraph cited above.

Radcliffe-Brown's conception of anthropology as a science, and many of his laws, provoked sharply divided reactions among his colleagues during his lifetime that only intensified after his death, beginning with the obituaries. Twenty years after *African Systems of Kinship and Marriage*, Needham (1971, 1974) and Schneider (1984), among others, effectively demolished his definitions in principle and in substance. So why should we still be concerned with intellectual issues put to rest over thirty years ago? As Needham (1971: 9) pointed out at the time: '[I]t is this very

notion of "descent" that needs investigation'. Here are two reasons why we might still agree with Needham.

First, the paradox in Radcliffe-Brown's work remains with us: social anthropology as the comparative study of human behaviour, based on the premise that human beings are all one in *Homo sapiens*, yet defined in wholly sociocentric terms that make it impossible to achieve the broad intellectual vision of 'human nature' that he hoped for. Persisting concerns about this problem are evident in these very lectures dedicated to Radcliffe-Brown, for example, E. Leach's lecture in 1976 and Sperber's in 1999, each of which makes strikingly different arguments about anthropology as a natural science. They are evident in anthropologists' latest definitions of descent, as in Barnard and Spencer's (1996: 152) efforts to address 'social' and 'actual biological' relations in their *Encyclopedia of Social and Cultural Anthropology*:

> Descent refers to relatedness based on common ancestry. Actual biological relationships in a population may well extend well beyond those that are popularly known and socially recognized. Equally, those whose claim to share the same descent is generally accepted may not necessarily all be biologically related. Because of its cultural loading, descent is essentially a social concept, and varies widely in significance in different societies.

These issues continue to be debated by scholars trying to achieve a more culturally grounded, yet broadly valid, understanding of 'relatedness' that would take into account long-standing anthropological interests in the study of food and housing, as well as recent work on new reproductive technologies, social conceptions of biology, and gay and lesbian kinship (for example, Carsten, ed., 2000; Franklin and McKinnon, eds., 2001; Strathern 1992), as well as new research in culture and cognition (Astuti 2000; Bloch and Sperber 2002).

Second, contrary to the predictions of anthropologists since the nineteenth century, the significance of descent has not diminished in the face of contractual relations, but rather increased to the point of becoming central to controversies over human nature. Radcliffe-Brown and Forde (1950: v) expressed anthropologists' long-standing assumptions when they prefaced *African Systems* by claiming that 'The way in which comprehensive obligations of kinship direct the activities and relations which, in our society, are segregated out as more specifically political, economic, and religious is a commonplace of social anthropology.' Barnard and Spencer (1996: 152–3) reaffirm this view.

Yet I would argue that exactly the opposite has occurred. Descent-based ideologies and practices do persist in many kinds of racism, ethnicity,

and nationalism, even if these do not always appear to be corporate descent groups in the classical sense. Furthermore, interest in genealogical reckoning in science and in popular culture has clearly grown over the past century and a half, since the mid-nineteenth century. As presented in more detail elsewhere (Feeley-Harnik 2002), popular interest in genealogies in the United States began to spread in the 1840s, increasing from the 1850s onwards. Genealogical research has become central to contemporary biological research in fields as diverse as genomics, DNA sequencing, systematics, conservation, and the biotechnologies with which they are associated (Pálsson 2002; Pennisi 2001; Sugden *et al.* 2003). Genealogical interests among scholars in the life sciences are matched by popular interests in genealogy (Kilborn 2001; Shute 2002), including genetic genealogies (Brown 2002). The second-most visited sites on the internet, after the sexually oriented sites, are the genealogical services and family news groups (Kilborn 2001: 24). Segalen and Michelat (1991) document the same trends in France during the same period, from the mid-1960s to the present. It might even be argued that the very discipline of anthropology, based in the study of kinship, originated in part from this steadily growing, wide ranging interest in descent. Yet a diversity of views seems to persist: perhaps an increasing bio-determinism in some sciences, but not necessarily in all popular practices (see, for example, Carsten 2000; Thompson 2001; Shaw 2003). So, to return to Needham's (1971: 9) point: '[I]t is this very notion of "descent" that needs investigation'. Or might there be many? And if so, what are the issues at stake and how might we find them without framing them in advance as 'social' or 'biological'?

My argument is that we must begin by broadening the framework of our analysis. Simply by restricting our understanding of kinship and descent to humans, we bracket off the larger web of relations in which these debates originated in the mid-nineteenth century, and which they still involve—namely relations among human beings with other organic beings—and we foreclose in advance on the possibility of explanations extending beyond human relations (Ingold 1997; Feeley-Harnik 1999). I propose that we do this by returning to another formative subject in anthropology, with which Radcliffe-Brown is closely associated, namely, 'totemism'.

'Totemism' in the British Isles

A decade after Darwin argued in *Origin* (1859: 433, 449 and *passim*) that 'descent is the hidden bond of connexion', transforming the 'plan of

creation' into a science, the Scot, John Ferguson McLennan, adopted the term 'Totemism' to refer to what he saw as the origin of religion. Darwin's influence is evident in McLennan's (1869–70, 6: 427; see also 417, 567, 569, and 7: 214) use of such terms as 'breed' and 'species' to describe his problem, as in the epigraph at the start of this essay. Yet McLennan's argument is very different: totemism involves humans' worship of animals and vegetables whom they ignorantly imagine to be their kin, breed, or species. In other words, totemism is a religious phenomenon having nothing actually to do with 'a real pedigree, a genealogical classification' as Darwin (1859: 423) had defined these terms. Although McLennan (1869–70, 6: 413) got much of his American data from Lewis Henry Morgan's research (1860) on Iroquois clan names, totemism in McLennan's sense originated in the British Isles in 1869, in dialogue with alternative conceptions of genealogical relations associated with Darwin and with the Bible. So perhaps we should not be surprised that the ghosts of Darwin and *Genesis* continue to haunt the anthropological debates about totemism that followed.[2] However, it is a curious fact that McLennan's (1869–70) series on 'The Worship of Animals and Plants' in *The Fortnightly Review* coincided with another series in the same issues of the *Fortnightly* by the historian Frederic Seebohm (1869–70) on 'The Land Question', culminating in 'The Severance of the English People from the Land', a matter to which we will return.

When Lévi-Strauss addressed *Le totémisme aujourd'hui* (1962) almost a century later, he credited Radcliffe-Brown (1952) with pointing the way in his second discussion of totemism in 'The Comparative Method in Social Anthropology'. Radcliffe-Brown (1952: 112–14) questioned why people in parts of Australia and America should identify their social groups by association with particular natural species:

> At this point we may feel inclined to ask why these social divisions should be identified by reference to two species of birds? . . . Why all these birds? . . . It is, however, not always a question of birds . . . moieties may be associated with other pairs of animals . . . eaglehawk and crow, eagle and raven, coyote and wild cat. . . . We may, it can be held, suppose that an understanding of the principle in question will give us an insight into the way in which the natives themselves

[2] McLennan (1869–70, 7: 194–6) included 'the Dove, or Pigeon' among his key examples, 'almost as great a god as the serpent', which was his prime example (see 6: 563–70). The dove (or pigeon) 'became an emblem with the Hebrews, and is still, as everyone knows, a symbol of the Holy Ghost—who once appeared in its shape. We have seen, however, that it was a reality long before it became a Christian symbol.' The persistence of Darwinian and biblical words and issues in subsequent discussions of totemism is striking; this would include Lévi-Strauss's *bon à manger* from *La Sainte Bible* (Genèse 3.6).

> think about the dual division as a part of their social structure. In other words, instead of asking 'Why all these birds?' we can ask 'Why particularly eaglehawk and crow, and other pairs?'[3]

Thus, as Lévi-Strauss (1962: 89) saw it, Radcliffe-Brown's contribution was to argue that 'their perceptible reality permits the embodiment of ideas and relations conceived by speculative thought on the basis of empirical observations'.

Although Lévi-Strauss summarised Radcliffe-Brown's position (and his own) as 'good to think' rather than 'good to eat', this is not the purely intellectualist view usually ascribed to Lévi-Strauss, but an effort to integrate domains. Scholars like Descola (1996), Ingold (1998, 2000a,b), Pedersen (2001), and Viveiros de Castro (1998), have taken this still further by re-examining our conceptions of 'animism' and 'totemism', to which Viveiros de Castro would add 'perspectivism'. This work has been most fruitful in suggesting that we should follow Hallowell (1960, 1992: 82–5, 96–7), in his work with the Ojibwa of Berens River (Manitoba), in examining bonds of sociality encompassing human and 'other-than-human "persons"', bonds that are essential to living '*pimädaziwin* (Life)' fully, including 'the sanctioned moral values which guide the relations of "persons"' (1960: 48), what Beidelman (1986) calls 'moral imagination'.[4]

Yet we should be wary of reifying by contrast what Viveiros de Castro (1998: 473) calls a 'Western naturalist ontology [in which] the nature/society interface is natural'. In fact Darwin's naturalism does not conform to the biological reductionism that is currently being critiqued. His views

[3] Radcliffe-Brown originally gave this paper as the Huxley Memorial Lecture for 1951. Curiously, Huxley's (1868, 1875) research on the classification of birds, especially partridges and pigeons, was critical in eventually convincing him to shift from his view that 'Zoological classification is a Census of the animal world' to Darwin's view that '"the natural system" [is] simply genealogical' (see their exchange of letters *c*.3 Oct. 1857, *Corres*. 6: 461–3).

Given the common view of Radcliffe-Brown as an ahistorical structuralist—supported by some, questioned by others—it is worth noting that Radcliffe-Brown (1952: 128–9) intended this paper on 'The Comparative Method in Social Anthropology' to support the claim that Anthropology includes 'historical (ethnographical and ethnological) studies' as well as 'the generalizing study known as social anthropology'.

[4] As Ingold (1998) has argued, Lévi-Strauss's very distinction—even as restated in new forms by Descola and others—'this appeal to the language of mental models, to the idea of accommodating beings that are really non-human into schemes of representation that construct them as social and therefore human, belongs squarely within a naturalist ontology, and it is from this that the terms of the comparison are derived. For what these terms do is to preserve a space for 'really natural' nature which is unaffected by the diverse constructions that the human mind might place upon them. Thus the comparison between naturalism and animism, since it is done on naturalism's terms, is hardly a fair or balanced one' (2000a: 107). See also Needham (1974: 30–7 and chapter 3, espcially sections 1 and 13).

of the relatedness of all forms of organic life, as expressed especially in the notebooks he kept from the late 1830s to the mid-1840s (Barrett *et al.* 1987), might more accurately be described as 'animist', and possibly also 'totemist' in Ingold's senses of these terms (1998: 112).

Ingold argues that what might be called 'totemism' in Australia should include 'linkages between people, land, and ancestral beings' (1998: 182). He contrasts these forms of relationships with those found 'among the native peoples of the circumpolar North [where] the land does not have quite the same significance that it has in Aboriginal Australia. For the powers that bring forth life, instead of being concentrated in the land itself, are rather distributed among the manifold beings that inhabit it', a phenomenon that might be called, for heuristic purposes, 'animism'. Scholars like Bamford (1998) and J. Leach (2003) have also emphasised the generative dimensions of land in sociality among humans and other creatures in parts of New Guinea. As Leach (2003: 31) puts it, 'in this sense kinship is geography, or landscape. . . . [K]inship is not about descent through genealogy but is an outcome of the relations between people and land.' Drawing on Brandenstein's (1970, 1972) research on subsection systems in Australia, Needham (1974: 36) would go still further to argue that 'the study of those matters conventionally subsumed under the rubric[s] of kinship [and 'totemism'] is part of a search for what con be called primary factors of human experience', which (following Hallowell 1960) would include relations with 'other-than-human "persons"'.

As I have argued elsewhere (Feeley-Harnik 1999), Darwin and his American contemporary Lewis Henry Morgan were alike in their studies of relatedness among humans and other creatures in searching for the key to their relations in the 'tangled wilderness' in which they lived and died and might be forgotten (to use the phrase of Morgan's cousin Nathaniel about his work on the Morgan family genealogy). In my view, the powerfully watery-earthy language of creation in *Genesis* contributed to their preoccupation with phenomena that were inextricably geological and zoological, biogeographical, in their forms. Yet the very commonalities in the work of these scholars, rooted in debates with *Genesis*, also highlight how profoundly the cosmic concerns motivating their geo-zoological explorations into the 'mystery' of life as they both called it, were differentiated by their political and economic geographies.

As I will argue here, the formation of an increasingly narrow naturalism, associated in part with new sciences of genealogy and descent, seems to be an historical phenomenon, developed out of shifting political,

economic, and ecological relations among humans and other-than-human forms of life, associated with land-enclosures in the British Isles from 1750 to 1870, and elaborated in new forms in British colonies abroad (including the American colonies). So our comparative perspective might better be served by a more historical perspective, analysing the phenomena in an analytical framework that does not presuppose the very naturalism it seeks to investigate, in order to understand how and why that naturalism might have emerged, and with what consequences for ideas and practices of kinship and ecology in science and in everyday life.

As it happens, Darwin put birds—pigeons—at the very heart of the cosmic vision of transmutation and extinction he presented in *Origin of Species*. So let us now follow Radcliffe-Brown's (1952: 113–14) suggestion and ask, as he did, 'Why all these birds?' And furthermore, to paraphrase him slightly, 'Why particularly fancy pigeons in all their varieties?' How might they be related to 'eaglehawk and crow, and other pairs' of such evident interest to people elsewhere? And what light might the relations between the humans and the birds shed upon 'the mutual relations of all the beings which live around us', the 'entangled bank, clothed with many plants of many kinds, with birds singing on the bushes, with various insects flitting about, and with worms crawling through the damp earth', where Darwin (1859: 6, 433, 439, 489) sought 'descent . . . the hidden bond of connexion'.

'Pigeons If You Please'

Darwin's *Origin of Species* (1859: 1) begins: 'When on board H.M.S. "Beagle", as naturalist, I was much struck with certain facts in the distribution of the inhabitants of South America, and in the geological relations of the present to the past inhabitants of that continent. . . .' Darwin certainly used the many facts he recorded during his five years on the *Beagle* in supporting his argument. The biogeography of the finches in the Galápagos eventually proved to be critical. Yet he was also quick to credit the insights he gained from his work with animal breeders whom, as he said, most other naturalists had ignored (ibid.: 4). His notebooks and correspondence show that English animal and plant breeders—livestock men, gardeners, horticulturalists, poulterers, but especially pigeon-breeders, in Great Britain and beyond—informed him in the ways of 'picking' and 'roguing', or killing off the aberrant kinds, that they called 'selection', which Darwin then used as the model for 'natural selection'.

Perhaps the most succinct way of summarising the magnitude of pigeons in *Origin of Species* is this. When Darwin sent his manuscript to the publisher, John Murray, Murray asked for an evaluation from Whitwell Elwin, the Rector of Booton (Norwich), his close associate who edited the *Quarterly Review*. Elwin wrote back to Murray (enclosing a copy for Darwin) saying that he and Sir Charles Lyell agreed that Mr Darwin should publish the part on the pigeons and leave the rest for later. As Elwin put it:

> Every body is interested in pigeons. The book would be reviewed in every journal in the kingdom, & would soon be on every table. The public at large can better understand a question when it is narrowed to a single case of this kind than when the whole varied kingdom of nature is brought under discussion at the outset. Interest in the larger work would be roused, & good-will would be conciliated to the subsequent development of the theory in all its bearings. . . . The book on pigeons would be at any rate a delightful commencement & I am certain its reception would be the best stimulus to the prosecution of his subsequent work. (Elwin to Murray, 3 May 1859, *Corres*. 7: 288–91)

Darwin paid no attention to Elwin's recommendation. Writing to John Murray three days later, Darwin described 'both Lyells & M[r] Elwyn's [sic] suggestions [as] impracticable', affirming his intention to publish the manuscript as a whole (Darwin to Murray, 6 May [1859], *Corres*. 7: 295–6). Now Mr Elwin's argument is hard to grasp. Yet Darwin's persistence in linking these two phenomena also raises questions. Why should pigeon-breeding have been so central to his argument about natural selection? And why should such a 'book on pigeons' have been so welcome in 'every journal in the kingdom [and] on every table'. We can begin to understand this better when we know two things. First, Darwin had been interested in fancy pigeons and other domesticated creatures for at least twenty years; and second, he was not alone. The 'fowl mania', as it was called in the popular press—an interest in birds ranging from pigeons to poultry to wild birds from Britain and all over the world—was broadly shared across classes from the 1830s to the 1850s, exactly when Darwin was researching and writing on the transmutation of species. So let us take each of these in turn.

Darwin's early interest in domestication is evident in the notebooks (*Notebks*.) he kept from 1836 to the mid-1840s, in his early essays (*Essays*) of 1842 and 1844, which begin with the same analogy, and in his correspondence (*Corres*.). In the spring of 1855, twenty years after returning from his voyage around the world on the *Beagle*, Darwin followed the advice of William Yarrell, a newsagent in the parish of St James in London

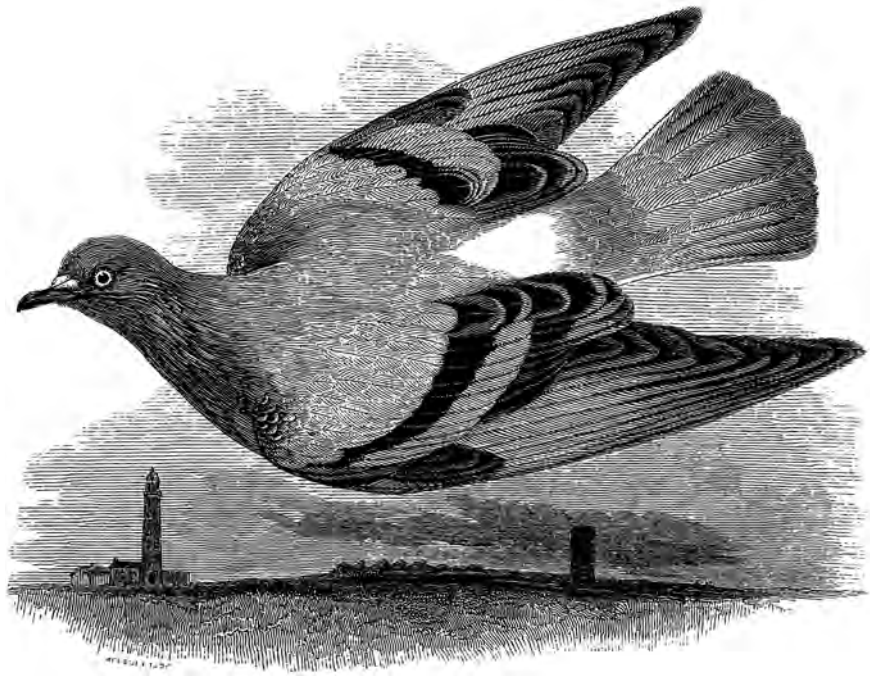

Figure 1. 'The Rock Dove' in William Yarrell's *History of British Birds* (Part 17 [2 March 1840]: 259), drawn on wood by Alexander Fussell, engraved by John Thompson. Yarrell's *History of British Birds* was issued in 1837–43 as a series of pamphlets (2*s*. 6*d*. each), then as a three-volume work (1843), revised and expanded in three more editions (1845, 1856, 1871–85), all published by John Van Voorst, bookseller to the London Zoological Society. The original pamphlets were decorated with the Society's logo: a portrait of John Ray ringed with the short title of his book, 'Wisdom of God in Creation'. Yarrell (1840: 260) stated that 'there appears to be no doubt that the Rock Dove is also the species from which our Domestic Pigeons were originally derived'.

and a self-trained naturalist, who suggested that if Darwin was interested in transmutation, he should focus on pigeons. Yarrell (1837–43, 2: 260) had recently completed his three-volume *History of British Birds*, in which he argued that Britain's domestic pigeons, which most fanciers regarded as distinct species created by God, had a common origin in the Rock Dove, *Columba livia* (see Fig. 1).

Darwin started buying pigeons from John Baily sen. and jnr., father and son, well known poulterers and poultry judges in the West End (Mount Street, near Berkeley Square), not far from Yarrell's home and shop, and also the shop (and former home) of William Bernhardt Tegetmeier, a journalist, editor, and pigeon-fancier whom he got to know through Yarrell. By early November of 1855, Darwin was encouraging

Sir Charles and Lady Lyell to visit by promising that 'I will show you my pigeons! which is the greatest treat, in my opinion, which can be offered to [a] human being' (Darwin to Lyell, 4 November 1855, *Corres*. 5: 492). A few days later, he was writing to J. D. Hooker that he had 'pairs of nine very distinct varieties, & I love them to that extent that I cannot bear to kill & skeletonise them' (Darwin to Hooker, 8 November 1855, *Corres*. 5: 497).

By late fall 1855, he had been elected as a member of two London pigeon clubs, the Philoperisteron in the City and the Columbarian, probably the one in Southwark (Secord 1981: 177; *Corres*. 5: 509). By May 1856, the pigeons had become so central to his questions about 'natural selection' that Lyell wrote to him: 'I wish you would publish some small fragment of your data [on] *pigeons* if you please & so out with the theory & let it take date—& be cited—& be understood' (Lyell to Darwin, 1 May 1856, *Corres*. 6: 89, Lyell's emphasis), the same advice that Lyell also gave when Elwin contacted him about his concern that Darwin had no evidence for his arguments in *Origin*.

As Darwin (1859: 4) eventually explained to the readers of *Origin*, he used the pigeons and their human breeders to introduce his ideas about 'Nature' because humans' domestication of plants and animals provided the best 'explanation [for] the coadaptations of organic beings to each other and to their physical conditions of life . . . the best and safest clue'. He repeated the same argument in more concrete terms in *The Variation of Animals and Plants under Domestication* (1868, 2: 447–8), his first book expanding on the arguments in *Origin*: 'It is hardly possible, within a moderate compass, to impress on the mind of those who have not attended to the subject, the full conviction of the force of inheritance which is slowly acquired by rearing animals, by studying the many treatises which have been published on the various domestic animals, and by conversing with breeders.'

The pigeons remained primary in his subsequent works on domestication, even compared to such 'privileged species' in England (Thomas 1983: 100–20) as horses and dogs. Pigeons occupy over one hundred pages in *Variation* compared to about thirty pages each on dogs and cats, seventeen on horses and asses, fifteen each on pigs and cattle, eight on sheep, three on bees, and one on goats. Darwin's *Descent of Man, and Selection in Relation to Sex* (1871), which he published three years later, is essentially an analysis of 'the descent or origin of man' as a process of domestication, drawing on comparisons of savage and civilised people with wild and domesticated animals already outlined in his *Journal of Researches* (e.g. 1839, 1: 179). So why pigeons?

'Even a Skilful Pigeon-Fancier': Darwin's analogy between artificial and natural selection

Scholars of Darwin's work—notably, historians Robert Young and James Secord, and biologist Mary Bartley—have argued that Darwin got more from the pigeon-breeders than the readers of *Origin*, or perhaps even Darwin himself, might have realised. Robert Young (1971, 1985) was a pioneer in making the argument that Darwin drew upon the plant and animal breeders for the central metaphor of 'natural selection' in *Origin of Species*. Young's main goals were to substantiate Marx's critique of Darwin that he represented the state of nature as if it were English capitalist society, 'with its divisions of labour, competition, opening up of new markets, "inventions" and the Malthusian "struggle for existence"' and to argue that one of the consequences of Darwinism (if not Darwin's own views in their complexity) has been to reify 'the natural, zoological way of thinking' that (as Marx had also observed) aristocrats had long encouraged by their interests in breeding and ancestry. Young also wanted to argue for the need to recognise the power of such metaphors in science. Yet he never elaborated on Darwin's experiences with the breeders that inspired him to use their language.

Secord (1981, 1985) provided a closely detailed analysis of the networks of relations that Darwin established with the breeders, first the pigeon-breeders in particular (Secord 1981), then the many other communities of animal and plant breeders with which Darwin was involved (Secord 1985). Concentrating on the breeders' competitive world, organised around class-based clubs, shows, and prizes, Secord (1985: 539) argued that his findings confirm Young's earlier insights. In short, 'This analogy of selection, which developed gradually in the months and years after Darwin read Malthus, depended critically upon the existence of a group of men engaged in competitive struggle for prizes and individual success. In Darwin's exposition of the structure and ethos of the breeding community, the "common context" of Victorian social and biological theory characterized by Robert Young (1969) is made manifest and concrete' (Secord 1985: 539). While Darwin gained from the breeders' long-time practices of artificial selection, the breeders gained from Darwin the opportunity for social mobility inherent in lifting their 'practice' to the level of a 'science' (1985: 537). Darwin's many acknowledgements of the breeders' work, especially in *Variation*, were part of a larger 'system of intellectual paternalism' (Secord 1985: 536–41). Secord's (1981) study of Darwin's relations with the pigeon-

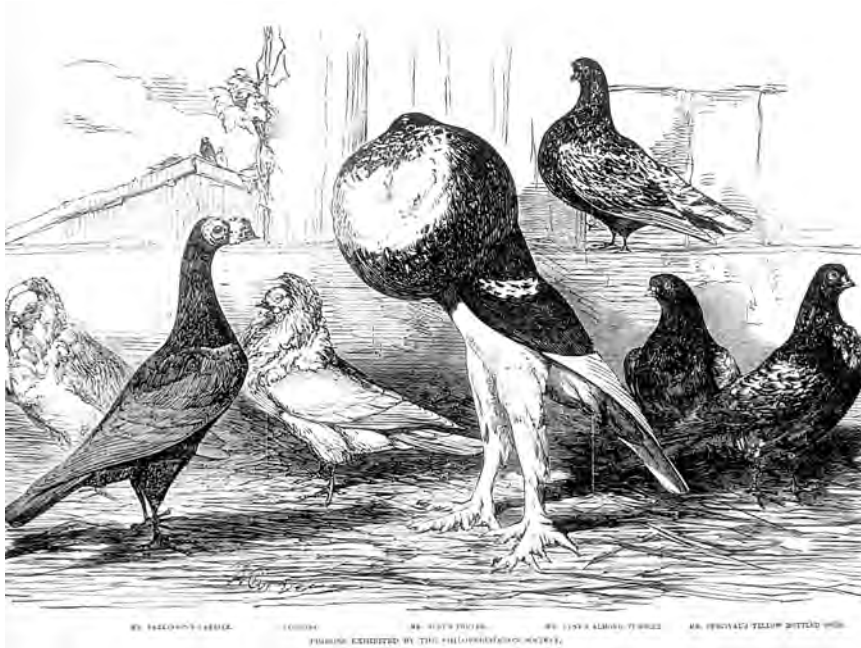

Figure 2. 'Pigeons Exhibited by The Philoperisteron Society' in *The Illustrated London News* 18: 48 [18 Jan. 1851], drawn and engraved by Harrison Weir, himself a pigeon-breeder and member of the Society. The pigeons are identified by both their breeds' and breeders' names.

breeders goes much deeper into how the breeders actually practised their craft. Here he argued that Darwin used his first-hand observations of breeders' fine distinctions of the pigeons' smallest variations, especially their practices at shows, as a model of nature's scrutinising eye: 'nature . . . acting during long ages and rigidly scrutinizing the whole constitution, structure, and habits of each creature . . .' (Darwin 1859: 469) (see Figs. 2, 3).[5]

At Thomas Huxley's suggestion (Darwin to Huxley, 16 December [1859], *Corres*. 7: 434), Darwin included in *Variation of Animals and Plants*

[5] In *Origin*, Darwin (1859: 28) noted that his data on the descent of fancy pigeons 'from a common parent' might encourage naturalists to accept 'a similar conclusion in regard to the many species of finches, or other larger groups of birds, in nature'. Secord (2003; see 1981: 182) suggests that Darwin made pigeons his prime example in order to highlight by comparison the finches of the Galápagos Islands. Following the insights of John Gould, Darwin had come to see the finches as an example of adaptive radiation, not separate creation, as he eventually stated in the second edition of his *Journal of Researches* (1845: 147–8, figs. 1–3; see Sulloway 1982). The finches have since become icons of Darwin's theory (e.g., Weiner 1994).

Figure 3. 'Points of the Pouter', in Robert Fulton's *The Illustrated Book of Pigeons. With Standards for Judging* (*c.*1876: 133, 58). The diagram shows key measures for evaluating quality, to be made with a slide-rule calibrated to sixteenths of an inch.

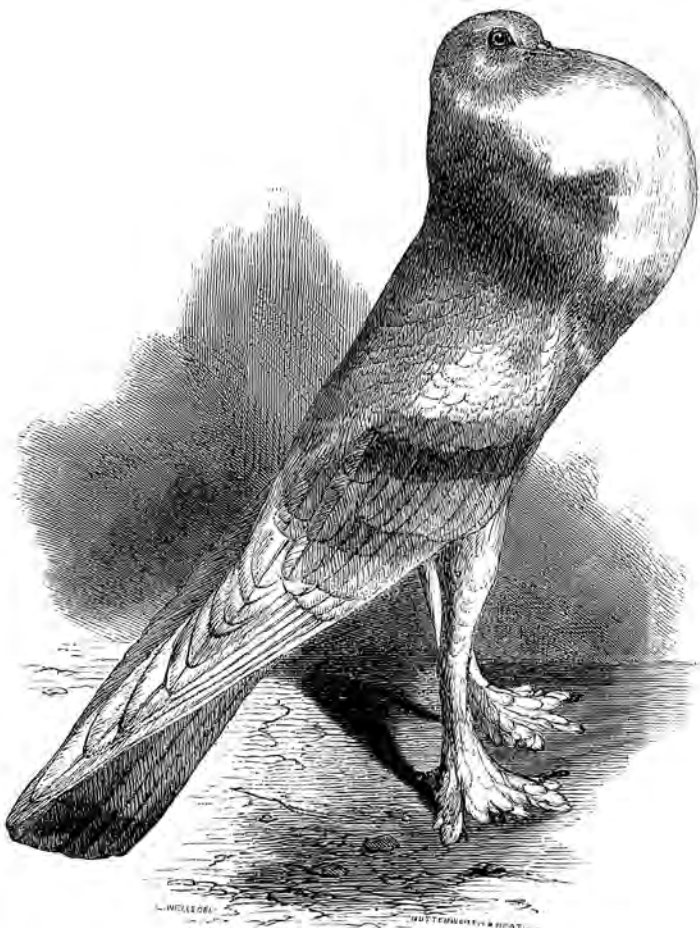

Figure 4. 'English Pouter' in Charles Darwin's *Variation of Animals and Plants under Domestication* (1868, 1: 137–8), drawn by Luke Wells, engraved by Butterworth and Heath. Darwin says of the Pouters, the only 'race' in his Group I: 'If the most strongly marked sub-race be taken, namely, the Improved English Pouter, this is perhaps the most distinct of all domesticated pigeons'.

under Domestication (1868, 1: figs. 17–23) engravings of the birds to give the reader a sense of the visual education not found in books that he got directly from the breeders and their birds (see Fig. 4).[6] The engravings of

[6] Huxley was to give a lecture on Darwin's work at the Royal Institution in London on 10 Feb. 1860 (see Huxley 1860). Darwin had written to Huxley, 'I really do not know how to advise about getting up facts on breeding & domestic breeds—Go to shows is one way—Read *all* treatise on any *one* domestic animal & believe nothing without largely confirmed' (Darwin to Huxley, 27 Nov. [1859]; see Darwin's letter of [5 Dec. 1859], *Corres.* 7: 404–5, 414–15). At

the English Pouter, English Carrier, English Barb, English Fantail, African Owl, and English Tumbler, were based on drawings made 'with great care by Mr Luke Wells from living birds selected by Mr Tegetmeier'; they are 'not in the least exaggerated' (Darwin 1868, 1: 135). Compared to the wild Rock Pigeon (*Columba livia*), 'the parent-form of all domesticated Pigeons', seen as a dead bird hanging upside down on a wall, their diversity is, as Darwin (1859: 21) had already stated in *Origin*, 'something astonishing'.[7]

Darwin attributed the capacity to originate such diversity from a common ancestor to the breeders' acute observation of the minutest variations in the forms of their fancies—their shape, carriage, head, beak, eye, feather—a learned skill requiring a 'lifetime [of] indomitable perseverance':

> If selection consisted merely in separating some very distinct variety, and breeding from it, the principle would be so obvious as hardly to be worth notice; but its importance consists in the great effect produced by the accumulation in one direction, during successive generations, of differences absolutely inappreciable by an uneducated eye—differences which I for one have vainly attempted to appreciate. Not one man in a thousand has accuracy of eye and judgment sufficient to become an eminent breeder. If gifted with these qualities, and he studies his subject for years, and devotes his lifetime to it with indomitable perseverance, he will succeed, and may make great improvements; if he wants any of these qualities, he will assuredly fail. Few would readily believe in the natural capacity and years of practice requisite to become even a skilful pigeon-fancier (Darwin 1859: 32).[8]

For biologist Mary Bartley (1992), Darwin's pigeon-breeding was not simply a metaphor or analogy. More than any other of his experiments,

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Huxley's request, Darwin sent him 'a few remarks & Extracts on Pigeons' to amuse his audience, and eventually lent him some large drawings of fancy pigeons that Dean Wolstenholme had made for John Eaton [see Fig. 6], books with pictures, his manuscript on pigeons (no longer extant) which became the second chapter of *Variation* (1868), two skulls and three lower jaws (Darwin to Huxley, letters of 13, 16, and 24 Dec. 1859, *Corres*. 7: 428–30; 434–6, 447–8). Darwin, who 'had not thought of illustrations' for his forthcoming work on 'domestic productions', may have been inspired by Huxley's example to follow his advice (Darwin to Huxley, 16 Dec. [1859], *Corres*. 7: 434).

[7] The Rock Pigeon was drawn from one of two dead birds that Dr Edmonstone had sent Darwin from the Shetland Islands (Darwin 1868, 1: 134). Yarrell (1840: 259) had thought that the Rock Pigeon, once common, now existed in Britain only in a 'domesticated state', but Selby (1835) and others had found small populations in remote coastal areas in the north.

[8] Given the paradoxes in Darwin's focus on the eye—his portrayal of human beings as sharp-eyed and calculating, with 'some distinct object in view', yet 'blind, capricious, and ignorant' compared to the all-seeing Being, or Nature—it is notable that Darwin emphasises the 'difficulty in forming such organ, as eye, by selection' (*Essays* [1844]: 84 n. 53); he returns to the problem of 'that most perfect organ, the eye', in *Origin* (1859: 187, 189, 202).

pigeon-breeding provided him with the data on inheritance and growth for his theory of generation called 'pangenesis', outlined at the end of *Variation* (1868). Darwin's conception of Pangenesis supports Hodge's (1985: 210) analysis of Darwin as a 'lifelong generation theorist' who was always 'relating generational and geological considerations to one another', and geographical we should add. Here, Darwin (1868, 2: 398–9) envisions animals and plants as gardens of earth filled with seeds:

> Inheritance must be looked at as merely a form of growth. . . . Each animal and plant may be compared with a bed of soil full of seeds, some of which soon germinate, some lie dormant for a period, whilst others perish. . . . An organic being is a microcosm—a little universe, formed of a host of self-propagating organisms, inconceivably minute and numerous as the stars in heaven.

Who are the pigeons in these relations? In *Origin*, Darwin (1859: 31) noted that '[b]reeders habitually speak of an animal's organisation as something quite plastic, which they can model almost as they please . . . Youatt . . . speaks of the principle of selection as "the magician's wand, by means of which he may summon into life whatever form and mould he pleases". Lord Somerville, speaking of what breeders have done for sheep, says:—"It would seem as if they had chalked out upon a wall a form perfect in itself, and then had given it existence"'.[9] In *Variation*, Darwin (1868, 1: 234), claimed that the pigeons are 'mere stones or bricks without the builder's art'. Yet, to make his argument that variations derive randomly from unknown causes with no foreordained purpose, Darwin (1859: 34) has to downplay the very artisanry he admires, describing the breeders' work as 'a kind of Selection, which may be called Unconscious', lest he imply that Nature is governed by a grand design.

In short, to make his case for the impersonality of random variation and non-random selection in *Origin*, Darwin had to play down the sociality, even spirituality, in the breeders' relations with their birds, based as much in the home as in the workplace. So let us take Darwin's work on the breeder's practices of domestication as an entry into what he left out, what his contemporary, Lewis Henry Morgan (1881) would have called their 'houses and houselife'.

[9] William Youatt (1776–1847) was a veterinarian in London, well known as the author of books on breeds of domestic animals and how to manage them. John Southey, Lord Somerville (1765–1819) had an estate in Somerset; he was the foremost breeder of Merino sheep in Great Britain (see Wood and Orel 2001: 60, 110–11, 146–7).

Figure 5. Portrait of the members of the Savage Club as Indians, in A. Halliday, ed. (1867), *The Savage-Club Papers*, frontispiece, drawn by William Brunton, engraved by Dalziel Brothers. William Tegetmeier is wearing a pouter pigeon as his feather-head-dress (and perhaps his hair). The Savage Club was founded in London in 1855–7 for 'Bohemians'—actors, dramatists, journalists, illustrators, writers—for example, G. L. M. Strauss (at the centre), Artemus Ward, J. R. Planché, John Hollingshead, George Cruikshank, W. S. Gilbert, Clement Scott, and Andrew Halliday, who are also shown here. Watson (1907: 60), a later member, noted in his chapter, 'Migratory': 'True to its Bohemian character, [the Savage Club] has moved about from place to place some half a dozen times, for it has never had a house of its own, but has always taken rooms at hotels somewhere or other near the Strand'. Many of its early members were connected to the Lyceum Theatre, perhaps inspiring the stage on which the figures are portrayed.

'Little Men'

The pigeon breeders in London, whom Darwin got to know best during the mid to late 1850s, were in the trades, especially trades related to journalism. William Yarrell and Samuel Bult were both newsagents, William Bernhardt Tegetmeier a journalist and editor, Harrison Weir and Dean Wolstenholme were illustrators and painters, John Eaton a tailor in Southwark (see Fig. 5). Their businesses were in the West End and in Southwark; their clubs in pubs in the areas of Covent Garden and Lincoln's Inn Fields, Berkeley Square, London Bridge, the Borough (Fulton *c*.1876: 384–6). Yet in these years, roughly a generation after Darwin had moved his new family from Upper Gower Street to Down in 1842, they too were beginning to move their households out to the suburbs north and south of London.

Darwin respected them for their knowledge, yet he described them as 'little men' in a letter to his son William in November 1855:

> I am going up to London this evening & I shall start quite late, for I want to attend a meeting of the Columbarian Society, which meets at 7 oclock near London Bridge. I think I shall belong to this Soc.^{y}. where, I fancy, I shall meet a strange set of odd men.—M^{r}. Brent was a very queer little fish; but I suppose Mamma told you about him; after dinner he handed me a clay pipe, saying 'here is your pipe' as if it was a matter of course that I sh^{d}. smoke.—Another odd little man (N.B. all Pigeons Fanciers are little men, I begin to think) & he showed me a wretched little Polish Hen, which he said he would not sell for £50 & hoped to make £200 by her, as she had a black top-knot.—I am going to bring a lot more pigeons back with me on Saturday, for it is a noble & majestic pursuit, & beats moths butterflies, whatever you may say to the contrary. (C. Darwin to W. E. Darwin, 29 Nov. 1855, *Corres*. 5: 509)

We are able to know these men a little through Darwin's correspondence and the London Post Office directories of the time; and in some cases because they wrote about their interests (or were written about by their kin or their friends). We know them mainly through their birds. Their writings about pigeons and pigeon-breeding, and their drawings and paintings—portraits in many cases—give some indication of what Darwin omitted from his account, especially concerning the association of pigeon-breeding, domestic relations, and their own homes and gardens (see Fig. 6).

Pigeons were celebrated first of all for their loyalty and devotion. They were 'monogamous', to use the breeders' own language, expressing their love for each other in 'the Colombine kiss' and forming life-long unions. The male and female birds together brooded their eggs and

Figure 6. 'A Portrait from Life in the Possession of the Author [Short-faced Almond Tumbler]', in J. M. Eaton (1852), *A Treatise on the Art of Breeding and Managing Tame Domesticated, and Fancy Pigeons* . . ., frontispiece, one of eighteen plates drawn, engraved, and painted by Dean Wolstenholme (1798–1883), an artist specialising in animals and a pigeon fancier. Eaton prefaced his *Treatise*, self-published at Islington Green, with this epigraph: 'All that a Man knows, or ever will know, is by Observation or Reflection. Locke'. Having inherited his father's tailoring business in Southwark, Eaton later gave it up for breeding and writing about pigeons (Tegetmeier 1868: 277).

nursed their young with 'Pigeon's Milk' which, in being regurgitated from their crops, seemed to come from their breasts. The pigeons' very loyalties to their mates allowed a breeder to keep pairs of many kinds in the same loft without worrying that they would step into others' nests. Yet they were also communal birds, preferring to live their paired lives in flocks. Their social bonds were thought to explain the pigeons' famous 'homing' ability: they flew home, even from great distances, in order to be with their loved ones, including their human companions, in whose hands they would allow themselves to be held. In the words of one breeder: 'To say the truth, we believe a great deal of the charm of the pigeon fancy lies in the facility with which a bird can be thus held in the hand' (Wright 1879: 36).

Second, like other kinds of pets, the pigeons seem to have been regarded as children like the breeder's children, but also like himself as a child. Breeders' favourite pigeons were typically the kind they played with as children, closely associated with the parent (usually the father or grandfather), or family friend, who gave them their first birds, and almost always with a close childhood friend. The birds evoked a larger world of intimate relations including humans as well as animals. While Darwin abstracted the fanciers' designs and social relations from his analysis of the historical origins of the various breeds of pigeons, the fanciers connected them, identifying people with their birds (as in Fig. 2) and representing the birds' genealogical histories with human genealogies set in the same remembered places.

Third, they were linked to ideals of craftsmanship. While Darwin downplayed the breeders' artistry, this was the breeders' main interest: how to entice pigeons to settle in their home, how to get fearful Tumblers to tumble, how to doctor their ailments, but above all, how to get their birds to breed in confinement, which could not be forced, and to create thereby new living forms of beauty. The art in pigeon-breeding lay in the spectacular and ever more refined and subtle designs in the shapes, colours, feathers, sounds, and movements of the birds, but also in the delicacy of the social relations through which the birds agreed to make their home with the breeder, be fruitful and multiply. In the words of the Reverend J. Lucas (1886: 14–15), writing his memoirs as a pigeon-fancier: 'Pigeon-Fancying is the art of propagating life. . . . Pigeon-breeding is a consummate art. It has been tastefully and truly termed the cultivation of living flowers—the production of living pictures beautiful in form and rich in colour. The Fancier is an artist; and no artist has attained to perfection in the art. . . . The best bird has yet to be bred.' Yet, as Mr Lucas also knew well, the worst birds could always be killed and eaten.

These ideals of craft and art seem to have varied in different trades. Racing pigeons became the favourite of miners in the north of England (but this seems to be a later development). In the case of fancy pigeons in Britain, the trade was weaving, and more broadly the textile and fashion trades. Darwin (1868, 1: 226) himself drew a parallel between the two domains in speculating on the seeming arbitrariness of tastes in the fancy, such that breeds highly valued in one place might be worthless in another:

> Fashions in pigeon-breeding endure for long periods; we cannot change the structure of a bird as quickly as we can the fashion of our dress. In the time of Aldrovandi, no doubt the more the pouter inflated his crop, the more he was

> valued. Nevertheless, fashions do to a certain extent change; first one point of structure and then another is attended to; or different breeds are admired at different times and in different countries. . . . Breeds which at the present time are highly valued in India are considered worthless in England.

The enormous importance of these craft ideals among textile workers may best be appreciated if we go even deeper into the heartland of the pigeon-fancy, which—as everyone knew then—lay not with the middling classes of newsagents, journalists and better sorts of tailors, but with people formerly called 'artisans', but then increasingly 'mechanics' or 'operatives', and not in the West End of London, but in the East End. As Mr Lucas (1886: 34) also explained: 'Considering the pedigree in England, Spitalfields is the cradle of the fancy.'

'Spital-field Weavers & All Sorts of Odd Specimens of the Human Species, Who Fancy Pigeons'

In September 1856, Darwin wrote to an American colleague, James Dwight Dana, a geologist and zoologist at Yale University: 'In the case of Pigeons, we have (& in no other case) we have much *old* literature & the changes in the varieties can be traced. I have now a grand collection of living & dead Pigeons; & I am hand & glove with all sorts of Fanciers, Spital-field weavers & all sorts of odd specimens of the Human species, who fancy Pigeons.' (Darwin to Dana, 29 September [1856], *Corres*. 6: 236, Darwin's emphasis.) Darwin would have learned about the fanciers of Spitalfields from the men he had met through Yarrell. The origins of the fancy among artisans and mechanics comes out clearly in their accounts. For example, the same Mr Brent (1853: 35) whom Darwin found to be 'a very queer little fish' in 1855 had written a couple of years earlier: 'Time was, and not many years since, when "a Pigeon Fancier" was associated in all men's minds with Costermongers, Pugilists, Rat-catchers, and Dog-stealers, and for no other reason that we can discern than that the majority of Pigeon Fanciers were artisans—men who lived in the courts, alleys, and other by-places of the metropolis.'[10]

[10] At the time of his death in 1867, the editors of *The Field* (1867: 70) described Bernard Philip Brent as an 'old and valued correspondent [who] spent a considerable period of his life on the Continent and was well versed in the history of the varieties of fowls and pigeons cultivated in both France and Germany'. He also wrote numerous articles for *The Cottage Gardener* and *The Poultry Chronicle* in the mid-1850s, some of which he collected in books.

Except for the shop of John Baily father and son in Mount Street, Berkeley Square, most of the London bird markets were located in the poorest neighbourhoods, like St Giles in the Fields, Seven Dials, Whitechapel, St Olave's in Southwark. Of these, the best known was the Club Row market in the East End, in the area broadly known as Spitalfields. This is evident from many sources, for example, from Henry Mayhew's first letters on 'Labour and the Poor', published in the *Morning Chronicle*, beginning in September 1849 with the Spitalfields weavers, then continuing with letters on street-sellers and costermongers, the sellers of 'beasts, birds, fish and reptiles' first among them. The Club Row bird-market, extending into Sclater Street east to Brick Lane, was located behind Shoreditch Church (St Leonard's) and north of Shoreditch station when the terminus of the Eastern Counties Railway was built there in 1840. The Club Row market remained the most important bird market in London up to 1983, when the Royal Society for the Prevention of Cruelty to Animals succeeded in banning the street-sale of live animals, after decades of protest (see Fig. 7).

So who were the Spitalfields weavers? And why were they such 'odd

Figure 7. 'Sunday Morning Bird-Fair in Club Row, Shoreditch', in *The Illustrated Times* (8 Aug. 1868), p. 89, drawn by David Henry Friston. The view is the corner of Sclater Street and Brick Lane, looking north.

specimens of the Human species [that they would] fancy Pigeons', to use Darwin's words? Besides the accounts of contemporary writers like Mayhew, missionaries in the London City Mission Society, medical inspectors like Dr Hector Gavin (1848), and others, the most detailed evidence comes from the *Parliamentary Papers* (henceforth *PP*), especially Dr James Phillips Kay's report to the Poor Law Commissioners 'on the subject of Distress in Spitalfields' (*PP* 1837) and the reports of the Select Committee on the Condition of Hand-Loom Weavers in the United Kingdom written from 1838 to 1841.

Spitalfields was a place just outside the old east wall of the City, long identified with the manufacture of silk, by hand-loom weavers in families living in terraced houses with tiny yards, doing work so exacting that it required a 'weaver's eye', as it was then called. During the very years when Darwin was surveying on the *Beagle* (1831–6), writing his notebooks on 'transmutation' and 'metaphysical enquiries' (1836 to the mid-1840s), then his essays (1842, 1844) and eventually *Origin of Species* (1859), they had become the emblem of the most intense debates in political economy: over the persistence of hand-loom weaving in the face of the rapid industrialisation of the textile trades; the value of international 'free trade' in promoting domestic wealth; over whether the Spitalfield weavers could compete with other districts without the protections of the Spitalfields Acts, withdrawn in 1826; in short, what one of the reporters on the conditions of the hand-loom weavers called 'the great mystery of human progress' (*PP*/Fletcher 1840: 187).

Drawing on the reports of these contemporary observers of the Spitalfields weavers in the process of their transmutation in the 1830s, 1840s and 1850s, that eventually resulted in what became known as the 'black decades' of the 1860s to the 1890s, to use the words of Frank Warner (Warner *c.*1921: 542), a third-generation manufacturer of silk in Spitalfields, I will focus on four key issues: (1) the political ecology of the silk manufacture—its relation to land and seasons; (2) the housing of weavers; (3) the nature of the work requiring a 'weaver's eye'; and (4) its hereditary mode of descent.

The Biogeography of the 'Trade Art or Mystery' of Silkworking in London

Spitalfields, 'the suburban fields situate between the ancient highways of Bishopsgate-street and the Whitechapel High Street', was, as J. Mitchell

(*PP* 1840: 52) reported to the Select Commission: 'the oldest seat in England of the silk manufacture . . . and, for a long period, had almost exclusively the whole silk trade of the kingdom, and still employs many thousand looms'. Legal and other documents testify to the presence of 'the Trade Art or Mystery' of Silkworking within the City of London beginning in the 1330s (Warner *c.*1921: 626–31). From the mid-eighteenth to the mid-nineteenth century, the area associated with the Spitalfields weavers had gradually expanded to encompass the 'parishes of Christchurch Spitalfields, and Bethnal-green, the hamlet of Mile-end New Town, with portions of Whitechapel, of Hackney, and of St. Leonard's Shoreditch'. A comparison between Rocque's map of Spitalfields and Whitechapel in 1746 and the Survey Maps of London covering the same area in 1822 and in 1876 (surveyed in 1861–8) shows the increasing density of building on formerly open land east of the City (see Davies 1987: 70–2, British Library 1986: 136–9).

Despite repeated attempts, silk-worm cultivation never thrived in the British Isles, so silk remained a costly fibre imported from abroad, mainly from Italy, Turkey, India, and China (Warner *c.*1921). The delicacy and absorbency of the fibre were key factors in how it was handled. Mechanisation of silk weaving proved difficult to do without breakage. Therefore, hand-loom weaving persisted much longer in the manufacture of silk, compared to cotton, wool, and linen, and in all three branches of the trade: 'plain', 'figured', and 'fancy'—'fancy' being the technical term for the 'highest class of figured goods', including velvets, cloths of gold and the like (*PP* 1832: 8395).

'[Silk] being a Fancy Article', to cite the testimony of a silk manufacturer to the House of Lords in 1823, 'the Capital, like a Nursery Ground, rears the Articles and propagates the Manufacture to all Parts of the Kingdom' (*PP* 1823: 177). Based on such Fancies, the silk manufacture was at once highly lucrative, yet highly seasonal and, despite intermittent protective tariffs, ceasing in 1826, its growth was utterly unpredictable, subject to 'caprices of fashion [that] baffle all calculation' (*PP*/Mitchell 1840: 215):

> The first and great cause of the distress of the weavers, is the irregularity of their employment. . . . There is, perhaps, no occupation in society so much subject to irregularity and uncertainty of employment, as that of the silk weaver. In common with the merchant, he is affected by the fluctuations of commerce, and he is also subject to that which influences his fate still more, and which baffles all possible calculation, the caprice of fashion. . . . An extremely exciting and supposed prosperity, as in the beginning of 1825 and in 1836, bringing

> workers into the trade, may be followed abruptly by a sharp fall, leaving weavers without work, beginning with the least skilled, then affecting all.[11]

Thus weaving in Spitalfields was associated with the development of market-gardening in the fields east of London. Depending on the season, weavers also resorted to the London Docks for work and for goods that could be sold on the street (*PP*/Kay 1837: 192). As Mayhew (1849b [26 October]: 5) put it, the Docks 'constitute, as it were, a sort of home colony to Spitalfields, to which the unemployed weaver migrates in the hope of bettering his condition'.[12]

'Philosophy of the Roofs of Houses'

The intimate connection between geographical and seasonal transmutations in the silk manufacture, and changes in land-use patterns more broadly, is most evident in housing. As one of the Hand-Loom Commissioners observed, a weaver, by contrast to a shoemaker or tailor, requires a place for his loom: a house or at least a room. Although two small factories were established in Spitalfields in 1820–30, growing to around seven in 1850 (Warner *c.*1921: 75–6), most silkweavers worked in their homes or in the homes of others (*PP*/Hickson 1840: 647; *PP*/Senior *et al.* 1841: 280). Silk-manufacture in

[11] Hickson (*PP*/1840: 643), who revisited Spitalfields, also emphasised this point (and it comes up throughout the other reports): 'Upon this head, every weaver I consulted, whose testimony was entitled to credit, agreed in opinion that the trade of weaving had ever been from the earliest period, subject to great fluctuations; this, however, is more characteristic of the silk trade than of any other branch of weaving'. Hickson went on to argue that the fluctuations of the trade might be due in part to 'the peculiar circumstances attending its introduction into the country' which he identified with the Huguenots' flight from persecution in France following the revocation of the Edict of Nantes in 1685. As recipients of a special Government charity, 'La Munificence Royale', they had become accustomed to 'legislative [or] charitable assistance' rather than the 'self-support' that Hickson associated with free trade. William Bresson, a velvet-weaver and loom-broker in Spitalfields, also emphasised the fluctuations of the trade in his testimony to Hickson on 14 July 1838, using extracts from his cash-book as proof of the vicissitudes of his income over the last seventeen years; however he did not attribute his circumstances to a dependence on government charity or lack of trust in his own efforts, but rather to the 'uncertain and precarious' nature of the silk manufacture (*PP*/Hickson 1840: 644–5, 714).

[12] Thus, Henry Mayhew's (1849a,b) series on 'Labour and the Poor' in London for the *Morning Chronicle* began (after Letter 1 describing the purpose of his series) with Letter 2 on the 'Spitalfields weavers', undoubtedly because they were by then the best known of 'the Poor', followed by Letters 3 and 4 on the nearby London Docks where they sought work during their frequent, if not permanent, seasons of distress. The 'considerable number of the weavers . . . reported to be too feeble for great bodily exertion . . . scatter[ed] themselves over the town' as costermongers, while their children were hired out at the Monday market in Bethnal Green to weavers who had work and to shopkeepers (*PP*/Kay 1837: 192).

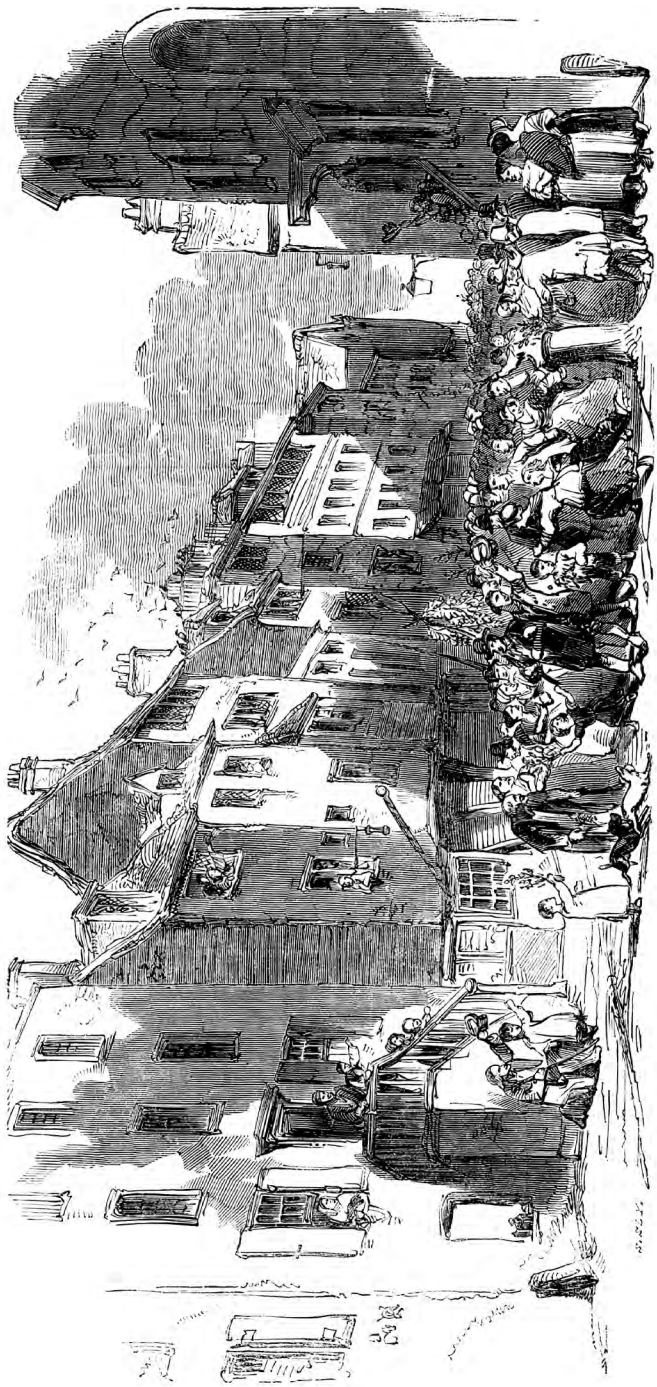

Figure 8. 'Palm Sunday in Spitalfields', in *The Illustrated London News* 4: 213 (6 April 1844), drawn by S. Ely. The view shows a house with weavers' windows called 'lights', characteristic of the house-workshops built in the 1700s, a dovecote on the roof, with birds flying about it.

the reigns of Queen Anne (1702–14) and King George I (1714–27) was still based in house-workroom-shops in the parish of Christchurch Spitalfields, connected to patches of gardenland and gardenhouses further east in the hamlet of Bethnal Green or beyond (see Fig. 8).

As the silk-manufacture spread out into neighbouring parishes, the townhouses gave way to densely packed rows of attached houses with tiny yards that were even more critical to supplementing income as some of the more easily mechanised aspects of the silk manufacture moved out of London, driving prices down in Spitalfields (see Fig. 9). Thus the birds, animals, and plants—domestic and exotic—sold in street-markets must also be seen as the outcome of a kind of radical intensification of the historical process of enclosure that was occurring around London as well as in other cities and in rural areas (see Figs. 10, 11).[13]

As Mitchell (*PP* 1840: 54) commented about the transformation in the quality of housing from the large lofty houses built in the early eighteenth century 'immediately contiguous to Christchurch Spitalfields' to those

Figure 9. Cranbrook Street in Globe Town, looking east towards the wharf on the Regent's Canal. Photograph by William L. Restall, JP (22 Feb. 1933). The view shows the later form of windows in terraced housing built for weavers in Cranbrook Street and adjacent Alma Road beginning in 1851. Reproduced with the permission of the Tower Hamlets Local History Library and Archives (331.1).

[13] See the account of Eversley (1894), founder of the Commons Preservation Society in 1865.

Figure 10. Pettits Walk (now Finnis St), Bethnal Green, *c.*1870. Photograph by the Improved Industrial Dwellings Company, London, prior to their demolition of the site. The view, looking north-west, shows garden houses transformed into weavers' house-workshops, and the Waterlow Buildings in Wilmot Street, constructed by the Improved Industrial Dwellings Company in 1869. Reproduced with the permission of the Tower Hamlets Local History Library and Archives (331.1).

'lately built': 'There is no parish in or about London where there is such a mass of low-rented houses with only an exceedingly small number of houses of a larger value.' For his contemporary Dodd (1841–4, 2: 385–6), seeing the situation from the perspective of a rider on the Eastern Counties Railway going from the lately built Shoreditch station out to Essex, Spitalfields called for a new 'philosophy of the roofs of houses':

> Were we to speak of the 'philosophy of the roofs of houses,' it would doubtless be deemed an odd innovation on the established range and scope of philosophy. Yet, though odd, it is not worthless: the busy scenes presented in our streets, the diversity of purpose to which the lower stories of our houses are appropriated, the changes in form and fashion observable in house-architecture, the varied adaptation to the extended wants and tastes of the inmates,—have all been prominent objects for study, on the part of the painter, the poet, the statesman, the topographer. But is there nothing to be gleaned from a more elevated point of sight? Is the region of attics and garrets, roofs and chimneys, a barren one? Let us see.
>
> We will suppose the reader to be accompanying us in a short trip on the Eastern Counties Railway, which, commencing in Shoreditch, cuts through a

Figure 11. Back yards of houses in Pereira Street, looking south from 9 Holmes Ave., *c.*1900, razed about twenty years later, after the First World War. Note the bird-cages in the two yards in the foreground (on the wall of a privy and at a kitchen door), and the dovecote in the yard at end of the row. Reproduced with the permission of the Tower Hamlets Local History Library and Archives (331.1).

> densely-populated mass of buildings before getting into the open country, and which, from the necessity for leaving space for the street-traffic beneath, is elevated to the level of the roofs. . . . House after house presents, at the upper stories, ranges of windows totally unlike those of common dwelling-houses, and

> more nearly resembling those of a factory or a range of workshops. . . . The windows tell their own tale; they throw light upon the labours of the *Spitalfields Weavers*, who, almost without exception, inhabit the houses here spoken of. . . .
>
> But the *roofs* of the houses; what of them? Many and many a roof exhibits a piece of apparatus which on steady inspection is seen to be a kind of bird-trap; or else another specimen of mechanism, which, resembling a pigeon-house in appearance, seems to be used as a large cage. Other districts in London are sparingly decked out in a similar way; but so thick are the instances in Spitalfields, that they form one of the characteristics of the spot;—a characteristic expressed in other words by saying that the weavers of Spitalfields and Bethnal Green are the most famous bird-catchers in or near London. These men supply the greater part of the singing-birds, such as linnets, woodlarks, goldfinches, greenfinches, and chaffinches, found in London: sometimes spreading their nets in the fields northward of the metropolis; and at other times finding a market for their birds in the eastern part of London. The erections on the roofs of the houses have reference to these bird-fancying, bird-catching propensities of the weavers.[14]

The persisting depth of attachment of Spitalfielders to their birds, plants, and animals is evident in contemporary accounts, for example the report of a missionary (*London City Mission Magazine* 1872: 249–50) for the London City Mission Society remembering the years 1852 to 1861, when he worked in the Nelson Street district behind Shoreditch Church in the parish of Bethnal Green. This was a densely settled area of small four-room houses, usually a family to a room, sharing a washhouse and small yard at the back, 550 to 600 families in four narrow streets, mostly weavers, but including some shoemakers and costermongers:

> In this close part of London it was singular to see the love which existed to gardens and animals. I remember the first-floor room of a shoemaker, who had so carefully trained ivy plants, that he had covered the walls and ceiling of the room with them as completely as the village church at Hadley is covered outside. . . . Another man, living with his wife and children on a first-floor, always kept in the room one or two monkeys, a cage of white mice, some fowls, a pigeon, a cat, and a dog, while his donkey was kept in the washhouse. Many of the weavers used to have a pigeon-dormer on the roof of the house, where they spent nearly the whole of their Sundays, and much of their time during the week. These few facts will give some faint idea of the class of people residing upon the Nelson-street district.

[14] Dodd's (1841–4, 2: 385–6) essay on Spitalfields in Knight's *London*, published about the time of Mitchell's (*PP*/1840) Parliamentary report on silk-weavers in Spitalfields, suggests that most Londoners from other parts of the city, if they did not frequent the street-markets, would have seen the weavers' windows from the heights of the Eastern Counties Railway running over them. Dodd does not mention, as Godwin (1854: 33) does a decade later, that the dilapidated housing east of Spital-square is 'becoming more and more crowded in consequence of the removal of houses by the Eastern Counties Railway Company, who have purchased part of the neighbourhood', and that '[i]n other districts, owners of houses will not permit the looms to be set up'.

The 'Weaver's Eye'

The birds and plants alike were linked to artisanal ideals. They were an aesthetic expression of ideals of craftsmanship associated with silk-weaving, especially skills in the design and execution of the forms, textures, and patterns of 'fancy' and 'figured' goods, like velvets, damasks, and patterned textiles, in which the 'weaver's eye' was crucial to the quality of the work. So when Thomas Huxley (1862: 101), in his 'Lectures for Working Men' given at the Museum of Practical Geology in London, introduced Darwin's theory with Darwin's example of pigeon-breeding, emphasising his ignorance of the 'great art and mystery' of the pigeon fancy, he may have used the guild language of their crafts to convey, as he said himself, his 'humility and hesitation'. Yet he would also have expressed the connection between their craft and their fancy. Thus the scrutinising eye of the pigeon fanciers, so apparent in the handling of their birds, has its corollary, perhaps its prototype, or more likely its interactive counterpart, in the scrutinising eye required in the most skilled work, the fancy work, of their craft.[15]

The extraordinary craft expressed in the 'weaver's eye' can best be appreciated from a closer look at the work itself, for example, the 'coronation velvets' that George Dorée—a velvet-weaver and warp-spreader—wove for the coronation of Edward VII, and inthronisation of Queen

[15] The acutely discerning eye of the weaver, or fancier, confronted with the ultimate 'mystery' of weaving, or breeding, is strikingly parallel to Darwin's distinction between the acutely observant, yet ultimately blind, eye of the fancier compared to the 'scrutinizing eye of Nature' at the heart of the 'mystery of mysteries' (Darwin 1859: 1) (see above, pp. 317, 326 n. 8). The 'Weavers' Flag', woven in 1808–11 to demonstrate that silk weaving in Spitalfields was superior to all, was organised around the sun-like image of an eye—described by its makers as the 'all-seeing Eye of *Divine Providence*'—overlooking allegorical female figures of Silk, Genius, and Enterprise and surrounded by doves (pigeons) and figures of Peace and Commerce (cited in Warner *c.*1921: 509–11, Plate 49, his emphasis).

The 'mystery' may also have referred to the trade secrets which were as prevalent in silk manufacturing as in animal and plant breeding. Robert Bakewell (1725–95), who became famous for the sheep he bred on his family's farm in Leicestershire, ensured that his records would remain secret even after he died. William Marshall (1745–1818), who surveyed English farming in the 1780s and 1790s was never able to induce Bakewell to tell him the origin of his breeding stock. However Marshall's later reference to the 'art, science and mystery of breeding' was intended to remind his reader that even the most experienced breeders had not fathomed every aspect of their craft (see Wood and Orel 2001: 57–9, 110). J. Secord (1985: 523) argues that the breeders' secrecy about their work, compared to the naturalists' dedication to communicating their scientific results, was one factor in keeping the groups apart. A. Secord (1994: 291–4; 1996: 386–8) documents the importance of skill in their crafts and scientific practices alike among artisan botanists in Lancashire in the mid-nineteenth century.

Alexandra, held on 9 August 1902. Frank Warner (*c*.1921: 99), a silk-manufacturer in Spitalfields and Braintree, interviewed George Dorée in his home at 42 Alma Road in 1914, two years before Dorée died (see Fig. 12). Here is his account of Dorée's house and yard, then occupied by himself, his wife who was a silk-weaver, and two unmarried sisters, who were also involved in the trade:

> The house contains four rooms on the ground floor, and a passage from front to back divides it in the centre. As one enters this passage, there can be seen through the open door at the opposite end of it, a small back-yard, gay with flowers in bloom and furnished with a large, neat aviary, in which a few specimens of a delicate prize breed of pigeons coo and strut in the summer sunshine in all the pride of their pencilled iridescent plumage.[16]

The entire upper floor, reached through a trap-door at the top of a steep flight of stairs, was occupied by Dorée's warp-spreading machinery along the three ordinary windows at the front of the house and two looms and their mechanisms along the casement window extending the length of the room at the back (see Fig. 13). The coronation velvets were woven on a third loom in the parlour, where he still had pieces of them displayed in a small glass-covered mahagony box (Warner *c*.1921: 100–1).[17]

According to what Dorée told William Manchée (1918: 420–1), who later interviewed him for the Huguenot Society:

> [King Edward VII's] Coronation velvet was thirty yards long and twenty inches wide. [Queen Alexandra's velvet was twelve yards long.] To use the technical expressions of the trade, it was an 1850 thread, 60 wires, 180 shoots, and treble pole with a two-thread ground. It took six yards of the top cane [warp] to make

[16] George Dorée told Warner (*c*.1921: 74) that he was born in 1845 in a poor street near Globe Road. His father, 'a weaver of Huguenot descent'. George Dorée moved at least four times before finally settling in the 1890s at 42 Alma Road near the Regent's Canal, one of several terraced houses built for weavers in the 1850s (see Fig. 9 above) that still 'stood in an open space divided into small gardens [most] hired by Spitalfields weavers' (*London Censuses* for the decades of 1861 to 1911 (Warner *c*.1921: 74)). In 1900 George Dorée successfully represented the weavers in Globe Town to the Borough Council which planned to level the houses to build an electric power station and dust destroyer on the site (Manchée 1918: 424). In 1914, there were still forty-six weavers' workshops in the area, thirty-eight of them in Alma Road and Cranbrook Street (Warner *c*.1921: 98–9). In 1959, the rowhouses in this area were torn down to build Cranbrook Estates, which opened in 1964.

[17] The mahogony box was a gift from Bhawani Singh, Raj Rana Bahadur of Jhalawar who visited Dorée in May 1904 and bought a replica of the King's coronation velvet (but twelve yards longer) (Manchée 1918: 421; Singh 1912: 61). Dorée's widow donated the box with the velvets, two brass reeds, and the trevat used to cut the silk loops to make the pile, to the Museum of London. The box, recorded as an acquisition in the early twentieth century, has not been found in recent inventory checks. The Museum has another scrap of Edward VII's coronation velvet kept in the small cardbox from a Holborn optician in which the donor gave it.

Figure 12. Fronts of houses in Cranbrook Street, looking north toward the back of George Dorée's former residence at 42 Alma Road. Photograph by William L. Restall, JP (22 Feb. 1933). Dorée's house had a central entrance with three ordinary windows on the second floor, like the houses shown in Cranbrook Street. As shown in Fig. 13 (from the inside), a casement window once extended the width of the second floor at the back to provide light for the looms. Restall's notes on the photograph indicate that the old casement window had been replaced by a 'new wall and frames' for ordinary windows; 'This is a pigeon dormer' on the far left. Reproduced with the permission of the Tower Hamlets Local History Library and Archives (331.1).

> one yard of the pile of the velvet. [This] means that Mr. Dorée . . . had to weave in the brass reed sixty times to every inch; nevertheless the cut of the pile is so true that the grain of the pile cannot be seen. . . . To each square inch 33,120 threads stand on end, to each yard 23,846,400 or 763,084,800 threads in the entire piece, and withal perfect in match and size, so strong that a man could stand on it without pressing it down.

It took George Dorée a week to weave three to three and a half yards of the silk velvet, and five months to complete the work, interspersing the weaving with lighter jobs because of the strain. The silk manufacturers, Bailey, Fox and Company in Trump Street supplied the velvet to Ede, Son and Ravenscroft in Chancery Lane, robe makers and court tailors since the reigns of William III (1689–1702) and Mary II (1689–94), who made

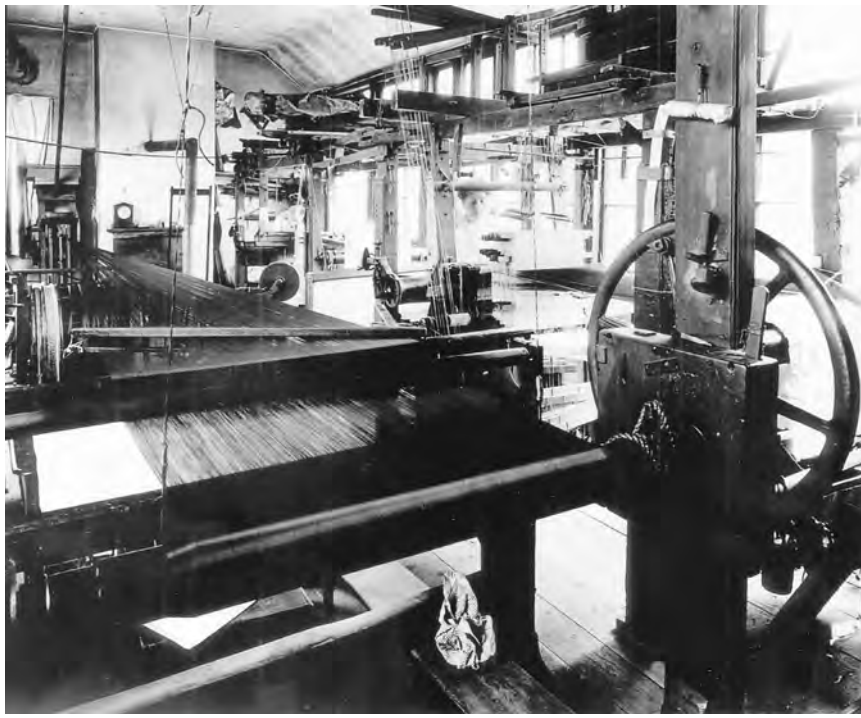

Figure 13. George Dorée's warp-spreading machine (along the three windows at the front), looking towards the two women weaving at looms along the casement window at the back. Photograph by the London County Council in 1909, or possibly 1900, when Dorée successfully represented the weavers in Alma Road and Cranbrook Street to the Borough Council (see above, n. 16). Reproduced with the permission of the Tower Hamlets Local History Library and Archives (680.2).

Edward VII's robe for £698.10.0, including the ermine tails lining the train and the cape (see Fig. 14).[18]

The train of Queen Alexandra's robe, carried in the coronation by eight pages, was embroidered at her request with what Filomena (1902: 254) described for the 'Ladies Page' of the *Illustrated London News* as 'a genealogical tree of the British Empire':

[18] The coronation robes of Edward VII and Queen Alexandra are in the Dress Collection Archives, Kensington Palace (Accession numbers 48.14/1 and 33.214/2; File: 'Edward VII Coronation Robe'). When they were examined in 1987, Edward VII's coronation velvet was edged with 94 ermine tails on the robe (many were 'missing or eaten') and 86 on the cape; Queen Alexandra's velvet was edged with 130 tails on the robe and 26 on the cape.

Figure 14. 'The Position of Queen Alexandra, Queen Consort at Her Inthronization', in *The Illustrated London News* 1902: 49; see 28, 35, 42), from a painting by S. Begg. The coronation in Westminster Abbey was planned for 26 June 1902, but not held until 9 August, so this is the artist's imagined view. The Queen was attended by the Duchess of Buccleuch and six daughters of Earls. She is wearing her silk velvet coronation robe lined with ermine and embroidered with 'the genealogical tree of the British Empire' (see Fig. 15). King Edward VII wore his crimson velvet parliamentary robes at the beginning of the service. His coronation was achieved in part through his investiture with the Supertunica or Imperial Pallium, which he is wearing in the background. This mantle was made of spun gold woven by Warners of Spitalfields/Braintree, and embroidered in purple silk with the same 'national emblems' (Warner *c.*1921: 548) as found on the Queen's train: Rose, Shamrock, Thistle, Lotus (for India), and Fleur-de-Lys, as well as Eagle (a sign of 'the independence of the crown'). King Edward VII could exchange the Supertunica for the purple coronation robe only after he was crowned, when he was leaving Westminster Abbey. The velvet for a King's coronation robe was woven of purple silk in both the warp and the weft. The 'traditional' colour for the silk velvet of a Queen Consort's robe was 'violet shot with crimson in the warp'. Queen Alexandra broke with tradition not only by insisting on the embroidered tree at the base of her train, but also by choosing a different crimson-purple colour for the velvet, called 'petunia' (Halls 1973: 53, plate 6).

> The base was the Plantagenet crown, from which the English rose grew forth, its roots entwined with fleurs-de-lys, recalling the ancient claim of our Plantagenet Princes to be Kings of France through maternal descent—a claim not abandoned till the days of the Stuarts. Amidst the rose-branches, the thistle of Scotland and the shamrock [of Ireland]. . . . This mass of gold embroidery diminished in heaviness as it rose higher and blended into the Star of India.

The genealogical tree, now embodied in the person and the office of King Edward VII, was crowned with an embroidered image of his crown (see Fig. 15).

The descent of weaving

The skilled work, requiring a weaver's eye, was transmitted through weavers' families. The descent of families was inextricable from the descent of their craft in their particular working conditions. Men carried out their transactions with other men, including their meetings and their trade in birds, in public houses and beer shops.[19] The reproduction of the craft, like the breeding of their birds, was clearly familial, based in their home-workshop-yards. I will make three points about this.

Silk-weaving was home-based work, profoundly familial, involving spouses, and transmitted from parents to children. The hand-loom commissioners observed this phenomenon repeatedly. Thus Mitchell (*PP* 1840: 216) asked of the weavers in Spitalfields:

> What are the chief sources of the numbers who come into the trade?—The weavers bring up their families to be weavers, from a desire to get something from their labour as soon as possible, and also from the inability to get them put out into other trades, and to pay a premium. [According to the testimony of weaver, John Duce]: 'Too great attachment to the occupation is the bane of the trade. . . . There is a sort of independence about the work. A weaver is not tied to hours like the carpenter, bricklayer, and most artisans. He may begin his work when he pleases. He is not confined within the walls like men in a spinning factory. He may go out when he thinks fit. He may work to 10 and 11 o'clock, or later, to make up for lost time. The weaver also enjoys the society of his family. He feels strongly the domestic attachments, even beyond what cool reason

[19] Darwin wrote to Huxley about meeting with 'a set of Pigeon-fanciers' in a 'gin-palace' in the Borough (27 Nov. 1859, *Corres*. 7: 404), in fact a fancier establishment than his phrase suggests (Dodd 1856: 471). Other contemporary accounts describe the pigeon-racing and bird-singing contests based in public houses (e.g., Tegetmeier 1867; Greenwood 1874). The Parliamentary reports on the conditions of the hand-loom weavers note that many public houses were kept by people associated with the manufactories in their neighbourhoods, including weavers; they often had chandlers' shops attached, and they served as unlicensed pawnshops.

Figure 15. 'The Train of the Queen's Coronation Mantle', in *The Illustrated London News* (16 Aug. 1902), p. 238, photographed by Elliott and Fry, London. The editors' caption describes the 'tree' as 'symbolizing the growth of the Empire'.

> would approve. Hence he will not find any other employment for his children, and easily believes that he cannot. From all these causes it is, that many are drawn into the trade, and afterwards bring up their children to it, and cling to the trade under every disadvantage.'[20]

The work could be transmitted through the inheritance of objects, like the loom itself and its mechanisms, handsticks or bobbins, pattern books, and other tools of the trade. But it was also understood by participants and observers alike to be transmitted through the body in at least two respects. First, in the transmission of skills beginning in childhood, expressed as 'bring[ing] up their children to it' (*PP*/Mitchell 1840: 216). For example, George Dorée had already moved on to the difficult and delicate art of velvet weaving when he was eleven years old (Manchée 1918: 420).

Second, the trade transformed the bodily constitutions of weavers and these transformations were passed on to their children. The silk-weavers of Spitalfields were well known to be 'little men' (as Darwin had described the pigeon-breeders to his son) because of the very practice of their craft over generations. Mitchell (*PP* 1840: 79–80) stated: 'That the weavers of Spitalfields are of a small stature has long been matter of public notoriety. . . . Many of the witnesses examined have stated, that they were sons and grandsons of weavers, and that their wives were the daughters and grand-daughters of weavers. Such men form a caste, and are of small size.' Mitchell quoted the observation of a weaver, Mr Redfarn, to which others had agreed: 'They are decayed in their bodies; the whole race of them is rapidly descending to the size of Lilliputians . . .' (see also Dodd 1841–4: 399). This happened gradually, over the course of familial work and over generations. Manchée (1918: 424) made a point of noting that George Dorée was '[s]mall of stature and delicately made [though] he was, despite his work, upright in figure'.[21]

[20] In summarising the reports of the hand-loom commissioners from all over England and Wales, Senior *et al*. (*PP* 1841: 316) repeated Mitchell's (*PP* 1840: 216) comments, noting that commissioners working elsewhere in England and Wales had also found that hand-loom weavers emphasised the familial structure of weaving, expressed in early marriages and high rates of child-bearing. Fletcher (*PP* 1840: 257–8) deplored 'the inevitable "over-stocking" of the labour market in an "old" country', alluding to Malthus's comparisons between England and America, and weavers' tendency to stick with weaving, while finding other solutions for low wages and periodic unemployment.

[21] During the years of the *Parliamentary Papers* on the condition of the hand-loom weavers, Darwin had speculated 'about trades affecting form of man' in his third notebook—C: inside front cover, *c*.March–June 1838 (*Notebks*, p. 239). Yet by the time he came to writing *Descent of Man* (1871) he concentrated on sexual selection, reproduction in a narrower sense.

While some weavers and observers attributed the small stature of the weavers to their work over generations, at least one weaver attributed it to transformations in their living conditions more generally. For example, William Bresson, a velvet-weaver and loom broker at 2 Daniel-street, Orange-street, Spitalfields, whom Mr Hickson (*PP* 1840: 717) examined on 14 July 1838, explained the 'reason why the weavers are generally such a short, stunted race' by the fact that 'most of the open spaces formerly let out in gardens are now built over, and there are no public walks or places for out-door exercises, as at the west-end of the town, where those who have private parks of their own have the benefit of the public parks'. Bresson noted that his house was located in one of the few open spaces left in Spitalfields, 'containing about three acres, all let out in strips of gardens, each only 90 feet by 20. They are at the present moment filled with flowers cultivated to great perfection. Spitalfields was once very famous for tulipbeds.' He then described the value of the tulips of a local butcher and those sold by an operative weaver who used the proceeds to set up a beer shop.

Hickson (*PP* 1840: 717) observed that Bresson, his wife, and their son and daughter (all involved in the silk trade) lived together with another family in 'a small house containing but three very small rooms, and a fourth barely large enough to contain six looms, by which it is completely choked up'. The house, having no cesspool or sewer, was adjacent to a 'stagnant ditch filled with abominable black filth, for which there is no drain'. They paid extra rent for 'the small strip of flower-garden in front'.[22]

[22] Dr Hector Gavin (1848: 53, 42), the medical doctor reporting on sanitary conditions in the parish of Bethnal Green, shared Hickson's views. Daniel Street, Orange Street was a footpath, a cul-de-sac (perhaps because it ran into fields) in his District No. 4, which Gavin described as 'exceed[ing] all those which have gone before it in filth, disease, mortality, poverty, and wretchedness; it abounds with the most foul courts, and is characterised by the prevalence of the greatest nuisances, and perennial foulness. Unlike the last district, there are several gardens in it resembling those already described, but infinitely surpassing them in everything degrading to our civilization. For many years this district has been notorious as the hot-bed of epidemics. This is easily explained, when the foulness of the streets, the dense crowding in some parts, and the nearly total absence of drainage and house-cleaning, are considered.'

Komlos (1998) and Woitek (2003) have since shown that historical variations in height, in particular, are so sensitive to short-, medium- and long-term business fluctuations as to be key indicators of the overall welfare of populations. While Komlos (1998: 793–4) acknowledges the complexity of height cycles, in which disease may be a factor, he argues that in nineteenth-century Europe and the United States, 'these cycles were associated primarily, even if perhaps not exclusively, with economic processes and associated structural changes'. I am grateful to Tom Trautmann for telling me about Bilger's (2004) essay on John Komlos through which I learned about his work.

Finally I would argue that these ideas and practices of the hereditary craft of silk-weaving—worked so profoundly into the constitutions of weavers that they passed into the very bodies of their children and grandchildren—were expressed in their birds. The pigeons also involved a kind of 'bringing up' or 'shaping' of children, using exactly the same kinds of skills and ideals of the silk-weaver's craft, in which the shaping of children who were to be the next generation of workers was essential to the life of a family as well as the reproduction of the trade.[23] As among the middling classes of breeders, the pigeon-fancy in Spitalfields seems to have been a lifelong pursuit, passed on from parents to children, but especially fathers to sons. And perhaps, as with Tegetmeier, Lucas and others, the birds had special associations with the childhood of the fancier, himself as a boy when he got the birds who became his lifelong favourites. These generational relations are likely to have been especially significant, given the importance in the fancy branch of the 'living draw-boy' (ideally a son, or nephew, rather than a boy off the street in Bethnal Green's Monday market), by comparison to the mechnical drawboy, then being introduced in the mechanisation of fancy work. As Warner (*c.*1921: 100) put it—he having moved the silk manufacture that he had inherited from his grandfather and father from Spitalfields to Braintree in Essex in 1895—'in a few years, at most, the silk-weaving industry in London will become extinct for lack of weavers, [leaving] nothing quite like the methods and traditional arrangements of Spitalfields [to be] found elsewhere'. And indeed that has since happened.

When the weavers fell into the gravest distress, they had to sell their most precious birds. Their Pouters, for which Spitalfields weavers were famous, ended up with the same weavers in Scotland who took over much

[23] Some of the weavers descended from Huguenot families did keep genealogies. 'La Munificence Royale' given to Huguenot refugees who entered the British Isles following the revocation of the Edict of Nantes in 1685, applied to their descendants. Those who could prove their Huguenot descent were still receiving pensions in the lifetime of William Bresson who was fifty-two years old in 1838. Bresson (*PP*/Hickson 1840: 717) testified that 'by intermarriages, however, the distinctive character of the French weaver is now lost'. Yet contemporary sources clearly indicate that Huguenot ancestry was idealised. The practices of keeping birds and flowers were invariably attributed to Huguenot refugees, even though it is clear from historical sources that these interests were broadly shared in Spitalfields. Duthie's (1987) analysis of historical sources on the 'introduction of plants to Britain in the sixteenth and seventeenth centuries by strangers and refugees', found no evidence to support the idealised view. Rather she found evidence for 'similar interest in raising, growing and exhibiting choice flowers' in Britain, France, Belgium, though rather differently in the Netherlands. When the directors of one of the early 'French' hospitals founded the Huguenot Society of London in 1885, one of its main purposes was to document 'family records', 'pedigrees', and 'genealogies'.

of the trade in silk weaving lost from London, focused increasingly on small items like fine wraps and scarves, tie silks, and handkerchiefs. According to the Scottish breeder, Robert Fulton (*c.*1876: 96, his emphasis), himself a third-generation descendant of the house of Messrs Fulton, silk manufacturers in Paisley:

> [T]here is not the slightest doubt that we owe the cultivation of the Pouter to the silk-weavers of Spitalfields, who brought this pigeon to perhaps as great perfection as was ever reached; in which, indeed, they had an advantage in the greater *number* of them who bred and cultivated it. When, however, the ruin of what was called the 'heavy' trade in London occurred, these poor weavers were unable to afford the keep of their pigeons, and their best birds fell into the hands of a few Scotch fanciers. . . . Formost of these were, and still are, Mr. James Huie, of Glasgow [who was often in London], and Mr. George Ure, of Dundee . . . [t]he late Mr. Wallace, of Glasgow [and] the late Mr. James Miller, also of Glasgow. . . . [T]o these four belongs the chief credit of taking the bird from the old Spitalfields fanciers and handing it down to the present generation.[24]

So let us return now to Radcliffe-Brown's question about totemism: How might these fancy pigeons be related to 'eaglehawk and crow, and other pairs' of such evident interest to people elsewhere? And what light might the relations between the humans and the birds shed upon the 'entangled bank clothed' with disparate creatures, where Darwin (1859: 426) sought 'the hidden bond of community of descent'?

'From Egypt Direct to Birmingham': an avian perspective on the biogeography of descent

The weavers' birds and flowers exemplify ideals specific to the silk industry, but also much more broadly shared among British artisans in the textile trades, because of shared ideals about craftsmanship especially in fancy or figured work; because of shared experiences of the political–ecological circumstances involved in urbanisation; but possibly also because of shared experiences of the fragility of their familial lives during these years of rapid industrialisation in which the hereditary transmission of the trade from parents to children was ever harder to achieve; and even the possibility of keeping their children under one roof was difficult. As

[24] As Fulton (*c.*1876: 95) explained, Pouters were his '"first fancy" . . . [w]hen about nine years old, it was the fancy of a parent, and of a friend who soon after "came into the family" by marriage', namely the late Mr James Miller of Glasgow. Thus: 'we literally "grew up" in the Pouter fancy; and even now, if really compelled to keep one variety, this would be our selection'.

Hickson (*PP* 1840: 672) said in summarising the reports of the Select Commissioners on the conditions of the hand-loom weavers in Britain: 'America is regarded by many of our artisans as their second home.' These changes were expressed in what could be called an avian imagery of biogeographical change, evident in the changing place of birds in rural agriculture and ecology and in urban slang, especially about migration and resettlement.

As explained in more detail elsewhere, pigeon-keeping had been a mainstay of rural agriculture, a legal monopoly of British nobility and gentry, manifest in large, free-standing pigeon-houses, containing 500 to 1000 nesting holes, built or rebuilt in the years from 1640 to 1750, some still standing (Barley 1985: 677; Cooke 1920). Manorial dovecotes were one element in an agricultural regime that included small stock and game (Thirsk 1992: 51–2). Rising grain prices after 1760 encouraged the adoption of a new agricultural system for integrating crop and large livestock production, associated with a new wave of enclosures. Pigeons for winter meat became as marginal as second sons to the economy of large estates (see Howitt 1835: 534).

Dovecote pigeons were taken up by small farmers and labourers for their own subsistence and local sale. After a lull in enclosures of common lands between 1640 and 1750, landowners began a new series of enclosures lasting into the 1870s, creating larger estates, expelling unwanted labourers, and destroying their cottages (Thirsk 1992: 51–2). The enclosures between 1750 and 1870 affected mainly farms in the English Midlands and in Ireland, where English and Scottish settlers owned ninety-five per cent of the land by the late 1700s. By the 1850s, 'there was very little arable left in open fields although upland commons remained' (Holloway 1996: 27, 30–3). In England by the early 1870s, 'no other rural élite in nineteenth-century Europe owned so large a part of their nation's soil. . . . [M]ore than four-fifths of the surface of the United Kingdom belonged to some 7,000 proprietors' (Hoppen 1998: 15–16).[25]

[25] Darwin's correspondence shows that he was involved in these processes in England. In addition to the farm he bought at Beesby (Lincolnshire) in the mid-1840s, he bought more land in different locations. He worked through John Higgins, the agent for his farm, then John's son Frederic who inherited the family business. As he explained to John Higgins at one point, he wanted more land '[f]or the sake of my sons' (C. Darwin to J. Higgins, 26 Dec. 1859, *Corres*. 7: 452–3). From about 1855 to 1868, Higgins also served as an assistant enclosure commissioner for England and Wales, as well as a crown agent and receiver of crown rents in northern England (see *Corres*. between Darwin and J. Higgins (*c*.1844–68) and between Darwin and Frederic Higgins (1868, 1881), or otherwise referring to their affairs.

The number of people living in cities in England and Wales increased from thirty-four per cent to fifty-four per cent of the population in the years between 1801 and 1851, and continued rising steeply thereafter, as northern manufacturing centres began to rival the former dominance of London and other cities and towns in the south (Thrift and Williams 1987: 28). Bird imagery is strikingly evident in the slang describing the migration and settlement of poor people: the 'rookeries' where they congregated; the 'call birds' or speculators' houses used to 'decoy' buyers to new sites (as building became the second largest industry in Britain after textile manufacture), the 'bird cages' or slop houses built there (Mayhew 1850: 5), and the 'birds of prey' hovering around them, as described in Dickens's *Our Mutual Friend* (1864–5).[26] In ways we cannot discuss here, 'British Birds', as Yarrell (1837–43) called them, also seem to have become salient markers of ecological transformations.

Darwin seems to have come upon the pigeons as a means of understanding life processes precisely because they served this purpose for people more broadly, a means of apprehending the vast face of Nature, including the vagaries of silk, backyards, and rooftops. In Spitalfields, and I think more broadly, the birds were intimately linked to the changing political-ecology of urban life, including processes of manufacturing in the textile trades, in which 'design' had a far more specific cultural significance than the grand design of creation might suggest: that is, designs in fashions whose consumption increasingly dictated the seasonal rhythms of weavers' work. For the silkweavers of Spitalfields, pigeon-breeding—the kind of fancy pigeons, like the Pouters, for which the Spitalfields weavers were famous—was a kind of hand-loom weaving in the very materials of their lives.

Dovecote pigeons, recognised as kin to Rock Pigeons, were among the small stock that urban workers kept for food. By contrast, most fancy pigeons were thought to have originated in the ancient Near and Far East—Turkey, Palestine, Egypt, Arabia, Persia, India, China—from which (like raw silk) they were now being imported. 'From Egypt direct to Birmingham'. So the fancier Robert Fulton (*c.*1876: 337) described the magnitude of international trade in fancy pigeons in the mid-1870s in Britain's second largest manufacturing centre after London. So we might also say: from the Galápagos direct to the British Isles. Darwin makes it clear in his own

[26] According to the *OED*, 'rook', referring to 'a cheat, swindler, or sharper, especially in gaming', dates to 1577; 'rookery', referring to an urban neighbourhood of people imagined to live by cheating and stealing, dates to 1829. Comparable avian imagery, involving 'Asiatic' and 'African' crows, has characterised debates over Indian migrants into Zanzibar since the late nineteenth century (Greenough n.d.).

writing—in *Origin* (1859: 28) and in *Variation*—that the pigeons of England stand for the finches of the Galápagos, just as he used the microcosmic world of the pigeon-breeders to stand for the immensity of the 'face of Nature'. However his work in the Galápagos Islands affected the way he saw and interpreted the radically changing political ecology of the British Isles, the shift from agriculture to industrialisation, associated with massive migrations from countryside into cities, especially London.[27]

J. Secord (1996: 458) has argued that 'The history of natural history needs to become part of environmental history.' We would do well to put the study of kinship among creatures back into the context of the political-economy of land and labour, the geography in which it was so crucially embedded. Darwin's (1859: 130, 489) argument about natural selection in *Origin of Species* is increasingly biogeographical and ecological, moving from the 'great Tree of Life' to the 'entangled bank, clothed', as he says, with diverse kinds of plants, birds, insects, and worms, so different yet so complexly interdependent. Yet Darwin's argument about artificial selection is strikingly abstracting, very much in keeping with the new forms of enclosure and confinement that facilitated the new forms of 'methodical selection', based on a shifting focus from soils, climates, and seasons, to blood (Wood and Orel 2001: 46, 264). Artificial selection is to be found in the eyes, but especially the hands of breeders, abstracted from context. Indeed, the larger immediate context of interests in domestication, at least since the development of the Wardian case in the late 1830s to the early 1840s (Barber 1980: 111–12), exacty those years of Darwin's notebooks and the Parliamentary reports, is to take plants from one place and domesticate or naturalise them in another place (see also Kuklick 1996).

[27] Evidence that Darwin himself was re-examining his understanding of biogeography in the British Isles from the perspective of the Galápagos Isles is suggested by the analogies between corals and earthworms that he had begun exploring some twenty years earlier and continued throughout his lifetime. One of the first papers he gave to the Geological Society of London on returning from his five-year voyage on the *Beagle*, was 'On the Formation of Mould', written between papers on the 'elevation and subsidence' of oceans and continents associated with the growth of corals and 'volcanic forces', presented on 1 Nov. 1837, published in the Society's *Transactions* in 1840. Drawing a parallel between the corals and the earthworms based on 'the digestive process of animals [as] a geological power', Darwin (1840: 509) suggested that the creation of tropical islands through the growth of corals is paralleled by the creation of soils in the British Isles through the actions of worms. Both corals and worms are geo-zoological creatures whose organic beings are inseparable from the inorganic relations in which they are involved. In *The Formation of Vegetable Mould Through the Action of Worms with Observations on Their Habits* (1881), published just six months before he died, Darwin expanded on this parallel and also argued that worms were, in effect, the first agriculturalists of Great Britain, the earliest improvers of the soil.

Many historians have examined Darwin's extensive reading in political economy, while overlooking or taking for granted his relations with the pigeon-breeders (Secord 1985: 521). Now, from our current vantagepoint, the breeders appear to be far more significant in the long run. Even while Darwin's reputation has waxed and waned and waxed again, the most consistent outcome of social and biological interests in transmutation has been our ever greater capacity to breed animals and plants according to our own designs and transfer this knowledge to the breeding of human beings, and now transfer the body parts of animals to humans as well.

These processes by which the birds moved from the bushes to the hand, from fields to roof-tops, from home-workshops to institutional laboratories, suggest that we also need to examine the ways in which 'the hidden bond of descent', conceived in genealogical terms, may link all forms of life more tightly, yet more unequally, through historical processes of disconnection from land, expressed in migration and dispossession. Keeping in mind the weavers' perspectives on these processes, I found myself wanting to know more about the Brown family in Birmingham into which Radcliffe-Brown descended in 1881. As John Middleton (in Middleton and Pellow 1999: 217) has observed, this kind of information about early life, including childhood, is relevant to later intellectual work. Radcliffe-Brown, whose father died young as the result of his work as a commercial traveller for a Birmingham manufacturer, became a kind of labour migrant. For most of his life, he worked outside the British Isles in the Andaman Islands, North-Western Australia, Tonga, Cape Town, Sydney, Chicago, Yenching, São Paulo, Alexandria, and Grahamstown, where many of his colleagues would also have been labour migrants, and doing his ethnographic research with people (perhaps most notably in Australia) who were themselves migrants in more forcible terms, for example, the genealogical work with the men and women in the lock hospitals for venereal diseases on Bernier and Dorre Islands in Shark's Bay described by his assistant, Grant Watson (1968: 53–4, 64).

The radically abstracted forms *in* which Radcliffe-Brown worked were undoubtedly compounded by the massive dislocations and migrations of the people *on* whom he worked, who were abstracted not only from places, but from their generative relations with people in those places, through which they might have formed competing labour regimes.[28] And

[28] In considering 'The Land Question' (see above p. 315), Seebohm (1871: 136) eventually argued that 'The vice in our modern society is something deeper than the severance of the people from the land. They have not only been severed from the land, but also from capital. They have no capital, and therefore they cannot invest it in land.' Nevertheless, Weaver (2003) argues that the

perhaps these circumstances were normalised by an ideology of kinship to contract, clearly evident in Radcliffe-Brown's and Forde's own preface to *African Systems of Kinship and Marriage* (1950: v), in which they argued that 'comprehensive obligations of kinship . . . are segregated out . . .', where we might now think they had shifted hands.

To state my conclusions in their plainest terms: The historical data show that 'descent' as it came to be used in the work of Radcliffe-Brown and his contemporaries—the conception of 'descent' that Ingold (2000b) argues is now a commodity—is derived from the abstraction of generational from geographical, or biogeographical relations. The abstraction of genealogy from geography is not the source of major conceptual differences between social and biological branches of anthropology and beyond, but rather a feature common to both. This process derives from increasing controls over reproduction most explicitly expressed in the domestication of animals, but with analogues in the colonisation of people. Further understanding of such political processes is essential to evaluating the subjugations, even deaths, upon which conceptions of reproduction and life—including our lives—are based. Such understanding is equally necessary to achieving a more integrated understanding of the geozoological generation rooted as much in land as in genealogy in circumstances in which neither can be considered to be politically or economically neutral phenomena.

Darwin (1859: 27) said in *Origin*: 'pigeons have been watched, and tended with the utmost care, and loved by many people . . . for thousands of years in several quarters of the world'. Peculiarly, Darwin could not have chosen a more biblical creature than the pigeon to make his point that 'descent is the hidden bond of connexion'. The significance of the pigeons in linking seen and unseen worlds, earthly and spiritual realms, ancestors and their living descendants, is strikingly similar to what anthropologists have found about bird–human relations elsewhere (for example, Balzer 1996; Feld 1982; Friedrich 1997; Galaty 1998). Now we know that Rock Pigeons and humans entered into domestic relations perhaps as early as ten thousand years ago (just four thousand years or so after dogs and before any other species of bird). Human beings treasured the pigeons as food and company, and as the very epitome of fertility,

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cultural value attached to land ownership and to improvement in Britain, especially in England, was critical in generating the search for land in what became British colonies (Australia, New Zealand, Canada, America, and South Africa), and in shaping the ways land was appropriated and handled by colonial settlers and by later residents who carried on these cultural traditions and social practices even after declaring their political independence from Great Britain.

perhaps because they were the only other creatures besides themselves breeding year-around in the settlements of the ancient Near East where their bones and effigies are now found together (Johnston and Janiga 1995: 6–8, 269–70, drawing on Sossinka 1982).

If we took the long view, as I think Darwin did, seeing the temporal and global scope of pigeons' intimate association with humans as justifying his great analogy, then we might see Darwin and his fellow pigeon-breeders as the latest in a long line of human-pigeon explorations into the mysteries of life. Our studies of 'descent as the hidden bond of connexion' should therefore include kin relations between humans and other animals, as well as among them, and should set the full range of these delicate relations in the context of the micro-environmental processes of which they are part. By examining how complex social relations between human and other-than-human creatures have been incorporated into, and left out of, our understanding of the 'entangled bank', we may understand better our past and perhaps also the relations of consanguity and affinity among sentient beings so critical to our future.

Note. This paper is based on research in archives (including 'woven documents' and other objects) and published primary sources (government publications, newspapers, periodicals, pamphlets, books, and ephemera) at the British Library; Guildhall Library; Huguenot Society; State Apartments and Royal Ceremonial Dress Collection, Kensington Palace; Tower Hamlets Local History Library and Archives; the Textiles Division, Victoria and Albert Museum; and the University Library, University of Michigan-Ann Arbor. I thank especially Malcolm Barr-Hamilton, Beatrice Behlen, Clare Browne, Jenny Lister, Christopher Lloyd, Donald Pohl, David Rich, and the Hatcher evening staff guided by Marna Clowney. I am also grateful to these readers for their insights: Alan Harnik, John Middleton, Rodney Needham, Thomas R. Trautmann, Katherine Verdery, and an anonymous reader for the *Proceedings of the British Academy*. Colin Baldwin, Vicky Baldwin, Peter Marshall, and James Rivington of the British Academy were very generous with their help overall. Heartfelt thanks to Tim Ingold, colleagues, and students in the Anthropology Department of the University of Aberdeen, for inviting me to join in celebrating the founding of the Department with a programme on 31 October to 1 November 2003 that included this lecture; and to Maurice Bloch and his colleagues at the British Academy for their generous reception on 11 November 2003.

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