

RESEARCH ARTICLE

‘Constitutions selection’: Darwin, race and medicine

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Abstract

In the course of his discussion of the origin of variations in skin colour among humans in the *Descent of Man*, Charles Darwin suggested that darker skin might be correlated with immunity to certain diseases. To make that suggestion, he drew upon a claim that seemed self-evidently correct in 1871, although it had seemed almost certainly incorrect in the late eighteenth century: that immunity to disease could be understood as a hereditary racial trait. This paper aims to show how fundamental was the idea of ‘constitutions selection’, as Darwin would call it, for his thinking about human races, tracking his (ultimately unsuccessful) attempts to find proof of its operation over a period of more than thirty years. At the same time and more broadly, following Darwin’s conceptual resources on this question helps explicate relationships between conceptions of disease and conceptions of race in the nineteenth century. That period saw the birth of a modern, fixist, biologically determinist racism, which increasingly manifested itself in medical writings. The reverse was also true: medicine was a crucial site in which race was forged. The history of what has been called ‘race-science’, it is argued, cannot and should not be written independent of the history of ‘race-medicine’.

In the spring of 1862, three years after the publication of *Origin of Species*, Charles Darwin received permission from the Medical Department of the British Army to send a rather peculiar survey to regimental surgeons. A blank form accompanied remarks asking medical men to record whether there was any correlation between the hair colour of the men under their care and susceptibility to the diseases of the tropics. Darwin reproduced his request in a footnote in the *Descent of Man* (1871). ‘If the surgeons of the several regiments, when stationed in unhealthy tropical districts’, it read,

would be so good as first to count, as a standard comparison, how many men, in the force whence the sick are drawn, have dark and light-coloured hair, and hair of intermediate or doubtful tints; and if a similar account were kept by the same medical gentlemen, of all the men who suffered from malarious and yellow fevers, or from dysentery, it would soon be apparent, after some thousand cases had been tabulated, whether there exists any relation between the colour of the hair and constitutional liability to tropical diseases.

Darwin noted the obvious practical relevance, within the British Empire, of any observed correlation, since the information could be used ‘in selecting men for any particular

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service'. His own interest was more theoretical, however, for Darwin was also exploring one of the deepest questions of Victorian anthropology: how could one explain the origins of human races?¹

A simple application of his principle of natural selection could not elucidate why some people were dark-skinned with curly black locks and others light-skinned with straight, blonde hair. Climate had long been invoked to explain why brown or black people were to be found in warmer latitudes, but the general logic broke down quickly under scrutiny. One found too many differences between peoples at similar latitudes (skin colour varies widely within the tropics) and too many similarities among peoples at widely disparate parts of the globe (Amerindians, for example, were taken to be a single race, yet they occupied a vast north–south range). Still, Darwin had hope that one might perhaps find evidence for the *indirect* operation of natural selection.

In focusing on hair colour and survival rates from diseases such as yellow fever or malaria, Darwin had in mind (as he often did) an analogy to the animal and plant kingdoms. In his 1862 remarks, he observed that 'several well-marked cases have been recorded with our domestic animals of a relation between the colour of the dermal appendages and the constitution'.² A few years later, in his *Variation of Plants and Animals under Domestication* (1868), he detailed a number of cases. In a certain part of Virginia, for example, black pigs could eat the roots of the *Lachnanthes tinctoria* with apparent impunity, while the ingestion of the plant caused the hooves of their lighter-coloured kin to drop off. Those breeding the pigs tended to choose black members of the litter to raise to adulthood, with artificial and natural selection, therefore, 'working hand in hand'.³ White and black sheep in the Tarantino found themselves in an analogous situation, where the darker animals were immune to a vegetable poison that killed their fairer ovine relatives within a fortnight. And if plants could be poisonous to animals, they could also themselves be afflicted: purple plum trees were more severely affected by a given disease than green or yellow varieties; due to a blight known as the 'yellows', yellow North American peaches died in large numbers compared to peaches with white flesh. 'Now if these plants had been forced to struggle with other competing plants and enemies', Darwin observed, 'there cannot be a doubt that the colour of the flesh or skin of the fruit, unimportant as these characters are considered, would have rigorously determined their existence'.⁴ Similarly, he suggested, it might be the case that skin colour (and hence hair colour) was correlated to relative immunity from certain diseases. 'Assume that a dusky individual best escaped miasma', he wrote pithily to Alfred Russel Wallace in 1864, '& you will readily see what I mean'.⁵ Dark skin, in other words, might not itself be of advantage to an individual, but it might be *correlated* to an advantage, and hence could be selected for over many generations.

Although these arguments, or elements of them, have been described before (in an ever more voluminous Darwin literature), their crucial significance to Darwin's thought has not been recognized. Adrian Desmond and James Moore's *Darwin's Sacred Cause* remains the most detailed account of Darwin's views on race and slavery, and the book contains multiple references to Darwin's ideas connecting disease immunities and skin colour. Discussing the survey with which I began, for example, they observe that, for Darwin, 'Sexual selection could explain so many odd traits, but he had always supposed

1 Charles Darwin, *The Descent of Man, and Selection in Relation to Sex*, one-volume facsimile of two-volume first (1871) edn, Princeton: Princeton University Press, 1981 (vol. 1), pp. 244–5. Copies of the blank form have not been located.

2 Darwin, *op. cit.* (1) (vol. 1), p. 245.

3 Charles Darwin, *The Variation of Animals and Plants under Domestication*, 2 vols., London: John Murray, 1868, vol. 2, p. 227.

4 Darwin, *op. cit.* (3), vol. 2, p. 228.

5 Darwin to Wallace, 28 May 1864, *Darwin Correspondence Project* (henceforth DCP).

that skin colour was naturally selected, a dark complexion being more useful than alluring in hot climates.⁶ Yet such mentions are scattered throughout the work, never brought together for a single synthetic analysis. The deep significance of the medical argument for Darwin is never registered in the text, in part, I would suggest, because of a misreading of a key passage in Darwin's notes. In March 1856 Darwin scrawled a summary of Robert Knox's *Races of Men: A Fragment* (1850) – a text that insisted on the fixity of the races as well as their radical differences. Responding to Knox's insistence that the races had not changed for millennia, Darwin laid out two explanations for why this should be so: 'The slowness of change explained by constitutions selection & sexual selection'. This sentence is well known, since it is the first usage of a Darwinian neologism: sexual selection.⁷ In glossing this crucial sentence, Desmond and Moore offer a great deal of additional text, reading it thus: 'The slowness of any changes [must be] explained by [resilient] constitutions [and the chancy nature of natural] selection & sexual selection.' The version offered in Evelleen Richards's superb recent monograph, *Darwin and the Making of Sexual Selection*, is both simpler and, I believe, more accurate: 'The slowness of any changes explained by constitutions selection [through resistance to disease] & sexual selection'.⁸ Richards demonstrates in painstaking detail the high value that Darwin placed on sexual selection as an explanation for a multiplicity of traits across the animal kingdom, from the very beginning of his musings on the 'species problem'. It would be sexual selection, ultimately, that Darwin settled on in *Descent* as the mechanism by which human races had formed: myriad aesthetic choices made for mates over generations eventually adding to produce characteristic racial differences. And yet, as I show here, sexual selection struggled to explain the most seemingly obvious racial trait for Victorians: skin colour. Darwin had real stakes in an explanation that related survival and colouration, and those stakes remained even after his mature formulation of what the subtitle of *Descent* termed 'selection in relation to sex'.

In this paper, I build on scholarship that has focused on sexual selection by detailing the ways that 'constitutions selection' grounded Darwin's attempts to solve the specific riddle of human racial divergence. 'Constitutions selection', I show, had been part of Darwin's thinking since the late 1830s (when he first read Malthus *On Population*), and he was still actively searching for evidence to confirm the theory well into the mid-1860s, abandoning it only reluctantly in *Descent*. To this historical concern with Darwin's own changing understanding of the causes of human races, I add a historiographical intervention. A great deal has been written about race in nineteenth-century Britain and its empire, and a considerable portion of this literature has concentrated on scientific understandings of race.⁹ Given comparatively short shrift, however, have

6 Adrian J. Desmond and James R. Moore, *Darwin's Sacred Cause: How a Hatred of Slavery Shaped Darwin's Views on Human Evolution*, Boston: Houghton Mifflin Harcourt, 2009, p. 289.

7 Evelleen Richards, *Darwin and the Making of Sexual Selection*, Chicago: The University of Chicago Press, 2017.

8 Richards, op. cit. (7), p. 325. Richards cites the key passage in her note on Figure 10.4, a facsimile of the final page of Darwin's notes on Knox. The quote, without parenthetical explanation, is given on p. 324.

9 See, as a sample, George W. Stocking, *Victorian Anthropology*, New York: Free Press, 1987; Stocking, *Race, Culture and Evolution: Essays in the History of Anthropology*, Chicago: The University of Chicago Press, 1982; Nancy Stepan, *The Idea of Race in Science: Great Britain, 1800–1960*, Hamden, CT: Archon, 1982; Anne McClintock, *Imperial Leather: Race, Gender, and Sexuality in the Imperial Conquest*, New York: Routledge, 1995; Colin Kidd, *The Forging of Races: Race and Scripture in the Protestant Atlantic World, 1600–2000*, Cambridge: Cambridge University Press, 2006; Heather Streets, *Martial Races: The Military, Race, and Masculinity in British Imperial Culture, 1857–1914*, Manchester: Manchester University Press, 2010; Sadiya Qureshi, *Peoples on Parade: Exhibitions, Empire, and Anthropology in Nineteenth-Century Britain*, Chicago: The University of Chicago Press, 2011; Douglas Lorimer, *Science, Race Relations and Resistance: Britain, 1870–1914*, Manchester: Manchester University Press, 2013.

been the relationships between race and medicine.¹⁰ This imbalance is unfortunate, for were we to ask how most people outside Europe encountered the naturalistic conceptions of race held by European settlers, explorers, slave owners and colonizers, the answer would overwhelmingly point to the work of medical practitioners. Doctors, surgeons and midwives vastly outnumbered botanists and biologists in the colonies, for example, and European forms of treatment and bodily discipline were likely administered by those with medical training who brought distinct understandings of racial difference to their tasks.¹¹ Even within studies of metropolitan science, however, the neglect of medical arguments is problematic. Many, if not most, of those who published on scientific conceptions of race were originally trained in medicine, and they brought their training to the study of black and white bodies. James Cowles Prichard, for example, was the doyen of British ethnology in the first half of the century as well as a Bristol physician. His arguments on diseases and race will be discussed in some detail below. His vociferous opponent, and author of one of the most significant racialist texts of the mid-century, Robert Knox, was an anatomist who left Edinburgh several years after his involvement in the infamous Burke and Hare body-snatching scandal. His *Races of Men: A Fragment* contains an extensive discussion of racial immunities and susceptibilities to disease. To fully understand even metropolitan race-science requires, then, better understanding of race-medicine. History and historiography thus come together as we examine how significant medical arguments were to Darwin, one of the most important race theorists of the nineteenth century. As will, I hope, become very clear, histories of naturalistic conceptions of race must be attentive not only to racial *anatomies*, but also to racial *pathologies*.

Disease susceptibility and racial origins in Darwin's early thought

As the full title might suggest, the book known now as *The Voyage of the Beagle* was based on the diary Darwin had kept on his journey around the world.¹² The main body of the work was at the printers by early 1838. In early 1839 he added 'an Appendix, containing some additional facts ... which I have accidentally met with during the past year'.¹³ It was in that appendix that Darwin offered a correction to some comments on miasmatic fevers in Peru, visited by the *Beagle* in July 1835: 'When I put together the few and exceedingly imperfect remarks on the subject of Miasmata', he wrote, 'I did not know of Dr. Ferguson's remarkable dissertation ... on the Nature and History of the Marsh Poison'.¹⁴ More important for our purposes than the dissertation itself was a 'Note', of little more than a page, that the physician, William Fergusson, appended to his essay, entitled 'On the Negro

10 See as exemplars, however, Sander Gilman, *Difference and Pathology: Stereotypes of Sexuality, Race, and Madness*, Ithaca, NY: Cornell University Press, 1985; Mark Harrison, *Climates & Constitutions: Health, Race, Environment and British Imperialism in India, 1600-1850*, New Delhi and New York: Oxford University Press, 1999; Mark Harrison, *Medicine in an Age of Commerce and Empire: Britain and Its Tropical Colonies, 1660-1830*, Oxford: Oxford University Press, 2010; Warwick Anderson, *The Cultivation of Whiteness: Science, Health and Racial Destiny in Australia*, New York: Basic Books, 2003; Philippa Levine, *Prostitution, Race, and Politics: Policing Venereal Disease in the British Empire*, New York: Routledge, 2003; Rana Asali Hogarth, *Medicalizing Blackness: Making Racial Difference in the Atlantic World, 1780-1840*, Chapel Hill: University of North Carolina Press, 2017.

11 Suman Seth, *Difference and Disease: Medicine, Race, and the Eighteenth-Century British Empire*, Cambridge: Cambridge University Press, 2018.

12 Charles Darwin, *Journal of Researches into the Geology and Natural History of the Various Countries Visited by the H.M.S. Beagle, under the Command of Captain Fitzroy, R.N. from 1832 to 1836*, London: Henry Colburn, 1839.

13 Darwin, op. cit. (12), p. viii.

14 Darwin, op. cit. (12), p. 627.

skin'.¹⁵ It began by asserting the immunity of the 'Negro' to endemic fevers: 'for to him marsh miasmata are in fact no poison, and hence his incalculable value, as a soldier, for field service, in the West Indies'. Fergusson pointed to African skin as the reason for this immunity. '[T]hick, oily, and rank', he hypothesized, the skin resisted the 'reception' of miasmata. This could only be a 'plausible conjectural inference', but Fergusson could add another data point: 'It is certain', he claimed, 'that amongst Europeans, the thick-skinned and dark-haired withstand the influence of the marsh poison much better than those of the opposite temperament'.¹⁶ The deep significance of these arguments to Darwin comes through in the notes he made after reading them: 'D^r Ferguson', he scrawled in summary, 'seems most clear that the ideosyncrasy [sic] of the Negro (and partly Mulatto) prevents his taking any form of Malaria – adaptation and species-like'.¹⁷ Differences in immunities to diseases, in other words, were racial differences that seemed (threatened?) to rise to the level of a difference in species between 'Negroes' and Europeans. As Darwin argued in the chapter on Australia in *The Voyage of the Beagle*, such differences could have immense effects. Noting that the population of Australian Aborigines was rapidly declining, Darwin pointed to three causes: the introduction of spirits, the loss of wildlife and 'European diseases (even the milder ones of which, such as the measles, prove very destructive)'.¹⁸ Racialized distinctions in disease susceptibility, in other words, could help explain impending – and hence, presumably, previous – human extinctions.

The year after he had hurriedly written down his comments on Fergusson, Darwin read a text that made clear yet more stakes behind the question of racialized disease immunities.¹⁹ By the 1830s, James Cowles Prichard, the third edition of whose *Researches into the History of Man* appeared in 1836, had become the leader of British ethnology, with the 'Prichardian paradigm', to use George Stocking's term, largely responsible for keeping at bay the racialism that increasingly characterized anthropological work in both France and the United States.²⁰ As befitted his training as a physician, Prichard was attentive to the relationships – whatever they might or might not be – between race and susceptibility to disease. 'The diseases and predispositions to disease peculiar to certain races', Prichard wrote, 'constitute as much a part of the physical description and enter as fully into the aggregate of distinctive characters belonging to these races, as any feature in their anatomical structure'.²¹ And just as differences of kind in anatomical structures, rather than merely degree, might lend some credence to those who insisted that humankind were not all one species, and not formed in the same act of creation (the

15 William Ferguson, 'On the nature and history of the marsh poison', *Transactions of the Royal Society of Edinburgh* (1823) 9, pp. 297–8. While his name was usually spelled Fergusson, in the above publication – and hence in Darwin's notes – it is spelled with only one 's'.

16 Ferguson, op. cit. (15), p. 297.

17 Darwin, Notebook D24, at <http://darwin-online.org.uk/content/frameset?viewtype=text&itemID=CUL-DAR123-&pageseq=1>. Cf. Desmond and Moore, op. cit. (6), p. 130.

18 To these three factors, Darwin added another: 'some mysterious agency generally at work' which explained why it was that '[w]herever the European has trod, death seems to pursue the aboriginal'. He also appended a footnote to his comment regarding the effects of measles on different peoples, suggesting that the climate played a role as well: 'It is remarkable how the same disease is modified in different climates ... In some countries, foreigners and natives are as differently affected by certain contagious disorders as if they had been different animals; of which fact some instances have occurred in Chile; and, according to Humboldt, in Mexico.' All quotations from Darwin, op. cit. (12), p. 520.

19 James Cowles Prichard, *Researches into the Physical History of Mankind*, 3rd edn, vol. 1, London: Sherwood, Gilbert, and Piper, 1836. Desmond and Moore, op. cit. (6), p. 158.

20 Stocking, *Victorian Anthropology*, op. cit. (9).

21 Prichard, op. cit. (19), p. 150.

position that came to be known as polygenism), so too with claims about susceptibilities to disease.

In the text, Prichard (a committed monogenist) grappled with data that seemed to offer evidence for the existence of innate differences between the races. It was known, of course, that one could acquire an immunity to some diseases (smallpox or yellow fever, for example) by having survived them once. But there appeared to be growing evidence that immunities could be inherited – that one could be immune without a first affliction. And that fact would appear to point away from acclimatization and towards the idea that the differences between the races had existed since their first – and separate – creation. Prichard wanted to short-circuit this last move, by accepting and advocating for a limited inheritance of acquired characteristics. In his words: ‘a tribe of people, by long residence in a given district, are capable of acquiring a peculiar hereditary and national variety of constitution, predisposing them to a particular disease from which other tribes of the same original stock are altogether or very nearly free’.²² Why this claim mattered, he made very explicit: ‘On the whole it appears evident, that races of men acquire predispositions to particular diseases by a residence of several generations in particular districts. Hence, then, varieties of predisposition are no proof of diversity of origin.’²³ Relative, if not absolute, racial immunity and susceptibility to disease could thus be considered an established fact by 1836, but Prichard resisted the strongest conclusion to be drawn from these data. Facts concerning the ‘diseases and predispositions to disease peculiar to certain races’ could not be deployed to support polygenist arguments.

Between Fergusson and Prichard, by 1839 Darwin had two ideas tumbling together. First, that immunity to disease might be related to complexion – in ‘Negroes’ and also in Europeans. And second, that racial immunity today was bound up in questions of racial origins – whether single or multiple – in the past. Precisely when he put these notions together to formulate his medical theory for the origins of racial diversity we cannot be sure, although it is worth noting his claim, in a letter from 1860, that he had ‘long suspected’ that a correlation between susceptibilities to fevers and skin colour ‘might possibly explain the origin of colour of negroes’.²⁴ Certainly, he had been aware of problems with climatic explanations of skin colouration from very early on, so that some new explanation was required. Richards has drawn attention to Darwin’s paraphrase of William Lawrence’s *Lectures on Man* (1819) in a notebook entry from August 1838. Darwin, she notes, ‘questioned the standard ethnological correlation of climate and civilization with race. There had to be another correlate or cause that would explain “colour & shape & idiosyncrasy”’.²⁵ Lawrence provided such an alternative cause in ‘one accessible package’, delivering ‘the essential arguments for racial divergence through sexual selection’.²⁶ To follow Darwin’s later arguments one had only to imagine that different human groups had slightly different aesthetic sensibilities, preferring darker or lighter skin, for example, or higher or lower cheekbones. Those deemed more attractive would gain more mates than their less attractive peers, and would pass on their traits more

22 Prichard, op. cit. (19), p. 155.

23 Prichard, op. cit. (19), p. 158.

24 Charles Darwin to Jeffries Wyman, 3 October [1860], *DCP*.

25 Richards, op. cit. (7), p. 151.

26 Richards, op. cit. (7), p. 152. Thus, for example, Lawrence: ‘Connexions in marriage will generally be formed on the idea of human beauty in any country; and influence this, which will gradually approximate the countenance towards one common standard. If men, in the affair of marriage, were as much under management as some animals are in the exercise of their generative functions, an absolute ruler might accomplish, in his dominions, almost any idea of the human form.’ W. Lawrence, *Lectures on Physiology, Zoology, and the Natural History of Man*, London: Benbow, 1822, pp. 392–3. Quoted in Richards, op. cit. (7), p. 148.

successfully. Over enough time, races would emerge, with traits that had no adaptive advantage, but which were deemed more aesthetically pleasing to their population of origin.

Richards makes the convincing case, therefore, that Darwin had something like a sexual-selective explanation for the origin of human races in mind from early in his theorizing. We can see that he had many of the key elements for his theory of constitutions selection for essentially as long. Both explanations became increasingly significant to Darwin as he began to work, in the mid-1850s, on what was meant to be the culmination of twenty years of note taking on natural selection.

Data gathering

Darwin's 'big species book', as he described it, was originally to include substantial sections on humans. Constitutions selection and sexual selection, as they applied to the races of man, now required elaboration and evidence. He would find much on both, and often together. The first piece of direct evidence of his argument connecting sexual selection and race, for example, is to be found in notes taken on George Gliddon and Josiah Nott's polygenist opus *Types of Mankind* (1854). The text is filled with references to the beauty of the Caucasian race and the ugliness of the 'Negro'. In a note at the back, Darwin asked and then answered a question: 'What effect wd idea of beauty have on races in selection. it wd tend to add to each peculiarity.'²⁷ Aesthetic choices over many generations, in other words, would amplify once small differences, leading to the emergence of races through sexual, rather than natural, selection. Darwin would also find the text useful for his account of constitutions selection, since it provided evidence for the idea that disease immunity was a racial characteristic, not merely one acquired through acclimatization. It had 'long been known', he declared in *Descent*, citing *Types of Mankind* as his source, that 'negroes, and even mulattoes, are almost completely exempt from the yellow-fever, which is so destructive in tropical America'.²⁸ The work by Knox that inspired Darwin to write down his neologisms – constitutions selection and sexual selection – contains many references to the beauty (or lack of it) of various races, as well as the insistence that distinct races have a natural abhorrence to one another which prevents them from naturally mixing. It also contains an extensive discussion of racialized immunities to disease. 'Can the fair races of man become so acclimatized in tropical countries as to resist the pestilential climate of such regions?'²⁹ Knox asked, in a chapter entitled 'The dark races of men'. The negative answer followed only a few pages later:

France entertained, and perhaps still entertains, hopes that her armies in Algeria might in time become acclimatized; in these hopes the nation is almost sure to be disappointed. It is still a mere hypothesis, and the existing facts are all against it. Suggestions have been made to send thither the inhabitants of the South of France ... but there still remains the question of race, which has its influence not merely in one climate, but in all.³⁰

Resistance to the diseases of tropical climates, then, was not a matter of habituation. Those born in France might be accustomed to hot weather, but for Knox the fundamental issue was about race, not about acclimatization. One can see why Darwin, reading Knox as

²⁷ Quoted in Desmond and Moore, op. cit. (6), p. 282.

²⁸ Darwin, op. cit. (1) (vol. 1), p. 243.

²⁹ Robert Knox, *The Races of Men: A Fragment*, Philadelphia: Lea and Blanchard, 1850, p. 191.

³⁰ Knox, op. cit. (29), p. 208.

he thought about the origins of human races in the mid-1850s, might list both sexual selection and selection for those more immune to disease as his key mechanisms.

Even more generally, the appearance of Knox's text in 1850 serves as a convenient marker for a fundamental shift in ideas about race in Britain. As noted earlier, the 'Prichardian paradigm' in British ethnology had downplayed the significance of racial differences in favour of monogenist unity. That unity was in turn confirmed by philological evidence that demonstrated connections across multiple languages. That Sanskrit, Latin and ancient Greek were all related was taken as proof that those now inhabiting Europe, regardless of their skin colour or facial features, were the brethren of those on the subcontinent. Yet challenges to the authority of those orientalists who vaunted the value of native languages in Indian educational policy can be discerned already in the mid-1830s, when Thomas Babington Macaulay wrote his infamous 'Minute on Indian education' (1835), and the dominance of Prichard's position barely outlasted his death in 1848.³¹ Already, by that date, those who wished to question the unity of the human species could find substantial support across the Atlantic, where the physician and professor of anatomy at the Pennsylvania Medical College in Philadelphia Samuel George Morton had been deploying a vast collection of skulls to argue for the fixity and inequality of the races since at least the 1830s. After Morton's death in 1851, his most prominent followers, the physician Josiah Nott and the Egyptologist George Gliddon, continued the programme of what came to be known as the 'American school' of ethnology, publishing a polygenist tract dedicated to Morton in 1854 – *Types of Mankind* – and a collection of essays – *Indigenous Races of the Earth* – arguing the case in 1857. Gliddon's essay in this last volume, describing the clashes between 'The monogenists and the polygenists', was at once odious and tedious, but had the benefit of introducing terminology that historians – largely regardless of period – have used since.³² Nott's contribution, for our purposes, was considerably more interesting, for it continued an argument he had made for some time, using differential disease susceptibilities as evidence for innate and original differences between the races and hence for fundamental limits in the capacity for any race to move beyond its own homeland. Thus his insistence that 'the white and black races differ, at the present day, as much in their physiological as they do in their physical characters; and until their actual characteristics are changed, it cannot be expected that their normal geographical range will be enlarged'.³³

The American school would find much to admire in Knox. And in the 1850s a growing band of British naturalists in their turn deployed American data in defending American slavery, eventually founding the Anthropological Society of London in 1863 as a polygenist and anti-Darwinian counterpart to the Ethnological Society which had Darwin and his allies as members.³⁴ It is thus that one may find, fifteen years after Prichard's death and in

31 T.B. Macaulay, *Speeches by Lord Macaulay: With His Minute on Indian Education*, London: Oxford University Press, 1935; Stocking, *Victorian Anthropology*, op. cit. (9); Thomas R. Trautmann, *Aryans and British India*, Berkeley: University of California Press, 1997.

32 George R. Gliddon, 'The monogenists and the polygenists: being an exposition of the doctrines of schools professing to sustain dogmatically the unity or the diversity of human races; with an inquiry into the antiquity of mankind upon Earth, viewed chronologically, historically, and paleontologically', in Josiah Clark Nott, George R. Gliddon and L.F.A. Maury (eds.), *Indigenous Races of the Earth: Or, New Chapters of Ethnological Inquiry; Including Monographs on Special Departments*, Philadelphia: J.B. Lippincott & Co., 1857, pp. 402–602.

33 Josiah Clark Nott, 'Acclimation; or the comparative influence of climate, endemic, and epidemic diseases, on the races of man', in Nott, Gliddon and Maury, op. cit. (32), pp. 353–401, 367.

34 George W. Stocking, 'What's in a name? The origins of the Royal Anthropological Institute (1837–71)', *Man* (1971) 6, pp. 369–90. On Knox's significance for the founding and early days of the ASL see Evellen Richards, 'The "moral anatomy" of Robert Knox: the interplay between biological and social thought in Victorian scientific naturalism', *Journal of the History of Biology* (1989) 22, pp. 373–436.

the middle of the American Civil War, the president of the Anthropological Society, James Hunt, arguing, 'Scientific men, therefore, dare not close their eyes to the clear facts, as to the improvement in mind and body, as well as the general happiness, which is seen in those parts of the world in which the Negro is working his natural subordination to the European'.³⁵ All of which is to say that, as Darwin began to systematically gather evidence for his ideas concerning human racial origins, he did so in an intellectual, political and cultural environment in which race was acquiring increasing salience as an explanatory and not merely descriptive concept, and where the idea of human unity – whatever one thought of equality – could no longer be broadly assumed.

With this context in mind, I shall spend some time in tracking Darwin's attempts to find evidence connecting constitutions and complexions. Towards the end of 1856 and thus within only a few months of reading Knox, Darwin opened a letter from William Freeman Daniell, a British Army surgeon and botanist, who had spent the previous seven years on the western coast of Africa. Writing now from the Isle of Wight, Daniell in his turn had just received a letter from Darwin and was replying with answers to questions. Among those questions was 'whether [there were] differences in constitution with reference to light or dark complexions in the European resisting the influences of an African climate'. Daniell answered in the affirmative, but presumably not in the direction Darwin had expected, for the surgeon insisted that it was light-complexioned Europeans who did best: 'twice as well and *as long again* as the melancholic or dark complexioned man'. Offering an explanation, Daniell suggested that the 'sanguineous or choleric temperament' possessed a skin with 'greater vascular organization', which promoted more perspiration than that of their darker-hued fellows. Lighter-skinned Europeans suffered more while under the influence of the disease, but they were more easily able to throw it off. Hence Daniell's claim that he had 'always had less difficulty in curing light than dark complexioned men'.³⁶

Daniell was not alone in being asked this question at around this time, although he might have been the only person to have answered. Two years later, in a letter asking for similar information from his close friend and colleague the American botanist Asa Gray, Darwin apologized for what he feared might be a repetition: 'A sort of vague feeling comes over me that I have asked you all this before ... I know I once wrote several letters to various parts of the world for similar information.' It is worth quoting the entirety of Darwin's question to Gray, since it makes clear not only the nature of his precise interests, but the intensity of them:

there is one point on which I am very anxious to gain information & possibly it may be gained in the S.[outh] of your country & I can think of no one to apply to but you. Old writers often insist on differences of constitution going with complexion; & I want *much* to know whether there is any truth in this. It has occurred to me that liability to such a disease as yellow-fever would answer my question in the best possible way. Do you know of anyone of a scientific mind to whom to apply to ask whether any observations have ever been made or *published*, whether Europeans (without of course any *cross with negro-blood*) of dark complexion & black hair are more liable or less liable to be attacked with yellow-fever, (or any *remittent Fever*) than persons of light complexion. If you could aid me in this it would be of much value to me.³⁷

35 James Hunt, *The Negro's Place in Nature: A Paper Read before the London Anthropological Society*, New York: Van Evrie, Horton & Co., 1864, p. 25.

36 William Freeman Daniell to Charles Darwin, 8 October–7 November 1856, DCP, original emphasis.

37 Charles Darwin to Asa Gray, 18 November [1858], DCP, original emphasis.

In spite of receiving the request for information more than once, Gray seems never to have satisfied Darwin on the question of human immunity to diseases and poisons.³⁸ 'I suppose', wrote Darwin with diminished hope at the end of 1859, 'that you have not succeeded in getting me any information on correlation of complexion in Europeans & tendency to yellow or other Tropical Fevers'. To Darwin's profound pleasure, however, Gray would soon supply an example from the animal kingdom. In April of 1860, Darwin replied to a letter of which we no longer possess a copy, describing the kinds of questions that still bothered him, now that *Origin* had been published. The first two examples will be familiar to any student of Darwin's work: the eye, which, with its profoundly complex structure, would seem to be evidence for design, and hence a designer; and the peacock's tail, a case that would seem to prove that God's desire for the aesthetically pleasing trumped any sense of utility for an animal that every predator could locate in an instant. The third example is less well known to readers now, but was clearly equally significant for Darwin, for it provided proof that attributes that could not be selected for might nonetheless provide proof for his theory, by being correlated with advantageous traits:

It is curious that I remember well time when the thought of the eye made me cold all over, but I have got over this stage of the complaint, & now small trifling particulars of structure often make me very uncomfortable. The sight of a feather in a peacock's tail, whenever I gaze at it, makes me sick! Under this point of view your story of the Black Pigs in the Everglades *delights* me, & supports other cases, which though founded on good evidence I could hardly digest. – Pray keep Prof. Wyman up to the mark about writing to me; I sh^d, also, look at it a great honour & favour, *if you possibly can find out name positively of the red nuts*.³⁹

Darwin was not overstating his pleasure. A week later he wrote to Charles Lyell to describe the example in similarly enthusiastic terms:

Asa Gray sends me from Wyman (who will write) a good case of all the pigs being black in the Everglades of Virginia; on asking about cause, it seems (I have got capital analogous cases) that when the *black* pigs eat a certain nut, their bones become red & they suffer to a certain extent, but that the *white* pigs lose their hoofs & perish.⁴⁰

Four months later, in August 1860, Darwin wrote to Gray again, noting Gray's confirmation of 'the capital pig story'.⁴¹ In September he heard from Jeffries Wyman, who had related the story to Gray, and in October he explained to Wyman why the example mattered so much to him. 'Few facts', he wrote,

have interested me more than your case of the black Hogs; it shows such a marvelous relation of mere colour, (generally thought to be so unimportant) & constitution: I have long suspected that such correlation of colour & tendency to fevers, might possibly explain the origin of colour of negroes; but I can get no facts to support this crude speculation.⁴²

38 Charles Darwin to Asa Gray, 11 November [1859], *DCP*.

39 Charles Darwin to Asa Gray, 3 April [1860], *DCP*, original emphasis. Jeffries Wyman (1814–74) was professor of anatomy and curator of the Peabody Museum at Harvard.

40 Charles Darwin to Charles Lyell, 10 April [1860], *DCP*, original emphasis.

41 Charles Darwin to Asa Gray, 11 August [1860], *DCP*.

42 Charles Darwin to Jeffries Wyman, 3 October [1860], *DCP*.

The hunt for facts to support his ‘crude speculation’ nonetheless continued. In August 1859, just before the publication of *Origin*, he had turned to yet another potential source, the Jamaican magistrate Richard Hill. ‘[I]s there any current belief in the W. Indies’, Darwin asked, ‘that there is any difference in the liability of pure *Europeans* of a light complexion and hair, or of a dark complexion and hair, to take the Yellow Fever or other Tropical complaints?’⁴³ Hill replied to many of the questions in Darwin’s letter in November but provided no information regarding human liabilities to diseases. With a number of queries having been sent out and only a single reply, one can see why Darwin might have decided that a more systematic approach would be necessary. Hence his turn to the army. As might be imagined, however, not all in the armed forces had any great enthusiasm for the time of army surgeons being taken up with ‘additional labour’, however valuable it might be to science.

Darwin was told on 1 April 1862 that his memorandum had encountered difficulties, and that ‘the usual official nonsense or obstructiveness has got into the Director General’s head’.⁴⁴ However, a letter a week later, from Edmund Alexander Parkes, professor of hygiene at the Army Medical School, Chatham, seemed more optimistic. Parkes proposed limiting the bounds of Darwin’s inquiry to ‘Malarious & Yellow Fevers and to Dysentery’, on the grounds that they were ‘definite and easily recognized Complaints’. He also drew up a table for surgeons to fill in, suggesting that it could be shown to the director general, ‘& if he approves he might send it out to Calcutta, Bombay, Madras, and the West Indies with a request that the attention of the Army Surgeons be drawn to the subject, but without making the return compulsory’.⁴⁵ In understanding why Parkes aided Darwin in this way, there are several possible answers. He may simply have been willing to do a favour for a respected naturalist and somewhat distant relative (Parkes’s grandfather was nephew to Darwin’s grandfather, Josiah Wedgwood). But it was also true that Darwin’s question was not as peculiar, for an army physician, as it might otherwise seem. It is certainly not surprising that Parkes proposed a tabular form for the data Darwin needed, nor that he could produce one so rapidly. Similar forms had been standard in the army since the 1810s: statistics on race and disease in the British Empire drawn from this information had been published in four massive reports between 1838 and 1841 and were largely responsible for cementing the view that immunity and susceptibility were racial traits.⁴⁶ Darwin cited the principal author of these reports, Major Alexander Tulloch, in *Descent*, while Parkes would combine the idea of racial immunity with a growing medical orthodoxy concerning the specificity of the causes of disease in his *Manual of Practical Hygiene* (1864), a work that, as Mark Harrison has noted, ‘became the standard text for military men in Britain and the colonies in the

43 Charles Darwin to Richard Hill, 8 August [1859], *DCP*, original emphasis.

44 George Busk to Charles Darwin, 1 April 1862, *DCP*. Busk enclosed a letter from E.A. Parkes, dated 30 March, which described the response of the director general of the Army Medical Department, James Brown Gibson.

45 Edmund Alexander Parkes to Charles Darwin, 8 April 1862, *DCP*.

46 A.M. Tulloch, *Statistical Report on the Sickness, Mortality, and Invaliding among the Troops in the West Indies*, London: W. Clowes and Sons, 1838; Tulloch, *Statistical Reports on the Sickness, Mortality, and Invaliding among the Troops in the United Kingdom, the Mediterranean, and British America*, London: W. Clowes and Sons, 1839; Tulloch, *Statistical Reports on the Sickness, Mortality, and Invaliding among the Troops in Western Africa, St. Helena, the Cape of Good Hope, and the Mauritius*, London: W. Clowes and Sons, 1840; Tulloch, *Statistical Reports on the Sickness, Mortality, and Invaliding among Her Majesty’s Troops Serving in Ceylon; the Tenasserim Provinces; and the Burmese Empire*, London: W. Clowes and Sons, 1841. On the effect of Tulloch’s report see most recently Tim Lockley, *Military Medicine and the Making of Race: Life and Death in the West India Regiments, 1795–1874*, Cambridge: Cambridge University Press, 2020.

1860s, 1870s, and 1880s'.⁴⁷ I would thus suggest that Parkes's and Darwin's views on the question of racial susceptibilities to diseases bore a general similarity and that, while it is difficult to directly determine Darwin's understanding of the broader medical conception of relations between constitutions and race in Victorian Britain, Parkes's text provides a helpful baseline, particularly with regard to the period after mid-century.

Where Fergusson, as we have seen, had argued in 1823 against the idea that a specific material was the cause of the 'marsh poison', and denied explicitly that putrefying vegetable substances were responsible for matter that then differentially penetrated the 'thick, oily, and rank' skin of the 'Negro' and the thinner skin of Europeans, Parkes insisted on a more determinate aetiology.⁴⁸ In the case of paroxysmal fevers, for example, Parkes noted that the 'external cause' was generally 'presumed to be putrescent or, at any rate, decomposing vegetable matter, which is carried into the body by the medium of water or air'.⁴⁹ This single and specific external cause – the cause only of paroxysmal fevers – then encountered different internal states, not simply a different barrier to entry. 'The conformation, or structural condition, which permits the external cause to act', Parkes wrote, 'is evidently not equal in different individuals, or in different races'.⁵⁰ Making this last point more explicit, Parkes also drew attention, as Darwin had, to analogous variations within a given race. 'Different races', he asserted,

possess the peculiar habit which allows the external causes to act in very different degrees; this is marked in the case of negroes and mulattoes as compared with white men, but even in the European nations it has been supposed that the northern are more subject than the southern nations.⁵¹

Along with the increasing hardening of racial ideas that characterized the Victorian age had come a concomitantly stronger medical conception of racial difference, one that took racialized susceptibilities and immunities for granted and explained them in terms literally more than skin deep.

Darwin would thus have had a genuine ally in Parkes, and the latter's interventions seem to have been sufficient to win approval for the survey. Yet the voluntary nature of the exercise, if understandable, was also inadvisable. Writing to Wallace two years later in 1864, Darwin noted that printed forms had been sent 'to the surgeons of all Regiments in Tropical countries ... but I dare say I shall never get any returns'.⁵² His prediction would prove to be astute.

Constitutional decline

Writing about the relationship between complexion and susceptibility in *Descent*, Darwin could only cite Daniell and a Dr Nicholson, who had apparently written from Antigua to deny Darwin's premise: 'he did not think that dark-coloured Europeans escaped the yellow-fever better than those that were light-coloured'. An essay from the *Anthropological Review* of 1866 confirmed the point. Like Daniell, J.M. Harris insisted that

⁴⁷ Mark Harrison, 'Tropical medicine in nineteenth-century India', *BJHS* (1992) 25, pp. 299–318, 312. On British medical ideas in this period see Margaret Pelling, *Cholera, Fever, and English Medicine, 1825–1865*, Oxford: Oxford University Press, 1978.

⁴⁸ Ferguson, op. cit. (15), p. 297.

⁴⁹ Edmund A. Parkes, *A Manual of Practical Hygiene, Prepared Especially for Use in the Medical Service of the Army*, London: John Churchill and Sons, 1864, p. 427.

⁵⁰ Parkes, op. cit. (49), p. 428.

⁵¹ Parkes, op. cit. (49), p. 431.

⁵² Charles Darwin to A.R. Wallace, 28 [May 1864], *DCP*.

it was the light-complexioned who were favoured in tropical climates, to the extent that Harris preferentially chose redheads for service on the African coast. They were 'slight indications' but the point was seemingly clear. '[T]here seems no foundation', wrote Darwin, 'for the hypothesis, which has been accepted by several writers, that the colour of the black races may have resulted from darker and darker individuals having survived in greater numbers, during their exposure to the fever-generating miasmas of their native countries'.⁵³

By the mid-1860s, then, Darwin had come up short in his quest for data to confirm his theory of constitutions selection. By 1865, he had also become aware that his theory was not entirely novel. In a letter to Joseph Hooker written in October, he noted that 'a Yankee has called my attention to a paper attached to Dr Wells' famous Essay on Dew, which was read in 1813 to Royal Soc. but not printed, in which he applies most distinctly the principle of N. Selection to the races of man'.⁵⁴ Wells had argued that the 'European' and 'African' races possessed different abilities to withstand diseases. This difference, he wrote, 'I assume as a fact, though I am utterly unable to explain it'.⁵⁵ With this unexplained assumption in hand, he quickly proceeded to anticipate at least some of Darwin's claims. In 'An historical sketch of the recent progress of opinion on the origin of species', an essay appended to the beginning of the fourth edition of his *Origin of Species* (1866), Darwin quoted Wells at length. 'Of the accidental varieties of man, which would occur among the first few and scattered inhabitants of the middle regions of Africa', wrote Wells,

some one would be better fitted than the others to bear the diseases of the country ... The colour of this vigorous race I take for granted ... would be dark. But the same disposition to form varieties still existing, a darker and darker race would in the course of time occur; and as the darkest would be the best fitted for the climate, this would at length be the most prevalent, if not the only race, in the particular country in which it had originated.⁵⁶

We might surmise that, with little to show for his long-held hypothesis, and the realization that this part of his theorizing might well be regarded as derivative, Darwin began to lose his former enthusiasm for the notion of constitutions selection.

However we might account for it, I can locate fairly scant evidence in Darwin's correspondence that he continued to ask questions concerning the relationship between complexion and disease resistance in humans after the mid-1860s with the same frequency as a decade earlier. Indeed, in one of the few places the issue does arise – in exchanges with the explorer William Winwood Reade – Darwin does not appear to have been the instigator. In setting off for the Gold Coast in May 1868, Reade wrote to Darwin to see 'whether you might desire me to make any special inquiries either as to the habits of animals or of the natives'.⁵⁷ Darwin replied with a plethora of queries, involving, among other matters, the facial expressions and standards of beauty among 'Negroes', and the

53 Darwin, op. cit. (1) (vol. 1), p. 245.

54 The 'Yankee', as Darwin noted in *On the Origin of Species by Means of Natural Selection*, 4th edn, London: John Murray, 1866, p. xv, was the Reverend Mr Brace, of New York, although Brace himself wrote to Darwin to give the credit to his neighbor, Robert S. Rowley. Charles Loring Brace to Darwin, 29 April 1867, DCP.

55 William Charles Wells, *Two Essays: One upon Single Vision with Two Eyes; The Other on Dew. [Including] ... An Account of a Female of the White Race of Mankind, Part of Whose Skin Resembles That of a Negro; With Some Observations on the Causes of the Differences in Colour and Form between the White and Negro Races of Men*, London: A. Constable and Co., 1818, pp. 433–4.

56 Wells, op. cit. (55), pp. 435–6. Darwin, op. cit. (54), p. xv.

57 William Winwood Reade to Charles Darwin, 19 May 1868, DCP.

physical characteristics of rams on the Guinea Coast. He did not ask about the relationship between disease susceptibility and race.⁵⁸ Reade, nonetheless, would soon offer insights on precisely this point, but referenced Wells alone as the theory's proponent. '[J]et black tribes', he wrote in June 1870, 'inhabit a country which is swampy and moist in the rainy season, and *febrile* : intensely hot in the day. Dr Wells' idea is I believe possible, although the immunity of the negroes from coast fever is by no means so complete as is usually supposed'.⁵⁹ Darwin replied to many aspects of Reade's letters, but does not appear to have engaged with this element.⁶⁰ Nonetheless, Reade took up the question again – and again associated it with Wells alone – in a letter from November. He emphasized the fact that immunity to malarious fever was not 'perfect' among Africans, for he had seen his 'own men, pure negroes, down with fever'. That said, those who had suffered had been comparatively light-skinned, so that it might be that Wells was not so much wrong as premature. Perhaps, Reade suggested, the action of natural selection was ongoing. In any case, more data were needed. 'We want', he opined, 'not the mere passing notes of travelers, but a series of medical observations extended over years; but how get them in West Africa?'⁶¹ The question – valid, if grammatically awkward – went unanswered by his correspondent.

We might contrast this seeming lack of interest with Darwin's continuing enthusiasm regarding the question of coloration and resistance to poison and disease in the non-human world. He could not easily give up Wyman's capital pig story. At almost exactly the same time as he received the letter from Reade described above, Darwin replied to one from the physician William Ogle, who had sent him an offprint of a paper about anosmia.⁶² Ogle suggested that an animal's sense of smell was related to the pigmentation near its olfactory organs: to put it simply, there was a 'correspondence between the degree of nasal pigmentation and the keenness of smell'.⁶³ Where Darwin thus proposed that some innate, colour-related resistance explained the fact that when white and black pigs ate the same plant, only the white ones perished, Ogle countered by asking whether anyone knew for a fact that the different-coloured swine had partaken of the same substance. Perhaps the dark pigs, who had a better sense of smell and hence of taste, could identify the dangerous plant and avoid it.⁶⁴ Darwin was having none of it. 'I cannot yet give up the ghost about white colour & vegetable poisons', he replied. He advised Ogle to send his paper to Wyman and ask whether someone trustworthy in Florida could try giving the root to both black and white pigs and seeing if they would eat it. The issue was still on his mind after he finished the letter, for he followed his signature with another query: 'I wonder whether white pigs find truffles & pig-nuts as well as black pigs.'⁶⁵ Darwin, in other words, remained convinced that correlations existed between the colour of plants and animals and their resistances to diseases and toxins. By 1870 he no longer seemed determined to track down analogous evidence for human races.

So went one of Darwin's two theories about the origins of human racial divergence. In *Descent* he continued to puzzle over a related question, not about the past but about the present. Wells and Fergusson had taken it as a given that racial differences in susceptibility to disease were due to innate, fixed biological causes. So too had Nott and Gliddon. Yet

58 Charles Darwin to W.W. Reade, 21 May 1868, *DCP*.

59 W.W. Reade to Charles Darwin, 4 June 1870, *DCP*, original emphasis.

60 Unfortunately, we cannot be precisely sure on this point, since several of Darwin's letters to Reade are lost.

61 W.W. Reade to Charles Darwin, 6 November 1870, *DCP*.

62 William Ogle to Charles Darwin, dated 'before 9 November 1870', *DCP*.

63 William Ogle, 'Anosmia, or cases illustrating the physiology and pathology of the sense of smell', *Medico-Chirurgical Transactions* (1870) 53, pp. 263–90, 279.

64 Ogle, *op. cit.* (63), p. 282.

65 Charles Darwin to William Ogle, 17 November 1870, *DCP*.

even on this issue – interracial as opposed to intra-racial differences in susceptibilities – the evidence was unclear. Darwin cited – as had Knox – the army medical statistician Alexander Tulloch.⁶⁶ ‘Negroes’, he would write, ‘likewise escape to a large extent the fatal intermittent fevers that prevail along, at least, 2600 miles of the shores of Africa, and which annually cause one-fifth of the white settlers to die, and another fifth to return home invalided’. Was this because of innate racial differences between blacks and whites or simply because soldiers of African descent had acquired a resistance to endemic illnesses? Darwin decided that the answer involved a little of either choice. The cause of this immunity, he continued, ‘seems to be partly inherent, depending on some unknown peculiarity of constitution, and partly the result of acclimatization’.⁶⁷

Indeed, rather than definitively taking a side on the issue, Darwin in *Descent* now simply presented the debate as it was playing out within the French anthropological literature. On the one hand, he cited the naturalist and anatomist George Pouchet’s *De la pluralité des races humaines* (1858), the second edition of which was translated in 1864 into the English version Darwin used.⁶⁸ Pouchet had written briefly about the varying susceptibilities to disease of different races in the first edition, but he elaborated substantially on the topic in the second. There were two diseases, he claimed, from which Africans were largely exempt: the ‘marsh poisoning’ and the yellow fever. Some, it was true, insisted that immunity to marsh fevers was the result of acclimatization, yet Pouchet found that explanation deeply lacking, invoking the ‘unhappy results of the English expedition to the Niger in 1841’ as evidence for his cause. Of the 145 white men, 40 were lost, while of the twenty-five ‘coloured men’ – who had embarked in England and ‘were mostly born in America’ (and hence could not be imagined to be acclimated to the conditions of the West African coast) – not one died.⁶⁹ An even stronger case for the importance of race over acclimatization could be made for relative susceptibilities to the second disease, yellow fever. Indeed, he wrote,

If some authors have timidly advanced the theory of a former acclimatization with regard to marsh poisoning, the greater number of observers, Fenner, Nott, and Bryant, ought to admit that there was, even in the constitution of the black man, an obstacle – otherwise absolutely unknown in his nature – to the manifestation of the yellow fever; and that the black blood appeared to carry on this resisting force to the mixed breed, even if they were born far away.⁷⁰

Pouchet’s three sources for his claims about race and yellow fever were all – tellingly – Americans. What was novel in his discussion, however, and what captured Darwin’s attention, was the Frenchman’s description of what he termed an ‘extremely interesting experiment relating to this immunity’, a ‘physiological experiment’ that could be counted as ‘the first time, if we are not mistaken, that anthropology has been directly applied in the Old World to social science’.⁷¹ In the Franco-Mexican War that had been fought between the publication of the first and second editions of Pouchet’s essay, French troops had died in dramatic numbers. Taking up ‘the excellent idea of profiting by the resistance of the Negro race to the black vomit’, the French government asked the Egyptian viceroy

66 On Tulloch’s broad importance see Lockley, op. cit. (46).

67 Darwin, op. cit. (1) (vol. 1), p. 243.

68 G. Pouchet, *De la pluralité des races humaines: Essai anthropologique*, Paris and New York: J.B. Baillière and H. Baillière, 1858; G. Pouchet and Hugh J.C. Beavan, *The Plurality of the Human Race*, London: Pub. for the Anthropological Society, by Longman, Green, Longman, and Roberts, 1864.

69 Pouchet, op. cit. (68), pp. 58–9.

70 Pouchet, op. cit. (68), p. 60.

71 Pouchet, op. cit. (68), pp. 60, 61.

for a battalion of soldiers from the Sudan.⁷² Unlike the western coast of the African continent, however, the Sudan was not known as a region where the yellow fever was endemic, so it could not be assumed that its inhabitants were already acclimatized, and hence immune, to the disease. It was thus, in Pouchet's telling, that observers watched 'not without anxiety', for here one had a natural experiment, one that 'did not happen, as in our laboratories, *in anima vili*'. The sides were clear: there were those who believed in the 'functional uniformity of the Negro race' and hence assumed that immunity was innate and essential, rather than acquired, and those who held that immunity was not a racial and hereditary trait, and thus that all of these unacclimatized soldiers would soon perish.⁷³ The outcome, in Pouchet's eyes, handed the laurel to the racialists, since – as Darwin put it – 'the Sudanese recruits escaped the yellow fever equally well with the negroes originally brought from various parts of Africa, and accustomed to the climate of the West Indies'.⁷⁴

To represent the anti-racialists in *Descent*, on the other hand, Darwin cited Jean Louis Armand de Quatrefages, who sent a copy of his essay on the 'Unité de l'espèce humaine' to his British colleague soon after its publication in 1861.⁷⁵ As proof that immunities were not innate, but gained over time in a given environment, Quatrefages provided extensive evidence that immunity could be lost: 'That acclimatization plays a part', Darwin wrote, 'is shewn by the many cases in which negroes, having resided for some time in a colder climate, have become to a certain extent liable to tropical fevers'.⁷⁶ Quatrefages, in fact, turned one of Pouchet's examples against him. Pouchet had argued that because none of the black soldiers in the Niger expedition in 1841 had died – in spite of the fact that few if any had been born in Africa – immunity to yellow fever could be taken as an inherited trait. Quatrefages, however, noted that eleven black soldiers had become ill, and suggested that this was because all of these eleven had lived in England for several years and had therefore lost some of their immunity: not enough to render the disease mortal, but enough to make them more susceptible than before.⁷⁷

What was a difference in *species* for Pouchet, in other words, was merely a difference in *race* for Quatrefages, and hence no evidence that humans were anything but a unity. For Darwin, the result was stalemate, of sorts, and one to be met with an irenic solution. Both acclimatization (the older explanation) and innate, heritable racial differences (the newer set of claims) were factors necessary to explain differences in disease susceptibility between geographically dispersed populations. Darwin offered what we might consider a characteristically Darwinian reframing of the meaning of acclimatization. That term – and particularly the earlier partial cognate, 'seasoning' – had usually been used to describe a short-term adaptation, customarily a few years. In Prichard's *Researches*, the time period stretched to several generations, but in Darwin's hands acclimatization became a matter of hundreds of thousands of years: how else might one explain the seeming fact that Native Americans, 'who have resided there from time immemorial', were not immune to the yellow fever, while negroes were? Only by assuming that negroes had been exposed to the disease 'during a prodigious length of time', a time so prodigious that it dwarfed the period in which American aborigines had lived in their current home.⁷⁸ It was the same kind of logic Darwin would deploy in solving – by largely dissolving –

72 Pouchet, op. cit. (68), p. 60.

73 Pouchet, op. cit. (68), p. 61.

74 Darwin, op. cit. (1) (vol. 1), p. 243.

75 A. de Quatrefages, *Unité de l'espèce humaine*, Paris: L. Hachette et cie, 1861; Darwin to Quatrefages, 25 April 1861, DCP.

76 Darwin, op. cit. (1) (vol. 1), 243.

77 Quatrefages, op. cit. (75), p. 363.

78 Darwin, op. cit. (1) (vol. 1), p. 244.

the more general dispute between the monogenists and the polygenists. On the one hand, humans all derived from the same progenitors (as the monogenists claimed); on the other hand, races had diverged from one another a very, very long time ago, so that racial differences could be regarded, in the short term, as essentially fixed, much as polygenists tended to argue. Medicine, in other words, was yet another arena where Darwin's hope was that 'when the principles of evolution are generally accepted ... the dispute between the monogenists and the polygenists will die a silent and unobserved death'.⁷⁹

By 1871, then, Darwin had not only abandoned his idea of 'constitutions selection'; he was now no longer even sure of its most basic premise, that black immunity to disease was an innate, rather than an acquired, characteristic. Yet this conviction did not emerge until at least the mid-1860s. There is no reason to conclude, as Richards does, that even before 1859 'Darwin made the definitive decision ... that skin colour in humans was ... predominantly if not solely due to sexual selection, rather than through natural selection via resistance to disease.' Constitutions selection remained profoundly important in spite of Darwin's 'Origin declaration on the determining role of sexual selection in human racial divergence'.⁸⁰ This was so because sexual selection and constitutions selection were not equally powerful explanatory theories and they were not really in competition. That Darwin clearly became ever more confident of the truth of sexual selection, as it applied both to humans and to all other animals, did not necessarily affect his judgement about the role of susceptibility and immunity in aspects of human racial development. For 'constitutions selection' only explained one aspect of racial divergence. Darwin did not deploy it to explain most of the features for which he cited sexual selection, such as (from one of his notes), beards, ears, female tattooing, lips, flattened noses and steatopygia in both humans and baboons.⁸¹ Constitutions selection was invoked only to explain varieties of skin colour and complexion. And on this one issue, sexual selection was rather weak.

Why, we might ask, following Desmond and Moore, did Darwin decide that 'a dark complexion [was] more useful than alluring in hot climates'?⁸² In *Descent*, Darwin would supply much of an answer. Two chapters of the text were devoted to the 'secondary sexual characters in man', and in the last section before his summary of the second chapter, he offered to 'consider in a little more detail, relative to sexual selection, some of the characters which distinguish the several races of man from each other and from the lower animals, namely, the more or less complete absence of hair from the body and the colour of the skin'. Other features, which 'probably have been acted on through sexual selection', such as 'the great diversity in the shape of the features and of the skull between the different races', he left to one side.⁸³ Naked skin, Darwin suggested, was probably a disadvantage to humans in the struggle for survival, so that natural selection could hardly be invoked to explain the loss of hair relative to our closest animal forebears. The relative presence or absence of hair in different human groups gave a hint as to another cause, for degree of hirsuteness was not just a racial trait. 'The absence of hair on the body is, to a certain extent', Darwin wrote, 'a secondary sexual character; for in all parts of the world women are less hairy than men. Therefore, we may reasonably suspect that this is a character which has been gained through sexual selection'.⁸⁴ Just as the sexual dimorphism between the gaudy peacock and the drab peahen was, for Darwin, a sign that the anti-adaptive peacock's tail had emerged via sexual selection, so too anti-

79 Darwin, op. cit. (1) (vol. 1), p. 235.

80 Richards, op. cit. (7), p. 358.

81 From Darwin's notes on Lawrence (1819). Cited in Desmond and Moore, op. cit. (6), p. 284.

82 Desmond and Moore, op. cit. (6), p. 289.

83 Darwin, op. cit. (1) (vol. 2), p. 375.

84 Darwin, op. cit. (1) (vol. 2), p. 376.

adaptive female nakedness could be explained as an aesthetic choice made by mates over innumerable generations.

Precisely this sexually dimorphic sign was absent in the case of human skin colour. ‘The best kind of evidence that the colour of the skin has been modified through sexual selection’, Darwin wrote, ‘is wanting in the case of mankind, for the sexes do not differ in this respect, or only slightly and doubtfully’.⁸⁵ On the other hand, skin colour was, he knew from decades of reading, an aesthetically important trait to all races, and was hence likely to be subject to modification through selection. In a famous passage, Darwin declared it ‘at first sight a monstrous supposition, that the jet blackness of the negro has been gained through sexual selection; but this view is supported by various analogies, and we know that negroes admire their own blackness’.⁸⁶ Sexual selection could explain the varieties of human skin colour, but one can see in Darwin’s unemphatic tone precisely why he would hold on to his notion of constitutions selection – applied only to colouration, and hence not interfering with sexual selection – as an explanation for a vast array of phenomena. In *Descent*, Darwin gave up the theory he had held in some version for three decades, but we can imagine he did so reluctantly.

Conclusion

By the mid-1860s, Darwin had almost all the pieces in hand to arrive at the mature position on racial susceptibility to disease that he would lay out in *Descent*. Differential immunities, he had come to believe, were markers of racial, but not species-level, difference: immunities could be passed on to progeny and were hence innate, yet they could also be lost, and were hence originally acquired. His hope that immunities to disease might help explain the origin of human races, however, had been effectively dashed. The little evidence he could gather on the topic worked against his premise, that darker-complexioned individuals might fare better in tropical climates than their lighter brethren. The speed with which Darwin dispatched his theory of ‘constitutions selection’ in *Descent* is no doubt the main reason why so few scholars have paid it much attention, yet I hope to have shown that reading the dismissals in *Descent* backward is a mistake. The idea that disease susceptibility might be correlated to skin colour had been with Darwin since the earliest days of his thinking about the transmutation of species, and was flagged by him, together with sexual selection, as one of the two causes of human racial divergence when he began systematically working through the problem of race. As Richards has shown, he became only more convinced of the power of sexual selection in the late 1850s and throughout the 1860s, prior to the publication of *Descent* in 1871. ‘Constitutions selection’, by contrast, turned up little evidence for humans, although Darwin did find exciting analogies amongst lower animals and plants. His continued search for evidence on the subject, even as he became convinced that sexual selection might explain varying skin colours, should not, however, be understood either as mere pig-headedness or as characteristically Darwinian due diligence. First, because Darwin was hardly alone in nineteenth-century Britain in believing that immunities or susceptibilities to disease were racial traits. Race-medicine and race-science, racialized pathologies and racialized anatomies, were often understood as working together. It is our disciplinary and historiographical quirks that keep them apart, not our actors’. Second, and more personally, Darwin clearly continued to hold out hope that constitutions selection might provide a strong explanation on precisely the most salient racial characteristic in Victorian Britain – skin colour – a characteristic where the evidence for sexual selection

⁸⁵ Darwin, op. cit. (1) (vol. 2), p. 381.

⁸⁶ Darwin, op. cit. (1) (vol. 2), pp. 381–2.

was relatively weak. It was not to be. Darwin's explanation for human diversity would, as ever, be rooted in the supposition of an original human unity. In spite of its original promise, medicine would, going forward, have only an auxiliary role in Darwin's solution to the problem of race.

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