2 Science of Empire: The South African Origins and Objects Galtonian Biometrics

Francis Galton has been the subject of an enormous scholarly literature that is difficult to summarize. This literature is, in almost equal parts, biographical, history of science and social history. In broad strokes, his investigations and arguments fall in to two related fields. The first, and most influential, has been the development of the scientific field of biometrics – the application of empirical statistics to biology (including psychometrics, the contemporary sub-field of psychology). It was Galton who discovered and popularised two of the master procedures of modern statistics – the measures of correlation and regression – as part of the effort to build eugenics, the science of racial breeding. Working with his disciple, Karl Pearson, Galton was substantially responsible for the ascendancy of applied mathematics across the social and biological sciences as an inter-disciplinary field in Britain. Historians have examined the politics of the development of Galton's statistical thinking in many different areas, linking it to the rise of a new professional middle class, to an older racist anthropometric science and to new bureaucratic anxieties about the irredeemably poor in the city.

This is an inspiring body of scholarship that illuminates the power of ideas in the shaping of institutions and national politics, and also reveals the reciprocal workings of politics on the evolution of science. But I want to suggest that there is an unnecessary narrowing of the scope of the political terrain, an embarrassed silence about Galton's views of empire, at work in all of these studies.[2] I am struck by the way in which the history of Galton's writing has been organized by the problems that have retained their significance today – his interest in the normal curve gives way to the coefficients of regression and correlation. There is a similar constraint in the studies of the broader politics of Galton's eugenic movement, the evolution of policy and administration is dominated by British domestic politics, with an occasional transatlantic sortie.

The reason for this may be that the problem of Nazism looms over the eugenic movement in Britain and the US from the early 1930s. A common theme in all of these different studies is that after the First World War the eugenic project to identify and isolate the sources of poor heredity provoked intense local opposition from conservatives, medical officers preoccupied with behavioural reform, the Catholic Church, Mendelian biologists, influential social scientists and the elected leaders of the working class.[3] Galton and Pearson, in other words, faced with determined opposition almost from the outset, had been comprehensively defeated by the mid-1930s.

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[2]Raymond E. Fancher, "Francis Galton's African Ethnography and Its Role in the Development of His Psychology," *The British Journal for the History of Science* 16, no. 1 (March 1983): 67-79 is an important exception.

[3]Stephen Jay Gould, *The Mismeasure of Man* (New York: W W Norton & Company, 1981); D. A. MacKenzie, *Statistics in Britain, 1865-1930: The social construction of scientific knowledge* (Edinburgh: Edinburgh University Press, 1981); Ruth Schwartz Cowan, "Francis Galton's Statistical Ideas: The Influence of Eugenics," *Isis* 63, no. 4 (1972): 509-528; Michael Freeden, "Eugenics and Progressive Thought: A Study in Ideological Affinity," *Historical Journal* 22, no. 3 (1979): 645-671; Michael Freeden, "Eugenics and Ideology," *Historical Journal* 26, no. 4 (1983): 959-962; Simon Szreter, *Fertility, Class and Gender in Britain, 1860-1940* (Cambridge University Press, 2002); Nancy Stepan, *The idea of race in science : Great Britain, 1800-1960* (Basingstoke: Macmillan in association with St Antony's College Oxford, 1982); D. J Kevles, *In the name of eugenics: Genetics and the uses of human heredity* (Cambridge, MA: Harvard University Press, 1995).

Historians of the state have produced similar accounts of Galton's work. These studies place his writings on fingerprinting in the 1890s within the intellectual history of European criminology, tracking the development of fingerprinting back to a longer history of identification in Europe, and in France in particular. Like the wider scholarship on the evolution of Galtonian statistics, these histories are intensely illuminating of the history of our present, linking together disparate projects in a comprehensive, and theoretically powerful, account of the contingent steps and breaks that have produced the 20th century surveillance state. Galton's interest in fingerprinting is placed in to the 19th century continuum of anthropometrics, merging the much longer histories in Europe of the use of registers and documents of identification and the physical marking of the body of the criminal subject.[4]

Scholars have comprehensively demonstrated an intellectual genealogy that connects Bentham with Alphonse Bertillon, working as a clerk for the Paris Police in the 1870s. In these accounts Bertillon solved the problems of linking the body to the written register by applying anthropometrics—the statistics of the body—to the process of identifying "incurable vagrants," building a tool that allowed the police to follow the criminal "across time" by indexing the body itself.[5] It was Bertillon's interest in the statistics of probability that established the practical basis of biometry by specifying in minute detail the procedures that should be used to measure, describe and record eleven different parts of the body. Bertillonage, as the global system of criminal identification was called in the 1890s, injected the tools and racist preoccupations of phrenology and craniometry, the fields of anthropology that sought to assess personality and intellect by measuring the contours, size and shape of the skull, into the heart of the modern bureaucracy. Galton's work on fingerprinting was a logical remedy to the hidden statistical weaknesses of Bertillon's anthropometrics. Typically the empire slips in to these explanations in a sentence or a paragraph indicating that fingerprinting came from India, or that Apartheid was the "last physiognomic system of domination in the world."[6]

Where Adolphe Quetelet saw virtue in the Aristotelian mean, arguing that the fostering of the "normal man" should be the object of statistical research and social policy, Galton saw deterioration or regression, the elimination of the brave and the wise by the average qualities of the masses.[7] Eugenicists believed, with increasing anxiety over the next half-century, that civilization worsened the mathematical logic of ? by preserving the lives of the weak and the sick, and discouraging the reproduction of the "best stocks." Galton's innovation, in the accounts of

[4]Allan Sekula, "The Body and the Archive," *October* 39 (1986): 3-64; Carlo Ginzburg, "Clues: Roots of an evidential paradigm," in *Clues, myths and the historical method*, 1989; P. Sankar, "State Power and Record-keeping: The History of Individualized Surveillance in the United States, 1790-1935" (University of Pennsylvania,, 1992); Simon A. Cole, *Suspect Identities: A History of Fingerprinting and Criminal Identification* (Cambridge MA: Harvard University Press, 2001); Jon Agar, *The government machine : a revolutionary history of the computer*, History of computing (Cambridge, Mass.: MIT Press, 2003); Edward Higgs, *The Information State in England: the central collection of information on citizens since 1500* (New York: Palgrave Macmillan, 2004); Anne M. Joseph, "Anthropometry, the Police Expert, and the Deptford Murders: The contested introduction of fingeprinting for the identification of criminals in late Victorian and Edwardian Britain," in *Documenting Individual Identity: The development of state practices in the modern world* (Princeton: Princeton University Press, 2001), 164-183.

[5] Cole *Suspect Identities* 33, 48.

[6]Ginzburg, "Clues: Roots of an evidential paradigm," 123; Sekula, "The Body and the Archive," 63.

[7]Theodore M Porter, *The Rise of Statistical Thinking 1820-1900* (Princeton University Press, 1986).

the most influential historians of this subject, was to reverse the political logic of Quetelet's normal curve.[8]

My object here is to reinsert the politics of the empire, and particularly the South African cauldron, in to the history of the development of Galtonian biometrics. [If India, as Sengoopta has shown, before 1900, it was South Africa that played this part in the 20th century.[9]] This is not a matter of disregarding the long term significance of the emerging sciences in Europe, or the even longer history of documentary state power. These have been comprehensively demonstrated.[10] But it is a matter of acknowledging the ways in which the empire provided a laboratory for the development of the racial science that underpinned biometrics and segregation, a set of political arrangements that allowed forms of regulation that were unthinkable in England and, perhaps most importantly, a platform for the accumulation of prestige that translated in to authority in London (at least before 1906). Anxiety about the prospects of the empire, as an older literature showed, was used by the most influential politicians of this period to foster coercive forms of social welfare in England.[11] The long-term defeat of the most elaborate of these schemes in the 1920s seems to have encouraged historians to turn away from the empire. But there was no parallel defeat of Galton in the empire, and there are many signs that is in the old empire that biometric technologies will take the forms that he recommended.

Galton in South Africa

The most important elements of Galton's eugenic political philosophy were already well formed by the middle of the 1860s.[12] These elements – an insistent biological determinism, the belief that psychological characteristics like bravery and intelligence are inherited by racially defined descent, and, most importantly, the conviction that these characteristics could be manipulated in human populations by controlling reproduction – were all expressed in two papers published by Macmillan's Magazine, both written before 1865 but published later: “Gregariousness in Cattle” and “Hereditary Talent and Character.” The direct inspiration for the arguments of these articles was the publication of Darwin's On the Origin of Species by Natural Selection, which was released in 1859. Galton “devoured its contents” and attributed his enthusiasm for their arguments to a “bent of

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[8]Porter, *The Rise of Statistical Thinking*; Sekula, “The Body and the Archive.”

[9]Chandak Sengoopta, *Imprint of the Raj: How Fingerprinting was Born in Colonial India* (London: Macmillan, 2003); Radhika Singha, “Settle, mobilize, verify: identification practices in colonial India,” *Studies in History* 16, no. 2 (2000): 151-198.

[10]See, in addition to those already cited, Valentin Groebner, *Who Are You?: Identification, Deception, and Surveillance in Early Modern Europe* (New York: Zone Books, 2007); Jane Caplan and John C. Torpey, *Documenting individual identity: the development of state practices in the modern world* (Princeton: Princeton University Press, 2001); Philip Richard D. Corrigan and Derek Sayer, *The great arch : English state formation as cultural revolution* (Oxford: Blackwell, 1985); Jack Goody, *The logic of writing and the organization of society* (Oxford: Oxford University Press, 1986), \home\breckenr\pdfs\4262240000Goody1986.pdf; M. T Clanchy, *From memory to written record, England 1066-1307* (Wiley-Blackwell, 1993).

[11]Bernard Semmel, *Imperialism and social reform: English social-imperial thought, 1895-1914* (London: George Allen & Unwin, 1960); G. S. Jones, *Outcast London: A Study in the relationship between the classes in Victorian Society* (New York: Pantheon, 1971); G. R. Searle, *The Quest for National Efficiency: A Study in British Politics and Political Thought, 1899-1914* (Oxford: Basil Blackwell, 1971); Anna Davin, “Imperialism and Motherhood,” *History Workshop Journal* 5 (1978): 9-65; Of the most recent studies, Edward Higgs, “Fingerprints and Citizenship: The British State and the Identification of Pensioners in the Interwar Period,” *History Workshop Journal* 69 (2010): 52-67 has begun to consider the political meaning of Empire in Britain after 1910.

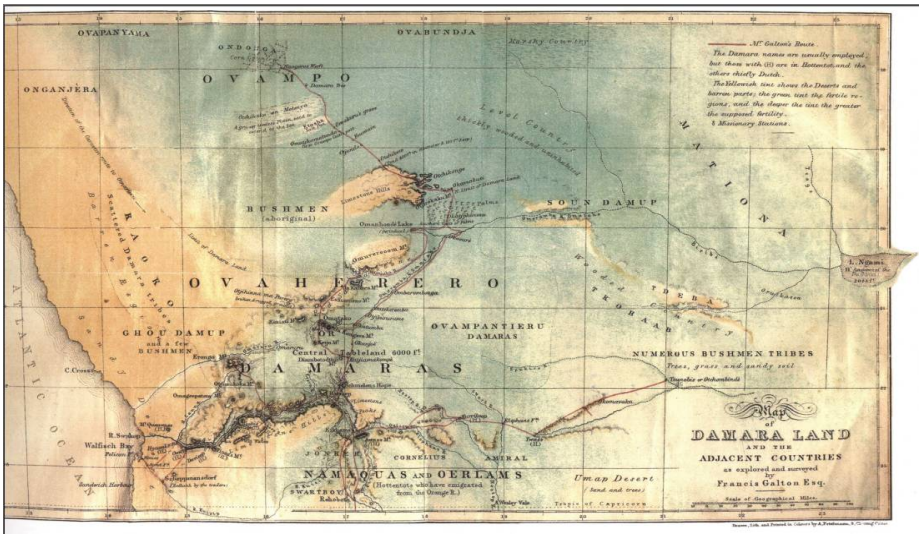
[12]Sir Francis Galton, *Memories of my life* (Methuen & co., 1908), 293; Karl Pearson, *The Life, Letters and Labours of Francis Galton : Researches of Middle Life*, vol. 2 (Cambridge: Cambridge University Press, 1924), 70.

mind" that both men inherited from their grand-father.[13] But Galton's reversal of the logic of natural selection in human beings – arguing that mediocre human descent promised to eliminate the exceptionally fit representatives of the species – did not come from Darwin. That required another source.

The most influential studies of Galtonian eugenics attribute his views to the earlier arguments of European social statisticians like Quetelet and Gauss. But the intellectual link between Galton and the earlier social statisticians is flimsy. Perhaps anticipating the arguments of later intellectual historians, Pearson observed that "while Galton's work seems to flow naturally from that of Quetelet, I am very doubtful how far he owed much to a close reading of the great Belgian statistician." Galton was notorious, in his own lifetime, for his disinterest in scholarly precedent. The content of his personal library suggest that he had almost no interest in the works of other statisticians. He owned none of Quetelet's books and the sprinkling of references in his work, Pearson believed, "are such as might easily arise from indirect sources."[14] Where, then, did he derive the idea that the intellectual qualities of human populations could be managed like stock animals? I want to show here, following Cowan, that Galton's statistics was the product of his eugenics, and, elaborating on observations from Stocking and Fancher, that the main source of his eugenics was his experience of the chaotic violence of the South African frontier.[15]

The first decade of Galton's adult life was a study in upper middle-class under-achievement. He had tried his hand as a medical student, and attempted the mathematical tripos at Cambridge (which would later be his key test of genius) but failed at both. In 1844 his father died, leaving him independently wealthy and with little reason to indulge the habit of frenzied work that he would later argue was the distinguishing biological characteristic of the civilized races. For the next six years he indulged himself, touring Egypt and Syria and hunting on the Scottish estates of wealthy friends. And it was hunting that encouraged him at the end of the decade to "travel in South Africa, which had a potent attraction for those who wished to combine the joy of exploration with that of encountering big game."[16]

[13]Galton, *Memories of my life*, 293.
[14]Pearson, *The Life, Letters and Labours of Francis Galton : Researches of Middle Life*, 2:14.
[15]Cowan, "Francis Galton's Statistical Ideas: The Influence of Eugenics."
[16]Galton, *Memories of my life*, 124.



Galton's journey to South Africa took two years; he left London on 5 April 1850 and arrived back in the city on the same day in 1852. For most of that time – August 1850 to January 1852 – he travelled in the interior of what is now Namibia, a two-thousand mile journey mostly on the back of an ox. His expedition took him from Walvis Bay up to Ovamboland, very close to the border with Angola, and then across to the east in to the Kalahari Desert. In the book he produced soon after returning to London, he described his objective as filling "up that blank in our maps which, lying between the Cape Colony and the western Portuguese settlements, extends to the interior as far as the newly discovered Lake Ngami."

Galton joined the Royal Geographical Society shortly before his departure and he was drawn to Namibia by a reading of David Livingstone's romantic description of his travels across the Kalahari Desert to Lake Ngami in February 1850. The letter described an arduous and exciting journey to the the southern-most part of the wonderful Okavango Delta, which the missionary suggested might provide an intersection with "a highway capable of being easily traversed by boats to an entirely unexplored, but, as we were told, populous region." This short description, and the gold medal that it earned from the RGS a few months later, marked the beginning of Livingstone's storied career as the archetypal explorer of Africa. What is often forgotten is that through this entire period – including the public controversy around Livingstone's disappearance and Stanley's celebrated, brutal effort to find him – Galton was the resident authority in London of the scholarly value of African exploration.

The two men shared very little else, and the contrast between them is instructive. Livingstone was an advocate of the missionary enterprise, and usually a sympathetic observer of Africans. He was a fierce critic of the settlers, an advocate of African independence, and he famously infuriated the Boers in the Transvaal by running guns to the Tswana chiefs on the western frontier. Galton was an apologist, and sometimes an enthusiast, for slavery. He surveyed and reported on the Africans he encountered with relentless derision. Some scholars have argued that this was also his view of the English poor, but Galton had remarkably little to say about the poor before 1900; for the last half of the 19th century he nurtured an especially degrading assessment of Africans as people unworthy of survival. Far from

representing the racist views of his time, Galton was a precocious champion of a special form of racist pessimism – something we could call normal racism if the phrase was not intrinsically misleading – that would dominate imperial policy at the end of the 19th century.

In their histories of Darwinian racism, Curtin, Stocking and Stepan have each pointed to the special role that the disbarred Scottish surgeon, Robert Knox, played in articulating the break with the argument that human beings had a common biological nature, that "all men were originally one."[17] Curtin described Knox as "the real founder of British racism and one of the key figures in the general Western movement toward a dogmatic pseudo-scientific racism."

Galton and Knox took up very different public positions in the emerging field of British Anthropology – Knox was one of the leading lights of the "Anthropologicals" whose recommendations on colonial policy can probably best be described as genocidal. Galton became secretary of the "Ethnologicals," while advocating policies that Knox would have endorsed, he believed that the study of the empire's colonial subjects should begin with the idea of common humanity.[18] Much of the difference between them followed from their different backgrounds – by the 1860s Galton was an exalted, and independently wealthy, member of the Victorian establishment - what Stocking has called the intellectual aristocracy - while Knox was an unsavoury Scottish surgeon earning a living from lectures because he could not practice medicine. Yet there were striking similarities between the two men, and Galton's influence persists long after Knox's genocidal enthusiasms had become untenable.

Knox, like Galton, earned his authority as an expert on race in South Africa. He was stationed as a surgeon with the British peninsular veterans on the Eastern Cape Frontier for three years before 1820, and the first of many to bring Xhosa skulls to the scientists of Europe.[19] After returning to Edinburgh he was an active member of the Wernerian Natural History Society. Knox took to lecturing publicly (and to polygenesis – the argument that the different races of man were distinct species) only after he was disbarred in 1828 for buying cadavers from a gang of murderers that he took to be grave-robbers.[20] His seminal work, The Races of Men: A fragment, published while Galton was still wandering the desert on his ox, drew on his experience of the comparative anatomy of the peoples of the South African frontier to make the argument that Galton would later adopt as his own, that "race or hereditary descent is everything." Knox used his personal knowledge of the peoples of the Cape – "the Hottentot, the Bosjeman, the Amakoso Caffre and the Dutch Saxon" – to make the point that environmental change and racial intermarriage were violations of the laws of physiology and history. After lecturing his audience on their physiological distinctiveness, he asked: "Whence came these Bosjemen and

[17]Philip D. Curtin, *The image of Africa: British Ideas and Action, 1780 - 1850* (Madison, Wisconsin: University of Wisconsin Press, 1964), 372; George W Stocking, *Victorian anthropology* (New York: Free Press, 1991), 64-5; Stepan, *The idea of race in science*, 41-3.

[18]Stocking, *Victorian anthropology*, 250-3.

[19]Robert Knox, *The races of men: a fragment* (London: H. Renshaw, 1850), 181.

[20]See the paper he presented in 1922, which struggles to fit the peoples of South Africa in to Blumenbach's taxonomy. "We may view the human race as derived originally from one stock, to which the arbitrary name of Caucasian has been given." Robert Knox, "Inquiry into the Origin and Characteristic Differences of the Native Races inhabiting the Extra-Tropical Part of Southern Africa," *Memoirs of the Wernerian Natural History Society* V, no. 1 (1824): 210.

Hottentots? They differ as much from their fellow-men as the animals of Southern Africa do from those of South America." The history of the country, as a racial laboratory, seemed to confirm his belief that race-mixing was a demographic dead-end. "The Dutch families who settled in Southern Africa three hundred years ago," he reported, "are now as fair, and as pure in Saxon blood, as the native Hollander."[21]

Both men drew their interpretations of racial biology from the same frontier society and, particularly, from the disturbing position of the light-skinned Khoi-Khoi and San in Blumenbach's[22] five-term continental racial taxonomy. But they differed crucially on the implications that South African history offered for the mutability of biological descent. For Knox, a radically pessimistic conservative, there was no possibility of change - distinctive and specific races "up to the earliest recorded time, did not differ materially"; for Galton the "curious and continuous changes" of the brown people of the Cape showed that "men of former generations have exercised enormous influence over the human stock of the present day."[23] The difference, of course, was Darwinism – Galton only began to formulate his arguments about hereditary ability after the publication of Origin of Species in 1859. This delay created the space for Galton's eugenic fantasy, but in most other respects the two men shared a common biological racism and politics. Knox's account of the AmaXhosa people of the Eastern Cape, with whom Britain had been at war for a generation, was considerably more sympathetic than Galton's description of the unfamiliar OvaHerero and Ovambo peoples.[24]

Galton's book, Narrative of an explorer in tropical South Africa – was published in 1853. Unlike Knox's lectures, which invoke the unyielding authorities of anatomy and history (or Carlyle's bombastic logic), Galton's three hundred page memoir is a detailed and engagingly written traveller's account, shaped by his amateur interests in hunting, geography and linguistics. The book became, as Stocking notes, one of the key sources of data for the arm-chair ethnologists of the 1860s.[25] But there is no sign in this work of the later Galton's obsession with anthropology: "not a word as to how to observe and record the anthropometric characters, folk-lore or religious customs of savage man; neither callipers, tape nor colour standards appear in Galton's instrumentarium."[26] Nor is it particularly interesting as ethnography – Galton was much too preoccupied with the basic category of race to understand very much about the people he was describing.

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[21]Knox, *The races of men*, 65-6.

[22]Stephen J Gould, "The Geometer of Race," *Discover* (November 1994): 65-69; Knox, "Inquiry into the Origin and Characteristic Differences of the Native Races inhabiting the Extra-Tropical Part of Southern Africa"; S. F Galton, *The narrative of an explorer in tropical South Africa* (J. Murray, 1853), 232, 250.

[23]Stocking, *Victorian anthropology*, 65; Knox, *The races of men*, 70; Francis Galton, *Inquiries Into Human Faculty and Its Development* (London: Macmillan, 1883), 208, 210.

[24] Knox on the AmaXhosa: "They are circumcised, eat no fish nor fowl, nor unclean beasts, as they are called; live much on milk, and seem to me capable of being educated and partly civilized … Their language is soft and melodious, and they seem to have an ear for simple melody … by coming into contact with Europeans, they have become treacherous, bloody, and thoroughly savage. Yet they have great and good points about them …" Knox, *The races of men*, 159-60.

[25]Stocking, *Victorian anthropology*, 80.

[26]Pearson, *The Life, Letters and Labours of Francis Galton : Researches of Middle Life*, 2:3-4; The often cited exception is his jocular use of a sextant to measure the anatomy of one of the local women. Galton, *An explorer in tropical South Africa*, 110.

Galton was accompanied on his expedition by the Anglo-Swedish adventurer, Charles Andersson. The distinctive absence of anything resembling ethnographic sympathy in Galton's book (and in the man himself) is very obvious after a reading of his companion's description of the same journey.[27] There was much about the lives of the Africans that Andersson found revolting – particularly the Herero practices of coating their bodies with ochre and abandoning the chronically ill to the wilderness, but his account is shaped by real sympathy and politeness that is completely lacking in Galton's book. The individuals and villages Andersson encountered were distinctive, with names, subtle allegiances, real sources of wealth and complex ritual and spiritual customs. Where Galton saw nothing but poverty and violence outside of the grain fields of Ovamboland, Andersson discussed at length the vast herds of cattle held by the dominant Herero kings and described, with simple pleasure, the food and drink prepared for them. On two separate occasions he comments on the sexual attractiveness of the women they encountered; Galton's comments on the same subject were framed by visceral and supercilious disgust. At the end of their journey Andersson observed, tactfully, that his now illustrious English friend "appeared delighted with the prospect of soon returning to civilized life." Anderson, who remained in Damaraland for another two years before returning to London to write his book, reported that while Galton "proved himself to be capable of enduring hardships and fatigue as well as any of us, it was evident that he had had enough of it."[28]

Frontier Violence

What the book does very well, and mostly unconsciously, is to provide a detailed first-hand account of the violence of the South African frontier. When he arrived at Walvis Bay on what is now the Namibian coast in 1850 Galton stepped in to the front line of the expanding Cape frontier. The thirty year epoch after 1820 was an especially horrible time in southern Africa, and historians have debated whether the sources of the conflict should be attributed to the rise of the Zulu state or the expansion of trading, cattle-raiding, and slavery as the emigrants from the Cape – white and brown – moved in to the interior. [29] Galton was certainly very aware that "the country here is in the wildest disorder" and convinced that the protagonists of the violence were "a set of lawless ruffians many of whose leaders were born in the Cape Colony" but that did little to temper his interest in presenting the region as a laboratory for racial conflict in the most sweeping terms.[30]

His letters home and his book describe the peoples of this region caught up in a Hobbesian war of all against all.[31] The primary villains in this

[27]Charles John Andersson, *Lake Ngami: or, Explorations and discoveries during four years' wanderings in the wilds of southwestern Africa* (Dix, Edwards & Co., 1857).

[28]Ibid., 195.

[29]For an excellent synthesis see Norman Etherington, *The Great Treks: the transformation of Southern Africa, 1815-1854* (London: Longman, 2001); and for examples of the new research Carolyn Hamilton, ed., *The Mfecane Aftermath: Reconstructive Debates in Southern African History* (Johannesburg: Witwatersrand University Press: Johannesburg: Witwatersrand University Press, 1995); and Elizabeth Eldredge and Fred Morton, eds., *Slavery in South Africa: Captive Labor on the Dutch Frontier* (Pietermartizburg: University of Natal Press, 1994).

[30]Galton, *An explorer in tropical South Africa*, 89-90; Karl Pearson, *The Life, Letters and Labours of Francis Galton: Birth 1822 to Marriage 1853*, vol. 1 (Cambridge: Cambridge University Press, 1914), 225.

[31] Galton fancied himself as an imperial proconsul, and he describes in some detail his comical announcement - as the sole local representative of Cape Governor Harry Smith - of a set of laws for the region. He took this role quite seriously. One of the great achievements of his journey, he concludes was that "the country

story are certainly the Oorlam commandos - the mixed descendants of Khoi and Nama, Christian, Dutch-speaking, horse-riding, and gun-bearing, whom Galton saw as the "offset" of the emigrant Boers.[32] He provides detailed descriptions of their frenzied efforts to seize cattle from Ovaherero families, part of a massive shift in a regional economy that had been organized around pastoralism and long-distance trade, to pervasive cattle raiding. This change in the basic pattern of accumulation was fuelled by the market for cattle in the Cape, which the Oorlams (and the other frontier raiders across the sub-continent) used to buy the guns and horses they needed to seize the enormous herds of the pastoralists. Galton was witnessing the rapid depletion of what Wilmsen has called the "surplus native product" of the desert fringe, a reservoir built up over generations. In his own grisly hunting operations around the water holes of the western Kalahari he was an early participant in the destruction of another unrecognised subsistence reservoir.[33]

Decades later, when Galton was attempting the first psychometric tests, he explained his ideas of the limits on the mind's repertoire of concepts by suggesting that "recollections tend to group themselves into a comparatively small number of separate compositions or episodes." He was referring to the "sameness of expression and anecdote" that he had to endure as a reviewer of manuscripts for the RGS, but he acknowledged that he was "quite as guilty of the fault as anyone else."[34] So he certainly was. A short list of themes cycled repeatedly through his text: the excitement of hunting, the banality of violence, the politics of slavery, joys of judicial authority, the psychology of pack oxen, and the biology of race. Each of these issues would contribute to the social biology that Galton championed after 1850.

His point, made repeatedly and with carefully considered detail, was that - as he explained to his mother towards the end of his trip - the black peoples of South Africa (with the very partial exception of the Ovambo) were "brutal and barbarous to an almost incredible degree." Galton constructed the case for this ubiquitous brutality by scattering anecdotes of casual anatomical violence through the narrative of his journey. His story opens with a description of an Oorlam attack on a mission station that was their first destination. The attack took place while Galton and his party were still en route. He describes meeting two women on the road "one with both legs cut off at her ankle and the other with one" which the Oorlams had cut "off with their usual habit, in order to slip off the solid iron anklets that they wear." He reports, as if he witnessed the incident, that one of the Oorlam leader's sons – "a hopeful youth" – walked up to an abandoned child and "leisurely gouged out its eyes with a small stick."[35]

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was suffering from all the atrocities of savage war when I arrived, and this state of things I had to put an end to before I could proceed." Galton, *An explorer in tropical South Africa*, 313. There was, unfortunately, no local reality to the Pax Galtonia: Cattle-raiding, ivory hunting and internecine war strengthened in the 1850s and 1860s. See Brigitte Lau, "Conflict and Power in Nineteenth-Century Namibia," *The Journal of African History* 27, no. 1 (1986): 38-9.

[32]See Lau, "Conflict and Power in Nineteenth-Century Namibia" for an excellent review of the peoples and politics of this period.

[33]Lau, "Conflict and Power in Nineteenth-Century Namibia," 30; Edwin N. Wilmsen, *Land Filled with Flies: A Political Economy of the Kalahari* (Chicago: University of Chicago Press, 1989), 93-129; Galton, *An explorer in tropical South Africa*, 268-287.

[34]F. Galton, "Psychometric facts," *Nineteenth Century* 5, no. 25 (1879): 430; For a description of his method, F. Galton, "Psychometric experiments," *Brain* 2, no. 2 (1879): 149.

[35]Galton, *An explorer in tropical South Africa*, 66, 67.

Anderson's account of this event, like his description in general, is restrained. He condemns the brutality of the Nama attack on the mission station, accusing them of indulging a "savage thirst for blood" but his version has none of the graphic violence of Galton's account, and he provides a detailed explanation of the basis of the conflict between Jonker, commander of the Oorlams, and Kahichene, leader of the Ovaherero settlement at the mission. This is the real difference between the two descriptions. For Galton, events are driven by racial populations with undifferentiated qualities and a universal propensity for horrifying violence. The subjects of Andersson's book are individuals, with distinctive moral qualities. Jonker Afrikaner emerges here as a ferocious, blood-thirsty, but very successful, individual leader of the raiders, quite unlike the other Oorlam leaders. There was no intrinsic tolerance for violence, and no racial solidarity. "Jonker [Afrikaner] and [William] Zwartbooi," he explains, "associated occasionally, but they were by no means well-disposed towards each other."[36]

Andersson reported the brutal conflict between the Ovaherero pastoralists and the mountain-dwelling Berg-Dama, but he was careful to explain that the evidence of "sanguinary outrages" was at second-hand. There is none of the sensational personal violence that punctuates Galton's account, and, especially, no representation of the Ovaherero as blood-thirsty murderers. For Andersson, the Ovaherero were dirty, deceitful, and callous in their treatment of the dying, but they were unmistakably fellow human beings. "It is a great pity that the Damaras are such unmitigated scoundrels," he concludes, after an extended discussion of their food and drink, "for they are full of fun and merriment."

The historiography of 19th century South Africa is replete with horrible violence,[37] but Galton's account is distinguished by the vicious sentiment he attributes to victims and perpetrators alike. In the 1870s Galton defended the RGS' feeble efforts to rescue David Livingstone – who had gone missing while looking for the source of the Nile in Central Africa – by publicly criticizing Henry Stanley's famously successful effort as sensationalist.[38] But his own writing from this earlier period was - especially in comparison with other accounts from the same period - unmistakably sensational.

Galton purports to offer an uncensored eye-witness account of the state of nature. Early in the book he describes rescuing two men who had been attacked by their neighbours. "The first man's throat was cut through," he reports in careful anatomical detail, and of the second, "all the back sinews of his neck were severed to the bone, and the cut went round his neck, but only skin deep near the jugular vein and the wind pipe." Galton has two points in mind here. The first, as he repeatedly observes, was that Africans were physiologically very different to Europeans: "The tenacity of life in a negro is wonderful."

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[36] Andersson, *Lake Ngami*, 103.

[37] The bibliography here is potentially very long. The finest single study is Jeff B. Peires, *Dead Will Arise: Nongqawuse and the Great Xhose Cattle-Killing Movement of 1856-7* (Johannesburg: Ravan Press, 1989).

[38] N. W Gillham, *A life of Sir Francis Galton: From African exploration to the birth of eugenics* (Oxford University Press, USA, 2001), 128, 131.

[39] The second was that the black people he encountered lived in a world of Hobbesian brutality.

What distinguishes Galton's account from Andersson's is the viciousness he attributes to the Ovaherero pastoralists whose herds were being harvested by the Nama raiders. Galton's book presents the life of the pastoralists as a struggle not worth living. He describes in horrifying detail the predicament of individuals attacked by hyaenas in their sleep, burned almost to death by lightening strikes and abandoned by their people. In a letter to his mother, written after he had been in the country for a year, he presented the pastoralists as the agents of horrifying violence. "The Ovahereros, a very extended nation, attacked a village the other day for fun, and after killing all the men and women," he wrote, " they tied the children's legs together by the ankles, and strung them head downwards on a long pole, which they set horizontally between two trees; then they got plenty of reeds together and put them underneath and lighted them; and as the children were dying poor wretches, half burnt, half suffocated, they danced and sung round them, and made a fine joke of it."[40]

This incident is, unusually, not described in Galton's book, and, like many of the events he mentions, the sources of his information are obscure. But what is clear is that he viewed the black people of the desert as morally depraved and incapable of sympathy. Galton returns, repeatedly, to the claim that "the Damaras kill useless and worn-out people: even sons smother their sick fathers."[41]

Carlyle's Beneficient Whip

Galton, like Carlyle a year earlier, was making the case for the restoration of slavery. This enthusiasm for slavery was precocious but it was not something new; an enthusiastic and self-conscious renunciation of the universalizing morality of his Quaker ancestry had been clear from his youth.

In 1840, at the apex of the abolitionist moment in Britain, Galton visited the slave markets at Istanbul and commented to his companion that he wished he had brought an extra £50 to purchase a Circassian slave woman.[42] After he arrived in Cape Town a decade later and had equipped himself with local servants, including an ex-slave from Mozambique, he wrote to his brother. "I have a Black to look after my nine mules and horses," he boasted, "He calls me 'Massa' and that also is very pleasant."[43] But there was much more to Galton's description of his journey in South Africa than the titillating, forbidden pleasures of slave-owning.

In direct opposition to those arguing at this time for a cross-cultural sympathy with Africans – like the Non-Conformist missionaries and the Anglican Bishop Colenso[44] - Galton's ethnographic account of the peoples of

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[39]This story is told in Pearson, *The Life, Letters and Labours of Francis Galton: Birth 1822 to Marriage 1853*, 1:30; and Galton, *An explorer in tropical South Africa*, 90-92 the claim is repeated on 66, 224 and; Galton, *Memories of my life*, 36.

[40]Pearson, *The Life, Letters and Labours of Francis Galton: Birth 1822 to Marriage 1853*, 1:236.

[41]Galton, *An explorer in tropical South Africa*, 112-3, 190-1.

[42]See also Gillham, *A life of Sir Francis Galton*, 35; For more on the same theme, see Kevles, *In the name of eugenics*, 11-2.

[43]Pearson, *The Life, Letters and Labours of Francis Galton: Birth 1822 to Marriage 1853*, 1:223.

[44]Jean Comaroff and John L Comaroff, *Of Revelation and Revolution: Christianity, Colonialism, and Consciousness in South Africa*, vol. 2 (Chicago: Chicago University Press, 1991), 198-252; Jeff Guy, *The Heretic: A Study of the Life of John William Colenso* (Johannesburg: Ravan Press, 1983), esp 69-82; William M. Macmillan, *The Cape Colour Question: A Historical Survey*, 1968th ed. (New York: Humanities Press, 1927), 210-289.

Damaraland was a polemical recommendation for the restoration of slavery. He made this case with several interwoven claims about African society. The first of these was that slavery was endemic. "It is not easy to draw a line between slavery and servitude" but his experience led him to say that "the relation of the master to the man was, at least in Damara and Hottentot land, that of owner rather than employer."[45] Like the missionaries he attributed part of the pervasiveness of slavery to the frontier raiders. "The Namaqua Hottentots and Oerlams, in all their plundering excursions, capture and drive back with them such Damara youths as they take a fancy to, and they keep them, and assert every right over them." There was little controversial about that claim – it was a standard complaint directed at Trekkers across the sub-continent. But the next part of Galton's argument was certainly unprecedented. He alleged that individuals volunteered for subjection amongst the Oorlams, and that the same kinds of relationships existed between rich and poor amongst the Damaras. "These savages," he italicized, "court slavery."[46]

This condition of self-imposed bondage, he claimed, was pervasive across the continent. Perhaps invoking the example of West African pawning, he claimed that "all over Africa one hears of 'giving' men away." These people had "abandoned the trouble of thinking what … to do from day to day." In a neat codicil to Carlyle's argument that Africans had been created to to be ruled by Europeans, Galton claimed that across the continent people routinely surrendered responsibility for governing themselves. "The weight of independence is heavier than he likes, and he will not bear it," he waxed; "he feels unsupported and lost as if alone in the world, and absolutely requires somebody to direct him."[47]

Studiously ignoring the effects of frontier-generated violence on the prospects of independence, Galton reported that the Damara "seem to be made for slavery, and naturally fall in to its ways" and that the Ghou Damup were "abused and tyrannised over by everybody, but servitude has become their nature."[48] These observations were only reinforced by the structural political relationships he witnessed between the settled grain-growing Ovambo in the far North and the nomadic peoples of the desert. For both of the travellers what made the Ovambo "a very different style of natives from those with whom we had been accustomed" was their economic autonomy. Andersson was much more conscious of the fact that this "determination and independence" was a product of Ovambo isolation from the raiders. For Galton these elements of character were racial. Where Galton interpreted the relationships between the pastoralists and the grain-farmers as evidence of a racial hierarchy and endemic slavery, Anderson stressed the formal equality he found amongst the Ovambo. "They treated all men equally well," he wrote, "and even the so much-despised Hottentots ate out of the same dish and smoked out of the same pipe as themselves."[49]

Another important peculiarity of Galton's book was his enthusiasm for the kind of imperial mastery that was expressed in the use of the whip. His journey was punctuated by floggings delivered with varying degrees

[45]Galton, *An explorer in tropical South Africa*, 237.
[46]Ibid., 232.
[47]Ibid., 239.
[48]Ibid., 239 and 257.
[49]Andersson, *Lake Ngami*, 139.

brutality. These anecdotes range from the threatened whipping of impertinent guides to the event in Ovamboland that may have been responsible for the atmosphere of mistrust that both Galton and Andersson described. After they had been waiting for several days for an audience with Nangoro, Galton started to worry that the herdsman provided by his hosts was not pasturing his oxen properly; to alter the man's routine he "took active measures upon his back and shoulders, to an extent that astonished the Ovampo and reformed the man."[50] The journey was concluded with the "business-like application of a new rhinoceros-hide whip" after Galton participated in an Oorlam assault on the homestead of a Ovaherero man who had killed Galton's favourite, but abandoned, oxen.[51]

When Galton published his most popular book in the middle 1850s, a guide to wandering on the fringes of the empire called The Art of Travel, he warned his countrymen that "the system of life among savages" was a romanticized version of Hobbes' state of nature. Quoting the same verses from Wordsworth's "Rob Roy's Grave" that appear on the opening page of Walter Scott's romance of the Scottish outlaw, he explained that the rule of action for the English traveller was that "they should take who have the power, And they should keep, who can."[52] It is clear from the tone of his descriptions, that these beatings upheld a particular kind of heroic masculinity that celebrated the physical strength of the master. But there were some obvious limits. Towards the end of the book he confronts a thief "six foot five inches high and large in proportion" and "dared not whip him."[53] Similarly he complained, a little ironically, that "I often wanted to punish the ladies of my party, and yet I could not make their husbands whip them for me, and of course I was far too gallant to have it done by any other hands."[54] In his autobiography, written nearly 60 years after his travels in South Africa, Galton described holding "a little court of justice on most days, usually followed by corporal punishment, deftly administered."[55]

Galton's endorsement of flogging - like Carlyle's almost simultaneous recommendation of the use of the plantation owners' "beneficient whip" for the freed slaves of Jamaica - was a self-conscious rejection of the arguments that had been made by the abolitionists and the utilitarians.[56] This studied attachment to the whip on the imperial frontier followed decades of very public controversy about the place of flogging in the British military, and vigorous abolitionist agitation in his own home town about the cruelty of whipping.[57] For Galton the Africans lived in a world which required an entirely new set of rules, where there was little time for the utilitarians' justification of government as progress or the humanitarians defence of a divinely sanctioned and common humanity.

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[50]Galton, *An explorer in tropical South Africa*, 215, see also 157, 200, 241, 289.

[51]Ibid., 289.

[52]Francis Galton, *The Art of Travel; or Shifts and Contrivances Available in Wild Countries*, 1st ed. (London: John Murray, 1855), 60.

[53]Galton, *An explorer in tropical South Africa*, 240-1.

[54]Galton, *An explorer in tropical South Africa*, 199; For an overview of the literature on imperial masculinity, see Angela Woollacott, *Gender and Empire* (London: Palgrave Macmillan, 2006), 58-79.

[55]Galton, *Memories of my life*, 145.

[56]Thomas Carlyle, "Occasional Discourse on the Negro Question," *Fraser's Magazine for Town and Country*, February 1849, 534, http://homepage.newschool.edu/het//texts/carlyle/carlodnq.htm; And for a synthesis of Carlyle's role in this political debate, Hall, "The Economy of Intellectual Prestige."

[57]J. R. Dinwiddy, "The Early Nineteenth-Century Campaign against Flogging in the Army," *The English Historical Review* 97, no. 383 (April 1982): 308-331; Catherine Hall, *Civilising subjects: metropole and colony in the English imagination 1830-1867* (Cambridge: Polity Press, 2002), 111.

The proximity of barbarism

There are echoes in this early work of the anthropometric concerns of the older Galton. At the start of the journey, for the first time in his life he was in daily contact with the conversation of poor people, including the English servants he had hired in Cape Town, and he reported being "shocked at the low tone of honour that pervaded it." He was astonished to learn that these men, who were "above the average of the working class," thought of the prison "as a kind of club or head quarters, where a person had an excellent opportunity of meeting his friends."[58] After he had spent some time on the frontier his anxieties switched to the brown people around him, and he began to use the arguments that would later motivate him to undertake the study of composite portrait photography. "The greater part of the Hottentots about me had that peculiar set of features which is so characteristic of bad characters in England," he reported, "and so general among prisoners that it is usually, I believe, known by the name of the 'felon face.'" By which he meant the Oorlams had "prominent cheek bones, bullet shaped head, cowering but restless eyes, and heavy sensual lips, and added to this a shackling dress and manner."[59] In the 1880s when Galton began to look to the English prisons for sources of anthropometric data, he would return to these anxieties about the intrinsic features of the criminal type.

But these are both isolated incidents in a lengthy account, and they reflected what were already very widely and fondly held prejudices in Europe. The real innovation of Galton's journey was to convince him – quite unlike the popular arguments of the new biological racists or the older climatological and religious claims of the monogenists – of the malleability of racial characteristics, and, in particular, of the proximity of barbarism.[60] Galton believed in race as fervently as the others but he was much more pessimistic about the intrinsic virtues of the Europeans. His own experience of the violence seems to have brought him to this view. That at least is what he intended his readers to understand when he reported that "many an instance may be found along the distant coasts of this wide world where a year or two has converted the Saxon youth, who left his mother all innocence and trust, into as diabolical and reckless a character as ever stabbed with a bowie-knife."[61] A decade after he had left South Africa he argued against both flanks of racial science that "our forefathers were utter savages from the beginning; and, that, after myriads of years of barbarism, our race has but very recently grown to be civilized and religious."[62] The implication, of course, was that this biologically regulated civilisational change would continue.

This was the lesson of his time in South Africa: Galton saw in the racial tapestry of the frontier the evidence of the biological dialectic that became his obsession after 1865. He returned, obsessively, to the self-evident instability of his own racial classifications.[63] On the one hand this was an argument about biological determinism. "There is no difference between

[58]Galton, *An explorer in tropical South Africa*, 52.
[59]Ibid., 125-6.
[60]Curtin, *Image of Africa*, 46-57, 363-387.
[61]Galton, *An explorer in tropical South Africa*, 301.
[62]Francis Galton, "Hereditary Talent and Character," *Macmillans Magazine*, 1865.
[63]For more examples of this obsession with the contradictiory standing of biology and culture see Galton, *An explorer in tropical South Africa*, 49, 88, 117, 179, 230-2, 250; and Galton, *Memories of my life*, 143-4.

the Hottentot and the Bushman, who lives wild about the hills in this part of Africa, whatever may be said or written on the subject," he insisted:

> The Namaqua Hottentot is simply the reclaimed and somewhat civilised Bushman, just as the Oerlams represent the same raw material under a slightly higher degree of polish. Not only are they identical in features and language but the Hottenot tribes have been, and continue to be, recruited from the Bushman.... In fact, a savage loses his name, "Saen," which is the Hottentot word, as soon as he leaves his Bushman life and joins one of the larger tribes...

But on the other it was about the cultural and, in Galton's terms, psychological change. Thus he described the "Namaqua 'Oorlams' or Namaquas" as people "born in or near the colony, often having Dutch blood and a good deal of Dutch character in their veins."[64]

These changes in culture and character, from slave to master, were also unmistakably about the making of hierarchy. Galton insisted that the terms Oerlam, Hottentot and Bushman referred to "the identically same yellow, flat-nosed, woolly-haired, clicking individual." But what was at work was a scale of civilisation: "the very highest point of the scale being a creature who has means of dressing himself respectably on Sundays and gala-days, and who knows something of reading and writing; the lowest point, a regular savage." [65] Invoking the ranking logic that would later distinguish Galton's statistics he observed that "all things are relative" and reported that "what these Oerlams were to the Dutchmen, that the Namaqua Hottentots are to the Oerlams."[66] Galton's ethnography is unmistakably about race, and racial order, but, unlike the other biological racists, he was absorbed by the contingency and instability of almost all the racial categories he encountered on the Frontier. Later Galton would use these themes to support the argument that "the improvement of the breed of mankind is no insuperable difficulty."[67] But these formed only a small part of his growing statistical interest in the qualities of the English intellectual aristocracy.

A much more direct, and powerful, consequence of Galton's South African journey was his transformation from an upper-middle class delinquent into a member of the English scientific elite. In the year it took him to write up his book Galton offered two papers to the Royal Geographical Society and published a summary article of his journey, including a very detailed map and table of coordinates of the triangle of territory between Walvis Bay, Ovamboland and the western Kalahari. Before his book was even out Galton was awarded the society's highest honour - the Founders' Medal - "for having, at his own cost and in furtherance of the expressed desire of this Society, fitted out an expedition to explore the interior of Southern Africa." The award was given more for Galton's geographical than his anthropological achievements, for a journey "upwards of 2000 miles as to enable the Royal Geographical Society to publish a valuable memoir and map" about "a country hitherto unknown."[68]

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[64]Galton, *An explorer in tropical South Africa*, 67-9.
[65]Ibid., 69.
[66]Ibid., 68.
[67]Galton, "Hereditary Talent and Character."
[68]"Presentation of the Gold Medals," *Journal of the Royal Geographical Society of London* 23 (1853): lviii-lxi.

As Galton acknowledged in his autobiography it was the RGS medal that " gave me an established position in the scientific world" and "caused me to be elected a Fellow of the Royal Society in 1856." Even more importantly the acclamation he received from the geographers resulted in his election to the Athenaeum Club – the jealously guarded social epicentre of the Victorian intellectual aristocracy. At the still callow age of thirty-four, Galton joined his step-cousin Charles Darwin, Thomas Carlyle, Herbert Spencer, Thomas Huxley, Disraeli (only after he became leader of the Conservative Party) at the heart of the rising English scientific and literary elite.[69] It was his rapid and early adoption by these exalted institutions that gave Galton influence far beyond his scholarly achievements and nurtured his narcissistic obsession with the English scholarly establishment. When Pearson observed that Galton "worshipped as one of simpler faith at his own peculiar shrine - a shrine dedicated to the genius of his race" he could easily have located the alter in one of the lovely smoking rooms of the Athenaeum Club.[70]

Over the rest of his life Galton indulged a narcissistic infatuation with the good and great of this English elite, past and present; in the process he formulated the key techniques of modern statistics.[71] In a string of books, starting with Hereditary Genius in 1869, he tried to make the case that the talents of the distinguished in England were hereditary and likely, under the reproductive pressures of modern civilization, to be overwhelmed by the mediocre biology of the great bulk of the population.

As he struggled to build the frightening case for radical biological reform, Galton invented the statistical procedures that now dominate the production of knowledge. The first of these was the tool that he used to draw out the significance of the talent, for example, of the Cambridge examination winners was the Gaussian "law of the frequency of error," or what we would today call the normal distribution. Where the statisticians before him had celebrated the moral power of the normal along Archimedean lines, Galton was obsessed with the importance of the exceptional. He turned the error curve in to a tool for the study of the significance of variation, substituting a new social prestige of statistical ranks for Quetelet's enthusiasm for the virtues of "moderation and compromise."[72]

Hereditary Genius, 1869

When he published Hereditary Genius in 1869 Galton used the normal distribution, which he called the "law of the deviation from an average," to make his point about the value of reputations across generations. Relying heavily on examination results from Cambridge and Sandhurst, which could easily be mapped against a normal curve, he argued that the distribution of "natural gifts" followed the same pattern in society and over time. "There must be," he suggested, "a fairly constant average mental capacity in the inhabitants of the British Isles, and that the deviations from that average – upwards towards genius and downwards towards stupidity – must follow

[69]Galton, *Memories of my life*, 153; Gillham, *A life of Sir Francis Galton*, 105-6; Stocking, *Victorian anthropology*, 96, 253.
[70]Pearson, *The Life, Letters and Labours of Francis Galton : Researches of Middle Life*, 2:98.
[71]Cowan, "Francis Galton's Statistical Ideas: The Influence of Eugenics."
[72]Porter, *The Rise of Statistical Thinking*, 102.

the law that governs deviations from all true averages."[73] Using the scales A to G, and a to g, he produced a ranking order that mimicked the normal curve. He began with the "four mediocre classes a, b, A, B," which combined included more than four-fifths of the total, drifting out to the "truly eminent" in class F who were placed "first in 4,000." In an extensive list of celebrated lives, Galton found virtue in the evidence of nepotism, proving that a small number of families produced the bulk of acclaimed individuals through history.[74] He used this evidence to make the claim that eminent individuals in class G, and the even more exalted class X (all ranks above G), were descended from eminent men and tended to produce eminent sons. (Women, in Galton's account, were theoretically bearers of ability but in practice they were simply vessels for the production of children.[75]) And he tried to show, with even less success, that "with moderate care in preventing the more faulty members of the flock from breeding, so a race of gifted men might be obtained." [76]

Galton had very little to say about the "faulty members" of the English flock in this book, relying, instead on a comparison between Africans and Athenians to set up his argument in favour of encouraging the fertility of the professions and placing the weak in "celibate monasteries."[77] The tool that Galton used for his comparison was "the law of deviation from an average, to which I am have already been much beholden."[78] And history was, again, the source of his data. Africans undeniably had some outstanding leaders, like the Haitian revolutionaries, but Galton used these figures and an arbitrary calibration procedure to prove the dismal implications of the normal distribution. "The negro race has occasionally, but very rarely, produced such men as Toussaint l'Ouverture, who are of our class F; that is to say, its X, or its total classes above G, appear to correspond with our F, showing a difference of not less than two grades between the black and white races, and it may be more." He made much the same point about the evidence of Africans being "good factors, thriving merchants, and otherwise considerably raised above the average of whites—that is to say, it can not unfrequently supply men corresponding to our class C, or even D." But these men were "classes E and F of the negro", proving that the "average intellectual standard of the negro race is some two grades below our own."[79]

Without anything resembling evidence for these claims, Galton used his South African experience to confirm his mathematical speculations. Following the logic of the normal curve on its negative axis, he claimed to speak with authority on the pervasiveness of stupidity. After citing "every book alluding to negro servants in America," he offered his own observations of the large proportion of Africans who were feeble-minded. "I was myself much impressed by this fact during my travels in Africa," Galton explained: "The mistakes the negroes made in their own matters, were so childish, stupid, and simpleton-like as frequently to make me ashamed of my own species, I do not think it any exaggeration to say, that

[73]S. F Galton, *Hereditary genius: An inquiry into its laws and consequences* (Macmillan, 1869), 32.
[74]Ibid., 317.
[75]Ibid., 63.
[76]Ibid., 64.
[77]Ibid., 362.
[78]Ibid., 337.
[79]Ibid., 340.

their c is as low as our e, which would be a difference of two grades, as before."[80]

Writing at a time when figures like Robert Knox and James Hunt were articulating a brutal form of racial supremacy (which Galton called the "nonsensical sentiment of the present day") that threatened to overwhelm the cerebral tenor that was cultivated by the Darwinians at the Atheneum Club – he was careful to leave the imperial implications of his argument to his readers.[81] He set the context of a world civilization that was growing in power and scope, and he warned of the great global transformation that would bring. He positioned the English between the Africans and the Athenians, whose ability "on the lowest possible estimate, [was] very nearly two grades higher than our own—that is, about as much as our race is above that of the African negro."[82] And he warned that the English, whose towns were "crushing them into degeneracy," faced the same problem as the Athenians. The demographic lesson from antiquity was clear. If the "high Athenian breed … had maintained its excellence, and had multiplied and spread over large countries, displacing inferior populations" it would have hastened the progress of human civilization "to a degree that transcends our powers of imagination."

Biometric statistics

After this first effort to formulate a new, and more pessimistic, form of biological social reform failed to match the success of his geographical writing, Galton attempted an even more directly biographical test of the question of whether "nature or nurture" was dominant in the making of scholarly ability. This book, English Men of Science, was unblushingly narcissistic. Galton sought responses to a questionnaire that he submitted to the other Fellows of the Royal Society who had "earned a medal for scientific work," who ate in his own dining clubs or who, on "account of their scientific eminence," belonged "to a certain well-known literary and scientific club, the name of which it is unnecessary to mention."[83] Galton's membership of all of three sources of his data had been secured by his South African travels.

As was often the case with Galton's work, the really important insight followed the publication of his original research. Despite his innovative use of the survey, and the first study of twins, Galton's second book on heredity also did not produce the unequivocal answers he was seeking. The responses he received to his questions were eloquent but "not sufficient to bear a more strict or elaborate treatment" of statistical analysis. So he turned to the study of the inherited characteristics of peas, which could be studied inter-generationally and reduced to number much more efficiently than the poetic and loquacious responses of his fellows. By 1877 his studies of the progeny of peas (and his fondness for the normal distribution curve) prompted him to formulate the principle of biological reversion (what he later termed regression) to an ancestral type.[84] One result of this experiment was the contemporary statistical procedure of regression

[80]Ibid., 341.
[81]Galton, *Hereditary genius*, 362; Stocking, *Victorian anthropology*, 246-257.
[82]Galton, *Hereditary genius*, 342.
[83]Francis Galton, *English men of science: their nature and nurture* (London: Macmillan and Co., 1874), 5-6.
[84]Gillham, *A life of Sir Francis Galton*, 202-4; Porter, *The Rise of Statistical Thinking*, 287.

analysis, another was a new statistical understanding of the concept of race, a renewed theory of racial hierarchy, a new politics of reproduction. "It is the essential notion of a race that there should be some ideal typical form from which the individuals may deviate in all directions and towards which their descendants will continue to cluster," Galton he wrote in 1884; "The easiest direction in which a race can be improved is towards that central type, because nothing new has to be sought out."[85]

It was Galton's search for similar numerical data for human beings that drew him to anthropometrics. In the early 1880s in Inquiries into Human Faculty, the work that coined the term eugenics, he struggled to make a convincing argument about the inherited qualities of human intelligence relying, once again, on composite portraiture, his own experiences and the impressionistic responses of his friends to questions about the workings of the mind. By this time Galton had established himself as an authority on anthropometrics in Britain. He was chairman of the Anthropometrics Committee of the British Association, and he had begun to collaborate with the administrators of prisons and asylums in his search for evidence. It was this collaboration that drew him in to the Atlantic science of criminology. Here, for the first time, he acknowledged the influence of the French criminologist, Prosper Despine, and he waxed poetical about the evidence from Dugdale's study in the Annual Report of the Prison Association of New York on the Jukes family, the "gypsy-like" descendants of the "somewhat good specimen of a half-savage."[86] This work announced Galton's statistics of intercomparison, once again relying on the normal distribution to rank individual measures on his newly christened Ogive, but, more than anything else, the book demonstrated how ill-matched his data was to the statistical methods he hoped to use. As we shall see, it was in the absence of the granular numerical evidence he required, that much of this book relied on his South African evidence.

[85]Galton, *Inquiries Into Human Faculty and Its Development*, 10; Porter, *The Rise of Statistical Thinking*, 140.
[86]Galton, *Inquiries Into Human Faculty and Its Development*, 52, 54; Kevles, *In the name of eugenics*, 71.

Francis Galton's First Anthropometric Laboratory at the International Health Exhibition, South Kensington, 1884–5.

Illustration 1: http://www.flickr.com/photos/sciencemuseum/3321607591/sizes/l/

It was an urgent desire to remedy this problem that prompted him to turn to anthropometrics. "When shall we have anthropometric laboratories," he asked, "where a man may, when he pleases, get himself and his children weighed, measured, and rightly photographed, and have their bodily faculties tested by the best methods known to modern science?" What Galton had in mind was the replication of the most extensive central archive of identification then available in Britain: the Merchant Seamen Register that was built up by the Admiralty after 1835. He described the holdings at the London Customs House, delighting in the "well-established library of well-ordered folios" that included a page on the "life of a particular seaman."[87] This ideal, of the perfectly ordered, all-encompassing biographical registry, would remain one of the great unachieved ambitions of his life. In 1882 he published a plan for an "anthropometric laboratory" that would allow the English gentleman to have his "family and himself measured physically and mentally."[88] He built the new lab—"an area 6 feet by 36 feet, crammed with instruments of his own design"—for the International Health Exhibition in 1884, and then kept it running in South Kensington to gather detailed anthropometric statistics from paying customers.[89]

For most of the 1880s Galton collected measures from the thousands of visitors to his laboratory, but when he came to write his master work, Natural Inheritance - the book that ushered in to being the science of biometrics - he still lacked the intergenerational data he needed to describe heredity. He was forced to rely on family histories that had been submitted in response to his offer of a £500 prize. This data was only barely adequate – providing 150 sets of figures on height, eye-colour, temper and disease –

[87] Galton, *Inquiries Into Human Faculty and Its Development*, 29; Higgs, *The Information State in England*, 51-2.

[88] John C. Kenna, "Sir Francis Galton's Contribution to Anthropology," *The Journal of the Royal Anthropological Institute of Great Britain and Ireland* 94, no. 2 (1964): 85; Gillham, *A life of Sir Francis Galton*, 210-4.

[89] Sengoopta, *Imprint of the Raj*, 95; Gillham, *A life of Sir Francis Galton*, 210-4.

but it allowed him to demonstrate, this time unmistakably, the analytical power of the normal distribution curve in the study of people. Using the data of intergenerational stature, he showed that the "law of Regression" he had earlier discovered in the breeding of peas, applied to human populations.[90] The hereditarian implications of the mathematical logic of reversion to the norm were suitably grim. "The law of Regression tells heavily against the full hereditary transmission of any gift," he explained: "Only a few out of many children would be likely to differ from mediocrity so widely as their Mid-Parent, and still fewer would differ as widely as the more exceptional of the two Parents."[91] The success of Natural Inheritance, attracting to Galton after nearly forty years of work a small group of tenacious disciples, was derived from its (mostly) careful statistics and the analytical power of his studies of deviation on the normal distribution. But the publication of the book also coincided with his most important statistical innovation. It was the combination of the first mathematically defensible study of human biology with Galton's method of measuring the coefficient of correlation that, as Porter observed, "marks the beginning of the modern period of statistics."[92]

Galton's discovery of the coefficient of correlation emerged from his assessment of the system of anthropometric identification that was championed by Alphonse Bertillon, the French criminologist. He encountered the method as he was completing work on Natural Inheritance, and, as he explained in his presidential address to the Anthropological Institute, Bertillon's system seemed to hold out the promise of "another use for an anthropometric laboratory." Bertillonage was the name given to the use of a set of ten discrete measures of the human body (like "length of left middle finger") that was then being adopted in France as an official system for the identification of criminals.[93] Like the later claims that Galton would make for fingerprinting, Bertillon used Pascal's probability theory to generate the very long odds that any individual might match the specific set of ten measurements. From his initial encounter Galton wondered whether "the several bodily proportions that are measured may be looked upon as independent variables." Here, at last, he was able to put to statistical use the data gathered in the Anthropometric Laboratory.

Galton invented the index of co-relation after subjecting Bertillon's measures to his favoured method of analysis, applying the ordering logic of variation along the normal distribution. This was an insight of real historical significance, but it is one that is poorly understood outside the minority who have some the statistical training. The coefficient of correlation is a number between zero and 1 (or more strictly, between -1 and +1) that measures the mathematical relationship between two sets of apparently discrete numbers.

Almost a century ago, Galton's disciple, Karl Pearson, observed that "thousands of correlation coefficients are calculated annually, the memoirs and textbooks in psychology abound in them; they form … the basis of

[90]Francis Galton, *Natural inheritance* (London: Macmillan and co., 1889); Gillham, *A life of Sir Francis Galton*, 250-6; Porter, *The Rise of Statistical Thinking*, 286-298.

[91]Galton, *Natural inheritance*, 106.

[92]Porter, *The Rise of Statistical Thinking*, 298; T. M Porter, *Karl Pearson: The scientific life in a statistical age* (Princeton Univ Pr, 2004), 215, 257-261; Gillham, *A life of Sir Francis Galton*, 258-9, 269-285.

[93]Cole, *Suspect Identities*, 32-59.

investigations in medical statistics, in sociology and anthropology …"[94] In the intervening decades Galton's invention has spread in to almost every field of knowledge, and especially in to Economics and the applied financial disciplines. It is no exaggeration to say that today the calculation of coefficients of correlation has become the most influential test of truthfulness across the sciences. Galton was drawn to the idea of an "index of co-relation" by his graphical studies of Bertillon's measurements and by his earlier work on the regression to the norm, but it was, as always, his preoccupation with the analytical power of the normal distribution curve that carried his analysis along.[95]

Gregarious Cattle and English Slaves

It is possible to trace the influence of the South African frontier on Galton's development of the normal distribution as a tool for explaining Darwinian evolution by following his curious interest in the statistical lessons offered by the oxen of Damaraland. This gentlemanly agricultural enthusiasm for breeding livestock started long before he arrived in South Africa, and it is a persistent theme in Tropical South Africa and Art of Travel. In the early 1860s he had begun to think about the research implications of the domestication of animals. These speculations were originally presented as a paper to the Ethnological Society in which he wondered what sociological evidence could be gathered from the different forms of animal domestication. He took up this theme with a very different line of analysis in a piece that was later published as "Gregariousness in Cattle and in Men" in Macmillan's Magazine in 1871, and then again, a decade later, in his book Inquiries in to Human Faculty. Picking up on the politics of ranking along the normal distribution that motivated Hereditary Genius, and unmistakably reflecting his own anxieties about the expansion of democracy and the implications of natural selection, he reversed the logic of the original paper and used the behaviour of animals to construct arguments about the biology of human society.

The target of this paper was the "natural tendency of the vast majority of our race to shrink from the responsibility of standing and acting alone." Here he worried, with Gladstone's stumbling movement toward male democracy in the background, why most people exalted the "vox populi, even when they know it to be the utterance of a mob of nobodies." For the answer he turned to his African experience, and to the behaviour of other animals he knew well. Having had "only too much leisure to think about them" during his slow journeys, he declared that the "ox of the wild parts of western South Africa" was the other gregarious creature "into whose psychology I am conscious of having penetrated most thoroughly."[96] Galton used his rich familiarity with the cattle of Damaraland to show that it was the "herd instinct," as Karl Pearson noted approvingly, that was the source of "many of man's intellectual weaknesses" under the conditions of modern civilisation.

Galton used the cattle obsession of the South African frontier to present a biology matched to the Victorian intelligentsia's worries, after

[94]Pearson quoted in Kevles, *In the name of eugenics*, 17; Porter, *The Rise of Statistical Thinking*, 270.

[95]F. Galton, "Co-relations and their measurement, chiefly from anthropometric data," *Proceedings of the Royal Society of London* 45 (1888): 136; Porter, *The Rise of Statistical Thinking*, 290-4.

[96]Francis Galton, "Gregariousness in Cattle and in Men," *Macmillans Magazine*, 1871, 353.

Carlyle, about the origins and prospects of heroic leadership.[97] Remembering the tedious difficulties he had suffered training teams of oxen to pull their wagons in to Ovamboland, he explained that a "good 'fore-ox' is an animal of exceptional disposition; he is, in reality, a born leader of oxen." He found the evidence for biologically-determined personalities in the selection practices of the frontier waggoners who spent their days looking for potential voorosse "who show a self-reliant nature by grazing apart from the rest." Even more prized were oxen who would tolerate being saddled, and ridden away from their companions. These colonial travails gave him real numbers to apply his new preoccupation with the Darwinian implications of the normal distribution. "Why is the range of deviation from the average such that we find about one ox out of fifty to possess sufficient independence of character to serve as a pretty good fore-ox?" he asked. Unlike Darwin, or Herbert Spencer, Galton saw an ominous lesson in these statistics which showed that "natural selection tends to give but one leader to each herd, and to repress superabundant leaders."[98]

To make his point about an evolutionary bias towards "slavishness" he moved quickly from his discussion of the cattle of Damaraland to an account of the "inhabitants of the very same country." In looking for evidence of a European past in the present organization of African societies and in accounting for the character of metropolitan culture on the basis of the reported behaviour of people outside of Europe, Galton was following the strong current of contemporary evolutionism. His innovation, like Malthus' a half century before him, was to assert the dismal prospects of progress using the new logics of natural selection and the normal distribution.[99] Finding the same "gregarious instincts" amongst the Africans, he suggested that the people of Damaraland provided a laboratory for the investigation of the "clannish fighting habits of our forefathers." These "blind instincts" for the protection of other human beings, produced by generations of barbarism, had the effect of "destroying the self-reliant, and therefore the nobler races of men." Implicitly comparing the English with the miserable conditions of the people of the desert he concluded that a "really intelligent nation" needed to break free from the biological constraints of the gregarious instinct. In order for the English to escape their fate as a "mob of slaves, clinging together, incapable of self-government" the instinct to subordination would need to be bred out, and the "most likely nest" of these new heroic natures would be in the colonies.[100]

This curious interest in the socio-biology of Namibian cattle is an important, and mostly forgotten, window in to the workings of Galton's combined obsessions with the empire and the normal curve. It was not a tangential interest amidst the broader project of his anthropometric interest in the English elite or the mathematics of correlation. Perhaps because he had such difficulty generating anthropometric data that would work with his normal distribution, Galton returned to the lessons of the Damaraland cattle in the early 1880s, thirty years after he had returned

[97]Frank M. Turner, "Victorian Scientific Naturalism and Thomas Carlyle," *Victorian Studies* 18, no. 3 (March 1975): 332.

[98]Galton, "Gregariousness in Cattle and in Men," 353-5.

[99]Stocking, *Victorian anthropology*, 144-72.

[100]Galton, "Gregariousness in Cattle and in Men," 357.

from South Africa. His book, Inquiries in to Human Faculty, has two extended discussions of the lessons of cattle-breeding in Damaraland. In the opening chapters he used the original Macmillan's essay unchanged, and then, again, in one of the longest chapters of the book, he returned to the domestication of animals. "The tamest cattle – those that seldom ran away, that kept the flock together and led them homewards – would be preserved alive longer than any of the others," he observes in conclusion; "It is therefore these that chiefly become the parents of stock, and bequeath their domestic aptitudes to the future herd." And he asserted the special importance of cattle selection as a test of the effects of heredity. "I have constantly witnessed this process of selection among the pastoral savages of South Africa," he asserted, shifting in to an ambiguous tense: "I believe it to be a very important one, on account of its rigour and its regularity."[101]

Normal racism

The connections between Galton's travels in South Africa and his interest in eugenics have been noticed by several historians, but most have moved quickly on, embarrassed, perhaps, by the extremity of his views on Africans. Nancy Stepan suggested that his journey was of "prime importance" in the development of the views on race he expressed after Hereditary Genius, but her explanation of the place of Africans in Galton's theory is made necessarily brief by the scope of her study. Her analysis of the conceptual consequences of his work is also truncated. She concludes that Galton was working with an imprecise and ambiguous concept of race.[102] Stocking, similarly, suggested that Galton's African experience led him towards a "pessimistic view of civilization in which biological mechanisms were centrally problematic," but he did not pause to explain how this happened.[103] Raymond Fancher, the historian of psychology, has looked most carefully at the travel writing. He notes that Galton "seems to have gone out of his way to believe and report the worst" about the people he was observing and that his observations were "almost always less restrained and fairminded than the parallel reports of his second-in-command, Charles Andersson." He concludes that "unflattering depictions of the African's character and intellect formed important parts of Galton's arguments in both of his seminal works."[104]

Galton's African experience was, indeed, important in the development of the biometric statistics, but it was also much more significant in the development of racism than scholars have yet recognized. In all of his important works, with the exception of Natural Inheritance, Galton relied heavily on the evidence of his travels in South Africa to build his case for eugenic reform. The operations of the normal curve, decades before he had worked out the mathematics, were established using claims based on his African travels.

More importantly, Galton produced an entirely new conceptual weapon into the politics of race. Over the long run I think that Stepan is not correct to argue that Galton was working with an imprecise and ambiguous

[101]Galton, *Inquiries Into Human Faculty and Its Development*, 50 - 7, 193.
[102]Stepan, *The idea of race in science*, 126, 129.
[103]Stocking, *Victorian anthropology*, 96.
[104]Fancher, "Francis Galton's African Ethnography and Its Role in the Development of His Psychology," 72, 79.

understanding of race. The hereditary, and statistical, concept that Galton first developed in his discussion of regression, with its ineluctable biological centre of gravity over time, broke with the older physiological, linguistic and geographical definitions of race.

It was this new statistical understanding of race that was used by the segregationists in the early 20th century to trump the liberal claims of the champions of African and Indian rights. Lionel Curtis, Milner's most important disciple, made exactly this argument in his famous proposals for a constitutionally segregated South Africa. "Individuals must be judged not by what they are but by their potentiality and that potentiality can only be measured by the history of the race as a whole," he argued in the face of Gandhi's protests: "An individual may rise far above the level of his race, but he cannot raise his posterity with him."[105] Here was a cast-iron retort to those, like Gandhi, who argued that education and property should secure the rights of a British subject without regard to skin colour.

It is important to notice that this argument about the normal distribution of racial qualities began very early in Galton's work. He started building the argument using his ethnographic experience decades before he had demonstrated the statistics of regression from the breeding of sweet peas. Early signs appeared in his response to the announcement of James Hunt's brutal polygenic racism in 1863.[106] For Hunt, like Edward Long, Samuel Morton, and Robert Knox, physiology placed hard limits on the intellectual and cultural capacity of Africans. At a session of the British Association in Newcastle, which was "interrupted by hisses and counter-cheers," he insisted that the humanitarians' demand that the "negro only requires an opportunity for becoming civilized" was delusionary, and concluded that it was one of the "decrees of Nature's laws" that the "European [was] the conqueror and the dominant race." But it also entailed another, easily contradicted, assertion. "The many cases of civilized blacks are not pure negroes," he announced, "but, in nearly every case where they had become men of mark, they had European blood in their veins." Galton's response suggests that he was already formulating his views on the normal distribution of human abilities. On the basis of his personal experience he claimed that Africa was home to "more abject, superstitious, and brutal tribes then elsewhere in the world." He was careful to avoid the obvious pitfall of Hunt's claims about African ability, arguing that he "thought that occasionally the race had produced clever men" but not to a degree that would mitigate the "slavish and brutal condition of the vast majority of the African race."[107]

[105]Lionel Curtis, "The place of subject people in the Empire," May 9, 1907, 25-6, A146, Fortnightly Club, Johannesburg, South African Historical Archive.

[106]On Hunt's views see Stocking, *Victorian anthropology*, 249-51.

[107]"British Association at Newcastle - Sectional Reports Continued," *The Reader*, September 19, 1863.