

Making climate risks work: Governmentality and ‘foreign residence’ in British life assurance, 1840-1940

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Abstract: Genealogies of life assurance have tended to focus on the governmental possibilities of actuarial calculations of mortality, but the case of foreign residence assurance draws attention to other ways in which British companies calculated climate risk between 1840 and 1940. Drawing on archival research, this paper demonstrates that the extra charges imposed on life assurance policies for foreign residence invited conversations about the risks of climate and mortality in countries beyond Britain, drawing on both contemporary climate science and other arguments about climate pathology. Climate risks, however, had to be made to work for both life assurers and policyholders through far-reaching social-material networks, and firms frequently tinkered with arrangements of people, ideas and artefacts in ways that enabled a mapping and governing of such risks. Whether ideas of climate circulating in life assurance were believed or not, they had effects and policyholders submitted to them. Drawing on archival material from several British life assurance companies, including some detailed cases of assured migrant lives, the paper explores how companies made risk calculations in ways that had consequences for ordinary decisions and practices. In so doing, the paper contributes to debates about life assurance and governmentality, showing that foreign residence policies enabled businesses to secure their risks in an era of imperial expansion. But this is no simple story of power and imperialism. Businesses constantly tinkered with their policies,

drawing on climate science and medical understandings, but only as part of an always messy, changing assemblage.

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Introduction

This paper considers the role that British life assurance companies played in shaping and disseminating climate science between about 1840 and 1940, arguing that the making of climate risks brought together finance, science and security in highly productive ways. While life assurance has attracted significant attention since it was first linked to governmentality nearly thirty years ago, this has tended – with some notable exceptions – to focus on actuarial calculations of mortality rather than other ways of assessing risk. As a consequence, the pricing of the risks of ‘foreign residence’ in climates beyond Britain has been largely overlooked. In dealing with this question insurers developed strategies drawing in many different actors to secure both firm and policyholders. We will show that what made climate risks ‘work’ – for life assurers, the lives they

assured, and imagined geographies of climate – were the far-reaching social-material networks or assemblages established by these firms. By ‘tinkering’ with their arrangements of people, ideas and artefacts, firms could act at a distance, and in doing so map and govern climate risks through more intuitive forms of calculation.

Climate was a matter of concern to life assurance because of the additional risks of ‘foreign residence’ faced by policyholders living outside Britain, who were charged higher premiums to guard against the cost of their early deaths. Firms consulted climate science to help them calculate the risks of foreign residence. As we have begun to demonstrate elsewhere (Kneale and Randalls, 2014, 2020), life assurance and climate science were closely linked during this period. It is unsurprising that firms understood climate to be a bundle of interrelated medical-geographical factors including temperature, relief, and endemic disease as this intersection of climate, health and medicine was “one of the most powerful and persuasive idioms” in environmental thought (Arnold, 1996: 12). Firms consulted experts and evidence from around the world, contributing to the development of scientific and popular understandings of the health risks associated with climate. This mirrored the stimulus given to medical science and practice as life assurance firms recruited doctors to examine candidates (Alborn, 2009; Bouk, 2015; Dupree, 1997; Jureidini and White, 2000; Murphy, 2010; Porter, 2000). Lively insurantal debates about environmental determinism, race, and tropical medicine not only shaped particular geographical imaginations of place (Kneale and Randalls, 2020; Livingstone, 1999; 2002), but were translated into practice through firms’ pricing decisions. Discussions of climate risks therefore present us with an unrivalled opportunity to see how climate knowledge was translated into business decisions that had real implications for the lives of those assured.

As we will show, life assurance firms tinkered with the pricing of climate risks in line with their ongoing experience and business strategies; charges changed, and risk zones shrank. We see this as

a creative and productive practice. As Donald MacKenzie and Juan Pablo Pardo-Guerra point out, “successful innovation is nearly always bricolage: the creative, ad hoc re-use of existing resources (ideas and other cultural resources as well as artefacts), not the mechanical implementation of a grand plan nor simply logical deduction from existing scientific theory” (2014: 157). Similarly, John Law and Evelyn Ruppert suggest that we might consider “patterned teleological arrangements” like life assurance as material-social *devices*, another way of talking about Deleuze and Guattari’s *agencement* or assemblages (2013: 229, and see Legg, 2011). These devices should be seen as “*rough and ready assemblages*, rather than as well-oiled systems or networks” (232, original emphasis). As a result, “*tinkering* may be a better model for thinking about how devices work in practice, rather than measuring or trying to understand them in terms of the extent to which they approximate a logic of perfect design” (232). For life assurance firms ‘perfect design’ –accurate predictions of overseas mortality – was always out of reach. Tinkering with climate risks held together an assemblage of actors in productive ways.

It is not enough to ‘recover’ ideas of climate risk, even if that could be done from archival sources; we would rather ask whether these calculations shaped ordinary decisions and practices. This shift in attention directs us towards ‘more-than-representational’ geographies (Lorimer, 2005) of climate and place, where texts are ‘immutable mobiles’ or circulating references (Latour, 1987; 1999) produced, stored, and circulated through everyday practices. For an example of what is at stake we should consider the “avalanche of printed numbers” so characteristic of Victorian public life (Hacking, 1990: 2). Theodore Porter identifies two common approaches to the history of numbers, the first offering a narrative of “the progressive accumulation of truer, or at least more powerful, methods” while the second “reduces them to ideology, to be explained mainly in terms of social structures of domination” (1995: 6). We will reject the first approach in the next section, as actuaries struggled with foreign residence risks. The second approach examines the rhetorical effects attributed to the use of numbers, exemplified by Mary Poovey’s argument that Victorian

statistics were authoritative because they were associated with the expert sciences wielded by elites (1995). Porter takes a third approach, asking whether numbers succeeded or failed to produce objectivity, trust and authority; they allowed actuaries to retain their authority, for example, while accountants lost much of theirs (1995).

Reflecting these concerns, we suggest that while it is impossible to establish whether ideas of climate circulating in life assurance were accepted by those who used them, it is easier to see whether people submitted to them. Drawing on work on governmentality, we argue that it did not matter whether actuaries, applicants for life assurance, or doctors knew about, or believed, arguments about the relationships between climate and health in particular places. To remain within this assemblage – to be given or claim a policy, or to receive payment as a director, medical referee, agent or actuary – individuals had to fit the places prescribed for them. This had a number of other consequences. First it produced *trust* in this arrangement of things and people, which was particularly important when these understandings had to be shared between the firm's head office in London and the distant colonies. Second, climate knowledge and climate risks were simultaneously both matters of scientific *rationality* (actuarial, climatic, and medical) that could be discussed, challenged and calculated, and unconscious bureaucratic *practice*.

The paper is a contribution to debates about assurance and governmentality in geography and history. Examining an overlooked site in the production of climate knowledge, we argue that as an affective technology (Thrift, 2008), foreign residence assurance provided a form of security that was much more than a rational response to a calculated risk. In considering the actions of British firms and policyholders during a century of imperial expansion it also begins to explore the extent to which those movements were secured by businesses rather than states.

We begin by considering the literature on assurance and governmentality before exploring the knowledges and practices firms developed to cover foreign residence risks. We draw upon archival material from several British life assurance companies, including the Prudential, the largest British firm at the end of the nineteenth century; the United Kingdom Temperance and General Provident Institution (hereafter UKP, the sixth largest); and several smaller companies including the Sceptre, the Whittington, and the Royal Farmers and General Fire, Life and Hail Insurance Company (or Royal Farmers). Presenting a number of detailed cases of migrant imperial lives assured and governed by these firms, the paper concludes by examining the social-material assemblages that made foreign residence work, arguing that this is a story of iterative problem-solving, tinkering, and bricolage in action. Documents setting out office strategies and working practices, brochures publicising the security provided by foreign residence insurance, and minutes discussing individual cases all provide a sense of how firms dealt with these problems as governmental questions.

Life assurance and governmentality

Governmentality refers to sets of practices shaping the behaviour of the self and others, ways of knowing individuals and populations, and a rationality of government by truth (Huxley, 2007). These are all key aspects of life assurance. In the late eighteenth century, the Equitable assurance office used mortality data and the mathematical tools of the ‘probabilistic revolution’ to calculate the premiums needed to cover a life (Clark, 1999). These actuarial calculations promised to reveal the ‘laws of mortality’ that dictated longevity, allowing companies to predict how many of their policyholders would die in any given period. As Daniel Defert pointed out, this was easily extended with an extra charge for other risks: “You aren’t inoculated for smallpox? A supplement. You travel? A classification of countries is drawn up according to their dangerousness, to fix your additional premium.” (1991: 219). Previously unsecurable phenomena like foreign residence became new markets as part of this emerging ‘actuarial imaginary,’ “the ways in which, in a given social

context, profitable, useful and necessary uses can be found for insurance technology” (Ewald, 1991: 198).

Converting uncertainty into risk helped secure the business of the insurance office and had profound effects on those assured. Life assurance is “a governing technology for instilling and institutionalizing thrift” (O’Malley, 1999: 680) but it also ‘responsibilizes’ policyholders to submit to the strictures of their insurers in other ways. When policyholders agreed to pay foreign residence charges they were also agreeing to govern their own behaviour – to inform their insurers if they went abroad, and sometimes to travel on specified routes, at specific times of the year. Like licensing, assurance provides an extraordinarily effective and flexible alternative to other forms of discipline “by contracting out the governmental work of preventing disorder and monitoring risks to the private sector” (Valverde, 2003: 147); foreign residence assurance monitored a specific class of risks and passed their costs onto policyholders. Assurance therefore provides security for individuals and firms, a form of biopower that manages “the affective life of individuals and collectives” (Anderson, 2012: 28-29). Assurance continues to be considered in work on ‘finance/security’ or ‘finance/security/life’ relations, and ordinary finance plays a vital and constitutive role in contemporary life (e.g. de Goede, 2017; Langley, 2017).

The importance of actuarial calculation has however been much discussed. Actuarial thinking did not displace other ideas of risk, and firms drew on other forms of evidence. Away from the ‘ordinary’ lives that constituted the main business of life assurance, the careful compilation of statistical evidence and the use of probabilistic reasoning were less common or effective. The risk prices produced by Australian fire insurance companies were not based upon detailed records and statistical calculation, for example, but on commonsense judgements and a sense of ‘cumulative dangerousness,’ “a practical epistemology that sought to identify as many hazards as possible in

pursuit of identifying bad risks” (O’Malley and Roberts, 2014: 257, 258). As we will show in a moment, firms approached foreign residence risks in this way.

Theodore Porter suggests that this lack of actuarial exactness did not undermine the effectiveness of assurance; instead it gave actuaries the chance to defend their expertise (1995). Nineteenth-century Parliamentary Select Committees examining life assurance fraud were not reassured to hear that firms interpreted these supposedly universal laws differently. When MPs demanded objectivity, actuaries pointed out that the selection of lives required judgement as well as mathematical reasoning. So while travel charges are one of the examples Porter gives of “the unease of actuaries in the absence of systematically gathered quantitative data on risks” (104), he concludes that “the point here is that reliance on calculation was by no means inconsistent with the exercise of discretion, provided that nobody pretended to perfect quantitative precision” (105). Actuarial knowledge requires local, expert, case-by-case tinkering.

This argument transforms our sense of the importance of residence risks. Alborn argues that these charges, like other extras added for ‘non-standard lives’ (women, those in risky occupations or poor health), “remained strikingly arbitrary into the twentieth century” (2009: 103). Data on overseas lives were limited; rates were based on market forces and necessity, not rigorous actuarial calculation. However, some effort was made to share the experience of firms, and there could be broad agreement about rates for particular locations (Kneale and Randalls, 2020). More importantly, we would argue that these rates were significant precisely because a lack of satisfactory data made the careful use of discretion even more important when it came to judging the dangers associated with different climates. The actuarial unease identified by Porter and Alborn was highly productive, allowing firms to demonstrate trust and authority in their expert deliberations. Tinkering proved to be more effective than actuarial exactness.

Ben Anderson reminds us that governmentality is not a deadening, certain, force but an enlivening one through which “the contingencies of life must be known, assayed, sorted and intervened on.” (2012: 65). A similar point can be made about the supposedly calculating, rational life assurance subject (Amoore, 2014; Morris, 2018), or the apparently perverse outcomes that reward ‘bad behaviour’ (French and Kneale, 2012). These recent arguments give us a new sense of the significance of apparently marginal aspects of life assurance like foreign residence. They strengthen claims for the significance of insurantal imaginaries and practices in historical and contemporary social life, not least because of their power and flexibility. But how did firms engage with climate knowledge?

Climatology and company experience as parallel forms of climate knowledge

Archive materials demonstrate that firms were concerned about climate. Insurers drew upon their own ‘experience’ – their own policyholders’ mortality records – and on data collected by the Institute of Actuaries and the Faculty of Actuaries (the professional bodies and centres of calculation for English and Scottish actuaries respectively). The Institute’s *Journal* published several discussions of the experience of firms assuring lives in the West and East Indies between 1850 and 1900, for example (Marshall, 1854; Thomson, 1878; Stott, 1878; Hardy and Rothery, 1888), as well as compilations of the foreign residence experience of a number of firms (Thiselton, 1893; Lutt, 1907). Companies also sought alternative sources, like records of British military mortality (see Cullen, 1975; Kneale and Randalls, 2020), the census and mortality records of the Victoria colony (Burridge, 1882), the East India Company’s pension funds, Bombay Medical Service records (Brown *et al*, 1871), and other Indian sources (Martin, 1856).

The library of the Institute of Actuaries also contained many other studies of mortality from British colonies, the USA, and beyond (for example Miller, 1874; Stokes, 1882; King, 1924). The South African physician J. Paterson MacLaren described this collection of data as a “great harvest of

statistical information on almost every disease” (1927: 5), but sharing information in this way did not make it easier to calculate residence risks, as these figures were not commensurate (Anon., 1927: 335), and ‘climate’ stood in for a complex of risks (Brinton, 1863). Still, this work produced a useful sense of *relative* risk, and the ‘cumulative dangerousness’ of temperature, humidity, relief, and so on (O’Malley and Roberts, 2014). As we suggested above, disagreements about the dangerousness of specific locations may well have allowed firms to develop a better sense of the interaction between general factors and local conditions.

While comparative mortality statistics helped establish the relative risks of a location, firms sought confirmation in climatological debates. Despite the claim of actuary Thomas Bond Sprague that the extra premiums charged by firms were based on limited knowledge of climate risks (1886), the Institute of Actuaries had acquired many important publications on climate and health (Kneale and Randalls, 2014, 2020). Medical climatologists like Robert Scoresby-Jackson (1861, 1863) discussed the health of various climates and provided guidance on preparing the body for travel. In 1895 Thomas Sprague’s son Alfred Ernest Sprague recommended R.W. Felkin’s *On the geographical distribution of tropical diseases in Africa* (1889) to his fellow actuaries. Further evidence of the importance of climate for life assurance practice comes in the advice firms gave their medical examiners. Handbooks (for example Brinton, 1863, and Allen, 1867) explained the particular disease risk profiles that doctors should examine potential policyholders for in light of their plans to travel to specific places, taking these discussions into examination rooms.

The development of latitudinal thinking in climate science proved to be extremely helpful for assurance, as climate risks could be readily delineated on maps. Life assurance firms drew maps of extra premiums based primarily on latitude, concentrating in particular on the risks between 33°N and 30°S, as can be seen in a map produced by the Prudential (1882, see Figure 1). Others, such as the colour map in de Havilland Hall’s medical handbook, offered a more complicated story, with

most parts of Africa at special rates, a two-part separation of risks in south America and some free travel in British-controlled Egypt and Southern Africa (1903, see Figure 2). Maps simplified the task of calculating foreign residence risks for individuals.

[FIGURES 1 AND 2 HERE]

Such simplicity was challenged, however, by lively nineteenth-century debates about climate and health. The rise of germ theories of disease diminished the importance of climate as the primary cause of ill health, and emphasised self-governance in conduct to protect the traveller from a tropical climate (Endfield and Randalls, 2015). These changing climatological debates provided a context for creative tinkering, with separate rates charged for hill stations in India, seasonal exceptions for places like New Orleans, and expectations of ‘good’ self-conduct while travelling. Still, firms retained broad climate maps and this imagined geography of risk remained useful, not least in managing the complexities created by ongoing debate about the effects of climates.

Acclimatisation prompted particularly vigorous debate (Livingstone, 1999). Polygenic theories arguing that a body had a native climate or could be acclimated within a few years cut both ways, as firms pondered the risks of bodies travelling overseas from native climates, changed medical risks on returning home, and the ‘degeneration’ of those born overseas. Such a discussion inevitably touched on racial tropes through ideas of ‘differential racial acclimatization’, where white bodies were seen as particularly vulnerable in the tropics and black bodies in colder climates (Livingstone, 1987). Interestingly, the emergence of local insurance firms in the early twentieth century happened just as concerns about the threat of disease to both white and ‘native’ lives became less troubling (Pearson, and Lönnborg, 2008; Borscheid and Haueter, 2012). Life assurers contributed to and learned from complex and changing arguments about climate, race and health well into the

twentieth century (Kneale and Randalls, 2014, 2020). We can now consider how they put this knowledge to work in terms of their practice in assessing applicants for foreign residence.

Assuring Imperial Lives through Foreign Residence

These arguments about climate and health made it hard to derive foreign residence risks from actuarial calculations. Charging for foreign residence risks had to be a form of bricolage sensitive to local factors; the maps discussed above were a rough and ready solution that would cover most, but by no means all, cases. Foreign residence charges support Porter's argument that "quantification is a technology of distance" (1995: ix). The principle of 'rating up' applicants was simple enough to be understood at all points across the firm's network. Firms transformed applicants into mobile data or circulating references (Latour, 1999). The extra rate charged was based on the firm's policy on broad zones of risk, plus additional factors related to individual cases. While lengthy discussions of foreign residence risks might seem wasteful, they allowed directors to demonstrate their tinkering skills, drawing on different kinds of knowledge beyond the statistical laws of mortality. Considering a civil engineer's application to work in Lagos in 1897, for example, the Sceptre board charged an extra £5 per annum per £100 assured, put an upper limit on the policy, and insisted that he return to England between May and September each year (Sceptre, 1904). Rates acted as mobile black boxes summarising deliberations about the 'cumulative dangerousness' of climate, location, disease, and season for the firm's employees and the policyholder.

In this section we consider the pricing of these risks in more detail, covering both broad company policy and decisions about individual applicants. These accounts, taken together with those outlined in the next section, suggest that foreign residence insurance may have supported the expansion of the British empire around the world, assuring the lives of colonial administrators, capitalists, and missionaries from Venezuela to Hong Kong, as well as soldiers and police fighting in the Anglo-

Zulu and Boer Wars and the Zulu Rebellion, or acting for the Imperial British East Africa Company.

Firms were wary of foreign residence risks in the first half of the nineteenth century. In 1841, for example, the UKP charged Mr Pelling an extra six guineas on his £200 policy for a return trip to Jamaica, adding between 76-150% to the cost of his annual premiums (UKP, 1842). Insurers became increasingly confident after 1846, however, when Standard Life opened a new company, the Colonial Standard, offering low rates (Walford, 1871: 611-615; Moss, 2000; Alborn, 2009). Nearly 40% of the firm's business covered Britons "going abroad or having the prospect of foreign residence," with another quarter assured for residence in North America and the remainder concentrated in the West and East Indies (Walford, 1871: 614). The company's success inspired others to cut their rates for foreign residence, just as British firms were developing many other new products to open up middle-class markets for life assurance (Pearson, 1997; Alborn, 2009). Rates were relaxed further when a growing number of firms established a 'free area' where residence carried no additional charge. However, practices still varied: only sixteen of the seventy-three largest insurers imposed no restrictions at all in the 1890s, with the majority listing areas where additional risks were thought to threaten life (Thiselton, 1893). And while firms set different rates for these areas, there seems to have been broad agreement on the relative degree of risk well into the twentieth century.

Foreign residence was always a very small part of life assurance, though we would argue that this did not mean it was insignificant. While 30% of the British population had some kind of life assurance by 1890, a survey of twenty important firms found that fewer than 2% of the lives they had assured between 1865-67 were assessed for foreign residence charges (Alborn, 2009: 51, 114). However, this sample would still have covered perhaps 1600-3000 lives, making doctors' examination rooms and insurance offices significant sites for the dissemination of ideas of climate

risk. Other companies assured a larger proportion of travellers: Colonial Standard issued 8582 policies in the first eighteen years of its business (Walford, 1871: 613-14), and nearly 10% of the London Assurance company's policyholders had visited the tropics or might expect to do so as officers in the army, navy or merchant marine (Ryan, 1884: 321). Given that many of the individuals assured in this way were actively engaged in colonial warfare, business, or missionary work, we would argue that the *volume* of foreign residence assurance was not as important as the light it throws on the purchase that climate science might have had on the world. The fact that the average size of the policies issued by the Colonial Standard between 1847 and 1864 was over £643 certainly suggests that the majority of policyholders were wealthy men (Walford, 1871: 613-14).

This reminds us that all lives, regardless of their rank or activity as agents of imperial expansion, were subject to their insurers. Royal Farmers sought out the aristocracy and rural gentry for its life assurance business, so it had to impose its will on some of the most powerful men in Victorian Britain. The firm charged James Duff, the fifth Earl Fife (1814-79), an additional premium to travel and reside anywhere in the world (Royal Farmers, 1869). Duff was a wealthy and influential landowner and a Member of both Houses of Parliament, and his son married Princess Louise, daughter of the future Edward VII (Anon., 1879b; Reynolds, 2011). The firm made similar arrangements for the twenty-third Baron Willoughby de Eresby (Royal Farmers, 1869), wealthy scion of "one of the most illustrious families of the English nobility" (Anon., 1868). Assurance firms were clearly able to compel even the most powerful lives to observe contractual limitations on residence and travel. Very ordinary policies had similar restrictions; the Prudential's working-class shilling-a-week policyholders could not leave Great Britain or Ireland without the Directors' permission (Prudential, 1887, 1899).

The vagaries of archive formation mean that the best records of individual decisions about foreign residence charges come from smaller companies like Royal Farmers and Sceptre. The extras

charged by these firms match the risk zones on the maps discussed above and the prices presented in their literature (see Table 1). Areas like New Zealand and the Caribbean were largely treated as risk-free, especially as time went on; China and India generally attracted a low rate; and West Africa remained highly rated, with an average annual addition of around £3 and nine shillings for every £100 assured by the company. Additional risks are present, too; while residence in Southern Africa incurred an addition of less than £1 per £100 between 1842 and 1892, a policyholder on active service during the Anglo-Zulu Wars in 1879 was charged £5, though it is impossible to establish how much of that was war risk. These regions were defined by British imperial ambition as much as climate risk; the boundaries of 'East Africa' reflect not only the territories of the British East Africa Company but also British missions within Portuguese Mozambique and present day Malawi, for example (Vail, 1976).

[TABLE 1 HERE]

While the Whittington's clerks did not record the percentage rate charged for foreign residence, the company's archives show its policy and practices fit the pattern noted above. An early prospectus mentions 'modest' additional charges for residence outside Europe, but from 1885 policyholders over thirty were entitled to travel to and reside in Canada, the United States north of 35° latitude, or any of the colonies of Australia, New Zealand, Natal and the Cape Colony without permission or additional charge (Whittington, 1867-1891). By 1890 the company had removed all extra charges for policyholders over thirty who had at least five years with the company (Anon., 1890), as "the risks arising from travelling to, and residence in, foreign parts have greatly diminished, while travelling has greatly increased" (Anon., 1893b, n.p.). The firm's memoranda book shows that its practice broadly agreed with these principles from 1857–1865 (Whittington, 1865), and the firm approved requests to travel to and reside in the East Indies, India, China, Ceylon, Western and South

Australia, and New Zealand for charges ranging from nothing (Australia) to £19 13/11 (the East Indies).

Colonial administrators, capitalists and missionaries: five assured lives

An investigation of the lives of five travellers demonstrates that foreign residence assurance helped secure the plans of colonial officials, businessmen, and missionaries, showing that imagined geographies of risk had real consequences for individuals. The strategies described above were not idle plans discussed in board meetings thousands of miles from the colonies; they enabled companies to act at a distance and policyholders to become actors within a burgeoning imperial world.

Our first example, the lawyer Henry John Ball, served as the first attorney-general of British Honduras (now Belize) (Bristowe and Wright, 1888: 102). He oversaw the introduction of the Honduras Land Titles Act, shaping the country's future development by concentrating land ownership in the hands of a few British settlers (Bolland and Shoman, 1975: 77-83). Ball then travelled to Hong Kong in 1862 to become judge of the Court of Summary Jurisdiction (Anon., 1862), paying the Whittington an extra £8 and 15 shillings annually for Chinese residence. Between 1863 and 1871 Ball acted as Chief Justice, Colonial Secretary, and Attorney General when the incumbents were too ill to perform their duties (Anon., 1863a; Anon., 1863b; Anon., 1865a; Anon., 1867; Anon., 1871). Ball's wife Sarah died at sea — of 'Tubercular Diarrhea' (sic), possibly contracted in Hong Kong — on the couple's return voyage to Britain in 1873 (Board of Trade, 1872-1883; 207). The following year Ball died of 'Cirrhosis of the Liver and Exhaustion' in London, aged only 54 (Anon., 1874b), which might have been understood to have been caused by either malaria or the heavy drinking associated with colonial administrators (Brockbank, 1908: 276; Castellani and Chambers, 1919: 89). Few of Ball's colleagues lived long, by the standards of

insurance firms: Colonial Secretary William Thomas Mercer sought leave on medical grounds, retired at 45 and died in England aged 57, and Chief Justice William Henry Adams died aged 56 shortly after leaving Hong Kong due to ill health in 1865 (Endacott, 2005: 83, 116; Anon., 1865c). Although the photographer, travel writer and RGS Fellow John Thomson claimed that Hong Kong no longer deserved “its reputation as the grave of Europeans” (1873-74: 10), foreign residence could expose colonial administrators and their families to real risks.

Not all colonial officials held such important roles. The Londoner Walter Rowsell established two policies with the *Whittington* before sailing to New Zealand with his wife and children in 1863, paying £2 and £3 additions for foreign residence to secure the family against the risk of emigrating (Ships and Migrant Database, n.d.). The couple ran the Maungaturoto post office from 1864 to 1912, and Walter also served on the local School Committee, Road Board, and County Council (Anon., 1898; Anon., 1924; Grice, 1926). New Zealand was generally considered to be as safe as Europe, perhaps even safer than England (Meikle, 1876: 290). In time most firms, including the *Whittington*, would charge nothing for living there. While Rowsell and his wife made more modest contributions than Ball, they might not have been made at all had it not been for the security produced by their foreign residence assurance.

Our third *Whittington* life is Henry Lord Boulton, who was charged an additional £15 to live in Venezuela in 1862, suggesting his life was assured for the sizeable sum of £1,500 (Whittington, 1867-1891). Henry was born in Venezuela but was assessed as a ‘British’ rather than ‘native’ life. His father John Boulton Townley was a partner in the Red ‘D’ shipping line, and Henry was visiting Europe on business when he sought insurance (Berglund, 1985: 393). The Boultons were close to the Venezuelan government, and Henry became the British Consul for Caracas in 1879 and for Venezuela from 1888 (Anon., 1879a; Anon., 1888a). He died in 1891, but by then Casa Boulton was one of Venezuela’s most important mercantile, financial and manufacturing concerns, acting as the

most significant lender to the government (Berglund, 1985, 1986). The additional charges Boulton paid show that while a British life born abroad might still be at risk from his 'native' climate, his policy would still provide financial security.

Not all of the Whittington's travelling policyholders prospered. The J. G. Chapman who was permitted to travel to Adelaide in 1862 for an addition of £2 and five shillings seems likely to have been the John G. Chapman who set up an export-import business between England and Adelaide in 1865, and a drapers shop in Adelaide by 1867 (Anon., 1865b; Boothby, 1867: 140). However, in December of that year Chapman broke his leg travelling on the mail coach; his infant daughter died the next day (Anon., 1869a; 1869b). The following year his businesses in Britain and Australia collapsed, and the Chapmans left Adelaide (Anon., 1870a; Anon., 1870b; Anon., 1872a; Anon., 1872b). Chapman's insurance policy could not secure him against every risk, and his life presents a contrast to the successes of Ball, Rowsell, and Boulton.

The Sceptre company's records allow us to examine another important group of travellers as the firm's 10% 'minister's discount' proved attractive to missionaries. In 1888 the Reverend W. G. Howe was charged 45 shillings per £100 of his policy to reside at the East African Mission in Golbanti, in what is now Kenya (Sceptre, 1875, 1894, 1904; Anon., 1888b). Two missionaries were killed at Golbanti in 1886 (Anon., 1886), but the climate was thought to be a bigger risk:

the history of our East African Mission ... shows that the characterization of East and West Africa as 'the white man's grave' is no libel. ... From 1865 to 1918 about ten heroic workers died from the effects of climate. Since 1861 no fewer than eighteen zealous missionaries have been invalided home and refused permission by the doctors to return to their stations, because the deadly climate had under-mined their health. (Pinner, 1919: 501).

Howe returned to Britain in 1893 and in 1899, the firm remitting part of his foreign residence charge (Anon., 1893a; Sceptre, 1904). He had been reluctant to make the second trip home, but “it was absolutely necessary for his wife’s health” and he said that with a year’s absence from East Africa he “would be of more use to the mission cause than if he overwrought himself, destroyed his health, and perhaps found an early grave” (Anon., 1899).

These five men and their families helped shape the colonial histories of the Americas, Africa, Asia and the Pacific. Life assurance promised some security from the diseases that threatened British emigrants, though it could not guarantee a successful life abroad. Having explored the pricing of foreign residence and the ways that it bound firms and lives together, responsabilizing both parties, we will now explain how this system worked.

The social-material network

Considering the networks of imperial administration, Patrick Joyce asks “How, then, did empire cohere? ... Paper is the short answer” (2013: 150). As John Law suggested, “long-distance control depends upon the creation of a network of passive agents (both human and non-human) which makes it possible for emissaries to circulate from the centre to the periphery in a way that maintains their durability, forcefulness and fidelity” (1986: 254). We turn now to the way similar emissaries bound firms and assured lives together to make foreign residence assurance work.

Like empire, life assurance depended upon the production and circulation of paperwork and on effective bureaucratic practice (Ogborn, 2007; Joyce and Mukerji, 2017). Dan Bouk notes that in the US context, “By the turn of the twentieth century most applicants never set foot in a life insurers’ home office – instead they arrived as pieces of paper, via the mail” (2015: 57).

However, paper does not simply extend action; forms, letters and other documents were

designed to structure the relations between different elements of this network. Life assurance forms recorded information about the policyholder, translating lives into numbers so they could be manipulated through calculation and circulated as references (Latour, 1999). At the same time these forms governed the firm's employees. The medical referee or agent who filled in a form or report incorrectly, or the clerk who misinterpreted it, might lose their connection with the firm. The insurance form resembles the humble checklist "that citizens ... are to use to govern not only the spaces and subjects that are under their control, but also themselves. One uses a checklist partly to govern one's own governing" (Valverde, 2003: 174).

Paper and office practices allowed the firm's climate policies to work at a distance. Firms built networks of people to carry on the work of face-to-face interaction with applicants and others, as well as producing, checking and circulating documents. Many life assurance firms already had extensive networks of local offices, agents, and medical referees in Britain and Ireland by the middle of the nineteenth century. By 1897 the Standard office was advertising the fact that its network "affords facilities to persons travelling or living in any part of the world" in the front pages of the Royal Geographical Society's *Geographical Journal* (Standard, 1897) and in 1900 the Sceptre office extended its network to the edge of empire by deciding that "the medical officer on a British Gun Boat in the Zambesi District may act as referee if he is duly qualified" (Sceptre, 1904). The Whittington had an ambitiously international outlook, with agents in Europe, the Caribbean, Sydney, and Mauritius and Réunion, and prospectuses in French, Dutch and German (Whittington, n.d.).

An example from the Sceptre's archives illustrates how these networks operated. In 1871 Edward Cahill established a £400 policy through the Sceptre's Southampton agent after being examined by the firm's local medical referee. A 38-year old Irishman and sergeant master tailor for the 91st (Argyllshire Highlanders) Regiment, Cahill was stationed at Aldershot in that year. Cahill then

fought in the Anglo-Zulu war in 1879, so he must have secured the firm's permission to live overseas. After that a note in the firm's ledger tells us that he "Proceeded to Ceylon [now Sri Lanka] Nov 85" with his Regiment. Cahill was charged an additional £1 per cent of the sum assured per annum, matching the company's published rate for Ceylon (Sceptre, 1872). Leaving the regiment before it went on to Hong Kong in 1888, he established a manufacturing tailors and outfitters business in Colombo, and by the early twentieth century Cahill & Sons was a well-known landmark in the city (Anon., 1907). The policy was collected sometime after 1898, presumably to support Cahill's retirement before his death from dysentery in 1911 (Anon., 1911). This policy may have given Cahill the confidence to leave the army and start a business in his fifties.

An international network of actors and documents made Cahill's policy work. The directors in the firm's London office considered the details provided by their Hampshire agent and medical referee. A teetotaler's policy required an annual letter from Cahill's local temperance society – in Aldershot, Africa, or Ceylon – as proof of his continued abstinence. His death would have to be certified by a local doctor before the claim was admitted. Cahill's entry in the Sceptre ledger therefore allowed the directors to monitor his life in Britain, Southern Africa, and Ceylon, as well as the work of their clerks in London. The firm's ledgers and minute books record the disciplining of other policyholders – avowed teetotalers who were secret drinkers, for example – and the dismissal of incompetent or untrustworthy clerks, events that threw elements of this assemblage out of alignment.

These insights allow us to return to the question of the importance of numbers in Victorian life. Valverde argues that knowledge formats – the material form that knowledge takes – structure relationships between people and documents: "The question of format is closely related to the question of epistemological authority, since certain formats have a built-in tendency to empower certain knowers. Numerical charts tend to empower technicians, health-risk statistics tend to

empower epidemiologists, and so forth” (2003: 24). This is not Poovey’s argument that these formats borrowed the authority associated with the experts who used numbers. Instead knowledge becomes effective through the relationships in which it is formed and disseminated, and knowledge formats reflect and shape these relationships. Numbers empower technicians, but they also condense abstract complexities and make them mobile. At the same time they make demands on their users, who have to be ‘drilled’, in Law’s terms: highly numerate, trained to complete and read forms correctly. For Latour these are ‘protocols’ that “ensure the compatibility and therefore the comparability” of data; these measurements and decisions survive past the moments in which they were made and can be moved, collated and compared around the world (1999: 46). In this way, “office politics and the systematic challenges involved in operating at long distances often play determinative roles in giving numbers more power” (Bouk, 2015: 56). Numbers are not inherently trustworthy, but in the absence of face-to-face interactions they become the most trusted and effective form of knowledge that can be passed around the world. And as documents are added to an archive, they come to possess an authority of their own perhaps self-referential in nature (Joyce, 2013: 158).

Here it is worth returning to the mappings of risk discussed above. The Prudential’s map (Figure 1) was a practical document, designed to be shown to the prospective traveller in the pocket-sized ‘Agent’s Instructions’ booklet issued in 1882 (Prudential 1882). The value of these maps as portable documents was not lost on one observer, who argued that “Such maps, if accurately engraved, should have a considerable advertising value, for our prospectuses would then be much more frequently carried about and constantly referred to” (Thiselton, 1893: 33). As another kind of knowledge format, paper maps expected a certain amount of technical understanding from their users, but they also made the geographical imaginations of life assurance offices highly mobile and effective.

This materialisation of the international networks of life assurance achieved several things. It allowed the business to extend from the head office in London to the colonies. Policyholders secured their futures; firms tracked these mobile lives, received their premiums and paid their claims. At the same time responsibilities were distributed throughout the network, binding together the policyholder observing the restrictions on their policy, the directors and medical referees keen to avoid bad risks, and the clerks trying to keep accurate records. Whether any of these people believed that the risks of foreign residence had been accurately calculated is irrelevant; they had to act as if they believed it, or the network failed.

Conclusions

We have argued that climate science and the collection of comparative mortality data from colonial sources played a part in Anglophone life assurance during this period as firms assessed the risks of foreign residence. However, to return to Porter, actuarial science did not solve the problems of foreign residence risks through better and more truthful calculations, and foreign residence assurance did not derive its power from other sources of authority. In fact, it proved difficult to use climate knowledge to provide convincing actuarial calculations of risk, as the relationships between climate, disease, and place were complex and good quality data was lacking. Instead firms considered the ‘cumulative dangerousness’ of these and other factors, sometimes referring to simple latitudinal delimitations of risky zones, and at other times making decisions on a case-by-case basis. These deliberations in London offices transformed the dreadful uncertainty of ‘the white man’s grave’ into risks that could be managed by careful book-keeping and the addition of an extra 1% or 5% per annum to the policyholder’s premiums. This could involve a good deal of micromanaging, though this attention to detail might well have been productive as an expert performance. The absence of actuarial certainty did not make these decisions any less authoritative, and we would argue that foreign residence is still best understood as a form of governmentality, because these

decisions relied on the actions of an assemblage of actors scattered across space, with a corresponding division of responsibility through the network.

However, we have suggested that foreign residence represented a form of tinkering, of trying new combinations of elements within this assemblage, rather than an attempt to follow the laws of mortality or climate science. As O'Malley and Roberts note in their study of Australian fire insurance, "risk is a 'tolerant' way to govern, allowing individual diversity within broad parameters rather than requiring universal adherence to prescriptive norms" (2014: 265). Directors could exercise their discretion to tailor company policy to individual examples. They could charge for foreign residence risks as normal, raise or lower the charge or cancel it altogether, refuse a policy or refuse a request to live abroad, restrict travel during particular seasons, or anything else that seemed reasonable. This tinkering drew upon climate science, but did so as one part of a messy, changeable assemblage.

Numbers were an important part of this tinkering, as they allowed individual risks to be quantified. But if they were powerful it was because of the networks of people and paper through which they travelled. Converted into numbers in particular knowledge formats – the firms' forms and ledgers – these risks were highly mobile, their meanings understood by different actors across the network, and therefore effective because they ensured that things happened across long distances. As Latour puts it, "Truth-value circulates here like electricity through a wire, so long as this circuit is not interrupted" (1999: 69). Understandings of climate and medical risks may well have flowed through the network, as doctors explained to their patients why Sierra Leone was considered to be more dangerous than China, but this did not need to happen for the network to function. As long as clerks, paper, doctors and policyholders played their parts, the uncertainties of climate could be contained. Numbers, protocols and knowledge formats – forms and maps – served to discipline these elements to ensure that everything worked.

Finally, these arrangements supported British lives engaged in imperial projects across the globe, including military conquest, colonial administration, trade, and missionary work. Establishing foreign residence assurance was a rational response to the risks associated with European residence in the tropics, for those who could afford it. But as an affective technology assurance offered multiple forms of security: a lessening of the fear of early death, collateral for a loan to support a new enterprise, and a sense of trust in the firm and its understandings of climate science and tropical medicine. At the same time the traveller was responsabilized to save for their premiums, to seek the firm's permission to travel, and perhaps to remember to stay out of the noonday sun.

In all of these ways foreign residence assurance – a small part of Britain's life assurance business – turns out to be much more significant than it might at first appear. This paper's exploration of this topic shows that life assurance played an active role in the production and dissemination of climate knowledge, helped constitute imperial subjects and colonial projects, and was not simply a matter of actuarial calculation but remained an intuitive and affective technology securing life against the risk of 'the white man's grave.' In bringing together histories of the environment and of assurance we have demonstrated the continuing significance of historical accounts of governmentality, as well as the value of contemporary work on governmentality and socio-material networks for histories and historical geographies of climate and empire.

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Figure 1 Special Instructions and Tables, Prudential Assurance Company Ltd. February 1884, p. 143, with the permission of the Prudential PLC.

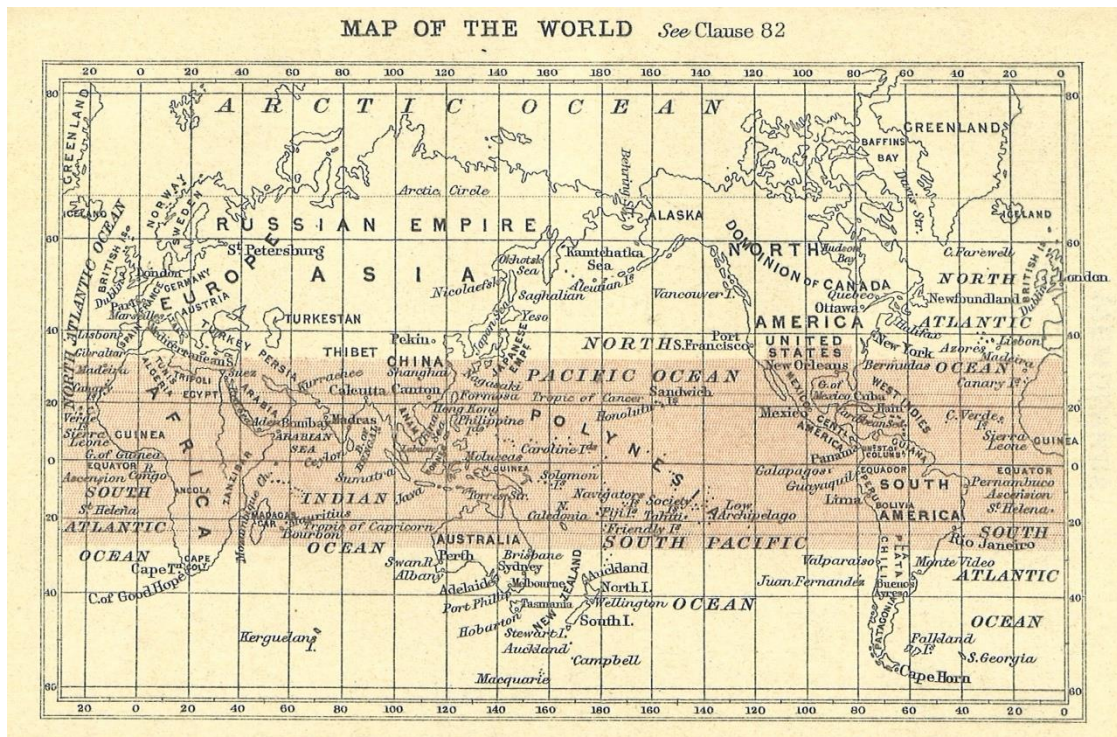


Figure 2 Map, endpapers, De Havilland Hall, Francis (1903) *The Medical Examination for Life Insurance*. Third edition. Bristol: John Wright and Co.

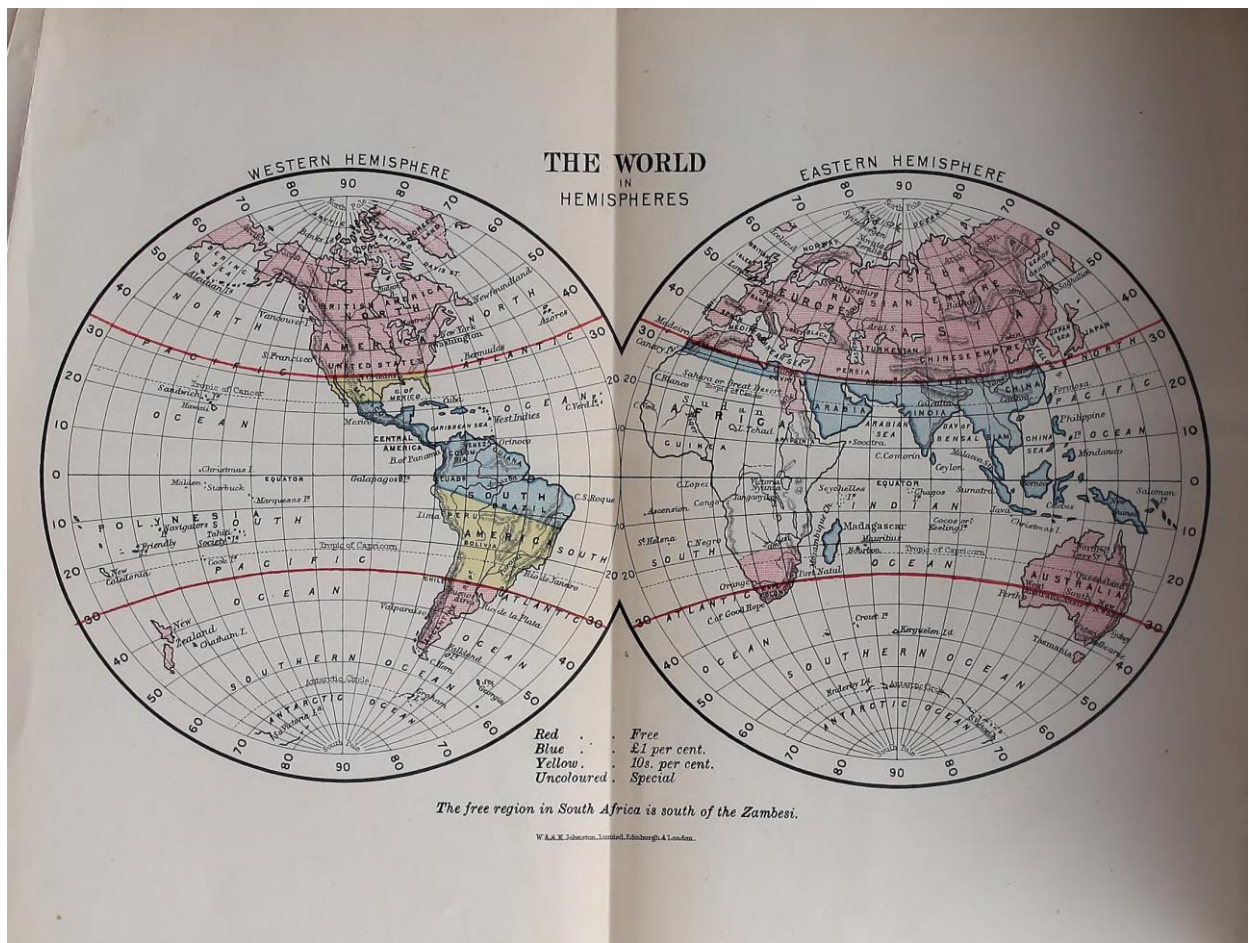


Table 1. Rates charged for travel residence, 1846-1914

REGION (OFFICE)	Number	Destination	£ per £100 assured p.a.	Notes	Date agreed
Southern Africa (Royal Farmers)	1	Port Elizabeth	0.5		1842
Southern Africa (Sceptre)	4	South Africa	5	Active service	1879
		Mashonaland	0.5	Police service	1891
		Madagascar	0.75		1891
		Mashonaland	0.5		1892
North America (Royal Farmers)	2	Canada	0.5		1846
		Boston, US	1.05		1848
New Zealand (Royal Farmers)	1	New Zealand	No charge		1848
West Africa (Sceptre)	7	Sierra Leone	3		1880
		Congo	5		1883
		Congo	3.75		1883
		Sierra Leone	4		1887
		Congo	4		1887

		Sierra Leone	2	Short stay	1891
		Gold Coast	2.5		1894
Caribbean (Sceptre)	4	Jamaica, hills	1		1883
		Jamaica	Unknown	Reduced to 0.75 then 0	1889
		Barbados	No charge		1889
		Jamaica	No charge		1891
Pacific (Sceptre)	1	Samoa Islands	No charge		1885
Middle East (Sceptre)	6	Cairo	1.5		1885
		Egypt	1.6		1888
		Smyrna (Turkey)	No charge		1897
		Egypt/Jerusalem	No charge		1899
		Cairo	Unknown	Reduced to 0	1892
		Egypt	1		1908

REGION (OFFICE)	Number	Destination	£ per £100 assured p.a.	Notes	Date agreed
	5	Caracas	0.5		1886

South America (Sceptre)		British Guiana	1.5		1887
		Venezuela &c.	1		1890
		Brazil	1		1891
		British Honduras	0.5		1894
India (Sceptre)	3	Punjab	1.75	Reduced to 0.875	1887
		India	Unknown	Reduced to 0	1887
		India	Unknown	Reduced to 0.5	1893
China (Sceptre)	6	China	1		1887
		China	No charge		1888
		Shanghai	0.5		1890
		North China	0.5		1891
		North China	0.5		1891
		China	0.5		1894
East Africa (Sceptre)	10	Soudan	No charge		1885
		East Africa	2.25		1888
		Suakim, Sudan	4		1889
		East Africa	2.5		1891
		Blantyre Province, Shire Highlands, Br. East Africa	1		1893
		East Africa, Mozambique, Chartered Co. Territories	2		1893
		Wadi Halfa, Sudan	1		1897

		Aden	2.1		1906
		Aden	1.5		1907
		Khartoum	1		1908
Atlantic (Sceptre)	1	Bermuda	No charge		1889
SE Asia (Sceptre)	2	Philippines	0.5	Short stay	1892
		Singapore/Straits	1		1914
TOTAL	53				

Source: minutes of the Sceptre (1879-1914) and Royal Farmers (1842-1868) companies.