Insurance against Germ Theory: Commerce and Conservatism in Late-Victorian Medicine

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SUMMARY: This article highlights the role played by commercial life insurance companies in determining the response to tuberculosis in Britain between 1865 and 1920. Late-Victorian life offices hired two sorts of physicians to help them screen out high-risk proposals: provincial medical examiners, who collected fees for examining candidates; and salaried medical advisors, who developed guidelines for the medical examination and interpreted the examiners’ findings for the head office. The latter set of physicians, many of whom worked at specialist consumption hospitals in London, established an orthodoxy among life offices that privileged hereditary explanations for the cause of tuberculosis. The provincial examiners resisted that orthodoxy, arguing that advances in public health and treatment rendered irrelevant any apparent correlation between family history and tuberculosis. In adjudicating this internal dispute, life offices stood by their salaried advisors, but in the process pushed them away from viewing disease in terms of specific causes and toward viewing disease in terms of statistical correlation. This victory of statistics over etiology preserved, at least for the rest of the twentieth century, the institutional prominence of insurance as a technique for coping with medical uncertainty.

KEYWORDS: tuberculosis, pulmonary consumption, life insurance, nineteenth-century Britain, Brompton Hospital, medical examination, statistics, etiology, heredity

Since Erwin Ackerknecht’s pioneering study of anticontagionism half a century ago, historians have been debating the connections between commercial interests and theories of disease. A favored focus of these studies has been the response to epidemics, since such responses often

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move beyond the relatively narrow ambit of the market for medical services and trespass into the wider territory where allegedly free agents enact exchange relationships with one another. In Ackerknecht’s famous construction, promarket “liberal” regimes in Britain and France denied that epidemics were spread by contagion, in order to encourage the free passage of goods and people, while “absolutist” German regimes adopted a contagionist etiology in order to rationalize their ongoing pattern of intervention into the affairs of civil society.1 Successive generations of historians have chipped away at various components of this account, leaving the original dichotomy nearly unrecognizable if not wholly untenable.2 Among other things, these revisions have revealed significant overlaps between British doctrines of contagion and miasma that were once seen to be both theoretically and politically at odds; have challenged the timing and stability of anticontagionism as a response to disease in France; have used the example of Hamburg to suggest that not all Germans fit the “contagionist” model; and have pointed to a deep ambivalence toward public health policy in the work of such allegedly “anticontagionist” heroes as William Farr, Edwin Chadwick, and Louis Villermé.3

The case for a clear division between “public health” and “commercial” interests has been even harder to sustain for tuberculosis, an endemic disease that evaded monocausal explanation for more than a century prior to its decline in the 1940s, and that has continued to spur debate among historical demographers. While commentators variously urged a primary role for poor nutrition, infection, weak physical constitution, and heredity as the true sources of consumption, no single theory

2. See, however, Peter Baldwin, Contagion and the State in Europe, 1830–1930 (Cambridge: Cambridge University Press, 1999), which revives the relevance of “the Ackerknechtian past” in order to compare “political interpretations of different strategies internal to the development of prevention against contagious disease” (pp. 24, 30).
of the disease ever enjoyed the unalloyed support of “commerce” or “the state.” Nor, as Katherine Ott has suggested for the American case, did tuberculosis usually demand as immediate or clear-cut responses from civil authorities as was the case for more catastrophic outbreaks of epidemic disease. Although some historians of tuberculosis have taken sides in the etiologic debate, most have taken advantage of the uncertainty surrounding the disease in order to cast light on culturally specific obsessions concerning medicine, gender, morality, markets, and the human body. Hence American studies have variously linked tuberculosis with hucksterism, domestic economy, racism, anti-immigrant sentiment, “the social experience of illness,” and changing patterns of professionalization among physicians and nurses; David Barnes’s recent analysis of tuberculosis in France features chapters on alcoholism, housing, and socialism; and British historians of tuberculosis have focused on sanatoria, socialized medicine, and the rise of medical officers of health.

In most of these studies, the state and the medical profession receive detailed scrutiny, while market agents play primarily reactive roles: either by engaging in a backlash against state-engineered reforms, or by trying to relay those reforms into economic gain. This article instead highlights the transformative role played by private enterprise in determining the response to disease, by focusing on a sector of the British economy—the life insurance industry—that sought to identify risk factors signaling the onset of disease instead of trying to solve etiologic, therapeutic, or preventive questions. As institutions, British life offices were economically

8. Although standard British usage is life *assurance*, not life *insurance*, the latter phrase will be used in this article since it was used by most British medical advisors at the time. “Tuberculosis” in this article will refer only to pulmonary tuberculosis, which was interchangeably referred to during the period under discussion as consumption and phthisis. Other forms of the disease, affecting the joints, brain, etc., were much less common and less likely to be fatal than the pulmonary variety, and hence of less concern to life offices.
powerful and socially pervasive at the turn of the century; they controlled more than £500 million in invested funds in 1913, and came into contact with a vast majority of middle-class and professional families.9 And since, in contrast to politically sensitive British government officials, life offices could afford to take a longer-term view of disease, they were less concerned with the fleeting effects of epidemics than with the more insidious toll exacted by tuberculosis on their mortality tables. In 1900, that toll was still very high among the life offices’ target audience, men who bought their policy before middle age: tuberculosis was responsible for one-third of all male deaths between the ages of fifteen and forty-four.10 If physicians could identify even a portion of the men who would fall into this group, they could save the life office large sums of money in claims that were paid out prematurely.11

Since many of the physicians who worked for life offices were leading late-Victorian experts on consumption, this article adds depth to existing studies of the British response to the disease by fleshing out a previously unnoticed “commercial” context for the debate.12 My main focus, however,


10. Bryder, Below the Magic Mountain (n. 7), p. 1. The death rate from tuberculosis per thousand upper- and middle-class men was less than half that of unskilled male workers; but since more men from the former group survived the age of forty-four, the proportion of them who died of tuberculosis prior to that age is still nearly a third: ibid., p. 4.

11. John Mann, medical advisor for the British Empire Mutual life office, calculated that consumption was responsible for 77.25% of “the total losses of . . . annual premiums” in his company despite being responsible for only 26% of its members’ deaths: John Mann, A Contribution to the Medical Statistics of Life Assurance; with Hints on the Selection of Lives (London: J. Masters, 1865), p. 40. The Scottish medical advisor Robert Christison arrived at a similarly abysmal “survivancy ratio” for consumption victims in the Standard Life Assurance Society: see below, n. 28.

is on the way that context itself could shape a debate at the intersection of medical theory and economic practice, by indicating which problems needed to be solved and which methods were proper to follow. Insurance doctors, who were paid to predict longevity and not to heal, were among the most skeptical in the debate over the therapeutic implications of germ theory in the late-Victorian campaign against tuberculosis. To them, family history was the most reliable indicator of a policyholder’s likely demise from the “white plague.” Ironically, however, life insurance was also a context for one of the strongest reactions against this perspective. Many of the provincial physicians who worked for life offices as local medical examiners were among the most avid British converts to Robert Koch’s discovery of the tubercle bacillus in 1882 and his accompanying claim that tuberculosis was “an exquisite infectious disease.” They urged the companies to pay closer attention to the environment and present physical condition of prospective policyholders, instead of judging lives primarily on the basis of family history. The physicians who took sides in this debate either stubbornly consigned everyone with consumptive relatives to a likely premature death, or argued that the new availability of preventive and curative measures rendered irrelevant any apparent statistical correlation between family history and future incidence of tuberculosis.

The reasons for polarization, in this case, derived partly from conflicting organizational priorities within the life insurance industry, and partly from long-standing professional tensions within the industry’s two-tiered system of medical screening. As business organizations, British life offices relied on a balance between head-office surveillance (typified by the actuary who protected the firm’s financial well-being by keeping claims within a “normal” statistical range) and ubiquitous marketing (typified by the branch manager who drummed up business by unrealistically assuring all comers that they qualified as “normal” lives). The companies also needed to balance the professional commitments of the experts whose advice they solicited—in this case, their salaried medical advisors and their provincial consultants. When the chief advisors defended the relevance of family history, this revealed the influence of the actuaries’ statistical thinking on their work—but it also derived from their experience as family medical advisors, their association with consumption hospitals, and their perception of medical practice as an outgrowth of

14. A Lancet reviewer in 1905 noted that “the weak point of all insurance companies is that the interest of the agents cannot coincide with that of the office” (Brandreth Symonds, “Review of Life Insurance Examinations,” Lancet, 10 June 1905, 1: 1580).
evolutionary biology. When provincial examiners rejected the evidence in favor of family history, this was partly because they received support in this view from branch managers and salesmen, who saw the hopeful implications of germ theory as an opportunity to extend the gospel of life insurance to far more people—but partly they belittled family history because the fatalism that it implied grated against their hopes for the preventive and curative powers of modern medicine, which they took from their professional work as surgeons and founders of sanatoria.

Besides affecting the parameters within which the debate between advisors and examiners took place, the organization of the life insurance industry also largely dictated its resolution—which favored the advisors, but in the process pushed them away from strict hereditarianism and toward an agnostic position on the causal factors underlying a “family predisposition.” Why were the chief medical advisors willing to bracket (if not utterly abandon) their prior belief in heredity? Most simply, because the demand for causal explanation (as opposed to statistical correlation) had never been very high on the life offices’ agenda, making it easier to dispute the antihereditarian views of the provincial examiners by disclaiming the value of etiology in general, rather than persisting in the debate over causation. At a deeper level, the advisors’ willingness to turn away from etiology can be traced to the routinization of the insurance medical examination that had been under way since the 1860s. As doctors in the head office ceded much of the actual examination of candidates to provincial physicians, they privileged components of the examination that were less liable to subjective interpretation. A candidate’s physical symptoms (beyond basic measures like blood pressure and pulse rate) were difficult to standardize, and into the 1910s laboratory tests were often suspected of being widely variable depending on the competence of the local examiner. Family history, in contrast, required only a series of “yes” or “no” answers that could be checked on a prepared form, and then checked against a parent’s death certificate if necessary.

As I will conclude, however, the same commercial demands that pushed chief advisors toward a more thorough commitment to statistical knowledge ultimately constrained their ability to refine that knowledge. For the most part, actuaries failed to cooperate with the physicians’ requests to reduce company-generated medical records to a set of precise correlations between family history and disease-specific mortality. Ironically, part of this failure stemmed from the fact that actuaries continued to view medical knowledge as unquantifiable, even after the physicians themselves had apparently made their peace with quantification. But part of the actuaries’ reticence had deeper roots in the late-Victorian market for life insurance, where competition among companies
constrained the scientific quest for truth. Sorting people into increasingly precise risk groups (arranged by family history or any other variable), and announcing that arrangement to the world as a new medical discovery, would have diminished the crucial element of choice in purchasing an insurance policy. Life offices collectively protected themselves from insolvency by adopting standard mortality tables for calculating their premiums; but beyond that, they offered a wide range of competing schemes for distributing surplus and collecting payments. Part of this range included a variety of penalties for having a consumptive relative, from minor fines to rejection—which had developed not by design, but from the contentious and imperfect state of medical knowledge concerning family history. Once insurance doctors resolved their internal dispute sufficiently to envision a research program that would remedy these imperfections, they discovered to their chagrin that germ theory was not the only medical innovation that held little interest for British life insurance.

“Something behind the Bacillus”:
Chief Medical Advisors against Germ Theory

The debate between chief medical advisors and local examiners over tuberculosis directly arose out of the changing professional and social relations among insurance doctors during the second half of the nineteenth century. At the beginning of this period, between 1840 and 1860, most prospective policyholders either met directly with a company’s directors and/or medical advisor in its head office in London or Edinburgh, or asked their personal medical attendant to send in a report on their medical history and present physical condition. This pattern started to change in the 1850s, when provincial physicians put up an organized resistance against submitting these referee reports without being adequately remunerated; their typical demand was a guinea per report. The life offices eventually agreed to pay for the local medical examination in cases where a visit to the head office was impractical, but in doing so they switched to a new system of independent examinations by physicians who did not necessarily know the candidates. They did this both to guard against personal attendants sending in biased reports on behalf of their patients, and to exercise more control over the nature of the examination.15

A large part of the process of controlling the practice of local medical examiners devolved on the printed examination report, which provided

15. For background on the changing structure of the insurance medical examination, see Dupree, “Other Than Healing” (n. 12), pp. 84–93.
the examiner with a set of questions to ask and specific risk factors to look for. The forms were typically drawn up at the head office by the medical advisor in conjunction with the actuary. By the end of the century many of them ran to dozens of questions, and nearly all required a large focus on detecting any “family taint” in examinees. A model form composed by the Life Assurance Medical Officers’ Association in 1901, for instance, requested the examiner to ask the candidate, “Have any of your Near Relations suffered from cancer, consumption, gout, or insanity?” and warned the physician to interpret reported deaths from “‘Childbirth,’ ‘Dropsy,’ ‘Natural Causes,’ [and] ‘Change of Life’” as signs of a more serious disorder. Many chief medical advisors viewed a thorough form as a necessarily imperfect substitute for an examination that they could personally conduct at the head office. Since a local examiner’s diagnostic skills could not necessarily be trusted, specific answers to his direct questions took on greater weight than his subjective opinion as to the candidate’s physical symptoms. The London physician Hingston Fox, who was chief advisor to the United Kingdom Temperance and General life office, stressed this point when he warned against admitting candidates with questionable family history but an exceptionally sound constitution; this was acceptable if the customer presented himself at the head office, he argued, but not in the case of “country proposals, which we have to judge often upon small data.”

Because of the importance of the printed form, one must inquire more closely into the assumptions of the medical advisors who wrote these forms in order to see how “family taint” came to figure so largely in insurance medical examinations. The typical chief medical advisor split his time between private practice, where he came into contact with the sort of upper-class and professional client who was also most likely to take out an insurance policy, and hospital practice, which provided exposure to clinical statistics. Within the relatively small community of chief medical advisors, the highest authorities worked for the upper crust of the London and Edinburgh life offices, which specialized in high-priced policies that protected creditors against the untimely demise of aristocratic debtors. These firms put a premium on the skill of the medical

advisor, since the lives they insured were often unsound in health as well as personal finance, and their high profit margins meant they could afford to pay what it took to hire the most prestigious metropolitan physicians. A typical doctor in this regard was the London physician Theodore Williams, who was medical advisor for the English and Scottish Law office from the 1870s until after 1900. Williams combined a large private practice, which he had inherited from his father, C. J. B. Williams, with a full-time position at the Brompton Hospital for Consumption, where he compiled statistics on his patients’ family histories.

Owing partly to the centrality of consumption as a risk factor in life insurance, and partly to a developing web of referrals, Brompton produced a disproportionate number of London insurance advisors. When it was established in the 1840s, it was the only hospital in Europe specializing in the treatment of consumptive patients. Although it had only 330 beds, it soon developed a thriving outpatient service that, by the late 1860s, was processing more than 10,000 cases a year. The hospital’s effectiveness in curing these patients was doubtful, even into the 1930s, but it did provide staff physicians with much grist for research into the causes and duration of tuberculosis, and as a result it emerged as a center of British research on consumption, attracting and producing leading experts in the field.19 Until at least 1900, life offices could be assured that a Brompton-based medical advisor offered an authoritative perspective on the underlying factors, average duration, and age distribution of pulmonary tuberculosis—one that, at least in Britain, thoroughly represented the mainstream of medical opinion.

Besides Williams at the English and Scottish Law, Brompton physicians who doubled as salaried insurance advisors included James Pollock at the Economic; Reginald Thompson and Percy Kidd at University Life; Frederick Roberts at the Phoenix; Richard Quain at the Law Union; Arthur Latham at the Legal and General; William Bosanquet at the Guardian; William Stone and J. K. Fowler at the Clergy Mutual; Hector Mackenzie at the British Empire Mutual; Douglas Powell at the Clerical, Medical and General; and Richard Payne Cotton and Edmund Symes-Thompson at the Equity and Law. In 1870, seven of the ten physicians and assistant physicians at Brompton were also on salary at a life office, as were fourteen of the twenty-four full physicians who were at Brompton

19. Other London consumption hospitals founded after Brompton included the Quaker-affiliated City of London Hospital for Diseases of the Chest (est. 1848), the North London Hospital for Consumption, and the Royal National Hospital. Together, these hospitals possessed two-thirds as many beds as Brompton, although the City of London did serve about the same number of outpatients. See Smith, *Retreat* (n. 7), pp. 63–66; Hardy, *Epidemic Streets* (n. 7), p. 222.
for at least five years between 1870 and 1920. These physicians uniformly used their accumulated hospital experience to argue that hereditary diathesis was the primary factor in the transmission of consumption. Williams appealed to Brompton’s records to support his discovery of a “family predisposition” to tuberculosis in 484 out of 1,000 private patients, a figure that Powell repeated as “the latest authority” in the 1878 edition of his textbook *On Consumption*. Pollock, on the basis of twelve thousand Brompton interviews between 1857 and 1864, set the minimum level of “hereditary cases” at two-thirds. Thompson contrasted the duration and age of onset of the disease among groups of one thousand “acquired” and “hereditary” Brompton cases, and Cotton mined the hospital’s records for his study of a thousand consumptive patients; both cited heredity as a factor in more than a third of all the cases they examined. Although Symes-Thompson never relayed his forty-three years at Brompton into any published statistics, he did lecture extensively on heredity and tuberculosis at Gresham College. Pollock’s firm belief

20. The City of London Hospital (later known as the Victoria Park Chest Hospital) also produced two insurance advisors who figure in this article: Glover Lyon, who advised the London-based Mutual office and published extensively on insurance medicine; and George Heron, whose heterodox views on germ theory will be discussed below at greater length. Brompton physicians’ affiliations are taken from the *Post Magazine Almanack* and from Maurice Davidson and F. G. Rouvray, *The Brompton Hospital: The Story of a Great Adventure* (London: Lloyd-Luke, 1954), pp. 78, 144–47.


24. *Memories of Edmund Symes-Thompson . . . by his Wife* (London: Elliott Stock, 1908), p. 81. Most of these physicians used their statistics to explore many other features of tuberculosis in addition to its allegedly hereditary nature. Cotton analyzed his data in terms of patients’ occupations and the location of their lesions (*On Consumption* [n. 23], pp. 21, 67), and Williams published several papers on statistical correlations between consumption and climate (e.g., “Lettosimian Lectures on the Influence of Climate in the Treatment of Pulmonary Consumption,” *Brit. Med. J.*, 8 January 1876, 1: 38–42). On similar hereditary views among Brompton physicians who were unaffiliated with life offices, see Smith, *Retreat* (n. 7), pp. 37–38. For both Williams and Symes-Thompson, tuberculosis ran in the family in
in consumption’s hereditary nature was the central feature of his *The Elements of Prognosis in Consumption*, published in 1865, as was Thompson’s in his influential treatise *The Different Aspects of Family Phthisis* (1884).

Most insurance medical advisors who did not have an affiliation with Brompton followed the specialists’ lead on the matter of family predisposition, frequently citing their statistics and treatises. John Mann, who preceded Mackenzie at the British Empire Mutual, discovered clear signs of heredity in only a third of his office’s consumption deaths, but upped that figure to two-thirds by referring to the “[g]reater accuracy of the disinterested evidence” from Brompton; he concluded that “this element of family history is really the *only one* by which the investigator will be led to form a correct judgment” regarding the likelihood of consumption. In Edinburgh, which lacked any consumption hospitals, two of the leading insurance advisors similarly insisted on the significance of family predisposition. James Begbie, chief advisor for the Scottish Widows’ Fund, appealed to the Brompton evidence by way of preaching “caution in the admission of those who appear to inherit the tubercular diathesis”; at his urging, his company framed a rule in 1845 that rejected all “younger” candidates with at least one consumptive parent. Robert Christison, professor of medicine at Edinburgh University and chief advisor for the Standard Life Assurance Company, put consumption (together with cancer and gout) on a short list of diseases that could be “better foreseen by . . . an unsound family constitution.”

At least part of these physicians’ emphasis on the hereditary origins of tuberculosis can be attributed to their concern to defend the hospital as a legitimate site for giving care to consumptive patients. Before Koch’s discovery, they were hostile to any suggestion that consumption was contagious, since this threatened the premise that putting tubercular
patients together in the same facility was the best available form of
treatment. Pollock, for instance, pointed to consumption’s “spontaneous
origin from constitutional causes” in presenting “the many advantages
which hospital treatment affords”,29 and Cotton contrasted his hereditar-
ian views with contagionism, which, he claimed, distressed his nurses and
led people to withhold “Christian kindness” to dying consumptives.30 As
F. B. Smith has suggested, late-Victorian doctors also promoted the
hereditary origins of consumption because it helped secure “medical
authority within the family.”31 It was common for patients with a con-
sumptive family history to consult their doctor about suitable marriage
partners, a point that Thompson addressed in Family Phthisis when he
warned against “the promiscuous proscription of marriage” between
people with consumptive family history.32 While not prohibitive, however,
Thompson’s own advice that such people should postpone marriage
until after the age of thirty-five indicates the effects that hereditarian
views had on family counseling.33

Besides viewing heredity in terms of their pastoral role as caregivers
and patient advisors, many leading insurance doctors were thoroughgo-
ing Darwinists, who made it their mission to extend the ideas of evolu-
tionary biology to their medical work. Symes-Thompson wrote in 1895
that it was “our privilege to have lived with Darwin,”34 and Reginald
Thompson appealed to “the memory of our great Naturalist, and . . . the
completeness with which he investigated the vast subject of inherit-
ance.”35 Darwinism privileged the constitutional aspect of disease trans-
mission, leading to the conclusion that it was susceptibility to consump-
tion that was inherited rather than the disease itself. Focusing on the
inherited strength or weakness of their patients allowed physicians to
hold out some hope for curing tuberculosis, or at least alleviating the

cember 1855, 2: 626–28, quotation on p. 627.
30. Cotton, On Consumption (n. 23), p. 10. For similar examples see Smith, Retreat (n. 7),
pp. 48–49. Williams, appealing to more than fifteen years of “my own hospital practice,”
denied ever seeing a single case of consumption that had been spread by infection;
Thompson offered the only slightly less implausible figure of 15 cases of infection in
1882, 2: 618–21, especially p. 620.
32. Thompson, Family Phthisis (n. 23), p. 191.
33. Ibid., p. 194. Pollock flatly stated that “[t]he phthisical should not marry; those
strongly predisposed by family inheritance of the disease should not marry; near relations
so predisposed should not marry” (Elements [n. 22], p. 348).
35. Thompson, Family Phthisis (n. 23), p. 168.
suffering it caused. Hence Williams staunchly defended the “mountain cure” for tuberculosis, arguing that it worked by developing “the girth of the chest” of consumptives and not by exposing them to “a germless atmosphere.” The doctrine of diathesis also allowed for a degree of internal debate among Brompton physicians, as when Powell urged that consumptive siblings had “been placed alike in the circumstances favourable to the production of phthisis” and had not, as Williams claimed, inherited the same constitution from a parent. But therapeutic options and diverse opinions were alike limited by the consensus view that one’s original susceptibility to consumption could never wholly be altered. Summing up this approach, Pollock warned that every individual, though free, was “ever guided by the impressed character of those who have preceded him, the invisible rein of their accumulated power or weakness is round his neck.”

The insurance advisors’ hospital experience and faith in hereditary diathesis led them to hold firm against the implications of Koch’s discovery during the decade after 1882. Thompson mentioned the “recent brilliant discoveries of Koch” in _Family Phthisis_, but claimed that they applied only to “the development of phthisis,” not to its origin. And Williams appealed to the high rates of exposure to consumption to argue against infection as the crucial variable: “when we consider the number of consumptive people who, being under no restriction, go about coughing and expectorating freely in the streets and parks of London . . . we must admit that the bacilli, though ever present, are not very active in ill-doing.” He similarly referred to his experience at Brompton, where


40. Thompson, _Family Phthisis_ (n. 23), p. 143.

41. Williams, “Contagion of Phthisis” (n. 30), p. 618.
poor ventilation during much of its establishment “must have led to a large accumulation in the wards of the products of respiration, and also of our friends the bacilli.” On the theory of infection, at least some of these germs should have stricken the nurses and the many non-consumptive patients at Brompton; instead, he claimed, all the statistical evidence pointed against an unusually high risk to such people.42

As support for the public health applications of bacteriology increased in the 1890s, insurance doctors modified their views somewhat without straying from their primary focus on heredity. Pollock’s successor at the Economic, Joseph Payne, argued that Koch’s discovery “only shows that what is generally inherited is not the tubercle bacillus itself, but a certain vulnerability of tissue which renders the individual less able to resist the attacks of the microbe.”43 Glover Lyon of the Mutual conceded in 1892 that tuberculosis was “now clearly made out to be caused by the entrance into the body, and growth there, of a specific germ”; but this did not shake him from his belief that “[t]he susceptibility to phthisis, as in all zymotic diseases, is largely hereditary.”44 Christison’s successor at the Scottish Widows’ Fund, Claud Muirhead, modified his office’s total prescription of “tainted” candidates in light of Koch’s discovery and his own updated company statistics, but he nonetheless insisted that germ theory had only added “greatly intensified importance and precision” to the doctrine of hereditary diathesis.45 Regarding treatment, Brompton physicians offered an old-fashioned justification of the newly fashionable sanatorium therapy. When Brompton opened a sanatorium at Frimley in 1905, its first director, Marcus Paterson, subscribed to the principle of “auto-inoculation” whereby patients were admonished to build up bodily resistance to the bacilli through ceaseless toil. He combined a fervent faith in the curative potential of such a regime with a continuing belief that “there certainly is a soil . . . suitable for the growth of tubercle bacilli in many children born of tuberculous parents.”46 Insurance advisors followed Paterson in advocating the sanatorium as a preferable response

42. Ibid. See also Pollock’s similar conclusions regarding the Brompton staff: Pollock, “Prognosis and Treatment” (n. 22), 8 January 1881, p. 39. F. B. Smith notes that this appeal was “subsequently shown to be false, even within its own assumptions” (Retreat [n. 7], p. 36).
44. T. Glover Lyon, “Remarks on Consumption in Relation to Life Assurance,” J. Inst. Actuaries, 1892, 30: 120–24, quotation on p. 120.
to tuberculosis, favoring it over more costly and (in their view) less cost-effective preventive efforts.  

The studies by Williams and Pollock, together with their quick response to Koch, fueled a new hereditarian dogma among insurance medical advisors. Pollock co-wrote, with the actuary James Chisholm, the leading textbook for insurance medical examinations, which sternly recommended as much as fifteen years’ “rating up” for lives with even a single parent who had died of consumption; Francis de Havilland Hall’s *The Medical Examination for Life Assurance* similarly recommended ten extra years for a consumptive mother, and seven for a father who had died of the disease.  

In a section of *Family Phthisis* devoted to life insurance, Thompson presented an elaborate system for charging extra on the basis of “four classes of heredity and four periods of life,” and he urged offices to reject outright any candidate under the age of twenty-five with one relative who had died from consumption. Thompson concluded an earlier study of “cross-heredity” as a major risk factor in consumption with the admonition that “life assurance offices do wisely in rejecting lives of young individuals who have father and mother affected with consumption,” and both he and Williams warned life offices that sufferers of “hereditary” consumption died from the disease at an earlier age than those who acquired it from their environment. 

A good example of the manner in which London medical advisors wielded their social authority occurred in 1898, when George Heron, who had studied under Koch, brought his case to the Life Assurance


48. James E. Pollock and James Chisholm, *Medical Handbook of Life Assurance*, 3d ed. (London, 1889), p. 155. Life offices “rated up” higher-risk lives by treating them as if they were several years older than they actually were, then charging them the difference as calculated by their premium tables. Pollock and Chisholm advised an “extra” of between five and fifteen years for candidates with at least one consumptive parent depending on age, occupation, and the age at which the parent had died.


51. Williams and Williams, *Pulmonary Consumption* (n. 21), p. 118; Thompson, *Family Phthisis* (n. 23), p. 24. Williams claimed that men with “hereditary” phthisis died two years earlier than those without, a disparity that rose to more than five years for women. As both Williams and Thompson noted, the earlier average age of death had more to do with an earlier onset of consumption in “hereditary” cases, as opposed to a more rapid progression of the disease: see Thompson, *Family Phthisis* (n. 23), pp. 20–23.
Medical Officers’ Association that heredity was overrated as a risk factor. Despite being a founding member and eventual president of this society, which had been established four years earlier as a forum for London chief medical advisors to discuss their work, Heron was a relative newcomer to insurance medicine—just as the company that he advised, Mutual of Australasia, was an upstart among London life offices. As a physician at the City of London Hospital for Diseases of the Chest, he was also an outsider to the circle of Brompton consumption specialists who had forged such strong ties with the insurance industry. Along with his tutelage under Koch, these factors led him to spend the 1880s criticizing London’s medical elite and life offices for failing to learn the proper lessons from modern bacteriology. In 1890 he collected these criticisms in a series of published lectures, which contrasted “this very old theory of what has been popularised under the phrase, ‘hereditary predisposition to consumption’” with “Koch’s researches on tuberculosis” which met, “to the full, every requirement of the bacteriologist.” His criticism of insurance practice was more cautious, amounting to an accusation that life offices followed “the usual practice” instead of keeping abreast of “modern research.” In keeping with the views of most insurance doctors, he called for uniform surcharges and further empirical work.

When Heron went further in his 1898 paper, urging “the exemption from extra rating of the proposer who would be placed in the first class, were he not regarded as an inheritor of a special susceptibility to the infection of tuberculosis,” his fellow medical advisors quickly responded. Pollock repeated his view that there must be “something behind the bacillus . . . something that goes back for generations,” and added that “[t]here is nothing more clear in the whole history of human life than heredity.” Williams appealed to the experience of “gentlemen in this room” who had “heard cases . . . over and over again” of family members with a consumptive mother who had died of the disease in all parts of the world, and added that “Dr. Pollock and I have seen plenty of hereditary cases; we know whole families that are swept off by phthisis.” Symes-Thompson claimed that “there is not merely an inheritance, but that there is an inheritance of a special form of phthisis which may perhaps be

54. Heron, “Some Extra Ratings” (n. 17), p. 93.
56. Theodore Williams, discussion of ibid., p. 106.
due to a special vulnerability.”

This variety of responses indicates the rhetorical strategies taken up by chief medical advisors who defended hereditary explanations of tuberculosis, which ranged from appeals to statistics and personal experience to bald assertions—supported by little more than their substantial professional prestige—of heredity’s inevitable power to influence health.

Such physicians appealed to medical statistics to make sense of their prior conviction about heredity as a factor in caregiving, as opposed to appealing to heredity to make sense of the numbers. C. J. B. Williams invited his son to apply the numerical method to his case histories to confirm empirically his “experience and reasonings of a long life largely occupied in the study and treatment of Pulmonary Consumption”—and also, one suspects, to provide some extra authority to counter the “fickleness or indocility” that the senior Williams’s patients displayed when confronted with his unpopular advice.

Even when Thompson cited the financial success that life offices had achieved as a result of applying the statistical evidence of family predisposition, he was quick to trace this detail back to Darwin’s scientific authority: “As Darwin remarks . . . with regard to breeding, hard cash paid down is an excellent argument of inheritance.”

Most medical advisors, in fact, were happy to discard their numbers whenever these failed to reveal sufficiently clear evidence of heredity. As Cotton argued, a collective investigation of consumption among parents and siblings missed the many cases in which the disease “may remain dormant, for one, two, or even more generations, and then show itself again at a remote period.”

They also supplemented inconclusive statistics with analogies between consumption and other diseases, such as insanity and gout, in which the “universal conditions of inheritance which are known to foster the family disposition” were less in doubt.

The chief advisors’ ambiguous position on medical statistics is a point worth stressing, because it reveals a deeper ambivalence toward the quantitative methods favored by the actuaries who sought their advice. In the 1850s and 1860s, when advisors were still in the process of formalizing the two-tiered system of medical examination, they gladly appealed to statistics (both from their own offices and from outside sources) in order to

57. Edmund Symes-Thompson, discussion of ibid., p. 110.
58. Williams and Williams, Pulmonary Consumption (n. 21), pp. xiv, x.
59. Thompson, Family Phthisis (n. 23), p. 14. To support his claim that life offices had, in fact, profited by paying attention to family history, he cited a study by the Mutual of New York (pp. 16–17).
61. Thompson, Family Phthisis (n. 23), p. 3.
discipline physicians who were overly lax about filling in proposal forms or death certificates. Robert Christison, for instance, contrasted “ratios of survivancy” for lives selected under his watch with those admitted by his less-stringent predecessors at the Standard, and used disease-specific survivancy data to direct examiners’ attention to particular risks. As more formal medical examinations became firmly established, however, most chief advisors came to view statistics with the same mixture of anxiety and condescension that elite physicians also displayed when considering the impact of new instruments and laboratory methods on their “incommunica...
1920s, when blood and urine tests became sufficiently standardized to render them similarly impervious to a local examiner’s possible failings, chief advisors continued to view family history as the only trustworthy antidote to the “personal equation” getting in the way of objectively charting a candidate’s future health.67

“An Ominous Paragraph in Every Proposal Form”: The Provincial Examiners’ Response

Provincial physicians were less directly connected to life offices, and more sympathetic to the new etiologies of tuberculosis that appeared after 1882, than were the metropolitan advisors who called for their reports. Besides moonlighting for life offices, these examiners were also often active local promoters of sanitary reform or founders of sanatoria, and as such were biased in favor of the therapeutic potential of germ theory. Medical examiners could also count on support for their anti-hereditarian views from branch managers and salesmen, who offered them forums for expressing these views. All these factors led many examiners to challenge openly the instructions handed down from life offices, which almost invariably called for them to report any case in which a candidate for insurance had consumptive relatives. They strongly urged the companies to include room on the insurance examination for other things that they saw as relevant risk factors for tuberculosis, including personal habits and present physical condition. Some also suggested that tuberculosis itself should figure less prominently in the examination, since they assumed it would be eradicated in the near future.

As the market for life insurance spread from London and Edinburgh to every corner of Great Britain, life offices came to rely more and more on the efforts of their provincial medical examiners. A medium-sized office like the Scottish Widows Fund paid fees to more than nine hundred British physicians in 1888, while the much larger Prudential office was said to employ more than a tenth of the country’s physicians as part-time examiners at the turn of the century.68 In larger cities, the leading local examiners often held positions at the charity hospital, and sometimes taught at a redbrick university or served the town council or school

68. Dupree, “Other Than Healing” (n. 12), p. 82; T. Glover Lyon, discussion of Thomas Harris, “The Relationship of Provincial Medical Examiners to the Officials of the Head Office,” TLAMOA, 1898–99, p. 182. It has been estimated that more than 15 percent of all British physicians between 1890 and 1910 earned a substantial income as medical referees: Crowther and White, “Medicine, Property and the Law” (n. 12), p. 863.
board as medical officer. These physicians could be trusted to perform a competent and thorough examination of a candidate for life insurance, especially since, as Douglas Powell observed in 1912, they were typically “not connected in any advisory capacity with the proposer.”

Their other professional duties, however, as either surgeons or public health officials, often led them to challenge the head office’s pessimistic outlook on family history.

For the most part, local medical examiners’ access to insurance company executives was entirely mediated by chief medical advisors, who were responsible for rendering medical reports fit for actuarial consumption. Consequently, the most popular fora for local examiners to present their criticisms of the heredity school were provincial Insurance Institutes, which had been established in more than a dozen cities by 1900.

These brought together salesmen, branch managers, and physicians for regular discussions of insurance-related issues, which were frequently reported in the local press and which, after 1900, were collected together in the federated institutes’ Journal. At these gatherings local examiners could freely discuss opinions about disease that were actively discouraged when they made their report to the head office. Although these opinions were often received sympathetically by their audience, they were seldom as influential in determining company policy.

The first provincial insurance doctors to question the relevance of heredity to tuberculosis, Andrea Rabagliati of the Friends’ Provident Institute and Hugh Beevor of the Norwich Union, were neither proponents of germ theory nor local examiners. Both focused on poor nutrition rather than bacteria as the primary source of consumption, and both were chief advisors and members of the Life Assurance Medical Officers’ Association. The fact that their respective offices were based in York and Norwich, and their heterodox medical views, were both factors in their departure from the chief advisors’ consensus. Rabagliati, who directed equal doses of ire at the “fetish of . . . germs” and heredity,

70. In less densely populated provincial regions, life offices often had to make do with a candidate’s family doctor as a medical referee. Although these physicians might have been expected to side with the chief advisors regarding hereditary predisposition, they also had a strong interest in minimizing the role of a “family taint” on an examination form in order to stay in the good graces of their patient. In any case, they mainly ceded their authority to speak on behalf of provincial insurance examiners to the surgeons and public health reformers from the larger cities.
informed the Yorkshire Insurance Institute in 1895 that the causes of tuberculosis were more likely to be “personal than that they were hereditary, inasmuch as they are more likely to be found among the incidents of daily personal life than among those of the ancestry.” Four years later, Beevor argued that improvements in diet rather than sanitary reforms had been responsible for consumption’s declining death rate since the 1880s—resting his case in part on the fact that mortality rates from consumption since 1871 had declined by 25 percent among the increasingly well-fed general public, while remaining relatively constant among the “well-to-do” members of the Scottish Widows’ Fund. Unlike Beevor, who remained silent on the immediate therapeutic implications of his findings, Rabagliati waxed optimistic regarding the capacity of people to change their behavior and environment in order to combat disease, claiming that “inheritance of the narrow chest will not stand for more than a tenth of the causes which induce the disease, the other ninetenths being made up of the conditions which we can modify in the present generation.”

Prior to 1900, however, such early signs of rebellion were typically pitched in cautious language. Rabagliati concluded his remarks by conceding that disease prevention was “not the function of an Insurance examiner as such” and reminding local examiners that their “advice, even if tendered, may not be believed and may not be acted on.” Beevor merely commented that “[c]oncerning hereditary susceptibility the diagrams only declare that the declension of phthisis is great in spite of it.” We see a similar pairing of firmly antihereditarian views with cautious practical advice in an 1899 insurance institute paper delivered by the Manchester surgeon William Thorburn, who listed “geographical location, occupation, education, and imitation” as factors that were often mistaken for heredity as causes of tuberculosis, and concluded that often what appeared to be a family taint was “in reality a mere accident capable of elimination by removal of the child from its parental environment.”

But in his practical suggestions he settled for urging offices “to aim at a

74. Sir Hugh Beevor, An Oration on the Declension of Phthisis (London: n.p., 1899), p. 4. On Beevor, whose views were subsequently echoed by Thomas McKeown and then rejected by Simon Szreter, see Hardy, Epidemic Streets (n. 7), pp. 218–19.
75. Rabagliati, “Personal History” (n. 73), pp. 188–89.
76. Ibid., p. 192.
77. Beevor, Oration (n. 74), p. 4.
greater precision of knowledge which will enable us not only to obtain an average of correct opinions but a diminishing number of errors.  

In the following decade, local examiners became more strident in their criticisms of life offices that rated up lives with a consumptive family history. One physician praised Rabagliati for giving “the heredito-maniacs” a “salutary douche” and dealing a “scientific . . . blow at the crude, Oriental fatalism of an ‘educated’ age.”80 Another provincial examiner complained in 1902 that heredity “bulks largely in the text-books of medicine, it is loudly insisted upon by the authorities in medical examination for life assurance, it forms an ominous paragraph in every proposal form, and yet it is a disease one may hope to see exterminated.”81 Such opinions found even more enthusiastic expression among those working the marketing side of the insurance industry, who saw in germ theory a new way of breaking down the obstacles to qualifying for a whole-life policy. One insurance agents’ magazine called Rabagliati “an enlightened man, with modern ideas and who adopts modern methods of enquiry and investigation,” and predicted the disappearance of tuberculosis within fifty years.82 Within months of Rabagliati’s paper, the London secretary of the Scottish Metropolitan Company, Mogridge Hudson, rushed into print Heredity in Life Assurance: Being Some Notes as to the Improbability of Diseases Being Inherited; his baseless claim that “the death strain amongst assured lives has been absolutely less amongst those rated up, as against those accepted at normal rates” drew scorn from medical and insurance journals alike, but he did have the effect of recasting Rabagliati’s position as moderate in comparison to his own.83

Behind the medical examiners’ complaints about procrustean proposal forms and outmoded science was a growing anxiety that head offices were not keeping pace with the rapid advance of modern medicine. Taking aim at the orthodox defense of hereditary diathesis, Thorburn berated the chief advisors for neglecting “the view of Weissman that the acquired characters of the parent are not inherited by the child.”84 More generally,

79. Ibid., pp. 380–81.
80. George Samuel, Letter to Post Mag., 1895, 56: 351.
84. Thorburn, “Heredity” (n. 78), p. 375. (Italics in original.)
the Birmingham cardiologist Joseph Emanuel noted that “while the medical profession is occupying itself in teaching the public the all-importance of the infectious character of tuberculosis, the insurance world still only regards the hereditariness of the disease to the total disregard of its infectivity.” And with similar impatience, the Yorkshire physician McGregor Young complained that the ordinary proposal form gives but little allowance for the local medical referee to present such arguments for or against a candidate, and I imagine (I may be wrong) that the examiner who went into matters in any such detail would be considered a wordy, windy sort of fellow at headquarters. Facts, and not arguments, we are told, are the business of the local medical officer. . . . After all, bald facts do not always convey the real and the essential, but too often only the apparent truth.

Such complaints about the format of the “ordinary proposal form” led provincial physicians to suggest possible alternative questions that focused on the insurance candidate’s exposure to carriers of tuberculosis. One such question read: “Do you come frequently in contact, either at your home, office, place of business, workshop, factory, or intimate social circle, with anyone you know to be suffering at the present time from a troublesome cough?” For life offices, the implication of such suggestions was that more responsibility would devolve on the agent to protect the company against high risks. And local examiners, who often felt caught between stern orders from the head office and pleas for lenience from branch managers, felt it was about time the salesman started taking on some of the policing functions that had typically been their sole preserve. The Nottingham physician W. B. Ransom urged that “the agent and the medical examiner might well co-operate more than they usually did, and it should be the task of the agent to make minute and careful inquiries.” His colleague Louis Harrison agreed: “The agents must investigate their cases very closely, and call both at the house and place of business of the applicant. They must enquire into the health of his household . . . and ask if any of those with whom he comes into daily and close contact in his business suffer from chronic cough.”

In urging a revision of proposal forms and a new division of labor among physicians and salesmen, local examiners were replaying within the life office a wider perception that focusing on heredity greatly limited the potential for the medical profession to prevent or cure consumption.\(^9^0\) Ransom and Thorburn both argued that tuberculosis might be passed on from a mother to her child, and Thorburn more generally stressed “the manifold ways in which parental influence may transmit disease to the child by the establishment of an environment in which that child must spend its life.”\(^9^1\) All this was effective enough in claiming that many sources of consumption that had previously been attributed to heredity could in fact “be greatly modified or entirely obviated.”\(^9^2\) It was less effective, however, as an argument against the standard practice of life offices, which interviewed candidates long after the opportunity for such intervention had passed. In practice, these sweeping indictments of hereditarianism translated into less consequential proposals: companies should identify exceptional cases in which candidates had been sent to boarding school, or inquire if “the parent or brother developed the disease after the candidate for Insurance had grown up and left home.”\(^9^3\) Emanuel made the similar point that parents could just as easily catch the disease from their children as the other way around, or from a boarder, either of which cases would result in a risk that would go unnoticed by a life office subscribing to hereditarian principles.\(^9^4\)

Undeterred by the minor relevance of germ theory to the actual medical examination, some physicians took a longer view, and suggested that life offices could protect their financial interests by investing in public health measures that would diminish the overall incidence of consumption and other infectious diseases. These physicians envisioned the life office as a powerful ally of such voluntary efforts as the National Association for the Prevention of Tuberculosis, and as preferable to the

90. This was part of a growing concern that many local duties (and hence opportunities to put their skills to good use) performed by physicians as consultants were being subordinated to the economic and political demands of the larger bureaucracies that paid their fees. The Hampstead MOH who complained about the “late tendency . . . to sink the skilled adviser into the permanent official” would have found much support among insurance examiners: cited in Anne Hardy, “Public Health and the Expert: The London Medical Officers of Health, 1850–1900,” in Government and Expertise: Specialists, Administrators and Professionals 1860–1919, ed. Roy M. MacLeod (Cambridge: Cambridge University Press, 1988), pp. 129–42, especially p. 142.
93. Ibid., p. 381. See also Harrison, “Heredity of Consumption” (n. 89), p. 24.
government as an enforcer of social hygiene.95 “Better than State control,” argued Ransom in 1900, “would be the influence of the Insurance Company”; policyholders “would be better lives for the companies and for themselves if the companies’ inspectors were to insist on proper ventilation, drainage, and sleeping accommodation in . . . shops and warehouses.”96 This point was seconded by the medical examiner A. J. Hume in 1902, who wrote a series of letters to the Insurance Record urging companies to issue to their customers “a Primer of Health treating ventilation, exercise, diet, etc.” and to lobby local and national government officials for better public health laws.97 To seal their case, both Ransom and Hume cited the model of fire insurance companies, which routinely inspected buildings before agreeing to cover risks, and which helped subsidize fire brigades, salvage corps, and other methods of preventing fires.

Besides calling on life offices to take a more active role in promoting public health, provincial examiners also suggested that companies could help lessen the risk of death from tuberculosis by funding the construction of sanatoria. McGregor Young urged life offices to donate “a grant towards the all too few sanatoria which have been recently erected.”98 And Ransom envisioned a future in which “the sphere of action of the companies extend[ed] to the environment of those who were actually affected with the disease,” noting that this was already happening in German health insurance companies, which had announced a tangible dividend in the form of greatly reduced claims ratios; British life offices would find it “worth their while,” he argued, “to assist the cure of their phthisical policy-holders, and to exercise a beneficial control over their subsequent work and mode of life.”99 The context of Ransom’s remarks, in this case, underscored the divided loyalties of many provincial medical examiners who took it upon themselves to reform the practice of insurance companies. Two years after urging life offices to subsidize the construction of sanatoria, Ransom would open his own private sanatorium in Nottingham; he went on to spark a decade-long debate in the medical press when he complained about opposition to sanatoria

95. An agents’ journal, in supporting the newly formed National Society for the Prevention of Consumption, presented it as a weapon against “those good people who . . . have preached heredity and heredity only” (Assur. Agents’ Rev., 1899, 12: 2). On the NAPT, see Bryder, Below the Magic Mountain (n. 7), pp. 15–22.
emanating from hospital physicians and family doctors, many of whom openly suspected privately run sanatoria to be sources of profit-seeking.\textsuperscript{100}

At least in the short term, most British life offices had little use for proposed links between their business interests and public health reforms. Their actuaries and medical advisors had long questioned the relevance of social hygiene to their business, arguing that any improvement in overall life expectancy produced by sanitary reforms had been due to a sharp decline in infant mortality, which had nothing to do with insuring middle- and upper-class lives past the age of twenty. If anything, argued the Scottish Amicable’s actuary in 1886, sanitary reform meant only “prolonging weakly lives a short time longer, and in the process of nursing them deteriorating the lives of the mothers.”\textsuperscript{101} The only British life offices to take a different view were industrial insurance companies like the Prudential and the Pearl, which made their profits from insuring the working classes, including a large proportion of children, and consequently saw a close connection between the people’s health and their own financial position. The Prudential’s secretary, Henry Harben, endowed a lecture series and a gold medal in 1896 “for the encouragement of original research in connexion with public health.”\textsuperscript{102} And after 1911 his company and other industrial offices participated more directly in public health reform by helping to administer the National Health Insurance Act, which channeled a portion of its revenues into the construction of sanatoria and the furtherance of medical research.\textsuperscript{103}

A more compelling argument against the rating-up tactics of life offices with a middle-class clientele concerned the inequity that resulted from rejecting a life on the grounds of family history, despite exonerating environmental or personal circumstances. The Bristol physician Vincent Moxley stressed this point when he urged that charging extra for a consumptive family history would “become more and more divergent from an equitable rate, as treatment becomes more and more

\textsuperscript{100} Worboys, “Sanatorium Treatment” (n. 37), pp. 56, 61.


\textsuperscript{103} On the National Insurance Act’s impact on tuberculosis, see Bryder, \textit{Below the Magic Mountain} (n. 7), pp. 37–41.
successful.” Louis Harrison likewise implored life offices to make sure that “the general public . . . are not unfairly treated and rejected” on account of an outmoded theory of disease. Such arguments held obvious appeal for insurance salesmen, who had a vested interest in seeing all rejected lives as unjustly treated. But appealing to the equitable treatment of exceptional individuals also made at least some headway with the head-office medical advisors. As will be discussed in the next section, chief advisors were willing to fight for changes in medical statistics that would help them determine more equitably the risks of family versus personal history, even while they derided or ignored the local examiners’ more general arguments on behalf of germ theory. These reforms, however, met with a mixed response from the insurance companies, which conceived of “equitable treatment” in a different manner than did the physicians, and which preferred alternative methods for compensating the victims of a faulty prognosis.

Statistics to the Rescue?

When chief medical advisors responded to the local examiners’ protests, they did their best to move the debate from the realm of etiology to that of statistical correlation. While they were often willing to concede that apparent cases of hereditary tuberculosis in fact originated in infection, they appealed to statistics to shoot down the local examiners’ efforts to import preventive or therapeutic innovations into the task of equalizing risk. In this limited sense, the chief advisors’ therapeutic pessimism folded neatly into the actuaries’ statistical fatalism, which consigned all members of a risk group to the same financial fate. But the debate over family history and life insurance was not resolved quite so easily as this description implies. Instead of remaining satisfied with a set of possibly inequitable risk groups based on imperfect medical data, chief advisors tried to balance their new statistical thinking with their older clinical impulses, by calling for better statistics that would expand the range of risk groups and standardize their boundaries. And instead of indulging their medical consultants’ newfound taste for statistical standards, actuaries resisted standardization out of a concern that it would be anti-competitive. Imperfect medical knowledge had produced a wide variety in the penalties imposed by companies for consumptive family history, and these had become part of the process by which firms distinguished

themselves from one another. Against these inertial market forces, the physicians’ ability to marshal professional support for statistical standards met its match.

One area where chief medical advisors and actuaries were certainly in agreement concerned their skepticism that a candidate’s unique personal or environmental circumstances could ever completely mitigate the effects of family history. J. J. Perkins, a physician at Brompton, conceded that “the adverse influence of inheritance may be kept in check by a healthy life and removal from tubercular surroundings,” but insisted that “as a practical point in assurance work one could never feel certain that these excellent surroundings would be maintained, and that the proposer would not at some time move to an unsuitable home or take up an unhealthy occupation.” Francis de Havilland Hall, chief medical advisor for the Rock life office, more generally warned of the danger of predicting people’s future environment and occupation, especially among the “bustling” sort who tended to insure their lives:

we are now living in days when we have to deal with such a very fleeting population. They are always on the move, and I think that is especially the case with those who go in for insurance. It is the active, business, bustling man, the man whose occupation takes him about, that is likely to insure, whereas, those who are rooted to the soil—the squire, the farmer, for the most part—are not likely to take up a policy of insurance.107

Although Hall was willing to admit that people were less likely to change their occupation than their place of residence, he worried that even in that case the conditions of modern life made family history the only safe predictor of future mortality: “When a man insures he insures as a farmer, perhaps he fails, and takes a public-house, and he passes from the most healthy to the worst of all occupations.”108

Many medical advisors also doubted the ability of physicians to provide a permanent cure of consumption and thereby remove its threat to life office mortality rates. As one physician cautioned: “‘Cure’ of tuberculosis that is lasting is a much rarer outcome of treatment than some admit.” Sun Life’s advisor, Elliot Risdon, was similarly convinced of the actuarial insignificance of the new therapeutics: “Although a recent

108. Ibid.
‘cure’ is considered a passport to insurance by many of the public, offices do not yet care to accept for any period, however short, cases of tubercle which have manifested signs of recent activity”; acceptance of such lives at a special rate, he concluded, would be justified only if “the lesion is of many years’ standing, limited in area, the general condition good and tending to improve.”

Theodore Williams conjoined the medical advisors’ suspicions of taking into account either present personal habits or future cures when he warned that many consumptive patients failed to maintain the “after-care” regimen they had learned in the sanitorium, and consequently suffered a fatal relapse of the disease. Although several chief advisors—including Douglas Powell and the Scottish physician Byrom Bramwell—were more optimistic about curing or preventing tuberculosis, none departed from the conviction that life offices could not trust consumptive policyholders to maintain the self-regulation that was essential to any lasting remedy.

In making their case against the local examiners’ therapeutic arguments, chief advisors exchanged their earlier hereditarian views for statistical thinking, which avoided the etiologic issue while firmly upholding the life offices’ existing practices. When Douglas Powell revised his consumption textbook in 1886 to account for Koch’s new “spores,” he revealingly commented that it was “almost a mere matter of account whether the phthisis be attributed to the spores or to the morbid state of tissues prepared for their delectation.”

In 1903, Hall modified the third edition of his popular insurance examiner’s textbook to shift the focus of “family history” questions from prior generations to family members living in proximity to the candidate, but remained convinced that a candidate’s relatives mattered more than any other risk factor for consumption. As a new generation of medical examination handbooks began to appear in the 1920s, “heredity” almost completely gave way to


114. F. de Havilland Hall, The Medical Examination for Life Assurance, 3d ed. (Bristol: John Wright, 1903), pp. 15–16.
the more neutral “family history” in discussions of tuberculosis, without substantially altering the pessimistic conclusion that candidates with consumptive parents or siblings should at the very least be rated up. “Consumption in the family history” was “of great importance,” according to Thomas Lister’s *Medical Examination for Life Insurance* (1921), although he did repeat the local examiners’ call for a closer inspection into the candidate’s term of exposure to the diseased relative. 115 J. P. MacLaren’s textbook in 1927 similarly stressed the importance of “personal contact or residence with an infected person,” but concluded that “contagion through sucking and nursing” meant that family history should continue to count against a candidate. 116

At least part of this shift toward statistical reasoning among medical advisors can be traced to a newfound collaboration between actuaries and physicians in the investigation of possible correlations between family history and tuberculosis. 117 Such collaborative efforts typically took place at larger offices, where assistant actuaries could be spared to sift through their company’s medical records while the head actuary pursued the more traditional task of setting premiums and bonuses. The usual method in such studies was to compare original information about family history from proposal forms with the cause of death that was recorded when the policy came due. In 1894, for example, Louis Simon, assistant actuary at the Metropolitan, included a section on causes of death in his published report on that company’s mortality experience; and between 1903 and 1912 the Prudential assigned two members of its large actuarial staff, Edward Rusher and Charles Kenchington, to tabulate, with its chief medical advisor E. M. Light, the family history of


117. A further sign that neither medical advisors nor actuaries were very interested in pressing the case for heredity (as opposed to family history) after 1900 was the relative inattention that both groups paid to the eugenics movement. Although the Institute of Actuaries did make Karl Pearson an honorary member, they did so mainly on account of his purely statistical work and viewed his eugenic program with either indifference or suspicion: see W. P. Elderton, “Professor Karl Pearson,” *J. Inst. Actuaries*, 1937, 68: 183–85; Lewis P. Orr, “Insurance Research and Eugenics,” *Eugen. Rev.*, 1913, 4: 331–55. Medical advisors, similarly, only rarely tried to bolster their arguments on behalf of family history by referring to Pearson’s well-publicized study of Brompton patients that linked hereditary tuberculosis to “national deterioration.” The strongest effort to apply Pearson’s findings to insurance medicine came not from chief advisors but from the social hygienist James Barr: see Smith, *Retreat* (n. 7), pp. 37–39; James Barr, “Some of the Medical Aspects of Life Insurance,” *Brit. Med. J.*, 1 February 1908, 1: 241–43.
rated-up lives.118 This investigation was typical in its avoidance of the etiologic issues that divided contemporary medical opinion. Rusher and Kenchington devoted six pages of their paper (published in 1913, shortly after Light’s death) to “tuberculosis and the medical profession,”119 but they gave equal time to both sides of the debate and did not “propose to enter . . . [i]nto the merits of these conflicting opinions.”120

In 1913, this agnostic approach to questions of disease causation still offended many physicians, who saw it as an insult to their scientific status. In the discussion of Kenchington and Rusher’s paper, S. W. Carruthers complained that “[a]ctuaries always spoke with a genial tolerance of physicians’ enthusiasm for causes of death,” and defended that enthusiasm as grounded in “an intense utilitarianism.”121 Roughly the same response had greeted the Scottish Widows’ Fund’s actuary fifteen years earlier when he lectured the British Medical Association on the statistical correlation between cancer and family history.122 A generation later, more chief advisors were willing to follow their actuaries in subordinating a clinical to a statistical definition of utility. Otto May, who succeeded Light at the Prudential (and who had been cited by Rusher and Kenchington on the “infection” side of the debate in 1913), directly confronted this methodological matter in a *Lancet* article in 1937: “the life assurance attitude towards tuberculosis is inevitably one of grouping cases into classes for which some sort of mortality table has been calculated, or can be presumed, rather than of considering them as clinical individuals”; May concluded that he saw “no way of avoiding this state of affairs.”123

There remained, however, one sense in which the chief advisors’ instinct to treat insurance customers as “clinical individuals” survived


120. Ibid., p. 484. They only once broke their promise to avoid medical debate, when they condemned two physicians who had recommended administering tuberculin to all applicants for insurance.

121. S. W. Carruthers, discussion of ibid., p. 532. Carruthers, the medical advisor for the Mutual of New York’s London office, had earlier tried to convince the Institute of Actuaries to conduct a massive classification of rated-up lives, modeled on the Dewey decimal system:


their turn to statistical methods: this was their goal to arrive at more precise statistics based on life office records, which would allow them to adopt uniform standards for charging extra premiums. The physicians’ professional prestige and the policyholders’ desire to be treated equitably both suffered from the justified impression, which became increasingly common after 1900, that the companies’ methods of rating up were “purely arbitrary, and dependent upon individual judgment or caprice.”

Local examiners complained that the wide range of extra charges that different companies attached to their reports hindered the credibility of the examination, and suggested that life offices should use their “statistics extending back over a great many years” to rectify that situation—and chief advisors, in this isolated case, joined the provincial physicians in calling on life offices to make collective use of their stores of information to pin down a more precise scale of extra rates. In 1895 the Mutual’s advisor, Glover Lyon, urged the Institute of Actuaries to “undertake an enquiry into . . . doubtful medical points in life assurance, such as the significance of a family history of phthisis.”

Vivian Poore of the Law Union agreed, calling for “some central bureau for the accumulation of scientific facts.” At least in part, such calls signified a new level of statistical sophistication among medical advisors, who had come to recognize problems in combining their stores of company-specific data (owing to different classification schemes) or in applying to life offices the better-organized numbers that were available from the General Registrar.

Many physicians assumed that the outcome of a collective study of the life offices’ medical records would be a uniform rule of law for equitably charging extra premiums. Here again, chief advisors and local examiners could agree—especially since each group was confident that a more comprehensive supply of data would bolster their respective side in the debate. One local examiner argued that “the more exact estimation of

the extra risk attached to definite cases of damaged lives . . . can only be brought about by the application of the statistical methods of the actuaries to the cases carefully classified by the medical officers,” and another predicted that actuaries would come around to Rabagliati’s views (and treat people with consumptive relatives more fairly) if only they made use of the statistics that were “crumbling away in the safes and cupboards of our great life offices.” Chief advisors also pitched their case for better statistics in terms of the equitable treatment of policyholders. Lyon criticized the existing state of uncertainty surrounding “the question of rating-up on account of a family taint” on the grounds that life offices possessed “ample material . . . to settle the question on equitable lines.” J. J. Perkins similarly assumed that “an investigation of the records of the companies” would “show how far the penalties have been adequate, how far excessive or too lenient,” and he called for “a general standard” that, “in an individual case, would give the limits within which the penalty should lie.”

Unlike other advances in standardized prognostic methods (such as laboratory tests) that lay more thoroughly within the physicians’ jurisdiction, the goals of improved statistics and uniform penalties required the cooperation of actuaries—either in their role as chief statistician, or as chief financial officer. Carruthers, in calling for a wider base of medical statistics, envisioned a “permanent Bureau of Joint Investigation” that would employ an actuary and a physician to tabulate “card records of every impaired life.” On the face of it, such a dream might have seemed realistic, given the impressive levels of cooperation that actuaries had been displaying since the 1860s in the collective investigation of policyholders’ mortality. Their efforts had produced a “Healthy Males” table in 1869 and a set of “British Office Tables” in 1893, the latter of which encompassed more than a million lives from sixty-three offices. Although it took many years for actuaries to agree that such investigations were consistent with their companies’ privacy rights, leaders of the profession eventually crafted a consensus view that the industry-wide

130. Anonymous letter, Post Mag., 1895, 56: 327.
131. Lyon, “Remarks on Consumption” (n. 44), p. 120.
133. Dupree discusses “[t]he spread of best practice and the standardization of practice” among insurance examiners after 1900 in “Other Than Healing” (n. 12), p. 97. Physicians were not, of course, wholly free to pursue improved standards in testing, since they needed to convince life offices to cover the costs of such tests.
benefits of accurate collective mortality statistics far outweighed any drag on competition.135 Advocates of a collective family history investigation received further encouragement in 1902 when the Actuarial Society of America commissioned a special mortality study covering policies issued between 1870 and 1899, including fourteen categories “based on weight (allowing for age and height) along with family record.”136

In practice, most British actuaries either ignored the physicians’ calls for better statistics or were openly dismissive of such a scheme.137 Part of their reticence, ironically, stemmed from their view of medical knowledge (one that many physicians themselves were in the process of abandoning) as an essentially subjective enterprise. This argument ensnared the physicians’ goal of standardization in a vicious circle, since it assumed that the records on which they hoped to base their standards were themselves founded on medical opinions that (in the actuaries’ view, at least) were hopelessly arbitrary. William Hughes of the Prudential complained that “lives have been rated up on the recommendation of numerous different examiners and officials, some lenient and others severe”; he concluded that actuaries could not “obtain a set of facts on which we could base some valuable theories” until all lives were “examined by the same doctor, accepted or rejected on definite and stated principles.”138

More charitably, Benjamin Newbatt of the Clerical, Medical and General cited the “most honourable” fact “that judgment necessarily differed with regard to difficult cases” as a factor telling against collective sickness data, adding that he “was not quite sure that it was one they would desire to eliminate.”139 Whether or not the “personal equation” in medicine was


137. A noteworthy exception was Lewis Orr, actuary to the Scottish Life Assurance Company, who in 1912 proposed a collective investigation into life offices’ family history: “Research in Life Assurance,” *Saturday Review*, suppl., 29 June 1912, 93: ii–iii. Significantly, Orr was one of the few actuaries who supported the eugenics movement: see his “Insurance Research” (n. 117).


desirable, the apparent difficulty in eliminating it meant the same thing to actuaries like Hughes and Newbatt: any classification of the results of medical examinations must be grouped broadly enough to allow for a substantial margin of error.

When they moved from the feasibility of a collective investigation of family history to its proposed application—a uniform schedule of extra rates—the source of the actuaries’ suspicion turned to what Newbatt called “that terrible thing called competition”; worrying that “[t]hey were living in days when they could not afford to be frank,” he concluded that the “meanness and sinuosities of modern competition” had consigned the idea of uniform extra rates to the class of “chimeras.” 140 At the root of this criticism lay the problem that medical examiners guarded against two essentially distinct things when they screened prospective policyholders: customers who deceptively withheld risk factors from a company, and customers who suffered unknowingly from debilities that would diminish their value to the office. As physicians’ diagnostic and statistical powers had grown more sophisticated, this distinction faded from view; so long as risk could be accurately determined, it did not matter whether the customer recognized its bearing. But most actuaries continued to worry, not unreasonably, about the problem of policyholders engaging in “reverse selection” against the life office, and hence undermining their predictions about collective mortality. 141 The best example of the continuing relevance of reverse selection was the undeniable fact that only some of the customers who were “rated up” actually purchased a policy. Newbatt estimated that fully half of all rated-up candidates either did not buy insurance at all or found an office that charged lower rates, leaving to the original company “the worse half—those who either accepted their dictum because they knew they had got the best of it, or had failed to get better terms elsewhere.” 142

Newbatt’s conclusion suggested that life offices needed to settle for a second-best definition of equity in classifying at-risk lives, one based on market forces rather than statistical precision. As long as policyholders were free to compare rates among different companies, a sort of rough justice would condemn the least-insurable lives to higher premiums and provide normal rates to those who could convince at least one office that

140. Ibid.

141. Reverse selection is a subset of the more general insurance problem known as “moral hazard”; it refers to the tendency of people with a higher perceived chance of dying prematurely to insure their lives, and continue to hold their policies, in a higher proportion than is the case for the general public.

they posed no special risk. As with the premise that physicians could never eliminate disparate opinions from their prognoses, this assumption held out little hope that life offices should be expected to present a united front in weighing different risk factors. And despite Newbatt’s claim that interoffice rivalry was “terrible,” there was little sign that actuaries were willing to discard that rivalry in favor of physician-crafted standard rates. To do so would have gone against the tendency of the British life insurance industry since the 1880s, which had been toward the proliferation of payment schedules and the celebration of consumer choice. As one Scottish manager counseled in 1900, “our Actuaries should continue to watch every turn of popular favour, and be prepared with something sound and secure to suit the changing taste of the public.”

The most popular of these new schemes was the endowment policy, which offered life insurance for a specified term (typically ten years), after which point it turned into an annuity. This policy minimized the impact of reverse selection, and hence the relevance of the medical examination, since on average the same number of less-healthy lives would survive a few years after the “life insurance” term ended (and hence cost the company relatively little in annuity payments) as those who would die before the term expired. Other policies traded on customers’ assumptions that they were in a better position than physicians to judge their future health, by waiving the medical examination in exchange for reduced or nonexistent coverage during the first several years of the policy. In 1900 the Sun introduced one of these “exam-free” schemes, and other offices soon followed suit. Although not an overwhelming commercial success, the idea of life insurance without a medical examination was received with general approbation among actuaries.

143. It is important to recall that policyholders, when choosing among life offices, took other factors into account in addition to the extent to which they were penalized for poor health or family history. Some might, for instance, opt to insure with an office that imposed a heavier fine in order to take advantage of its higher bonuses or its reputation for stability.


145. Many medical advisors observed that this feature of endowment policies should have had little bearing on customers with consumptive family history, since a much larger proportion of tuberculosis victims could be expected to die before the expiration of a ten- or twenty-year term: see, e.g., James Edward Pollock, discussion of Heron, “Some Extra Ratings” (n. 17), p. 102. On the popularity of endowment policies (which comprised the vast majority of new policies sold in Britain between 1890 and 1913), see Supple, *Royal Exchange Assurance* (n. 9), p. 221.
who were eager to present their offices in a liberal light.\textsuperscript{146} As might have been expected, physicians were quick to condemn examination-free insurance as dangerous to the life offices’ long-term financial security. But the ensuing debate, which almost exclusively focused on the “care and skill” of the medical profession in diagnosis and physical examination, diverted attention from the claim that medical knowledge could be rendered as precise as the actuaries’ mortality tables.\textsuperscript{147}

The fate of the campaign for better family history statistics, as well as the more general contours of the debate on the relevance of germ theory to tuberculosis, indicated the incentives as well as constraints that derived from the commercial setting of British insurance medicine. Life offices gave their chief advisors an additional forum in which to pronounce upon the hereditary nature of consumption, just as provincial Insurance Institutes provided a ready means for surgeons and sanatorium-founders to plead the case for the disease’s preventable sources. The industry’s dynamic organizational structure allowed for some dialogue between these views, although the social and intellectual ties linking chief advisors with actuaries ensured that the advisors had the last word. Yet despite keeping life offices firmly attached to the importance of family history as a risk factor for consumption, commercial considerations also limited the extent to which family history could be fully explored. The same market forces first supported the chief medical advisors’ hereditarian views, then led them to think of disease in terms of statistical correlation, but ultimately cut short their chance to provide firm evidence to support the newly proclaimed empirical basis of insurance medicine.

Conclusion

By focusing on risks affecting the average longevity of populations rather than the prevention or cure of specific diseases, life insurance companies rejected the framework within which turn-of-the-century debates on the merits of bacteriology took place. Hence although their perspective on disease would eventually seem at least as “modern” as the accomplishments of germ theory, it struck many onlookers at the time as thoroughly


\textsuperscript{147} Editorial, \textit{Lancet}, 14 December 1889, 2: 1239. See also the discussion of Nicoll, “Life Assurance without Medical Examination” (n. 146), pp. 94–96.
reactionary. This seeming disparity—between the original response to the companies’ practices and their resonance with the subsequent direction of disease control—indicates the problem with efforts to force the social history of medicine into simple dichotomies like “progress” versus “conservatism.” In Ackerknecht’s original case study of anticontagionism, the chief complicating factor was the eventual discovery—well after the debates that he discussed had ended—of the microbial sources of epidemic disease. As François Delaporte has observed, this led Ackerknecht to set up a second dichotomy, between “what was already known” at the time about epidemic disease and “what was not yet known” (namely, germ theory); and from there, to assume an identity between “progressive” political and medical ideas (in this case, liberalism and anticontagionism) that would last only until germ theory had demonstrated that anticontagionism was based on “bad science.” What counted as “progressive” in the mid-nineteenth century would become scientifically backward a generation later; while the “practical corollaries” of contagionist doctrine henceforth “ceased to seem the instruments of reactionary political forces.”

When we turn from epidemic disease to tuberculosis, and from “political forces” to the economic practice of life insurance, the complicating factors proliferate. A consensus has never emerged around a single all-important causal agent for tuberculosis, nor are historical demographers in agreement about which social, medical, or political practices had the most to do with its decline. Hence “what was not yet known” in 1900 about tuberculosis occupies, for the historian of medicine, largely the same ground today. What for epidemic disease was a neatly arranged story about the politics of medicine, resolved in equally neat fashion by the triumph of germ theory, is less clear-cut in the case of tuberculosis. Despite the best efforts of Edwardian public health advocates to present the life insurance industry as enemies of germ theory and therefore enemies of “progress,” they did not succeed in their campaign to charge the companies with the crime of conservatism. Moreover, the subsequent history of tuberculosis—both its decline after 1900 and its recent resurgence a century after Koch’s discovery—calls into question whether “conservatism” was ever the best term for describing those who suspected the significance of bacteriology for the containment of that disease.

148. Delaporte, Disease and Civilization (n. 3), pp. 146–47.
149. Ackerknecht’s critics, of course, deny that either his original story or its resolution was remotely as straightforward as he claimed: see above, n. 3.
150. On the relevance of the present-day rise in tuberculosis incidence to the history of the disease, see Barnes, Making of a Social Disease (n. 6), chap. 1.
The case for “conservative” life offices is further complicated when family history, a second risk factor whose magnitude was “not yet known” (and perhaps not knowable) at the time, is taken into account. In this case, a clear conflict emerged between what qualified as “progress” in science and in political ideology. The physicians who urged further investigation into the correlation between family history and consumption did so in the name of scientific progress—a different branch of science, referring to medical statistics rather than bacteriology, but science nonetheless. Insurance companies, to the extent that they resisted the call for better statistics, did so in order to preserve the standard insurance practice of equalizing risk. That practice, as embodied in government-sponsored social welfare programs throughout Europe and North America in the early twentieth century, was as resolutely “progressive” from a political perspective as any public health intervention. Even in the private sector, where egalitarianism was less thoroughly valorized, the scientific urge to classify populations into differential risk groups ran counter to the insurance industry’s desire to cater to a wide market. To attract as many people as possible into the fold of life insurance, nineteenth-century salesmen repeatedly contrasted the position of ignorance from which individual mortality could be calculated with the certain laws of collective mortality revealed by the doctrine of averages. As one agent put it in 1884, “it can be proved by science what are the chances of life’s continuance, but science is neither protection nor security individually.”

British life offices started paying physicians to protect against unhealthy lives coming into their fold in the mid-1800s once they realized that individuals could, in fact, differentially predict their future demise. They were well aware of the tension this introduced into their stated goal of offering equal protection against the chance that anyone in a group might die at any time. John Mann captured both horns of this dilemma in his observation that “although it would be repugnant to the first and fundamental principle of Life Assurance, which is, that the long lives should pay for the short ones, to exclude any class, yet, on the other hand, if by any circumstances the short lives should be permitted very much to exceed their due proportion, the Company would itself be in danger of gradually declining.” With the assistance of better medical statistics, Mann and his fellow physicians singled out diseases that posed a greater danger of shortening lives beyond their “due proportion,” and identified a subset of those diseases that allegedly revealed especially clear warning signs of their future onset. Tuberculosis was one of these

152. Mann, Medical Statistics (n. 11), pp. 43–44.
latter diseases; epidemics like cholera and yellow fever were not. With every advance in the physicians’ ability to improve the precision with which they could predict the risks facing an individual—together with the declining incidence of “unpredictable” diseases like cholera—the “first and fundamental principle” of life insurance would gradually erode.153 For that reason insurance salesmen actively supported provincial examiners in their efforts to eliminate “family taint” as an important question on the medical examination; and for that reason insurance executives dragged their feet on the question of better medical statistics. What life offices did not yet know about family history could not, in fact, hurt them, as long as they could still convince millions of “long lives” to pay for less-fortunate premature victims of chronic disease.

153. Marc J. Roberts makes a similar point regarding American health insurance in the present time: “Americans now suffer more frequently from chronic and degenerative conditions than from infectious disease. As a result . . . many health care costs are now too predictable to be truly insurable, a degree of predictability that will only increase as our knowledge of the genetic basis of disease improves” (Marc J. Roberts and Alexandra T. Clyde, Your Money or Your Life: The Health Care Crisis Explained [New York: Doubleday, 1993], p. 24).