

## Chapter 2

# The Geographical Imperative in Nineteenth-Century French Medicine

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Medical geography was an abiding but at times peripheral concern of the medical art in nineteenth-century France. This article reviews selected works of the major medical geographers and examines the conditions of their emergence. Only mildly concerned with the values of cartographic precision, the article lays a foundation for future investigations into the subliminal geography of the medical profession as regards issues of race, imperialism, and disciplinary politics.<sup>1</sup> The perception of links between climate or physical environment and human health, of course, has a long history.<sup>2</sup> French medical geographers and expeditionary physicians of the nineteenth century frequently engaged the ideas of Hippocrates and other historical figures in their work.<sup>3</sup> Although it contained no maps, the Hippocratic treatise *On Airs, Waters, and Places* stands as the foundational text of the environmental geography of disease. France, perhaps more than any other country of Europe, has long celebrated the works of Hippocrates, and in 1800 a French-trained physician

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<sup>1</sup> On subliminal geography see J B Harley, 'Deconstructing the Map', *Cartographica*, 1989, 26 (2): 1–20; idem, 'Silences and Secrets: The Hidden Agenda of Cartography in Early Modern Europe', *Imago Mundi*, 1988, 40: 57–76.

<sup>2</sup> Frederick Sargent II, *Hippocratic Heritage: A History of Ideas about Weather and Human Health*, New York, Pergamon Press, 1982.

<sup>3</sup> Michael A Osborne, 'Resurrecting Hippocrates: Hygienic Sciences and the French Scientific Expeditions to Egypt, Morea and Algeria', in D Arnold (ed.), *Warm Climates and Western Medicine: The Emergence of Tropical Medicine, 1500–1900*, *Clio Medica*, no. 34, Amsterdam and Atlanta, Rodopi, 1996, pp. 80–98; idem, 'La Renaissance d'Hippocrate. L'hygiène et les expéditions scientifiques en Égypte, en Morée et en Algérie', in M-N Bourguet, et al. (eds), *L'invention scientifique de la Méditerranée*, Paris, Éditions de l'École des hautes études en sciences sociales, 1998, pp. 185–204.

named Adamantios Koraēs (Coray) (1748–1833) produced the most extensively annotated edition of this treatise to appear.<sup>4</sup>

The texts of French language medical geography are diverse in both scope and scale. This paper focuses mainly on large-scale and synthetic medical geography rather than on the more localized genre of medical topography. The medical work done by Napoleon's physicians in Egypt, although mainly textual rather than graphological, provides an example of this latter literature, which had clear strategic value but was most often of civic or regional scale. I define medical geographies as having maps as agents of display and striving toward or achieving a national or global level of understanding phenomena. Three figures are indicative of the major trends of French activity. The first is the medical geographer Jean-Christian-M-F-J Boudin (1806–1867), a mid-century army physician and anthropologist. Boudin's work was rightly identified by the Genevan physician Henri-Clermond Lombard (1803–1895), the best-known French language medical geographer, as a canonical work of French medical geography. Lombard's own contributions, in virtue of their length, scope, and sophistication, merit sustained treatment. The work of a third physician, Arthur Bordier (1841–1910), an anthropologist and medical geographer of French imperial policy, provides a late century window on the state of the art. A final section examines the trajectory of medical geography in two large medical encyclopedia projects of the era.

### The Enlightenment and Revolutionary Heritage

The French Renaissance scholar Jean Bodin touched upon many of the intellectual elements which would become medical geography. This included a concern with climate and health, and a theory of the celestial and terrestrial influences on humanity.<sup>5</sup> The thesis of climatic determinism, which reached a peak of popularity nearly two centuries later in Charles Louis Sedon dat de Montesquieu's *Esprit des lois* (1747), continued in the tradition of Bodin but looked more toward a future where biologists such as Lamarck could elaborate on the deforming influences of climates and environments. As discussed below, interest in the relationship between climate and health animated the Société Royale de Médecine de Paris and other Revolutionary-era professional bodies which frequently proposed but rarely undertook research programmes to understand the relationship between epidemic disease and climate and place.<sup>6</sup> Some of this activity owed its inspiration to a vogue of neo-Hippocratic thought in Napoleonic France, but much of it was not medical-geographical in nature and could be far distanced from or even blissfully free of a geographical or bio-geographical perspective. In this, French medical geographers responded to a constellation of concerns somewhat different in kind and emphasis from those

<sup>4</sup> Genevieve Miller, "'Airs, waters, and places" in History', *Journal of the History of Medicine and Allied Sciences*, 1962, 17: 129–40, pp. 137–8.

<sup>5</sup> Clarence J Glacken, *Traces on the Rhodian Shore: Nature and Culture in Western Thought from Ancient Times to the End of the Eighteenth Century*, Berkeley, University of California Press, 1967, pp. 434–47.

<sup>6</sup> Caroline Hannaway, 'The Société Royale de Médecine and epidemics in the Ancien Regime', *Bulletin of the History of Medicine*, 1972, 46: 257–73.

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enlivening British efforts at medical topography in India. Regardless of the context, however, be it in French Indochina or British India, medical geographical research functioned in an enigmatic manner. If it enabled colonizing activities and affirmed the dominance of European medicine, it also signalled the vulnerability of Europeans and pointed to unforeseen and seemingly intractable obstacles to modernity such as epidemic diseases.<sup>7</sup> The distinctiveness of the early French approach is evident in the researches of the biologist Jean-Baptiste Lamarck, who published a series of *Annuaire météorologiques* (1799–1810). Lamarck approached the study of the environment not as a medical or bio-geographer, but as a physical geographer of atmospheric and terrestrial chemistry.<sup>8</sup> In contrast, Henri-Clermond Lombard's methods are exhaustively descriptive, eminently geographical, and retain a fascination with neo-Hippocratic concerns. Like the Napoleonic survey of Egypt, Lombard's work is more of a negotiated masterpiece of compilation than an accurate distillation of fieldwork.<sup>9</sup>

Studies such as Montesquieu's, which located the heterogeneity of the globe's societies in their unique and distinctive blend of human, climatic and dietary factors, and those of Revolutionary-era geographers at the *École Normale* such as Constantin-François de Chasseboeuf de Volney,<sup>10</sup> loomed behind the conceptual debates and practical efforts of nineteenth-century investigators.<sup>11</sup> A growing fascination with physical geography and ruminations on the relationship between climate, race and health provided the conditions of emergence for the discourse of medical geography.<sup>12</sup> Two foreigners active in France, Alexander von Humboldt (1769–1859) and Conrad Malte-Brun (1775–1856), modified and clarified Enlightenment ideas of climate and place. Humboldt, whose *Cosmos* popularized the mapping of diverse qualities and attributes of the terrestrial and celestial environments, founded an approach to medical geography which inspired numerous imitators.<sup>13</sup> Although Kant, Philippe Buache and other *philosophes* had tried to establish physical geography and anthropology as separate disciplines with different intellectual trajectories, nineteenth-century French geographies of health and disease tended to fashion graphological displays from geometric, statistical, demographic and historical elements.

<sup>7</sup> For the paradoxes of colonial development, including the intractable nature of plague in India, see Michael A Osborne, 'Les Effets paradoxaux des sciences et techniques', *Cahiers de sciences et vie*, 1999, 50: 14–20; idem, 'The Social History of Science, Technoscience and Imperialism', *Science, Technology and Society* [special issue co-edited with Deepak Kumar on the social history of science and technology in the colonial context], 1999, 4: 161–70. On British activities in India see Mark Harrison's article in this volume.

<sup>8</sup> Ludmilla J Jordanova, 'The Natural Philosophy of Lamarck in its Historical Context', PhD thesis, Cambridge, 1976, ch. 4, 'The Sciences of the Environment', pp. 64–94.

<sup>9</sup> Anne Godlewska, 'The Napoleonic Survey of Egypt: A Masterpiece of Cartographic Compilation and Early Nineteenth-Century Fieldwork', *Cartographica*, 1988, 25 (1–2).

<sup>10</sup> See the course of Volney in Daniel Nordman (ed.), *L'École Normale de l'an III: leçons d'histoire, de géographie, d'économie politique*, Paris, Dunod, 1994.

<sup>11</sup> Numa Broc, 'Peut-on parler de géographie humaine au XVIIIe siècle en France?', *Annales de géographie*, 1969, 78: 57–75.

<sup>12</sup> Reviews of recent studies of historical geography, largely devoid of the topic of medical geography, may be found in 'Cartographie, topographie, géographie', *Annales, Histoire, Sciences Sociales*, 1996, 54 (4): 907–32. On the links between geo-medical analysis, nationalism and morals, see Chapter 11 by Jane Cameron in this volume.

<sup>13</sup> Nicolaas A Rupke, 'Humboldtian Medicine', *Medical History*, 1996, 40: 293–310.

At least as important as Humboldt for the development of French medical geography was the work of the Dane Malte-Brun. He began publishing his multi-volumed *Géographie universelle* in 1810 and helped found the Société de Géographie de Paris in 1821. Malte-Brun defined geographical knowledge as the combination of detailed local studies, a theory of geography, and a universal vision. The *Géographie universelle* elaborated a theory of geography which criticized Montesquieu for giving climatic factors too much agency and neglecting the crucial role migrations had played in the formation of the general character of nations. It was absurd, wrote Malte-Brun, “to have this character solely dependent on climate”, as the forces of social institutions and morals easily overpowered climatic influences.<sup>14</sup> The translation of local knowledge and its refabrication and projection to a national or global scale was no easy task. To be sure, the problems physical geographers encountered in constructing geographical maps—comparable data sets, reliability of information, technicalities of display, scale and projection—were shared by the medical geographers. But the emphasis physicians placed on the various elements of human geography, and their skill at displaying and framing the discourse of medical geography, and the domains in which they applied it, changed over the century. Thus, the history of French medical geography, like that of British medical topography in India, bears little resemblance to Edward Said’s notion of an essentialist and static Orientalist discourse of colonized environments.<sup>15</sup>

The connections between the new physical geography and medical geography remain diffuse, but many of the activities undertaken by nineteenth-century French hygienists and medical geographers are encapsulated in Malte-Brun’s universal but intensely human approach to geography. At times the interests of French physicians intersected with those of the geographers, but medical men formed only a small group in the new Société de Géographie de Paris. Indeed, physicians, surgeons and pharmacists accounted for less than 5 per cent of the membership of the Society until the eve of the Second World War.<sup>16</sup> A recent account of transformations in French geography argues that by 1840 the intellectual terrain of geography had contracted and much of its subject matter had been incorporated into narrow specialisms such as geodesy and cartography. Additionally, the broad and inclusive geographical programmes of Humboldt and Malte-Brun had “surrendered questions of environment and disease to medicine and field observation of antiquities to archaeologists”.<sup>17</sup>

<sup>14</sup> [Conrad] Malte-Brun, *Précis de la géographie universelle*, 5th ed., 4 vols., Paris, Au bureau des publications illustrées, 1845, vol. 1, p. 588.

<sup>15</sup> Said’s thesis is discussed by Mark Harrison in Chapter 3 of this volume.

<sup>16</sup> Alfred Fierro, *La Société de Géographie, 1821–1946*, Geneva, Librairie Droz, 1983, p. 22, found only four physicians on the membership roles of the founders. See also table 7, pp. 271–6. Others, such as the anthropologist and Muséum professor, Armand de Quatrefages de Bréau, who was active in the society during the Second Empire and Third Republic, had medical degrees but gave up practice.

<sup>17</sup> Anne Godlewska, ‘Traditions, Crisis, and new Paradigms in the Rise of the Modern French Discipline of Geography, 1760–1850’, *Annals of the Association of American Geographers*, 1989, 79 (2): 192–213, on p. 209.

### **Napoleonic Medical Topography**

The Napoleonic incursion into Egypt in 1798 produced a massive geographical, cultural and cartographic description of the region<sup>18</sup> and engendered a slim volume on the hygiene and health of the French army during the expedition. The report, edited by Napoleon's Physician-General, René N-D Desgenettes, provides an example of medical topographical work at the turn of the century.<sup>19</sup> Later in life, Desgenettes succeeded Lombard's mentor, Gabriel Andral, in the chair of hygiene at the Paris Faculty of Medicine.

The *Histoire médicale de l'armée d'orient* (1802) contained nineteen separate chapters written by expeditionary personnel. About half of the chapters take physical and medical topography as their subject, two treat the epidemic diseases plague and dysentery, and additional entries concern meteorology. The prescribed method for compiling medical geographical information included examination of the nature of the soil, a description of the prevailing winds and surveys of water, and the enumeration of edible and medicinal plants, and of the habits of the Egyptian peoples. Typical of the articles is a physical topography of the old city of Cairo. The recounting of this information is textual, rather than graphological, and is framed as an enumerative listing of all possible attributes related to the present and future health of the invaders. Most likely, the cartographers and physicians operated in separate circles and had few opportunities for professional collaboration.<sup>20</sup>

Cartographers and physicians did, however, share common concerns. Physicians of the Revolutionary era were aware of the problems of collating local and regional knowledge and fashioning it into a useful and shared body of medical information. Equally difficult was the task of producing a spatially-displayed summary of the information. These problems and others manifested themselves in a plan undertaken by France's major medical professional society in the 1770s. In an era when local and regional medical topographies had assumed a sort of vogue, the Société Royale de Médecine fashioned a network of provincial observers who would collect information on local diseases and meteorology in a standardized format. Caroline Hannaway has noted that while the project collected much information before falling victim to the Revolution, interpretive problems limited the utility of such ventures, and the project failed to clarify or provide new explanations of disease causation.<sup>21</sup>

As conceived in nineteenth-century France, medical geography was closely aligned with the activities of military and expeditionary hygiene, a major goal of which was to avoid disease and what were perceived as disease-causing places. Sectors of French military medicine as well as civilian medical geographers like Lombard and Bordier shared a common goal with the German followers of Humboldtian medicine to

<sup>18</sup> Charles C Gillispie, 'Aspects scientifiques de l'expédition d'Égypte (1798–1801)', in H Laurens, et al. (eds), *L'expédition d'Égypte, 1798–1801*, Paris, Armand Colin, 1989, pp. 372–4; Godlewska, op. cit., note 9 above.

<sup>19</sup> René Nicolas Dufliche Desgenettes, *Histoire médicale de l'armée d'orient*, Paris, Croullebois, 1802.

<sup>20</sup> Godlewska, op. cit., note 9 above, notes on p. 3 that the final compilation of the topographic map was done in Paris and that military expediency and the needs of colonial administration often prevented sustained and careful mapping.

<sup>21</sup> Hannaway, op. cit., note 6 above.

achieve “an integrated picture of the global occurrence of human diseases with the intent of uncovering general laws of distribution”.<sup>22</sup> From the 1830s or so, pleas for medical geography came to be framed in terms of the emerging discipline of hygiene. Dr Evariste Bertulus, a *professeur suppléant* at the École préparatoire de Médecine de Marseille and a *chargée du service* for the navy at Marseilles, was one among many who sought a global view of disease. In 1845 Bertulus argued before the Société Royale de Médecine de Marseille that naval hygiene was as yet only half constituted. When properly configured, according to Bertulus, naval hygiene would include “general hygiene and in consequence the medical topography of all maritime countries of the globe . . . [as well as] the etiology and prophylaxis of the illnesses particular to these countries”.<sup>23</sup> Although focused on disease, and not always displayed in graphological format, this project expressed desires for precision similar to the those found in the navy’s systematic mapping of the French coast which dated from the publication of Charles-François Beautemps-Beaupré’s *Pilote français* of 1822.<sup>24</sup> By 1864 French naval physicians launched their own professional journal and began what they hoped would be a more systematic collection and synthetic presentation of geographical and climatic information. A major goal of the new *Archives de médecine navale*, remarked its editor, was to construct “a kind of medical guidebook for the coasts of the entire world”. Little by little, the rigorous collection and publication of regional medical topographies would allow the “the united naval health corps to achieve a durable work: [a] *climatology and exotic pathology*”.<sup>25</sup>

French medical geographers frequently commingled textual and graphological display. What Ann La Berge has termed statistician-hygienists,<sup>26</sup> men such as the army physician Jean-Christian-M-F-J Boudin, joined numerical analysis with demography and the distribution of disease. Boudin completed tours of duty in the Mediterranean basin and rose to become chief physician of the Army of the Alps and Italy. During the 1840s and 1850s he published studies on the demography of France and its empires and on Algerian colonization from medical and economic standpoints.

It is uncertain when the term *géographie médicale* first appeared in French, but Boudin used it in an 1843 study entitled ‘Essai de géographie médicale’.<sup>27</sup> Boudin’s magnum opus on medical geography, the two volume *Traité de géographie et de statistique médicales et des maladies endémiques* of 1857, took its definition of climate from Humboldt’s *Cosmos* and was especially concerned with ethnicity and issues of

<sup>22</sup> Rupke, op. cit., note 13 above, p. 297.

<sup>23</sup> Evariste Bertulus, *L’hygiène navale dans ses rapports avec l’économie politique, commerciale, et avec l’hygiène publique, ou nouvelles considérations sur la matière, le but, l’enseignement et l’application de cette science*, Marseilles, Typographie Barlatuer-Feissail et Demonchy, 1845, p. 10. All the translations in this article are mine.

<sup>24</sup> Olivier Chapuis, ‘L’émergence des nouvelles cartes marines: l’oeuvre de Beautemps-Beaupré à la fin du début du XIXème siècle’, *Imago Mundi*, 1992, 44: 90–8.

<sup>25</sup> A Roy de Méricourt, Introduction’, *Archives de médecine navales*, 1864, 1: [5]–11, p. 9.

<sup>26</sup> Ann F La Berge, *Mission and Method: The early Nineteenth-Century French Public Health Movement*, Cambridge, Cambridge University Press, 1992.

<sup>27</sup> Paul Imbs (ed.), *Trésor de la langue française*, Paris, Gallimard, 1971–1994, notes the terminology is antiquated but does not give examples of its usage. J-C-M-F-J Boudin, ‘Essai de géographie médicale’, *Bulletin de la Société royale de médecine*, 1842–1843.

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national security such as the health of military recruits.<sup>28</sup> The technology of display in his maps presents information primarily on the French departmental and national level. His programme hints at rather than achieves the globalism of Humboldt or Lombard.

Boudin's *Traité de géographie* employed nine maps and numerous tables to display the health of the French nation. His effort was one of compilation and synthesis rather than of field work. Displaying a rhetoric of objectivity and neutrality, the work may be likened to a natural historical compilation. The maps, which indicate the concerns of Boudin's medicine in five shades of black and white, are mainly of France and are sub-divided by departmental boundaries. Boudin sought to enumerate, locate, and quantify the various factors acting on health. His data included military recruitment statistics and information collected by the regional *Cours d'appel*. The map of Plate III, for example, gives the frequency of goitre as a function of the cause of exemptions from military service from 1837–1849. The map of Plate IV indicates lightning strikes on humans, also displayed in the same black and white colour scheme. Another map (vol. 2, Plate V) charts the demography of Jews in France, and a coloured pie chart of death and temperature in London replicates some of the British hygienist William Farr's work.

Hygiene was the quintessential French activity to correlate place, modes of life, and human health.<sup>29</sup> Like the literature of hygiene, the genre of writings on medical geography also displays a reverence for the numerical methods of Pierre-Charles-Alexandre Louis. This was the case with Henri-Clermond Lombard, a Genevan physician whose work may be regarded as the epitome of nineteenth-century French language medical geography. Lombard's is the only French work to challenge the achievement of the German Hirsch in terms of scope, globalism, and synthesis.<sup>30</sup> Lombard, whose work functioned simultaneously as an encyclopedia of climatic therapy, clearly achieved a global view of medical geography and proposed synthetic laws. Lombard dedicated his five volume synthesis of medical geography to Louis, and his other French master at the Paris Faculty of Medicine, Gabriel Andral.

Born into a wealthy family in 1803, Lombard took classes from the intellectual lights of Geneva including the Paris-trained naturalist and friend of Lamarck, Augustin-Pyramus de Candolle. He also went on hospital rounds with Dr Charles Maunoir. Completing the baccalaureate degree in 1822, he left Geneva for Scotland and began medical studies at Edinburgh. In the winter of 1823–4, Lombard experienced repeated fits of coughing. Diagnosed as having a “dull” spot (probably tubercular) on his left lung, he was counselled to seek a warmer and drier climate.

<sup>28</sup> J-C-M-F-J Boudin, *Traité de géographie et de statistique médicales et des maladies endémiques*, 2 vols, Paris, J-B Baillièrre et fils, 1857, vol. 1, p. 217.

<sup>29</sup> La Berge, op. cit., note 26 above; William Coleman, *Death is a Social Disease: Public Health and Political Economy in early Industrial France*, Madison, University of Wisconsin Press, 1982.

<sup>30</sup> Biographical details from Raoul Gautier, ‘Le docteur Henri-Clermond Lombard’, *Mémoires de la Société de Physique et d'Histoire Naturelle de Genève*, 1895, pp. V–XI; C Picot, ‘Le docteur Henri-Clermond Lombard’, *Revue Médicale de la Suisse Romande*, 1895, 40: 116–23; H-C Lombard, *Traité de climatologie médicale comprenant la météorologie médicale et l'étude des influences physiologiques, pathologiques, prophylactiques et thérapeutiques du climat sur la santé*, 4 vols, atlas, Paris, J-B Baillièrre, 1877–1880, vol. 1, ‘Préface’, pp. vii–xxiii, esp. pp. viii–xii.

To restore his health, Lombard quit his programme at the University of Edinburgh and began private climatological study on the budget of a banker's son. Travelling throughout England and Italy before wintering at Pisa, he returned to Geneva in 1825 claiming to be in full health. In the same year, he moved to Paris to complete his medical degree. Later in his career, Lombard gained celebrity as a medical consultant to Europe's wealthy spa and sanatorium culture by directing them to some of the venues he visited on his own therapeutic voyages. These travels also provided something of a field work perspective for his medical geographical work.

In Paris, Lombard studied under Pierre-Charles-Alexander Louis (1787–1872) and Gabriel Andral (1797–1876). Louis, whose researches on the numerical method were crucial to the hygienic movement, had just published his big book on phthisis. A clinician with an activist spirit, Louis also campaigned against the ravages of tuberculosis.<sup>31</sup> Like Louis, Andral, who directed Lombard's thesis and assumed the chair of hygiene at the Paris Faculty of Medicine in 1827, was a seminal figure in the French hygienic movement. Lombard participated in the founding of Andral's intellectual circle, the Nouvelle Société d'Instruction Médicale, a group which also included the humanist and failed positivist Émile Littré (1801–1881), who would go on to complete a ten-volume translation of the works of Hippocrates. In 1827 Lombard completed a thesis which combined his personal and professional interests. Entitled an 'Essai sur les tubercules', it provided the starting point for researches on tuberculosis which won a prize from the Academy of Medicine in 1828. Ever the traveller, Lombard spent 1828 and 1829 travelling in England, visiting German universities, and collecting additional climatological information.

Back in Geneva, Lombard was named physician in chief at the hospital where he would work for thirteen years. After quitting the hospital in 1848, he used his knowledge of French, Italian, German and English to establish a consultancy for the medical needs of a wealthy and international clientele. Geneva was a crossroads for wealthy European travellers, and Lombard noted how some "come each fall to ask which winter station they should choose, while others enquire in spring about which summer alpine stay would be the most favourable for them".<sup>32</sup> In addition to his *Traité* described below, he was probably best known in Geneva for a work on alpine medicine, particularly his study on climatic therapy which went through three editions between 1856 and 1873 and took the title *Les climats de montagnes considérés au point de vue médical*.<sup>33</sup>

Lombard was a prolific writer whose methods joined public hygiene's numerical approach to medical geographical inquiry. A social demographer of sorts, he published a good deal on climatic medicine, alcoholism, influenza, mortality in Geneva, and depopulation in France. In addition to the intellectual tutelage he received from Louis and Andral, Lombard took great inspiration in Boudin's work. Although Lombard had published a coloured map with an 1832 historical study of

<sup>31</sup> Erwin H Ackerknecht, *Medicine at the Paris Hospital, 1794–1848*, Baltimore, Johns Hopkins University Press, 1967, p. 149.

<sup>32</sup> Lombard, note 30 above, vol. 1, p. x.

<sup>33</sup> Idem, *Les climats de montagnes considérés au point de vue médical*, 2nd ed., Geneva, Cherbuliez, 1858.



Asiatic cholera,<sup>34</sup> he considered Boudin to be France's first medical geographer and took Boudin's *Traité de géographie et de statistique médicales* as a foundational text of the discipline.<sup>35</sup> Lombard brought out his major contribution to medical geography, the four volume *Traité de climatologie médicale* and an accompanying atlas of twenty-five coloured plates from 1877 to 1880. The work was actually a collaborative effort between Lombard and two younger and barely mentioned physicians, Jean Henri Adolphe d'Espine, the son of Lombard's friend Dr Jacob-Marc d'Espine, and Lombard's nephew.<sup>36</sup> The methodology for the project was mainly one of compilation and synthesis, although the elder Lombard interjected his own knowledge of a few locations in Europe.

Hygienists and medical geographers sought an audience among the wider learned public. Lombard, like the statistician-hygienists, also used tables of mortality and social statistics and placed numerical information on several of his maps. Yet a reason to categorize Lombard as primarily a medical geographer rather than as a hygienist is his fidelity to graphological rather than numerical and tabular display. Maps were crucial tools for Lombard, who agreed with the naval physician Borius that "If numbers have their own eloquence, it is a language to which not all of the world is accustomed; the reading of a map, without having the precision of a geographical description, is always preferred to the reading of this description".<sup>37</sup>

In the atlas of Lombard's study,<sup>38</sup> some of the coloured maps are global, but the volume opens with a map of seasonal mortality patterns in France and Switzerland (see Figure 1), followed by two maps of Europe (maps II and III). While a textual recounting of these maps fails to do justice to the iconography, it fairly indicates what interested Lombard. Map I on seasonal mortality in France and Switzerland showed clearly that most deaths occurred in January, February and March. Generally, areas in France around the Manche, the Dauphiné, and the cities of Nancy, Limoges and Toulouse suffered most in winter, while cities such as Lyons, Marseilles, and Montpellier suffered most in late summer. Roman numerals in the form of fractional notation at locations on the map indicated the months of the year with the greatest mortality (placed in superior position) and fewest deaths (lower number). Map II, projected on the scale of Europe, adopted the same method of display for the months and quarters of the year with the most deaths, while Map III gave information on the times of least deaths. On both of these last two maps the oceans appeared in a green shade. Winter season events appeared in solid red, with lighter shades and hatch marks for less rigorous times of the year. Another European map, Map XIX,

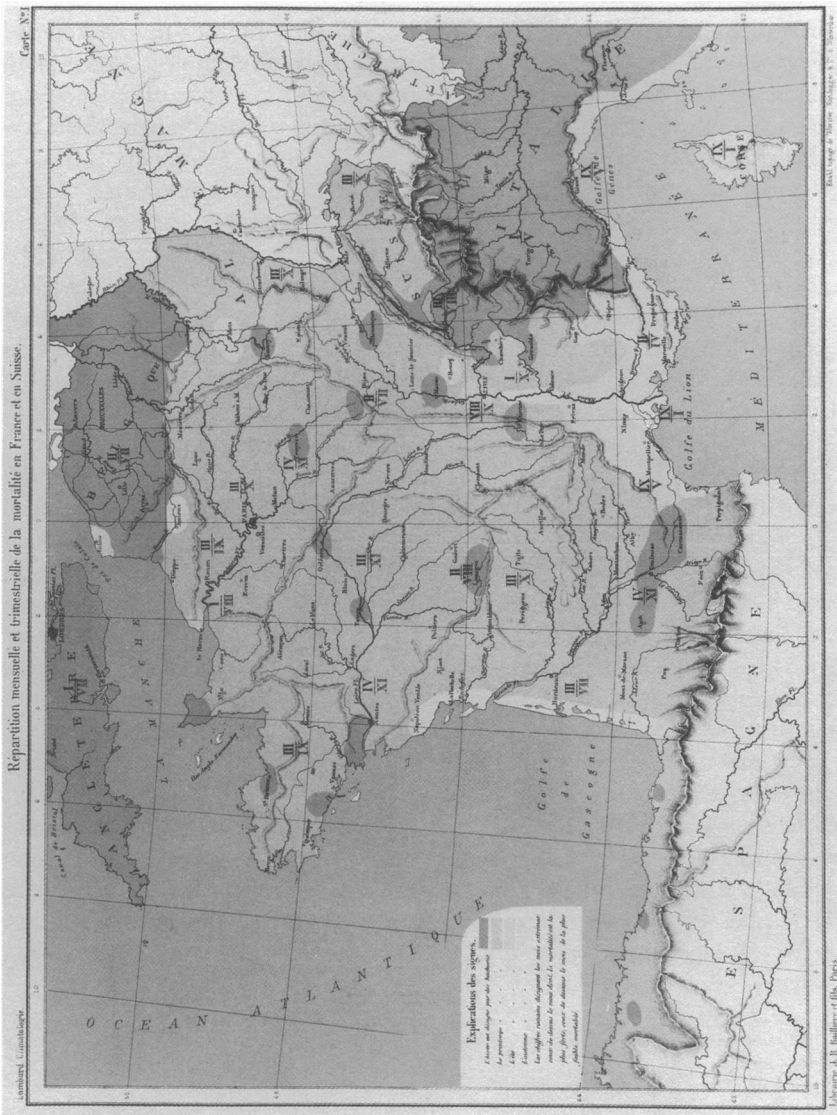
<sup>34</sup> Idem, *Notes historiques sur le cholera-morbus asiatique, avec une carte coloriée*, [Geneva?], Bibliothèque de l'Université de Genève, 1832.

<sup>35</sup> Idem, *Traité*, note 30 above, vol. 2, p. 3.

<sup>36</sup> *Ibid.*, vol. 1, p. xxiii. On hygiene in Geneva and for the relationship between the elder d'Espine and Lombard see Eduard-Rudolf Mullener, 'Genfer Medizinal statistik und Hygiene in der ersten Hälfte des 19. Jahrhunderts: André-Louis Gosse (1791–1873), Jacob-Marc d'Espine (1805–1860) und Henri-Clermond Lombard (1803–1895)', *Gesnerus*, 1964, 21: 154–92.

<sup>37</sup> Idem, *Traité*, note 30 above, vol. 4, p. 679, cites an article from Borius in the 1879 *Archives de médecine navales*.

<sup>38</sup> Idem, *Atlas de la distribution géographique des maladies dans leurs rapports avec les climats*, Paris, J-B Baillière et fils, 1880.



**Figure 1:** The first map in Lombard's *Atlas de la distribution géographique des maladies dans leurs rapports avec les climats* of 1880 dealt with the main contours of his intellectual world, in Switzerland and France, and showed the months of greatest (superior Roman numeral) and least (inferior Roman numeral) mortality.

displayed the distribution of pulmonary tuberculosis and indicated the ratio of all deaths credited to this disease in a given area.

Among the global maps, Map XXV on the distribution of epidemic dysentery and acute hepatitis used a brownish green display for hepatitis, and a system of red dots for dysentery. A legend indicated particular epidemics, after the fashion of this entry for dysentery “Cochinchine 1862, 1864, permanente”. Other maps sketched the global distribution of tuberculosis, yellow fever, malaria and cholera. Additional tables (e.g. Table V) and pie charts displayed monthly and quarterly frequencies of the distribution of deaths in regions from Belgium to the United States. The atlas contained some textual explanations, and volume four of the text which examined the geographical distribution of disease provided additional interpretations.<sup>39</sup>

In the four large volumes accompanying the atlas, Lombard situated medical geography in relation to other fields of inquiry. According to Lombard, his synthesis of medical geography had been made possible by the general advance of knowledge about far-flung corners of the globe. Thus imperialism and colonialism now enabled medical geography in much the same way as maps and geographical information enabled colonial expansion. For Lombard, medical geography was a pastiche, a synthetic endeavour which borrowed notions from geography, ethnography, anthropology, demography, physiology and comparative pathology.<sup>40</sup> It was Lombard's vision to collect and analyse information on nearly every country of the globe, and to treat each location in a rigorously similar manner. The value of the study was both descriptive, for example so that travellers would know the health dangers of each location and hopefully avoid them, and therapeutic, indicating locations which had pronounced salutary effects on various health conditions. Framed in the rhetoric of an objective and descriptive neutrality, each article begins with a description of the physical geography of the country, which is followed, always in the same order, with entries on climatology, ethnology, demography and pathology. The pathology sections are almost always the longest because Lombard enumerated the diseases present or reported in the country, and frequently provided detailed historical information on epidemics.

The generation of medical men after Lombard embraced physiology as the very symbol of scientific medicine. But Lombard too investigated the physiology of human health on at least two levels. The first class of phenomena were the primitive functional influences on physiology which he elucidated by making correlations between diurnal periodicity and births and deaths. Additional concerns included the constitutional influences climate exerted on mensuration and fecundity. After spending a volume on the physical elements of climate applicable to medicine, physiology, ethnicity, and the geographical distribution of diseases, Lombard devoted volumes two, three, and half of the fourth to enumerating a medical geography of the countries and regions of the globe. The final half of volume four presented the conclusions of the study, and contained entries on spas and sections on climates seen to be prophylactic, curative, or in other ways therapeutic for the white, black,

<sup>39</sup> *Idem*, *Traité*, note 30 above, vol. 4, ‘Conclusions sur la distribution géographique des maladies dans les différentes régions du globe’, pp. 339–561.

<sup>40</sup> *Ibid.*, vol. I, p. vii.

red and yellow races. Hence, health was read as attributable partly to ethnicity, partly to location, and, in the case of spa visits, partly to economic competence. Nowhere, it seems, was there a single universal and essential native “other”.

Probably, the product of Lombard’s team was less homogeneous than its lead author had hoped. Articles on the separate countries varied greatly in length according to the region studied, its importance to France, and the sources available. As J B Harley has noted, the composition and fashioning of maps is itself a rhetorical exercise and “The steps in making a map—selection, omission, simplification, classification, the creation of hierarchies, and ‘symbolization’—are all inherently rhetorical”.<sup>41</sup> Technically, Lombard’s *Traité* was a civilian product crafted by civil physicians. None the less, rhetorical strategies employed in French military documents shine through its pages. For example, in the section on North Africa, Lombard noted that for Algeria the documents were so numerous that he would cite only works in a French Army medical journal and six authors, including those of Alphonse Laveran, who discovered the malaria parasite in 1880.<sup>42</sup> Some diseases in Algeria, even those known in France such as abscess of the liver, are described as having a different dynamic and prevalence in North Africa.<sup>43</sup> While fevers and dysentery dominated the pathology of Algeria, the colony had little cholera and appeared remarkably free of tuberculosis. An article on French Indochina is much the same. It portrays the region’s major diseases as malaria, intestinal complaints, and ulcerous afflictions. The heat and humidity of Saigon is seen as unhealthy. In summary, wrote Lombard, the climate “favours anaemia and scurvy and simultaneously allows ulcerations to become exceptionally serious ... [and] it exercises an essentially debilitating influence on the indigenous peoples as well as on their temporary colonists”.<sup>44</sup> In this fashion, Lombard and his team typified and categorized the regions of the world according to their predominant disease regimes.

The *Traité* was a synthetic work which distilled the lessons of Lombard’s medical geographical tour of the world into four universal laws which encapsulated the relationship between climate and health. Like the biologist Lamarck, Lombard too had an idea of the organism as existing in a homeostatic state, though for Lombard physiological equilibrium was determined in part by regular patterns of exterior physical stimuli. Both men pointed to the deforming or perturbing aspects of the environment, but only Lombard worked out therapeutic aspects of the relationship. Lombard’s first law, the law of periodicity, stated that our organs were influenced by the rhythms of day and night, and the progression of the months and years. Second was the law of meteorological succession, which designated the physiological states of organs resulting from the periodicity of the first law. The third law posited a relationship between the intensity of meteorological forces and the physiological state of our organs. A fourth and final law pointed to the role meteorological variability played in animal functions.

Lombard’s great synthesis appeared just as Louis Pasteur, Robert Koch and others

<sup>41</sup> J B Harley, *op. cit.*, note 1 above, p. 11.

<sup>42</sup> Lombard, *Traité*, note 30 above, vol. 3, ‘Algérie’, pp. 588–628, p. 588, note 2.

<sup>43</sup> *Ibid.*, p. 611.

<sup>44</sup> *Ibid.*, vol. 4, ‘Indo-Chine’, pp. 161–78, on pp. 177–8.

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were elaborating a creditable germ theory of disease. Pasteur's microbes, which provided a target for action and an etiological focus for many hygienists, redefined and redirected epidemiology. While the traditions of medical geography persisted into the twentieth century, even those critical of laboratory medicine struggled to accommodate germs into their medical cosmos. The progress of the germ theory of disease, and particularly acceptance of Pasteur's fashioning of a vaccine for human rabies, was fairly rapid in France.<sup>45</sup> Still, sectors of military medicine and some of Lombard and Pasteur's generation clung to the study of medical climatology and thereby resisted an all-sufficient germ theory of disease.<sup>46</sup> Many, like Pasteur's colleague Joseph Grancher and Professor Joseph Grasset of the Faculty of Medicine at Montpellier saw in the work of Pasteur, "not the destruction of the work of Hippocrates, but its complement, development and provisional coronation".<sup>47</sup>

#### **French Medical Geography After Lombard**

Confronting the issues of microbes and medical geography's relationship to other human sciences are three other medical geographies which appeared in the early 1880s. Especially revealing of the state of French medical geography are two 1884 works, one by the hygienist Léon Poincaré (1828–1892), and another by the anthropologist Arthur Bordier. Reserved for later discussion is an 1882 monograph by the naval physician Jean Baptiste Mahé (1830–1896).

Poincaré, a professor of hygiene at the Faculty of Medicine in Nancy, positioned his work in relation to Boudin, Lombard, Hirsch, Bordier and the new etiology of disease. The title of his *Prophylaxie et géographie médicale des principales maladies tributaires de l'hygiène* gives a fair impression of his rhetorical strategy which sought to reclaim disciplinary terrain the author perceived as occupied, albeit unjustly, by descriptive medical geography. Poincaré's stated desire is to wrest the preventative and therapeutic consequences from medical geography and to popularize them. The book, which may have been something of a field manual, contained twenty-four blue and red coloured plates the size of a single page.<sup>48</sup> The author made repeated pleas for the autonomy of hygiene from medical geography and clinical medicine, especially pathology. Poincaré wanted to make medical geography subsidiary to the better institutionalized field of hygiene, which was recognized by chairs at French faculties of medicine. Hygienic knowledge, he argued, was too often drowned in other medical concerns, indeed it had been "sacrificed to symptomatology and pathological anatomy, in a word to the purely clinical history of the disease side of

<sup>45</sup> Gerald L Geison, *The Private Science of Louis Pasteur*, Princeton, Princeton University Press, 1995, pp. 221–9.

<sup>46</sup> Michael A Osborne, 'French Military Epidemiology and the Limits of the Laboratory: The Case of Louis-Félix-Achille Kelsch', in A Cunningham and P Williams (eds), *The Laboratory Revolution in Medicine*, Cambridge, Cambridge University Press, 1992, pp. 189–208.

<sup>47</sup> Joseph Grasset, *Les Vieux dogmes cliniques devant la pathologie microbienne*, Montpellier, Charles Boehm, 1894, pp. 6–7, and note 1 on p. 7. Grasset cites a talk given by Grancher on 18 November 1893 at the Sorbonne. Thanks to Mark Micale for this reference.

<sup>48</sup> Léon Poincaré, *Prophylaxie et géographie médicale des principales maladies tributaires de l'hygiène*, Paris, G Masson, 1884.

things”.<sup>49</sup> Wishing to emphasize the aspects of medical geography with hygienic value and produce an accessible work, Poincaré categorized the work of Hirsch and Lombard as overly climatological, and that of Bordier as too anthropological for his task.<sup>50</sup>

The organization of the book is straightforward, with each map accompanied by a descriptive medical geography of a disease followed by a guide for prophylactic measures. The distribution of the disease, rather than the local or national unit, defines the organizational element. Diseases are further classified into three categories. Diseases due to meteorological factors such as cold or heat constitute the smallest section of the book. Diseases due to diet garner something over one hundred pages, and miasmatic diseases account for about three-quarters of the text. This last category includes diseases which, “according to the current of modern ideas, are caused by microbes, and which, in any case, may be considered as engendering a biological poison in the [animal] economy”.<sup>51</sup> Poincaré divided the recommended prophylactic measures into municipal, national and individual courses of action. Engaging with ideas of immunity and the work of Pasteur and Jenner, Poincaré concluded that all medical inoculation to date could offer only temporary immunity against disease.<sup>52</sup> While Poincaré discussed many diseases including yellow fever and malaria, the chapter on plague is indicative of his methods.

Plague is displayed on its accompanying map of the world according to four contrasting shades: countries where the disease was endemic like the Levant received the darkest shade; a slightly lighter tint indicated countries suffering the plague in the nineteenth century; a light tint marked countries with pre-1800 outbreaks of the disease; and white indicated locations free of plague in recorded history.<sup>53</sup> The effect is to be able to “see” plague in its historical and present state at a glance.

Like Poincaré, Arthur Bordier also wrote about medical geography with specific goals in mind. In contrast to Poincaré’s attempt to subsume medical geographical knowledge into hygiene, Bordier, a professor of medical geography at the School of Anthropology in Paris, broadened the scope of medical geography and set it within a framework of anthropology, medical microbiology, and political utility. His *Géographie médicale* contained twenty-one coloured plates. Some of the maps are global and give distributions for a single disease. They appear without national boundaries and some, such as those on plague in Eurasia (plate 4) and yellow fever (plate 5), have isothermal lines. Most striking is a broad red horizontal swath on the plague map where the geography of the disease in Eurasia, which precisely follows an east–west band, is bordered on the north by an isothermal line of +5 degrees, and on the south by an isotherm of +25 degrees. Also included are other great scourges of the tropics such as yellow fever, leprosy (plate 9) and filariasis (plate 11). About a third of the maps replicate the French departmental projections

<sup>49</sup> Ibid., ‘But et plan de l’ouvrage’, pp. 1–9, on p. 4.

<sup>50</sup> Ibid., pp. 6–7.

<sup>51</sup> Ibid., p. 8.

<sup>52</sup> Ibid., ‘Considérations générales sur les mesures prophylactiques applicables à toutes les maladies miasmaticques’, pp. 11–324, p. 32.

<sup>53</sup> Ibid., pp. 313–24, on p. 313.

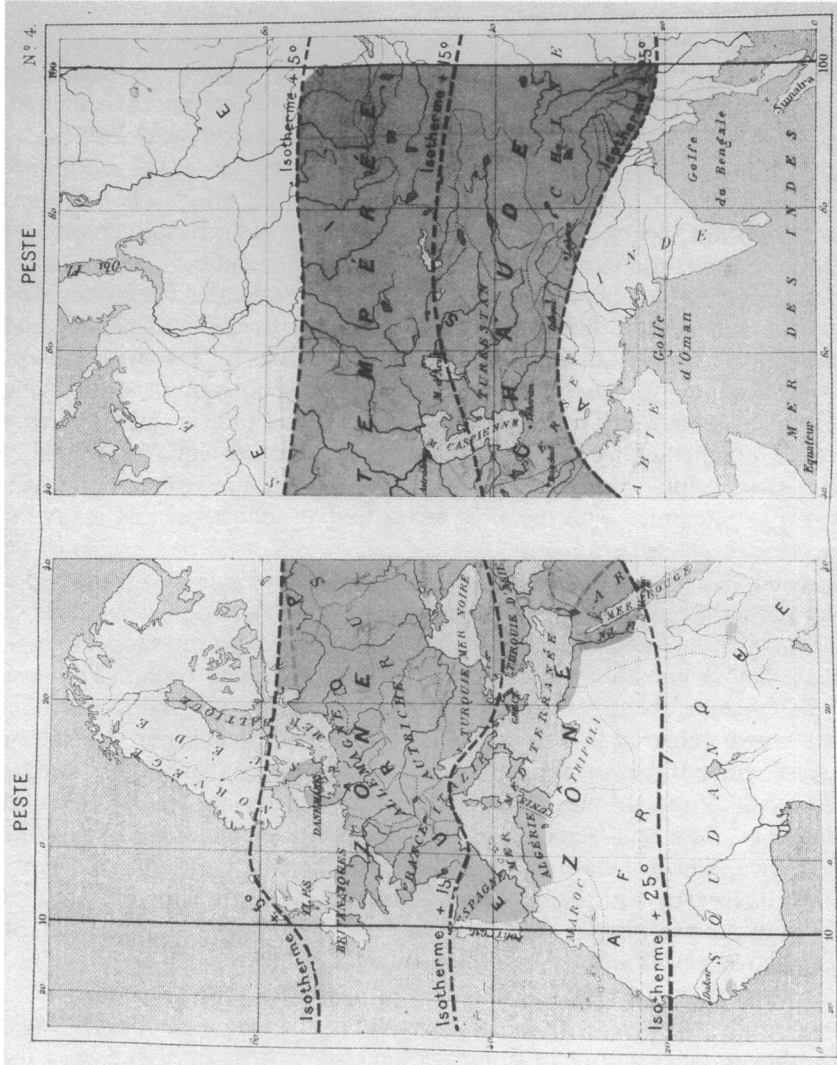


Figure 2: Arthur Bordier's map of the distribution of plague in Eurasia, which precisely followed isothermal lines, seemed to show the utility of medical geography and a climatic and environmental approach to the study of disease. From A Bordier, *La Géographie médicale*, Paris, C Reinwald, 1884, plate 4.

of Boudin and provide information on men exempted from military recruitment for being too short (plate 14), being near sighted (plate 17), or having a hernia (plate 19).

The organization of the volume and a chapter on malaria reveal Bordier's integrationist and modernist urges.<sup>54</sup> The first two-thirds of the book gives a brief nod to physical climatology and enumerates the diseases of humankind. The narrative presents the story as one of "Man's struggle against the fauna and flora"<sup>55</sup> and classifies diseases mainly as afflictions of diet, or those resulting from macro- or micro-parasites. Making use of Claude Bernard's concept of the internal environment, Bordier also accepted Lamarckian transformism, viewed Darwin and Wallace as following the same path, and elaborated his own theory of social selection.<sup>56</sup> Additional chapters group diseases by the anatomical site they affect. The last third of the book sketches a theory of social physiology and reviews racial elements of medical geography, heredity, teratology, degeneration and evolution.

The chapter on malaria reviews the geography of the disease, its history and variable symptomatology, and debates about its cause. In weighing miasmatic and parasitological accounts of the disease's etiology, Bordier casts his vote with Pasteur and others who think many diseases can be traced to the actions of a specific living organism. He also renders the germ theory of disease less radical, and therefore more worthy of acceptance by cautious physicians, by constructing a history of "germ" theorists stretching back to Vitruvius.<sup>57</sup> The picture presented is one of a medical geography integrated with the most recent findings of science and ready for application.

Bordier's social vision bears mention. The *Géographie médicale* also presented a theory of the phases of civilization which was teleological and framed in terms of the universalism of science and the manifest destiny of European overseas conquests. The first phase found humankind struggling just to get enough to eat. This was followed by a "sensitive" phase exemplified by skilled tool-making and fetishism, a level of development achieved in eighteenth-century Polynesian cultures. A third or "psychic" phase, comparable to present-day India and China, displayed elaborate metaphysical ideas. A fourth phase, the "intellectual" phase, apparently achieved only by Europeans, was "characterized by the decadence of metaphysics and the triumph of science, which definitively substitutes its influence for that of empty religions".<sup>58</sup> Europe's arrival at the intellectual phase of civilization gave it a moral imperative to educate the rest of the world, and in a book published only a few months after the *Géographie médicale*, Bordier sought to apply the lessons of medical geography to the French colonies.<sup>59</sup>

In *La colonisation scientifique et les colonies françaises* Bordier applies Claude Bernard's concept of determinism to French colonial policy. Bernard had used the

<sup>54</sup> Arthur Bordier, *La géographie médicale*, Paris, C Reinwald, 1884, 'Implaudism', pp. 187–204.

<sup>55</sup> *Ibid.* This is the title of part II, ch. III, pp. 184–222.

<sup>56</sup> *Ibid.*, pp. 621–4.

<sup>57</sup> *Ibid.*, p. 197.

<sup>58</sup> *Ibid.*, 'Phases de la civilisation', pp. 402–3, on p. 403.

<sup>59</sup> On the notion of moral hygiene in geography, see David N Livingstone, 'Tropical climate and moral hygiene: the anatomy of a Victorian debate', *British Journal for the History of Science*, 1999, 32: 93–110.



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concept in his landmark *An Introduction to the Study of Experimental Medicine* of 1865 as a way to counter vitalist arguments for the inexact nature of his vivisectional physiological investigations. Bernard had argued that “[i]n living bodies, as in inorganic bodies, laws are immutable, and the phenomena governed by these laws are bound to the conditions on which they exist, by a necessary and absolute determinism”.<sup>60</sup> For Bordier, determinism provided a philosophy for examining the conditions of existence of colonialism which was a kind of migration. Viewed in this way, the French empire would become more than just an object of pleasure and money, it became:

... something very compatible with reproduction in the existence of adult individuals; its function. The colony becomes a child which must be reared and who, when it has grown, will free itself. The ties which link it to the mother country then become parental strings, a mode of association for production and cease to be chains binding a slave to a master.<sup>61</sup>

Colonization, he continued, could “only be accomplished through *science*” (emphasis in original).<sup>62</sup>

Social and medical geography, though without maps, constitute about two-thirds of *Colonisation scientifique*. This is joined with recommendations on colonial medical services and advocacy of large-scale public works projects such as building an interior sea in Algeria by flooding portions of the Sahara Desert. The book searches for a determinism of colonial policy by investigating migrations, which are “determined by a certain number of causes, which are always the same in all times and among all peoples”.<sup>63</sup> Bordier’s turn toward a freely imperial policy coincided with a mature Third Republic and the imperial aspirations of Jules Ferry. These aspirations, long expressed in the literature of French military medicine, were generalized by Bordier whose books discussed here are largely devoid of specific military agendas.

### Conclusion

It would be a mistake to conclude with Said that there was a single, and somehow essential, European discourse which included medical geography. There is an evolution, development and maturation of French medical geography over the course of the nineteenth century, and, as I have tried to show, French language medical geography was beset by a number of conflicting disciplinary and rhetorical issues. In other words, the subliminal geography upon which medical geography rested was composed of shifting and highly contested intellectual and political questions. Additional evidence for the changing nature and dynamism of the field comes from examining topics related to medical geography in two of the major medical dictionary projects of the era. One of the century’s first great medical dictionaries, all thirty volumes of it, was edited by a team led by Nicolas Philibert Adelon (1782–1862).

<sup>60</sup> Claude Bernard, *An Introduction to the Study of Experimental Medicine*, transl. H Copley Green, New York, Dover reprint, 1957, p. 69.

<sup>61</sup> Bordier, op. cit., note 54 above, ‘Préface’, pp. xi–xvi, p. xiii.

<sup>62</sup> Ibid.

<sup>63</sup> Ibid., ‘Migrations humaines’, pp. 1–16, on p. 2.

The first volume of the second edition of this *Dictionnaire de médecine* appeared in 1832 and the final one came out a bit after Boudin's essay of 1843 in 1846.<sup>64</sup> The editorial team included many hygienists such as Louis René Villermé, Frédéric-Joseph Bérard, Alphonse Guérard<sup>65</sup> and others who spoke in favour of hygiene such as Émile Littré. The *Dictionnaire*, however, contained no entry for medical geography. Medical geographical information was dispersed over such entries as acclimatization, atmosphere, epidemics, epidemics [public hygiene], climate, medical meteorology, and medical constitution [meteorology]. For example, Guérard's thirty-page article on climate broke from the Ptolemaic tradition of defining climates by latitude and longitude. Employing the isothermal analysis of Humboldt, Guérard surveyed and categorized the climates of the world as hot, cold or temperate. He also specified the predominant human "temperaments" of each climate.<sup>66</sup> At base, Guérard's effort provides a kind of mosaic of localized medical topographies. Missing in all the articles are the graphological displays of Boudin's work, or the synthetic and global views of the distribution of diseases present in later writings like those of Lombard and Bordier.

A very different status for medical geography is evident in a later dictionary edited by Amédée Dechambre. His *Dictionnaire encyclopédique des sciences médicales* appeared between 1864 and 1889 and totalled one hundred volumes.<sup>67</sup> Many of the same climate-related topics treated in the first dictionary appear again, but there is one striking difference: the entry for medical geography, authored by the naval physician Jean Baptiste Mahé, runs to 400 pages. A former professor of clinical medicine at the School of Naval Medicine at Brest who spent ten years in Constantinople as a public health physician, Mahé was an active collaborator of the *Archives de médecine navale* and author of studies on tuberculosis and a *Manuel pratique d'hygiène navale* (1874).<sup>68</sup>

Mahé's article takes what he calls a nosogeographical perspective, provides a concise history of medical geography, and offers a four-page bibliography. His methodology is "the Hippocratic programme, but immensely expanded, refined and established on the foundations of modern science".<sup>69</sup> The first third of the monograph reviews physical climatology as it relates to health, and the remainder provides a nosography of diseases organized by whether the afflictions are epidemic or endemic, climatic or dietary, parasitic or anatomical. The article brims with tables detailing

<sup>64</sup> [Nicholas Philibert] Adelon, et al. (eds), *Dictionnaire de médecine ou répertoire générale des sciences médicales considérées sous le rapport théorique et pratique*, 2nd. ed., 30 vols, Paris, Béchet J[eu]ne, Librairie de la Faculté de Médecine, 1832–1846. Additional sources in encyclopedias and dictionaries include J J Virey, 'Géographie médicale', in *Dictionnaire des sciences médicales*, vol. 18, pp. 151–217, and Henri Rey, 'Géographie médicale', in Jaccoud Sigismund (ed.), *Nouveau dictionnaire de médecine et de chirurgie pratiques*, 40 vols, Paris Baillière, 1864–1886. These latter sources are analysed in Frank Barrett, *Disease and Geography: The History of an Idea*, Toronto, York University—Atkinson College, 2000. Many thanks to Professor Barrett for allowing me to read portions of this manuscript prior to its publication.

<sup>65</sup> For a short biography of Guérard see La Berge, op. cit., note 26 above, pp. 30–1.

<sup>66</sup> Adelon, et al. (eds), op. cit., note 64 above, vol. 8, 'Climat', pp. 117–47.

<sup>67</sup> Amédée Dechambre (ed), *Dictionnaire encyclopédique des sciences médicales*, 100 vols., Paris, P Asselin, Sr de Labé, Victor Masson et fils, 1864–1889.

<sup>68</sup> 'Décédés de M Mahé', *Bulletin de l'Académie de Médecine*, 1896, 36: 624–5.

<sup>69</sup> *Ibid.*

demography, the amount of area covered by coastlines on the continents of the world, and lists of occurrences of plague in Asia and the incidence of fevers. In comparison to Lombard and Poincaré, Mahé had travelled widely outside Western Europe and devoted much space to racial aspects of health. Like his anthropologist of choice, Armand de Quatrefages de Bréau, Mahé grouped humankind into three main racial groups “the White, the Yellow, and the Negro”.<sup>70</sup> Each branch had its own special pattern of morbidity and mortality which differed in turn from the other two.

Mahé mentions *On Airs, waters, and places* in his genealogy of medical geography. But for him the field was of recent origin and obtained from more proximate sources such as Friedrich Schnurrer’s *Geographische Nosologie* (1813), itself rooted in Cartheuser’s *De morbis endemiis libellus* (1771), and the works of L L Finke and James Lind.<sup>71</sup> Although his article, which was published in 1882, did not include maps, Mahé was favourable to them. He criticized publications such as the *Archives de médecine navale* and the *Recueil des mémoires de médecine militaire* as being too laden with statistics and lists and thereby causing readers to lose interest. He also faulted Lombard for placing too much emphasis on climatology.<sup>72</sup> Mahé’s section on malaria is typical of his method, which is largely descriptive and rather unconcerned with both etiology—Laveran’s discovery is not mentioned for example—and with therapeutics. Algeria is typified as the “classic country for malaria [paludism]”<sup>73</sup> and what obtains is mainly a description of all occurrences of the disease in history, its present-day range, and how race and climatological factors, including earthquakes, may have an influence on its development.

By the early twentieth century, medical geography was nearer to being a tributary of medical hygiene than it was in the middle third of the century. In 1908, after the germ theory of disease was widely accepted, the twenty-first edition of Émile Littré’s *Dictionnaire de médecine* defined medical geography in narrow terms as a one part of mesology, the investigation of environmental effects on organisms, which required grounding in “cosmography, physical geography, meteorology and the human races”.<sup>74</sup>

The germ theory of disease is often singled out as the major reason for the decline of medical geographical activity. But this interpretation renders obscure significant historical developments internal to geography and the disciplinary politics of medicine and hygiene. In France, at least, the considerable success of the medical specialism of hygiene was also instrumental in the decline of medical geography. Medical geography failed to attain the status of a recognized medical speciality as did hygiene. Medicine, as geology and natural history had done before it, appropriated the

<sup>70</sup> J Mahé, in Dechambre (ed), op. cit., note 67 above, vol. 8, entry ‘Géographie médicale’, p. 130.

<sup>71</sup> Ibid., ‘Histoire succinct’, pp. 383–6.

<sup>72</sup> Ibid., p. 385–6.

<sup>73</sup> Ibid., ‘Affections paludéennes ou maladies de malaria’, pp. 248–71, on p. 258.

<sup>74</sup> Émile Littré, A Gilbert, *Dictionnaire de médecine, de chirurgie, de pharmacie et des sciences qui s’y rapportent*, Paris, J-B Baillière, 1908, p. 725.

locational questions of geography and recast them in the newer disciplinary framework of hygiene.<sup>75</sup> Moreover, medical geography probably mattered most to military and colonial physicians where issues of place and race were crucial components in health care management. Yet military men, save for a few professors at Val de Grâce, were seldom among the élite of French medicine. Thus they were not in a position to institutionalize the study of medical geography by lobbying for a chair devoted to it at, say, the Paris Faculty of Medicine. Few military physicians gained entry into the élite Academy of Medicine, and in fact the number of academic physicians who spent at least a decade in the military declined over the course of the century.<sup>76</sup>

By 1890 the naval medical schools, one bastion of the medical geographical approach to health, were themselves partly civilianized, and perhaps more open to modern hygienic science and less committed to medical topography and geography.<sup>77</sup> Finally, medical geographical inquiry was largely a descriptive activity more akin to natural history than to clinical or therapeutic medicine. A number of physicians, from the medical *philosophe* Pierre Cabanis to the mid-century American clinician Henry Inersoll Bowditch, sought to expel natural historical methods—and by extension medical geography—from medicine.<sup>78</sup> By the decade of the Great War, medical geography also appeared far distant from the laboratory bench and the sort of experimental science promoted by Claude Bernard and Louis Pasteur, activities which constituted the new wave of scientific medicine.

<sup>75</sup> George Weisz, 'The development of medical specialization in nineteenth-century Paris', in Ann La Berge and Mordechai Feingold (eds), *French Medical Culture in the Nineteenth Century*, Amsterdam, Rodopi, 1994, pp. 149–87. For a look at how the fields of geography and medical research vied to define the concept of acclimatization, see David Livingstone, 'Human acclimatization: perspectives on a contested field of inquiry in science, medicine and geography', *History of Science*, 1987, 25: 359–94. See also Godlewska, *op. cit.*, note 17 above, p. 207.

<sup>76</sup> George Weisz, *The Medical Mandarins: The French Academy of Medicine in the Nineteenth and early Twentieth Centuries*, New York, Oxford University Press, 1995, p. 50, and p. 60, note 58, found sixteen military men in the academy in 1821, seven in 1901, and only six in 1935.

<sup>77</sup> Michael A Osborne, 'A Medicine of Race and Place: French Naval Hygiene and the Emergence of Tropical Medicine', forthcoming.

<sup>78</sup> On Cabanis, see Michael A Osborne, 'Medicine and Natural History', forthcoming. On Bowditch see John Harley Warner, *Against the Spirit of System: The French Impulse in Nineteenth-Century American Medicine*, Princeton, Princeton University Press, 1998, pp. 272–81, 'The Natural Historian and the True Physician'.