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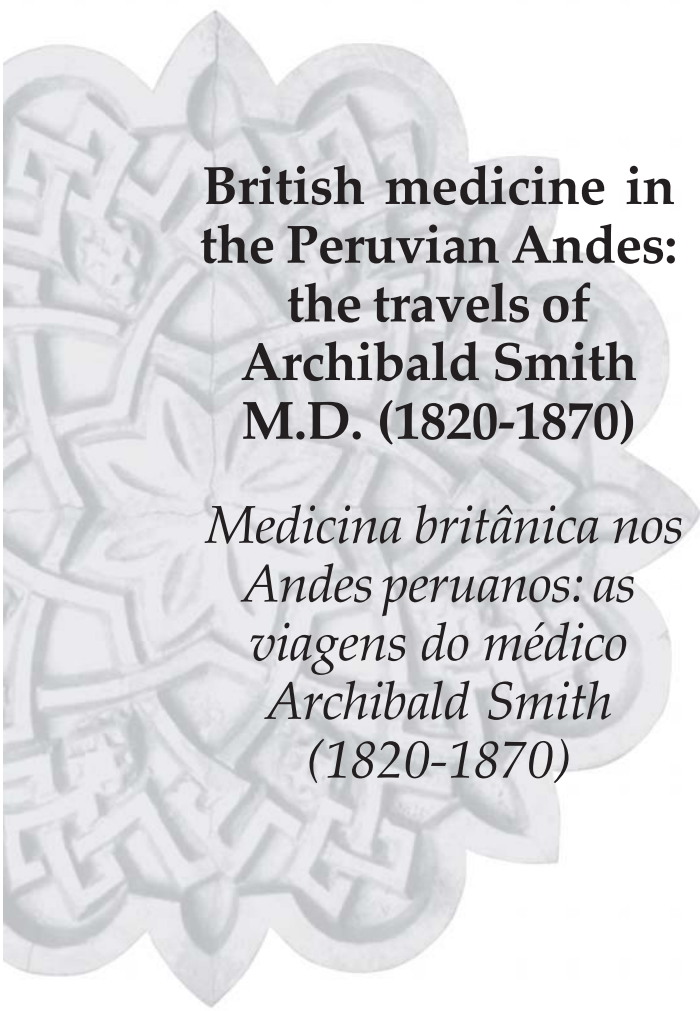
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British medicine in the Peruvian Andes: the travels of Archibald Smith M.D. (1820-1870)

*Medicina britânica nos
Andes peruanos: as
viagens do médico
Archibald Smith
(1820-1870)*

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This article traces the travels of the Scottish physician Archibald Smith through the Peruvian Andes between the 1820s and 1860s. Despite his prominent role in the nineteenth-century Peruvian medical scene, almost nothing has been written on Archibald Smith. By exploring Smith's medical activities, publications, and debates, this article intends to uncover unexplored areas of Peruvian medical history, such as the animosity between local and foreign physicians during the post-Independence war era and the important role played by medical geography as a scientific discipline for redefining ethnical and regional issues.

KEYWORDS: *Archibald Smith; medical geography; climatology; altitude medicine; yellow fever.*

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O presente artigo traça a vida e obra do médico escocês Archibald Smith durante sua permanência no Peru, entre as décadas de 1820 e 1860. Apesar de sua proeminente contribuição para a medicina peruana, quase nada foi escrito sobre Archibald Smith. Através da investigação das atividades, publicações e debates de que Smith participou, o artigo pretende desvendar áreas inexploradas da história da medicina no Peru, tais como a animosidade entre os médicos locais e estrangeiros no pós-guerra de independência e o papel importante da geografia médica como disciplina científica que redefine questões étnicas e regionais.

PALAVRAS-CHAVE: Archibald Smith; geografia médica; climatologia; medicina de altitude; febre amarela.

During the nineteenth century, Western physicians travelled around the world in order to map the global distribution of epidemic diseases, to analyze if white people were suited or not for adapting to varied tropical environments, and to look after the health of the European settlers. This was the case with Archibald Smith (1798-1870), a Scottish physician who resided in Peru between 1826 and 1870, years in which he wrote some of the most controversial and influential articles on the medical geography of the Peruvian Andes. Despite his prominent role in the nineteenth-century Peruvian medical scene, almost nothing has been published about him. By studying Archibald Smith's activities, publications, and debates, I intend to uncover unexplored areas of the Peruvian medical history, such as the conflicting relations between local and foreign physicians during the post-Independence war era and the important role played by medical geography in redefining ethnical and regional stereotypes.

Archibald Smith in Peru

Archibald Smith, M.D., arrived in Peru in 1826, hired by the Anglo Pasco Peruvian Mining Company, a British company dedicated to the extraction of silver from the high Andean district of Cerro de Pasco, to aid the "English miners and officials" in their process of adaptation to low oxygen environments. However, once in the mines Smith was required to care for people from distinct nationalities with all kinds of maladies. As he wrote: "as a matter of course, I was often called to visit foreigners from all countries, and also natives who resided at this seat" (Smith, 1840a, p. 298).¹ The extraction of silver was, during the colonial Era, one of the most important and most profitable sectors of the Peruvian economy and, during the chaotic decades that followed the Independence wars, the only link of the newly born Republic with the international markets (Deustua, 1986; Contreras, 2004).

Smith arrived in Peru immediately after the end of the Independence wars against Spain (1821-24): a period of economic stagnation, recurrent military conflicts, and political instability. In the national census of 1827, the total population of Peru was estimated at 1.5 million inhabitants (60% of the population was classified as indigenous; the other 40% encompassed Spanish descendants, Afro-Peruvians, European residents, and mixed races). It is also important to know how this population was distributed. While in the coastal cities, the predominant inhabitants were Spanish and African descendants, in the Sierra most of the population was indigenous, lived in rural communities, and spoke Quechua (the main native language) (Gootenberg, 1995).

¹ Unfortunately and despite extensive research, I have not been able to locate important biographic data such as Archibald Smith's exact date of birth or death.

In 1827, one year after Smith's arrival in Peru, the Anglo Pasco Mining Company went bankrupt. The silver mines of the central Andes also suffered from the economic stagnation and political and military chaos of the post-Independence era. Hence, Smith decided, as many of his co-workers did, to move to the valley of Huanuco, where he rented lands and bought machinery for the production of sugar cane. Located between the Andean mountains and the Amazonian forests, Huanuco was a small rural district located at a moderate altitude with a population largely composed of native peasants. Smith occupied the *Andahuaylas* plantation with his wife, daughter, and servants, keeping company with a circle of European friends with whom he organized dinners, hunts, and expeditions (Witt, 1992, p. 193). During his agricultural endeavours Smith had to overcome many adversities — among these, the destruction of the irrigation canals in his sugarcane fields by the local population, after the city mayor accused Smith of being a “kind of demon or goblin” (Smith, 1839, p. 161). Some months later, the local militias recruited all of his young employees by force, leaving him unable to proceed with his work (ibidem, p. 161). It was a time of political and social instability and distrust towards foreign residents.

Given these adversities, in 1830, Smith decided to settle in Lima. With an estimated population of 64,000 inhabitants, Smith found that although Lima was favoured by a very stable climate, the mortality rates were extremely high. Smith attributed these high mortality rates to the unsanitary conditions of the capital, the recurrent epidemic outbreaks, the endemic military conflicts, and the “delicate” constitution of its inhabitants. Smith had a very unfavourable opinion of the Lima citizens of Spanish descent, a population he regarded as lazy, weak, “unwilling to take exercise on foot,” and morally and physically degenerated (ibidem, 1839).

Thanks to the recommendations made by the British General William Miller, a prominent figure in the Peruvian political scene, Smith was appointed ward physician of the Hospital de Santa Ana, Lima's military hospital. Smith was also named medical advisor of the Hospital de San Andres “for the cure of the British and American distressed subjects and seamen” (Smith, 1861, p. 243-5). These appointments would become crucial for Archibald Smith's professional career, since they gave him the opportunity to engage with other physicians, develop a network of personal relations, experiment with medical treatments, acquire experience, and develop a better understanding of the Peruvian public health situation. The hospitals were administered by the *Sociedad de Beneficencia Pública de Lima*, a semi-independent public organism directed by a council of notable citizens. Yet, during the nineteenth century, hospitals still had the religious function of serving as a refuge for the poor and sick. Other important bodies devoted to public health

administration were the *Protomedicato* (a colonial institution that survived the first decades of the Republic, responsible for regulating the practice of medicine), the Lima Town Hall (responsible for city hygiene and thus for eradicating the locus of miasma emanation during epidemics), and the Church (during the nineteenth century, religious orders such as the Sisters of Charity or the *Juandedianos* were still responsible for aiding the sick). Smith combined his work as a hospital medical advisor with private practice: “not merely a wide circle of native patients, but likewise, all the Englishmen and American mercantile and domestic establishments” (Smith, 1840a, p. 300). Within a few years Smith became one of the most consulted physicians for North American and European immigrants, a clientele that included ambassadors and commercial agents amongst others. It was during a medical council established at the request of the Mexican ambassador in Lima that Smith got involved in his first public debate.

“No conocen nuestro clima”: “they’re not familiar with our climate”

The case of Smith can shed some light on the causes of the conflicting relations between local and foreign medical practitioners during the Peruvian post-Independence war era. As we shall see in the following pages, European medical practitioners were rejected, accused of empiricism, of ignorance in local climatic matters, and of accumulating fortunes without deserving them. I intend to argue that behind these accusations was the need for the local medical community to legitimize their authority (in a context of radical political transformations), their unwillingness to share the small medical market, and the paradigm imposed by Hipólito Unanue’s medical doctrine (a doctrine that emphasized that the climate of Lima dictated special rules for the practice of medicine).

In the early 1830s, the Mexican ambassador in Peru became a victim of dysentery, an endemic disease in Lima, and following the Peruvian upper class tradition he called for the establishment of a Junta. The Juntas were medical councils composed of four or five physicians summoned in order to determine the patient’s illness and the treatment to follow. Smith depicted this habit as a mere “oratorical display” where “the warmest discussion and all the learning, method, and criticism terminate in the most simple practice” (Smith, 1839, p. 98). Usually the councils deliberated for days before a decision was reached. According to Smith, the Junta “was a sort of ostentatious exhibition” called by “all who could afford to cite a group of doctors [that] desired to imitate the great and the wealthy” (ibidem, p. 98). Throughout his publications, Smith depicts with a subtle sense of humour some of the habits of Lima’s middle and upper classes, such as the use of the Juntas.

The Junta called by the Mexican ambassador included José Manuel Valdés, the Peruvian Protomedico, and Archibald Smith. José Manuel Valdés (1767-1843) was one of the most renowned Peruvian physicians, well known for his epidemiological studies, his Catholicism, and his patriotic involvement in the Independence wars against Spain. Valdés is also an interesting case because despite his humble origins he managed to get around the legal prohibition that coloured persons could not study medicine (although he was initially barred from receiving the degrees that certified his studies). Valdés represented a generation of physicians who bridged the Colonial to the Republican era (Lastres, 1951, p. 130-5; Woodham, 1970). While Valdés suggested bleeding the ambassador, Smith argued that nothing could be done because it was too late for the ambassador to recover. After years acting as a hospital ward, Smith had probably developed certain scepticism for clinical practice. The members of the Junta decided to follow the recommendations made by Valdés and some days later the ambassador recovered (Valdés, 1835a).

In the following months Smith and Valdés clashed in other Juntas and their animosity became public. As a way of discrediting him, Valdés accused Smith of empiricism. During the nineteenth century, university-educated physicians engaged in frequent campaigns against the so-called empiricists, emphasizing their lack of education, their economic motives for practicing medicine, and the dangers their practice implied. As Valdés was the Protomédico, accusing him of empiricism also had legal implications. During the nineteenth century, university-educated physicians had to share the medical market with a multitude of other practitioners, such as indigenous healers, Chinese practitioners, charlatans, domestic medicine, and others. With the aim of strengthening their position, the medical community promoted legal restrictions against empirical practices and foreign practitioners. Although this legislation was only loosely enforced, Valdés and other members of the Lima medical community felt that European practitioners were somehow “invading their territory.”

Valdés made it evident that foreign physicians practicing in Peru should always consult local professors on “the causes, peculiarities, and treatments of the diseases that are most common in the locality where he resides” (ibidem, p. 28). According to Valdés, foreign physicians were not capable of understanding the peculiarities of the local climate and geography, and therefore were not entitled to practice medicine (ibidem, p. 28). Climate and geography were particularly relevant issues in the nineteenth century because neo-Hippocratic theories were still dominant in Peruvian medical circles. In Lima there was a popular saying used to discredit foreign practitioner’s abilities: *no conocen nuestro clima*, i.e., “they’re not familiar with our climate” –

and therefore could not understand the special rules needed for the practice of medicine in Lima.

Smith decided to respond by sending two short articles to *El Regenerador* (a local newspaper), published in 1834 and 1835. In these articles Smith discredited the way most Peruvian physicians acted, their personal interests, their constant mistakes, and their misguided treatments. He claimed that there were only two reliable physicians in Peru and mocked the idea that only Peruvian-born physicians could practice medicine in Peru (Lastres, 1951, p. 156). Smith also wrote a letter to the British Consul in Peru, demanding that a formal complaint be filed against José Manuel Valdés. Smith accused the Protomédico of over-charging hospital patients, of defaming British medicine, and of being responsible for the death of hundreds of dysentery patients (given the prohibitions he made as Protomédico on the use of mercury for the treatment of dysentery and given his obsession with bloodletting). Following his advice, the British Consul filed an official complaint (Smith, 1839).

In response, José Manuel Valdés published a leaflet entitled “Al público peruano el Protomédico General de la República en contestación a la diatriba del D.D. Archibaldo Smith Impresa en los números 38 y 39 del periódico titulado El Regenerador” (1835). Valdés justified the publication of this leaflet by stating that: “being acknowledged by some friends that silence would dishonour the Committee I preside and being the medical Peruvian community unfairly attacked, I will expose the bad faith behind Smith’s words” (Valdés, 1835a, p. 2-3). I will argue that by publicly confronting foreign practitioners, the Protomédico intended to increase his medical authority and legitimacy, given the context of radical political transformations that were occurring in the country. It is also important to take into account that academic medicine was still in the process of consolidating its position, both inside the state and socially.

The debate between Smith and Valdés is also interesting because it shows us physicians’ differing perceptions of the local populations, and how these perceptions influenced the treatment provided. Archibald Smith opposed the frequent Peruvian practice of bloodletting in dysentery patients because, according to him, the digestive system of the people from Lima was too weak and “consequently the repair of the system, after its strength is reduced by bloodletting, is slow and imperfect” (ibidem, p. 389). Smith believed bleedings could only be applied to the Andean indigenous people because they had stronger organs; therefore, they were able to react more favourably to medical treatments. Valdés argued that Smith’s statements were based on his erroneous observations regarding the constitutions of the local populations. According to Valdés, people from the Andean altitudes were stronger only as regarded certain physical endeavours, such as “resisting the cold or walking long distances with

bare feet," but when it came to medical treatment, people from the highlands had the weakest constitutions. In Valdés's words: "Once they get ill, they become the weakest of all the races that inhabit Peru ... People from the high altitudes have a much greater tendency to get diarrhoea, dysentery, and pulmonary consumption" than people from lower lands (*ibidem*, p. 10).

Smith believed dysentery had to be treated with calomel (derived from mercury). Valdés defended his ban on the use of mercury, arguing that it was not suited to the Peruvian constitution. Smith, convinced of the universality of medical practices, stated: "Calomel cures dysentery in Peru and the Peruvians in no less proportion that it cures dysentery in India and the Englishmen" (Smith, 1841, p. 170); further, he accused Valdés of being ignorant in chemistry. Outraged by Smith's arrogance, Valdés rhetorically asked: "Does Smith presume to know more about the diseases in Peru than the Aguirres, Buenos, Unanues, and Tafures [local professors of medicine]? Only in a state of delirium could this professor presume that he will reform Peruvian medicine" (Valdés, 1835a, p. 11).

One of the few explanations for this animosity between local and foreign physicians in the post-Independence era was advanced by John Woodham in his classic article on "The Influence of Hipólito Unanue on Peruvian Medical Science, 1789-1820" (Woodham, 1970). According to Woodham, by the early nineteenth century Hipólito Unanue had imposed his medical climatologic doctrines as a paradigm among his disciples. The mediocrity of the Peruvian medical community left them unable to escape from his doctrine, exposed in his classical *Observaciones sobre el Clima de Lima* (1806), and therefore to reject any view that opposed Unanue's theories. Unanue's doctrine stressed that the climate of Lima dictated special rules for the practice of medicine; therefore, only physicians familiar with the peculiarities of the local climate and geography were entitled to practice medicine in Lima. Woodham shows how the few European practitioners that arrived in Lima in the post-Independence era observed with surprise the way Peruvian physicians rejected universally accepted remedies, arguing that "the peculiar climate of Lima altered the nature of the maladies" (*ibidem*, p. 713). According to Woodham, Unanue's followers, José Manuel Valdés amongst them, became too dependant on his authority. Rather than debate Woodham's argument, I intend to add some other causes to understand this animosity against foreign physicians.

The economic factor was certainly an important one. This is seen in a leaflet entitled "Foreign Professors of Medicine must pay Maximum Taxes for Practicing their Art" (1838), where a Peruvian Senator accused Smith of "accumulating a huge fortune in Lima in a very small period of time with no real merit for it" (Indelicato, 1838, p. 3). The small Lima medical market was divided amongst a

multitude of practitioners, which included, as mentioned earlier, indigenous healers, Chinese practitioners, domestic medicine, charlatans, and university-educated physicians. The university-educated physicians were not hegemonic in the medical market, neither were their remedies or practices more effective. In this reduced medical market, the presence of European practitioners was certainly regarded as an economic menace for the local university-educated physicians. It is interesting to see how, despite the hegemony that Unanue's doctrine enjoyed among the local medical community, it failed to influence decision-making by patients, who in many cases preferred European practitioners. In explaining this animosity, I have also tried to emphasize the local medical community's need to legitimize its medical authority during the post-Independence era.

The debate between Archibald Smith and José Manuel Valdés ended when the Government ordered that the *Protomedicato* ban on the use of mercury would only apply to Peruvian nationals. British citizens would be free to employ whatever treatments they thought more appropriate for themselves (Indelicato, 1837). Some decades later, in an article entitled "Note on Diphtheria in Peru" (*Transactions of the Epidemiological Society of London*, 1864), Smith recognized "the late Dr. D. José Manuel Valdés" as the only authority on the Lima epidemics during the context of the Independence wars (Smith, 1864, p. 257-8).

On the geography, climate, and diseases of Peru

During his stay in Peru, Smith's main interest became the medical geography of the Peruvian Andes. Smith's goal was to describe the most common diseases in the different regions of Peru and to discover the pathological influences of altitude climates. In his own words: "to show the different effects of climate, and especially the elevated and varied Andean climates on diseases, on general physiology, and pathology" (Smith, 1858, p. 62). Drawing up an ecological map of diseases was of course a complex process that included a variety of factors. Race, for example, was a key variable. Climates and elevations had different effects on the bodies of different races. Thus, if the Peruvian coast was a degenerative climate for European descendants, it was a proper climate for African descendants. Medical geography was a discipline closely related with identity, nation, and the question of "otherness." Smith, like his Western counterparts, mapped using moral judgments. Thus, it was believed that because of the effects of Lima's climate, Spanish descendants residing in this city were morally and physically degenerated (Smith, 1839, p. 162).

For the purposes of this article, I will not describe in detail Smith's observations, but I will instead present his more general ideas on the

medical geography of the Peruvian Andes. Smith divided Peru into three physical regions: Coast, Sierra, and Montaña. He subdivided the Sierra into two medical regions: the Andean high altitudes (higher than 4,000 metres above sea level) and the Andean intermediate altitudes (between 1,500 and 4,000 metres above sea level). According to Smith, the least healthy of the Peruvian regions was the Coast. He found that in Lima the mortality rates were approximately three times higher than those in the most populated British cities, such as Manchester or London. Smith attributed Lima's high mortality rates ("a large hospital of convalescents") to the pernicious effects of the climate (Smith, 1840a, p. 300). The overly equable climate, where "neither the extremes of heat or cold are ever experienced," rendered the inhabitants lazy and weakened their constitutions. "The white inhabitants of Lima have always been remarkable for their effeminacy and delicacy of constitution" (ibidem). The weakness of the digestive organs of the Coastal inhabitants was reflected in the frequency of stomach-related maladies like dysentery, *empachos*, or gastric fevers. Lima's humidity favoured the spread of "diseases of the organs of respiration," such as asthma, bronchitis, or phthisis. Native highlanders only contracted phthisis when descending to the Coastal cities (ibidem).

Lima had a 'degenerative' climate that predisposed its inhabitants to disease. "The long continued warm and humid atmosphere not only keeps up a relaxation of the skin, but induces to a more languid appetite and a less perfect and healthy action of the stomach and bowels which soon tells on the whole system" (Smith, 1856, p. 482). The European immigrants soon lost their physical strength and the "offspring of the athletic Spaniard" grew like a delicate man (ibidem, p. 482). The image of Lima as a degenerative environment completely contradicted the perception that inhabitants of Lima had of their climate. The local inhabitants praised their equable, healthy climate, and considered it superior to any European climate (Unanue, 1806).

Smith also mapped the disease ecology of the Andean high altitudes (above 4,000 metres). When non-acclimatized people go from the Coast up into the Andean altitudes, a multitude of distressful symptoms are experienced, such as headaches, vertigo, nausea, less acute sight and hearing, nose bleeding, extreme fatigue, and difficult breathing. Smith himself experienced the adverse effects of high altitudes during his first journey to the silver mines of Cerro de Pasco. As he recorded: "My headache was moderate, but my extremities soon became quite cold ... Then came a sense of sickness and oppression about the stomach and heart, with a short, hurried, and panting respiration" (Smith, 1839, p. 274-5). While some people associated *soroche* or *puna* (local names for mountain sickness) with work in the mines and emissions of metals from the mining districts, Smith, as many other scientists, attributed mountain sickness to "the expansion of the fluids of the body caused by the rare atmosphere

of the altitudes." The simplest and most effective way of ending mountain sickness was to go down to lower cities. "In cases of pure *soroche*, which always depend on an over attenuated atmosphere, the removal of the sufferer from a higher to a lower level at once removes the malady" (Smith, 1840b, p. 14).

Although some of the initial symptoms, such as headaches and nausea, disappeared after some days of residence in Pasco, Smith felt that in the Andean high altitudes, Europeans residents lost their muscular powers and never became completely acclimatized. On the other hand, "the deep-chested and firmly limbed native-born mountain Indians of Peru" were able to perform all kind of activities at high altitudes due to the characteristics their bodies had acquired during the process of acclimatization. According to Smith, the mountain climate helped develop stronger constitutions, and people from the highlands thus were stronger and healthier than people from the coastal cities (Smith, 1866, pp. 345-6). In addition to the rarefied atmosphere, Smith found that in the Peruvian high altitudes diseases such as bronchitis, phthisis, or hepatitis were not uncommon, due to the cold climate. "It will be readily conceived how the effects of a cold and rarefied atmosphere must aggravate inflammatory affections of the respiratory organs...hepatic congestion...cerebral congestion" (Smith, 1840b, p. 56).

The healthiest region of Peru, "the most salubrious and invigorating climate," was found in the Andean intermediate altitudes, particularly those cities and valleys located between 7,000 and 10,000 feet above sea level (Smith, 1840b, p. 56). The Andean valleys were favoured by an equable dry climate, and pulmonary-related maladies were therefore rarely seen, unless imported from the lower lands. Altitude acted as a natural medical barrier, so diseases typical of Tropical climates, like yellow fever, could not spread. The most common diseases of the Andean valleys were, according to Smith, goitre, *verrugas*, typhoid fever or *tabardillo*, and typhus. In Europe, goitre was already recognized as a disease of altitude locations, such as in the Swiss valleys. *Verrugas* (later *Bartonella bacilliformis*, a name given in honour of Alberto Barton, who discovered the disease's causal agent) was considered for decades to be a disease typical of the Andean valleys. Typhoid fever was attributed both to climate and to the unhygienic habits of the Andean populations. The recurrence of these diseases was attributed both to climatic and geographic factors and to the living conditions of the native peasants (overcrowding, poverty, lack of medical assistance).

The Andean intermediate valleys were not just healthy but therapeutic. Smith became convinced of the positive effects of transporting phthisical patients from the warm and humid valleys of the Coast to the dry, temperate, equable climates of the intermediate valleys of the Andes (at locations between 7,000 and 10,000 feet).

Among the Andean valleys, Jauja was considered the healthiest location of the Peruvian Andes (Smith, 1856, p. 484). In a moment of euphoria, Smith expressed his wish that his work of “showing the climate and topography of the great health resort of the consumptive in Peru” might be useful to all “phthisical patients of the world” (Smith, 1866, p. 349). Although the use of altitude therapeutics was practiced in Peru long before Smith’s arrival, it was partly from Smith’s articles published in British journals that the therapeutic effects of the Andean valleys, particularly Jauja, gained international renown (Weber and Weber, 1907, p. 304).

Towards the end of his stay in Peru, Smith narrowed his attention to one particular disease: yellow fever, since recurrent yellow fever outbreaks were witnessed in the main coastal cities of Peru during the 1850s.

The pathological effects of altitude

At the same time as the Coastal yellow fever epidemics, recurrent epidemic outbreaks of an unknown disease began to spread through the Andean valleys. A debate on the origins of these epidemics arose in the *Sociedad Médica de Lima*. By the mid-nineteenth century, the Peruvian medical community was unified in a single and very influential corporation, the *Sociedad Médica de Lima* (1854), established with the aim of homogenizing the practice of medicine, discussing the measures to be taken in case of epidemic outbreaks, and developing stronger links with European scientists. The economic and political context had also changed due to the enormous revenues generated by the exportation of guano (Cueto, 1989, p. 45-9).

While most members of the *Sociedad Médica de Lima* argued that the Andean epidemics had appeared spontaneously and did not have any connections with the Coastal epidemics, Smith argued that both the Coastal and Sierra epidemics had the same origin in yellow fever. Contradicting his own previous statement that yellow fever could not spread above certain elevations, Smith became convinced of the yellow fever origin of these epidemics. It is important to take into account that it was not until the early twentieth century that it was discovered that the disease was transmitted by the *Aedes aegypti* mosquito. During the nineteenth century, the propagation of yellow fever was attributed to direct contact with a diseased person, to the action of miasmas, related to climatic conditions or to the unhygienic state of the cities. The actions usually taken included quarantines, seclusion of the sick in lazarettos, or improvement of hygienic conditions in the locations invaded by the disease. The debates held on the origin of the Andean epidemics are interesting because they allow us to see how ethnic and regional stereotypes influenced the epidemiological debates.

A Commission established by the *Sociedad Médica de Lima* with the aim of determining the origins of the Andean epidemics concluded that it was a “spontaneously originated” typhus epidemic. The Commission, led by José Mariano Macedo (1825-94), a professor of general pathology at the San Marcos University, pointed out that the symptoms observed in the victims corresponded to typhus. It was agreed that yellow fever could only survive sporadically between 3,000 and 7,000 feet above sea level but that yellow fever definitively could not survive at higher altitudes (over 7,000 feet above sea level). In addition, Macedo argued that the fact that most of the victims belonged to the native population demonstrated that the disease was typhus, since yellow fever victims were usually found among foreigners. The Commission also suggested that the high mortality rates were explained by the weak constitutions of the native Andean population and their unhygienic habits (Macedo, 1859, p. 222-4).

The yellow fever origin of the Andean epidemics was questioned for a variety of reasons. By the mid-nineteenth century, yellow fever was already identified as a disease of warm climates; therefore, it was improbable that it could propagate in the cold altitudes of the Andes. Yellow fever also had a distinct clinical entity and the victims of the Andean epidemics did not present symptoms considered typical of the specificity of the disease, such as dryness of the liver or black vomit. Yet Smith was convinced the epidemics had not appeared spontaneously in the Andes. Based on meteorological reports, Smith stated that no atmospheric changes had occurred in the country that would create the conditions for spontaneous epidemics in the Andes. Smith also pointed out that many of the victims had recently travelled to coastal cities (where they probably became infected) and blamed the constant movement of troops from the capital to the inland provinces for transmitting the disease. “From all I can further collect on the subject ... it appears that the yellow fever germs were introduced from the Coast ... by the frequented lines of intercourse.” The epidemics had been imported from the Coast (Smith, 1857, p. 382).

Smith considered that in explaining the origins of the Andean epidemics, the pathological effects of altitude had not been properly taken into account. “Not finding [the yellow fever germs] there [in the Andean altitudes] the fitting conditions for their full development in the form of yellow fever as on the coast, they underwent a modified elaboration in the human frame and spread abroad in the form of the most deadly typhus” (ibidem, p. 382). The Andean was a transmuted typhoid epidemic with a yellow fever origin. “What I would here remark as most interesting in regard to the influence of elevation and climate on diseases of the human species is that the *peste* of the Sierra of Peru proved to be essentially of the same origin as, or an offshoot of, the epidemic yellow fever of the coast” (ibidem, p. 382). The coastal

yellow fever had mutated into typhoid fever when reaching the Andean altitudes and low temperatures.

Although Smith was not certain how these mutations occurred, he did believe altitude and temperature had the “power of modifying the miasma of the plains” and not only in the case of yellow fever. Smith had observed in previous years how the intermittent and remittent fevers of the Coast had been transformed into continuous fevers in the Andean valleys and how malaria had been transformed into typhoid while crossing the Cordilleras (Smith, 1868, p. 251). Smith was not so interested in analyzing the causes of these transmutations as he was in emphasizing that most of the epidemics experienced in Peru had originated from the coastal cities. “It was from Lima and the seaports that the various epidemics radiated to the interior in north, south, and central Peru. So it must be always remembered that while the epidemic had retained sufficient vitality to climb the snowy Cordillera, it was not in the colder elevations it originated” (ibidem, p. 253).

Smith also refuted the ethnical explanations given by the Commissioners appointed by the *Sociedad Médica de Lima*. Based on meteorological reports, personal patient records, mortality statistics, and autopsy reports, Smith’s observations were presented some years later in an article entitled “On the spotted-hemorrhagic yellow fever of the Peruvian Andes in 1853-1857” (1861). Smith stated that the epidemic of the Sierra was not a disease of race. In Smith’s words: “It has been a vain invention to call the [1853-57] epidemic of the Sierra a disease peculiar to the Indian race; [...given the socio-economic demographic reality] only Indians could be the victims” (Smith, 1861a, p. 298). Smith condemned allegations about the weakness of native people’s constitutions and blamed the unsanitary, unhygienic, and poor living conditions in which the native Indians were forced to live (Smith, 1839, p. 167). As to the causes of these epidemic outbreaks, Smith emphasized the relation between poverty, marginality, and disease. The mortality rates would have been the same among the different ethnic groups: “the poor Indian might have got as well as the better-accommodated *Dons* of the same indigenous race, [if they] had more means, and lived in houses instead of huts-in abodes of sufficient ventilation and fitted with compartments, in which the sick could be kept apart” (Smith, 1861a, p. 298). Smith blamed the unsanitary conditions in which native populations lived as a main cause for their high mortality rates.

Smith believed that the biased observations of the Lima doctors were partly due to the limited working experience they had in the highlands. While travelling through the Andes, Smith had observed the lack of university-educated physicians in the interior of the country. Smith ironically stated that the impossibility “to procure medical attendance in the interior villages of Peru” was due to “the variable

climate and temperature of the interior, changing from hill to hill ... a climate peculiarly unfavourable and disagreeable to the constitutions and habits of the medical gentlemen of the Coast" (Smith, 1839, p. 191). Smith was emphasizing how doctors from Lima were reluctant to ascend to the inland altitudes, as well as criticizing the limited experience of the Lima medical establishment.

Epilogue

In August 1858, Leonardo Villar (1825-1900), a professor of Anatomy at San Marcos University, published an article in the *Gaceta Médica de Lima* entitled "Reflexiones sobre la Geografía de las Enfermedades y Climas del Perú del Dr. Archibald Smith" (Villar, 1858). Villar opened his article stating: "Before initiating my reflections, I want to acknowledge the general respect Smith has gained among us, not only because of his professional qualities but particularly because of his personal qualities ... Smith is an intelligent, illustrated, ethical and honest human being" (Villar, 1858, p. 287). After these laudatory opening lines, Villar described the many failures he encountered in Smith's observations of the medical topography of the Andes. According to Villar, Smith attributed to the climate of the Coast diseases that occurred more frequently in the Andean altitudes (such as asthma). Villar also criticized Smith for not performing enough experiments before sustaining an argument. For example, Smith believed that one of the reasons why stomach-related illnesses such as dysentery were so common in Lima was because of the poor quality of the drinking water. Smith had not performed any chemical analysis of the water in order to know whether its quality was adequate or not. Villar was questioning Smith's overemphasis on theoretical rather than experimental medicine. Villar also pointed out that Smith usually misinterpreted the authors he quoted (either British or Peruvian doctors). Finally, Villar argued that Smith had not properly understood the peculiarities of the local climates and geography (*ibidem*, p. 295).

Yet by the mid-nineteenth century, Smith had already become one of the main authorities on yellow fever and climatology. He actively participated in the debates held at the *Sociedad Médica de Lima*, and his observations were discussed, translated, and published in the *Gaceta Médica de Lima*. In February 1858, Smith was unanimously accepted as a Correspondent Member of the Lima Medical Society, with the aim of developing relations between the Scottish and Peruvian medical communities (Sandoval, 1858, p. 126). It must be stressed that Smith never became isolated from his European counterparts, and although living in Peru, he published in both Peruvian and British journals. One year later, in June 1859, Smith was appointed Resident Member of the Lima Medical Society. This

appointment was proposed by Francisco Rosas (1827-99), one of the most prominent local physicians and later President of the Lima Medical Society, with whom Smith shared the post of medical advisor at the Santa Ana Hospital (Rosas, 1859, p. 230). After almost four decades of living in Peru, Smith had already developed a network of personal relations.

Finally, in March 1860 Smith was appointed Member of the Lima Medical Society Epidemiological Committee. The Epidemiological Committee was one of the most influential bodies within public health. It was composed of only four members and its main task was to address the etiology of epidemics and to propose measures for their control. As Smith recounts: "I was thus placed in a position which led me to enquire with more care into the origin and progress of certain epidemics in Peru, and very particularly yellow fever in the Andes" (Smith, 1861a, p. 282). In December 1860, for unknown reasons, Smith left Lima and returned to Edinburgh. Nevertheless, his concern with the medical topography of the Andes persisted, as can be seen from the letters he sent and received from his Peruvian colleagues in the following years (Archibald Smith, Personal Papers, MS 9516, National Library of Scotland).

When Archibald Smith accepted the position as consultant for a British mining company located in the Andean highlands, he probably had not imagined that he would develop his professional career in Peru. As with other Western physicians who decided to settle in foreign countries, Smith not only encountered adversities but also opportunities. The initial response of the Peruvian medical community was to disqualify Smith by accusing him of not being able to understand the peculiarities of the local climates (at a time when the practice of medicine was closely related to an understanding of the environment). Yet Smith managed to overcome the adversities and by the mid-nineteenth century, he was already recognized as a leading Andean climatologist and epidemiologist.

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