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Health, Hygiene and Sanitation in Latin America
c.1870 to c.1950

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Health, Hygiene and Sanitation in Latin America c.1870-c.1950

This Research Paper sets out to examine transitions within health care in Latin America between c.1870 and c.1950 and offers a preliminary synthesis. Whereas a powerful historiography has evolved over the past thirty years that strives to synthesise diffuse materials on the insertion of Latin America into the world economy and subsequent 'de-linkage', there are few attempts to summarise the historiography of social policy. Given the embryonic nature of the subject, the author is trying to avoid premature generalisation and excessive claims, and is fully conscious that more questions are raised than are resolved by this paper. A broad chronological canvas is adopted, which is useful in clarifying diversity within the continent, but can also obscure issues of periodisation.

The first section enquires into the relationship between the genesis of a modern public health policy and the experience of tackling epidemic and endemic diseases, and reviews the motives behind ameliorative health measures undertaken by the state and business, especially foreign enterprise, and their significance. The second section investigates the interaction between external forces and domestic changes: both the role of an international voluntary agency in tackling prostitution and, by implication, venereal diseases; and the significance of missions from developed countries that aimed to raise an alertness to modern methodology and investigation in 'tropical medicine', to institutionalise public health laboratories, and to undertake 'campaigns' against targeted diseases. This section concludes with an analysis of a specific example of externally inspired innovation in hygiene and sanitation: the Panama Canal. There follows a section that uses the special case of Rio de Janeiro to elucidate problems of evolving a public health policy for cities; and from that vantage point looks at the beginnings of public health policy in the Brazilian countryside. The penultimate section looks at the diffusion of scientific knowledge, the limits to its impact and the resilience of Luso-Hispanic, Amerindian and Afro-Latin American traditions of healing and curing. The final section consists of notes on the nature of the relationship between levels of health and of nutrition and housing.

The optimism associated with the liberal ascendancy and pragmatic policies of export-led growth between c.1870 and the World Depression of 1929-33 gave rise to optimism regarding issues of health care, hygiene and sanitation. Civilian elites were confident that it was only a matter of time before the health care performance and life expectancy rates of Latin America caught up with those of Western Europe and the United States, as

a result of the diffusion of European and US organisational models in public health and medical education and practice, investment in research (especially into 'tropical' medicine) and the application of its findings, together with the adoption of an advanced medical technology.[1] 'Europeanising' elites, consciously part of a vanguard that embraced republicanism, liberal economic ideology and symbols of modernity such as constitutions and rational legal codes, placed the professionalisation of medicine and public health policy firmly on their agendas for the first time. Solid grounds for optimism existed. Levels of health care and nutrition seemed to be rising as Latin America enjoyed the positive consequences of a combination of an influx of foreign capital, technology and European and Asian immigrants. Dietary preferences broadened; and the growth of cities and the construction of railways gave an impetus to commercial agriculture for domestic consumption. The markets acknowledged that Latin America enjoyed an abundance of resources, that ranged from cinchona bark, from which the invaluable prophylactic quinine was derived, to an unequalled variety of health-giving fruits, both temperate and tropical, with commercial potential. By European standards the region was remarkably free of the high death rates and broader disruption caused by major international warfare.[2] Latin American countries shared at little cost a distilled Euro-US experience of war-related improvements in health provision, such as the evolution of an army medical corps, and the treatment of gunshot wounds, fractures and traumas. Even in domestic upheavals, like the last of the Colombian civil wars – the War of the Thousand Days (1899-1902), European organisational models were adopted: a Red Cross ambulance attended the wounded during two major battles in 1901.

The half-century after independence had been disappointing. The promising, if haphazard, initiatives to improve medical education and to counter epidemic disease during the decades before the Spanish American and Haitian revolutions for independence were seldom sustained; and various attempts to revive 'progressive' policies in the embryonic republics were

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[1] For the European context, see W.F. Bynum, *Science and the Practice of Medicine in the Nineteenth Century* (Cambridge, 1994), which contains an invaluable bibliographical essay.

[2] The main exceptions were the damage inflicted on Cuba during the Second Cuban War of Independence (1895-8) and upon Paraguay and Bolivia by the Chaco War (1932-6).

aborted by poverty and civil war.[3] In Brazil a greater degree of political continuity permitted a series of modest social policy achievements that set a pattern of gradualism. But elsewhere the record was disappointing. It was only with the insertion of Latin America into the world economy after 1870 and concomitant processes of immigration, population growth and urbanisation, that public health acquired a particular salience. The main thrust of policy was to improve public hygiene and sanitation, especially in the cities. The beginnings of modern health policy were often simultaneous with the genesis of modern policing and detection methods, each being seen as means by which society would be sanitised in the name of progress.[4] Viewing public health provision as a form of policing that involved inspection and enforcement, civilian elites instigated the appointment of 'medical' and 'sanitary' police. While acknowledging public hygiene and sanitation policy

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[3] Thus, in Buenos Aires, the Protomedicato went into decline and the Junta de Sanidad was reduced to a board supervising port sanitation. The approval and re-validation of medical titles, the control of apothecaries, forensic investigations and port cleansing were all subject to political upheaval, fiscal crisis and shifting levels of concern among responsible bodies and individuals. One major consequence of warfare was the beginning of a hierarchy of military medical officers. Equipos de investigación histórica, *Buenos Aires 1800-1830,* tomo 2 *Salud y Delito* (Buenos Aires, 1977), esp. pp. 11, 20. Before the wars the impact of public health edicts, sometimes admirable in intention, that the Mexican viceregal authorities introduced, was nullified by incompetence among municipal authorities. Donald B. Cooper, *Epidemic Disease in Mexico City, 1761-1813, An Administrative, Social and Medical History* (Austin, Tx., 1965), esp. p. 188. See also John Tate Lanning (ed. John Jay LePaske), *The Royal Protomedicato: the regulation of the medical profession in the Spanish empire* (Durham, NC, 1985); David Goodman, 'The Scientific Revolution in Spain and Portugal', in Roy Porter and Mikás Teich (eds.), *The Scientific Revolution in National Context* (Cambridge, 1992), pp. 158-87. A smallpox epidemic had played a part in the crisis preceding the famous Comunero rebellion in El Socorro, New Granada, in 1781. Anthony McFarlane, *Colombia before Independence. Economy, Society and Politics under Bourbon Rule* (Cambridge, 1993), p. 252. Little of French investment in medical infrastructure, personnel and publication in Saint Domingue survived the Revolution. James E. McLellan III, 'Science, Medicine and French Colonialism in Old Regime Haiti', in Teresa Meade and Mark Waller (eds.), *Science, Medicine and Cultural Imperialism* (London, 1991), pp. 38-59.

[4] Lyman L. Johnson, *The Problem of Order in Changing Societies. Essays on Crime and Policing in Argentina and Uruguay, 1750-1940* (Albuquerque, NM, 1990), p. xiv.

as one of its tutelary functions, the state delegated to philanthropic agencies, pre-eminently the Roman Catholic Church, a dominant role in nursing and hospital care, where it had been influential since the sixteenth century.[5]

Between 1870 and the onset of the World Depression exposure to foreign models, more training of Latin American physicians in Western Europe and the United States, the impact of the early foreign missions (e.g. Pasteur, Rockefeller), and of international institutions like the League of Nations, combined with domestic pressures (an enlarged middle class, articulate elements in the labour movement, leaders of the military and business, and emergent strata of health professionals) to have a powerful and enduring impact. By the 1920s broader notions of public health policy began to supplant concepts of sanitation and hygiene in the richer Latin American countries. By the 1940s these ideas had penetrated central government agencies throughout the continent, so that in the mid-twentieth century most countries possessed at least the rudiments of a modern public health and social security system, although their substance was defective and the distribution of their benefits markedly uneven.

The economic crises of the World Depression and the Second World War challenged assumptions of a linear progress in health care as in other areas of the political economy. Various questions, which cannot be fully explored here, arise. How far did the World Depression constitute a watershed in social policy, and how far a point of clarification and reappraisal? How far did the hardship and suffering of the early 1930s give greater urgency to reform schemes mooted in the 1920s? To what extent did the Depression usher in a period of new social policies better adjusted to local conditions than earlier ones that emulated European models? The 1930s and 1940s were decades of experiments in social policy – some of them bold, pragmatic and altruistic – that ranged from the establishment of baby clinics and specialist cancer and cardiology services to modest urban public housing projects and early investigations of patterns of nutrition and the cost of living. Populist,

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[5] This was steadily eroded by an expansion of public hospital provision and the foundation of secular nursing schools between the 1910s and 1950s By the early 1940s the Catholic Church was unable to meet growing demand for hospital care and had done little to modernise nursing education, leaving space which the secular authorities and even Protestant missionaries sought to fill. Catholic conservatives complained of imperialist penetration by Presbyterians who built the American Hospital in Guatemala City. While expressing some sympathy for Protestant campaigns against alcoholism, prominent Catholics feared that these could undermine their networks of support and disrupt communal bonds, when they targeted *cofradías*. Nathan L. Whetten, *Guatemala – the land and the people* (New Haven, 1968), p. 308.

radical, liberal and some authoritarian conservative regimes conceived of health care projects as privileges useful in co-opting sections of organised labour and various occupational groups - the military, bureaucrats, schoolteachers - into the political order.

At the same time the notion asserted in the Mexican Constitution of 1917 that health care was an entitlement took root. Resistance came from some right-wing minorities, which perceived any moves beyond charitable provision as suspect and even 'populist'.[6] External forces, many of them emanating from the United States, reasserted themselves. In the 1930s and 1940s postgraduate training of physicians, public health specialists and then nurses in the United States and 'missions' by the Rockefeller Foundation to Latin America had by the 1940s a significant resonance, which was complemented by the power of international institutions, both permanent and ephemeral, like the Pan-American Health Organisation (PAHO, the International Labour Office (ILO) and the Pan-American Sanitary Bureau (PASB). Did international forces, both official and philanthropic, have the positive impact that they claimed? Or did they divert incipient health ministries from defining their own health care priorities to an agenda set from outside that distorted policy-making and budget allocations? The end of the Second World War was associated with a cautious optimism about the prospects of economic recovery for incomes and nutrition and a euphoria among health professionals about the discovery of penicillin. However, this optimism was qualified across Latin America by a greater alertness than before to disparities within the continent, notably the chasm between the 'European' levels of income and welfare pertaining in the cities of Buenos Aires and Montevideo and the 'sub-Saharan African' conditions prevalent in Haiti, and the gap between the dynamic manufacturing and coffee-exporting Centre-South of Brazil and the impoverished subsistence and semi-subsistence farming areas of the Nordeste. Issues of inequality by region, social class, ethnic group, age cohort, gender and the urban-rural divide, that had been incompletely appreciated before 1929 and had often been submerged amidst more generalised crisis between 1929 and 1945, became pressing in the health care sector, before Latin America was overtaken by the 'demographic explosion'. As the range of health issues was investigated by PAHO and other institutions, so their character changed, because another hasty transition occurred, from a continent with an overwhelmingly rural population in the 1930s to a predominantly urban population profile in the

[6] One example was *somocista* Nicaragua where in the early 1950s the World Bank warned that farm mechanisation and improved transport would bring about little increase in production without improvements in basic health and housing. IBRD (World Bank), *Economic Development of Nicaragua* (Baltimore, 1953), pp. 22-8.

1970s. New, more accurate tools of policy diagnosis were assembled, but precise prognosis and appropriate prescription became an increasingly hazardous task. New specialist institutions handling problems like cancer existed in several countries: but a transition in the function of the public hospital, still the health institution *par excellence*, from a 'waiting-room before death' to a place of therapeutic efficiency was far from complete.

Disease and public policy

For liberal, positivist and, in Mexico, nominally revolutionary governments, public health policy became an instrument for expanding the authority of the state, reconciling the growing middle class and elements of organised labour to notions of gradual and controlled change, and enlarging a technically proficient state apparatus in the face of persistent *caciquismo* and *coronelismo*. As nuclei of acknowledged expertise were formed in national capitals, the authority of the central state in health issues expanded at the expense of regional and local government. A new bureaucratic interest that demanded a degree of autonomy in the taking and execution of decisions was a force with which incoming governments had to reckon. Public policy in sanitation and hygiene played an essential part in strategies of export-led growth. Modernising elites looked to campaigns to 'eradicate' (or, more accurately, to 'control') specific diseases as vital means of enlarging the labour supply and alluring European immigrants. Some governments applied similar campaigns along the national frontiers in order to consolidate national markets and to enlist the loyalty of frontier populations to the central state.

Similar measures were taken in economically strategic areas of the tropical lowlands, such as oil-producing zones, in order to foster labour migrations from the highlands. By the 1890s policy was motivated in the Southern Cone and Brazil in large measure by a determination to lure European immigrants and to keep them.[7] Early *batllista* social policy in Uruguay – in health as in pensions and employment conditions – was predicated on the need to attract immigrants and integrate them, and not to lose them to Buenos Aires or from there to Australia or South Africa.[8] Commercial interests in Brazil, anxious that foreign ships would alter their schedules to stop only at Uruguay and Argentina, welcomed the imposition of sanitary reforms in Brazilian

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[7] Colin M. Lewis, 'Economic Restructuring and Labour Scarcity: Argentina in the 1920s', in Jeremy Adelman (ed.), *Essays in Argentine Labour History 1870-1930* (London, 1992), p. 193.

[8] M.H.J. Finch, *A Political Economy of Uruguay since 1870* (London, 1981), pp. 24, 40, 47.

seaports. Argentine business interests were alarmed when epidemics of smallpox and typhus, economic depression and a violent uprising by the Unión Cívica Radical (UCR) combined in 1890 to cause a net loss of immigrants for the first time in the history of the city of Buenos Aires.[9] By the 1890s governments in Brazil, Argentina and Uruguay recognised that extemporised responses to recurrent crises did not suffice, that preventive action was more effective and often less costly than curative, and that a corps of permanent expertise was needed to formulate policy on hygiene and sanitation and to handle problems of endemic and epidemic disease. By the 1920s most other governments in Latin America shared these views. Externally, hygiene and sanitation measures were useful in projecting an image of modernity and salubriousness to woo foreign investors and merchants, and, from the 1900s in the Caribbean, tourists. Domestically, the same measures were valuable to project a semblance of ordered benevolence, and also to instil social discipline among resident and migrant populations. To military and ecclesiastical uniforms was added the uniform of the white coat. It was no coincidence that in Latin America as in Europe religious and military metaphor was endlessly repeated, with references to hygiene 'campaigns', sanitary 'brigades' and 'crusades', and health 'missions'.

The impetus to a modern public health policy came from diverse quarters. One was war. Soldiers returning from the Paraguayan War (1864-70) brought cholera to Buenos Aires, precipitating the imposition of quarantine measures; nevertheless, 1,500 died. The Peruvian government equated preventive action with patriotic zeal: afraid of outbreaks of smallpox during the War of the Pacific (1879-83) against Chile, the Peruvian authorities gave a prize each year to a physician who excelled in propagating the merits of regular revaccination.[10] In Colombia the Leticia War against Peru gave an impetus to the reform of the health apparatus of the military in the mid-1930s.[11] In Mexico in 1921 civil war, especially the religious confrontations in Jalisco and Colima that preceded the *Cristero* revolt, increased the number of yellow-fever cases in 1921, which 'Rockefeller doctors' then tackled. War

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[9] Julia Kirk Blackweller, 'Urbanization, Crime and Policing: Buenos Aires, 1880-1914', in Johnson (ed.), *The Problem of Order...*, pp. 79-82.

[10] Juan B. Lastres, *La salud pública y la prevención de la viruela en el Perú* (Lima, 1957), p. 208. The *médico-higienista* José Casimiro Ulloa, who reorganised the medical services during the war against Chile is recalled as a national hero. *Ibid.*, pp. 210-6.

[11] Christopher Abel, *Health Care in Colombia c.1920-c.1950. A Preliminary Analysis*, Institute of Latin American Studies, Research Papers 36 (London, 1994), *passim*.

and revolution probably enhanced the reputation of the medical profession, enabling it to play a major part in the task of post-revolutionary pacification.[12] The medical profession and new medical technology were lauded, and indeed, in the paintings of the leading revolutionary artist Diego Rivera, celebrated (e.g. *Vaccination*, 1932).

The outstanding example of health changes induced by warfare was Cuba. During the Second Cuban War of Independence (1895-8) disease spread unchecked in occupied towns where troops were billeted, and again as conscripts and rebels returned to their homes. The *concentraciones* of rural populations in urban centres, part of the unsuccessful strategy of General Valenciano Weyler to defeat the rebels, exacerbated problems of hunger and dietary deficiencies, and reinforced Cuba's overseas reputation for high mortality and morbidity rates. Rampant famine and pestilence caused the death rate to soar from about 30 per 1,000 in 1895 to 72 per 1,000 in 1899.[13] The first US occupation government applied draconian public health measures in order to make the island 'safe' for metropolitan investment and to encourage peninsular immigrants. Strict regulations for burial and the quarantine of international travellers were applied; establishments selling and preparing food were inspected and regulated; and the Yellow Fever Commission ordered the draining of swamps, the 'petrolisation' of stagnant ponds and puddles, and the use of insecticide. In 1902 not one new case of yellow fever was reported. Since the mosquito carrying malaria was often the same as that carrying yellow fever, the number of new victims of malaria fell too.[14] Early twentieth century public health policy was so successful that mortality rates compared favourably to Southern Europe by the 1910s, and Cubanophils in Spain praised the good health record of the Cuban Republic.[15]

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[12] Solorzano Ramos, 'The Rockefeller Foundation...', *passim*.

[13] Nicolás Sánchez-Albornoz, *The Population of Latin America. A History* (trans. W. Richardson)(Berkeley, Cal., 1974), pp. 166, 173.

[14] Jorge Díaz Briquets, *The Health Revolution in Cuba* (Austin, Tx., 1983), esp. pp. 13, 32, 321; Nancy Leys Stepan, 'The interplay between socio-economic factors and medical science: Yellow Fever Research', *Social Studies of Science*, vol. 8, 1978, pp. 379-424.

[15] Jorge Le-Roy y Cassá, *Inmigración anti-sanitaria* (Havana, 1927); Fernando Ortiz, *Hampa afro-cubana. Los negros brujos* (Havana, 1979), p. 15. Contrast Peru, where in spite of the work done by itinerant vaccinators authorised to work outside Lima from 1847, a noisy polemic about the relative merits of vaccines imported from Argentina and Britain, the

In peacetime ideology and the interests of governing elites converged upon the formulation of effective public health policy. Aiming to evolve social policies that facilitated an expansion of the market economy, self-consciously 'enlightened' elites that identified with Western Europe and then the United States played a major part in promoting policies of public health and sanitation. Mexico exemplified the ways in which positivist thinking came first to infuse medical education and then to have a broader impact. Anxious to implant the most 'modern' ideas - scientific and educational as well as political and economic, national elites warmly embraced infusions of science. The first prominent positivist in Mexico, Pedro Contreras Elizalde, who had associated with Comte's disciples in Paris, held chairs in medicine in Mexico City and Guanajuato as early as the late 1850s and 1860s. Just as positivists prescribed a 'scientific politics' that released the state and the citizen from theology and superstition, so too they argued for the emancipation of all branches of education from the tutelage of the church. During the late 1870s Mexican medical students debated the aims and content of the curriculum, the relative merits of education and instruction, and the relationship of higher education and the state. A group of graduates, mainly physicians, from the prestigious Escuela Preparatoria formed the Asociación Metodófila Gabriel Barreda, which discussed Darwin's biological theories, sought to apply the rigorous logic of scientific method to all kinds of phenomena, and shaped an intellectual environment responsive to Social Darwinism.[16]

Mexican positivists, who debated whether Mexico was yet ready for a 'scientific priesthood' (or Comtean meritocracy), and who adapted Spencerian maxims to national circumstances, puzzled whether the 'redemption' of the Amerindian should be left to natural evolutionary forces, and considered in detail such questions as whether the dental structure of the Amerindian indicated an advanced evolution.[17] However, as Thomas F. Glick stresses,

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transformation of an Establo Vacinal into the Instituto de Vacuna in 1896, and collaboration from the ministers responsible for the army, navy, police and education in the task of vaccinating public employees, a smallpox epidemic raged in 1914. Lastres, *La salud pública...*, esp. pp. 220-5.

[16] It also helped place obligatory primary education on the statute book in 1888.

[17] Charles A. Hale, *The Transformation of Liberalism in Late Nineteenth Century Mexico* (Princeton, N.J., 1989).

positivism in Latin America preceded the experimental sciences.[18] Injections of scientific method and a smattering of scientific knowledge among rarefied minorities gave rise to polemics about 'scientific politics', 'scientific racism' and, later, 'scientific philanthropy'. These were circumstances in which medical professionals, dazzled by scientific and material progress, formed incipient public health 'movements' with allies in business, government and the professions, who were anxious to create 'civilised cities'. While medical elites gave public endorsement to new drugs peddled by German, French, British and US pharmaceutical enterprises, medical academies performed a didactic and consultative role, and endeavoured to establish an informed public opinion on public health issues, and published specialist periodicals for professionals.[19] Yet poverty and underdevelopment precluded the formation of more than a rudimentary research environment in the sciences, just as they limited the nationwide implementation of costly public health measures.

In several countries, most significantly Argentina and Mexico, socialists and radicals went further than positivists in pressing for change. Emulating their European counterparts Socialist intellectuals in Argentina called for changes in medical studies, in particular, in the 1920s stressing the need to study the environment of the patient and not only his/her medical condition. Socialists in charge of the Industrial Hygiene Section of the National Department of Hygiene and the Criminology Institute pressed for a greater awareness of social medicine and occupational diseases.[20] In the 1930s Mexican radicals went further. A Six-Year Plan of Health Organisation undertaken in 1935 budgeted for an extension of the public water supply in rural areas, and for health education manuals, pamphlets and recorded

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[18] Thomas F. Glick, 'Science and society in twentieth century Latin America', in Leslie Bethell (ed.), *The Cambridge History of Latin America. Volume VI: Latin America since 1930. Economy, Society and Politics. Part I. Economy and Society* (Cambridge, 1994), pp. 463-524.

[19] Luis Antonio de Castro-Santos, 'Power, ideology and public health in Brazil, 1889-1930', (unpub. Ph.D. thesis, Harvard Univ., 1987) esp. pp. 39-40.

[20] Positivists and socialists alike praised the merits of preventive action against venereal diseases and tuberculosis, as well as extolling the benefits of sports and cycling. Edward A. Zimmermann, 'Intellectuals, Universities and the Social Question in Argentina, 1898-1916', in Jeremy Adelman (ed.), *Essays in Argentine Labour History, 1870-1930* (London, 1992), pp. 199-216.

messages heard on phonographs in both Spanish and Maya.[21] From 1936 Mexican radicals debated vigorously whether rural physicians should be given a special training that was consonant with the agrarian aims of the Revolution. At UNAM (the National Autonomous University of Mexico) a five-month compulsory experience of working in a rural community before graduation was launched. The National Polytechnical Institute went further, introducing a full five-and-a-half-year teaching programme adapted to rural conditions, that included some study of social anthropology, and that produced its first graduates in 1947. This initiative was attacked for ideological reasons, because the promotion of 'socialised medicine' and even of communal responsibility ran contrary to ingrained individualistic traditions within the medical profession. Practical difficulties arose too, regarding admissions, training and the duplication of facilities.[22]

Official initiative was accompanied and sometimes preceded by business initiative. Some international enterprises came to recognise the benefits of company expenditure on rudimentary health care and a clean water supply, together with some cheap but sanitary housing provision, as means of assuring a continuous supply of skilled labour and of forestalling state interference. The British-owned Antofagasta (Chili) and Bolivia Railway Company provided medical services with a British doctor and nurses for British employees, and expanded its services with Chilean doctors to cover Chilean and Bolivian employees in the face of outbreaks of bubonic plague, malaria and typhoid, as well as problems of alcoholism and rail accidents. The company contributed funds, that complemented financing from the Chilean government, for the construction of a hospital by the Junta de Beneficencia (Charity Board) of the town of Antofagasta.[23] The US conglomerate, the United Fruit Company (UFC), which was the seventh largest *latifundista* in Cuba before the Revolution of 1959, established a clean water supply and hospital services with workers' housing – action consistent with the reformist legislation of the abortive revolution of 1933-4; but the UFC

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[21] Anne-Emanuelle Birn, 'Local health and Foreign Wealth: the Rockefeller Foundation's Public Health Programs in Mexico, 1924-1951' (unpub. Ph.D . thesis, Johns Hopkins University, 1993), esp. p. 259. Mexican public health priorities were persuasively outlined as early as 1916 by Alberto Pani (trans. Ernesto L. de Gogorza, *Hygiene in Mexico: A study of Sanitary and Educational problems* (London, 1917).

[22] Nathan Whetten (with foreword by Manuel Gamio), *Rural Mexico* (Chicago, 1948), esp. p. 347.

[23] Harold Blakemore, *From the Pacific to La Paz. The Antofagasta (Chili) and Bolivia Railway Company 1888-1988* (London, 1990), esp. pp. 69, 72.

resisted political pressure for moving beyond low-cost to high-cost welfare provision.[24] By the 1950s the two hospitals owned by United Fruit were among the best in Guatemala; other large plantations did not provide for their employees more than a periodic visit from a doctor in a nearby town.[25] In the Colombian banana zone such devices of labour management as hospital provision for workers failed in the late 1920s to prevent protests or to mitigate resentment at an alliance between the company and the military.[26]

Some national enterprises and immigrant groups took similar initiatives. The powerful Aspillaga family in Cayaltí, Peru, evolved an embryonic managerial philosophy, which included an acknowledgement of the advantages of extending some free medical services to reduce labour costs. Experiments in health attention to Chinese contract labour were extended to other groups.[27] Meanwhile, European immigrant entrepreneurs and professionals, like the German Welfare Association in Buenos Aires and voluntary groups of Asturians, Catalans and migrants from other Spanish regions, opened clinics and organised some medical assistance for contributors to voluntary schemes. Health, hygiene and sanitation conditions played a crucial part in the early labour movements. In Buenos Aires in 1870 one prerequisite of membership of the printing craftsmen's Sociedad Tipográfica Bonaerense, founded in 1859, was a medical examination to assess the health of the applicant and to determine the absence of chronic disease. From the 1860s funds to help members in the event of illness or death were available.[28] However, only with incipient industrialisation did questions of environmental and occupational health contribute to a growth in urban labour militancy. Meat-packing factories in Buenos Aires exposed workers to numerous hazards - alternations between extreme temperatures (chilling

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[24] Various authors, *United Fruit Company: un caso del dominio imperialista en Cuba* (Havana, 1976), pp. 88, 177.

[25] Lowry Nelson, *Guatemala, the Land and the People* (New Haven, 1961), p. 232.

[26] Judy White, 'The United Fruit Company in the Santa Marta Banana Zone, Colombia: Conflicts in the '20s' (unpub. B. Phil. thesis, Oxford University, 1971).

[27] Michael J. González, *Plantation Agriculture and Social Control in Northern Peru, 1875-1973* (Austin, Tx., 1985), pp. 154-9.

[28] Silvia Badoza, 'Typographical Workers and their Mutualist Experience: the Case of the Sociedad Tipográfica Bonaerense, 1857-80', in Adelman (ed.), *Essays in Argentine Labour History...*, pp. 72-90.

rooms and boiling sectors), humidity, the use of chemicals that caused welts and sores, the handling of diseased animals, and wet, bloody, greasy floors. Work accidents and amputations occurred because of the use of cutting instruments; and acid fumes caused respiratory diseases. Though not diagnosed as such in the early twentieth century, it seems likely that brucellosis was commonplace.[29]

The impact of public health policy was uneven by region and sector. The expansion of ameliorative measures seldom equalled the expansion of health problems, especially those arising from market growth, the sudden exposure of remote populations to diseases to which they had no immunity, and the migrations of workers between epidemiological zones. In the late nineteenth century Liberal governments maintained the practices of the Jesuit missions of concentrating once dispersed Amerindian populations into central settlements, which exposed them to unfamiliar diseases. In Mozos in the Upper Amazon region of Bolivia, epidemic, reinforced by attacks on communal property, the displacement of the handicraft industry, a growth in disease among livestock and migrations to the new cash-cropping rubber producing zones, caused population decline between 1867 and 1880.[30] Later, railway construction in Mexico - the building of embankments and irrigation ditches - intensified health problems by causing floods, contamination of the water supply and the creation of breeding sites for mosquitoes. Railway construction - the building of embankments and irrigation ditches - intensified health problems by causing floods, contaminating the water supply and creating breeding sites for mosquitoes. During the Mexican Revolution of the 1910s railways accelerated the movement of yellow fever, prompting the United States to express concern at lack of sanitary inspection along the Mexican frontier.[31] Troop mobilisations during the Revolution alerted army doctors, hospital personnel and President Alvaro Obregón to the desirability

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[29] Mirta Zaida Lobato, 'Work and Conflict in the meat-packing industry, 1900-1930', in Adelman (ed.), *Essays in Argentine Labour History...*, pp. 112-41.

[30] David Block, *Mission Culture on the Upper Amazon. Native Tradition, Jesuit Enterprise and Secular Policy in Mozos, 1660-1880* (Lincoln, Neb., 1994), pp. 120, 167, 179.

[31] Armando Solorzano Ramos, 'The Rockefeller Foundation in Mexico: Nationalism, public health and yellow fever (1911-1924)' (unpub. PhD thesis, Univ. of Wisconsin, 1990), p. 106; Anne-Emanuelle Birn, 'Local health and foreign wealth: the Rockefeller Foundation's public health programs in Mexico, 1924-1951', (unpub. PhD thesis, Johns Hopkins University, 1993), p. 8.

of diffusing preventive vaccines and immunisation techniques. Similarly, the expansion of the sugar-cane economy in Puerto Rico during the 1900s and 1910s and the concomitant decline of the coffee sector meant that return migrants from the sugar-cane producing lowlands carried malaria to the once coffee-producing highlands.[32] As late as the 1950s returning seasonal workers from the lowland plantations of Guatemala carried malaria parasites in the bloodstream that the bite of a mosquito could transmit to other highlanders.[33]

Frontier areas, without traditions of philanthropy or presence of health professionals, could be especially risky. In the early twentieth century the nitrate towns of the northern Chilean frontier lacked the modern hospitals, sewer and water systems that Santiago and some provincial capitals possessed. Health deficiencies exacerbated by bad housing conditions (the nitrate encampments consisting of shacks built from scraps of lumber and old nitrate bags), rendered their inhabitants victim to outbreaks of bubonic plague.[34] In frontier zones state capitalism was at times no more socially concerned than international capital, and could afford to be less so, because the state was both employer and arbiter. Twenty-three years elapsed between the discovery of oil in Patagonia in 1907 and an attempt to adopt a coherent social policy for the remote Argentine settlement of Comodoro Rivadavia. Labour militancy culminated in the strike of 1917, during which the oil workers fought for the introduction of medical and accident insurance, an adequate water supply, housing to replace the barracks and shacks where parasitic insects that caused purulent ulcers flourished, and food at affordable prices. An endemic water crisis was not resolved till 1920. Only belatedly did the Argentine state acknowledge in the oil zone what in the city of Buenos Aires it had long recognised: the link between social policy and a malleable labour supply.[35]

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[32] Victor S. Clark et al., *Porto Rico and its problems* (Brookings Institution, Washington D.C., 1930), pp. 55-71.

[33] In spite of a downward trend in the death rate, from 24.8 per 1,000 inhabitants in 1940 to 20.6 per 1,000 in 1955, Guatemala still had one of the world's highest death rates. Compare 13.3 per 1,000 inhabitants in Mexico in 1955 and 14.8 per 1,000 in Ecuador in the same year. Nathan L. Whetten, *Guatemala- the land and the people* (New Haven, 1961), p. 212.

[34] Michael Monteón, *Chile in the Nitrate Era. The evolution of economic dependence, 1880-1930* (Madison, Wis., 1982), pp. 60, 90-1.

[35] Carl E. Solberg, *Oil and nationalism in Argentina. A history* (Stanford, 1979), esp. pp. 97-8.

Inflexible attitudes that antedated the era of *desarrollo hacia afuera* often outlived the genesis of a modern public health policy. Scapegoating, apathy, panic and temporary movements of population from infected to salubrious areas were commonplace responses. Scapegoating was one way of handling epidemic. Immigrants, pilgrims, refugees and nomads made convenient scapegoats. Italian immigrants were accused of importing the nationwide cholera epidemic to Argentina that killed 400-500 people in Salta alone in 1886-7.[36] Portuguese and Italian immigrants, the victims of overcrowding, food inadequacies and poor sanitary facilities in the hostels of the Brazilian port of Santos, were readily scapegoated.[37] German immigrant professors were blamed by Chilean clericals for high beer consumption and alcoholism in Santiago.[38] Chinese contract labourers and their descendants in Cuba were held responsible for drug addiction. And during the early twentieth century Haitian and Jamaican black labour in Cuba became scapegoats for malaria, smallpox and other diseases. Indeed, the apparent association of black labour with particular diseases was used as part of the case for promoting white immigration; and a 'black scare' was probably orchestrated from the presidential palace in Havana in order to raise the price of permits to import black contract labour from Haiti and the British West Indian colonies. Disease provided a rationale for racism that concealed the irony that the quinquennium of the greatest reduction in the Cuban mortality rate (1920-5) was that of greatest Haitian and Jamaican immigration.[39]

Poor women also made convenient scapegoats. Imported from Madeira and the Azores out of a fear of the growth of homosexuality among Portuguese immigrant clerks and shop assistants, prostitutes were victimised for

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[36] James R. Scobie (completed and ed. Samuel L. Baily), *Secondary Cities of Argentina. The Social History of Corrientes, Salta and Mendoza, 1850-1910* (Stanford, 1988), p. 97.

[37] Thomas H. Holloway, *Immigrants on the Land. Coffee and Society in São Paulo, 1886-1934* (Chapel Hill, NC., 1980), esp. p. 153.

[38] Carl Solberg, *Immigration and Nationalism. Argentina and Chile. 1890-1914* (Austin, Tx., 1970), esp. pp. 77-8.

[39] Juan Pérez de la Riva, 'Cuba y la migración antillana 1900-1931', in *La república neocolonial. Anuario de estudios* Tomo II (Havana, 1979), pp. 1-76.

transmitting venereal diseases into the 'bosoms of families' in Rio de Janeiro.[40] Wet-nurses and unlicensed midwives suffered similarly. In Rio in the 1850s they were seen as figures of nurture and care; but by the 1890s their image among the upper class had altered radically. The spectre of transmission from the urban slums of syphilis, tuberculosis, yaws and elephantiasis through the body's milk to the baby haunted the *carioca* upper class, generating pressure for the medical examination of wet-nurses. By 1908 wet-nurses came to see that medical examination was useful because they could claim to be professionally certified.[41]

Apathy was commonplace too. At the beginning of the nineteenth century 'enlightened' Spanish colonial administrators sent the Expedition of the Vaccine to Venezuela, Puerto Rico and elsewhere to vaccinate adults and children with Jenner's vaccine against smallpox. A lack of medical practitioners and good roads and the awkwardness of the method of vaccination made it necessary to keep part of the susceptible population unprotected so that the supply of fluid could be maintained by the chain of vaccination. Thus the unvaccinated and the inadequately immunised population became infected when a case of smallpox was introduced to Puerto Rico.[42] In spite of the possibility of Spain concentrating her energies on Cuba and Puerto Rico after the loss of her other American colonies, various smallpox epidemics occurred in both islands between the 1830s to the 1890s.[43] The official response was an unenlightened indifference that was so complete that the Expedition of the Vaccine was not part of the collective memory in Puerto Rico by 1930, the year of the report on the island by the prominent think-tank, the Brookings Institution, which asserted that there had been no public health measures in Puerto Rico before the arrival of the US Navy in 1899.[44]

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[40] Luiz Carlos Soares, *Prostitution in Nineteenth Century Rio de Janeiro* (University of London, Institute of Latin American Studies, Occasional Papers 17) (London, 1989), p. 9.

[41] Sandra Lauderdale Graham, *House and Servant. The Domestic World of Servants and Masters in nineteenth century Rio de Janeiro* (Cambridge, 1988), esp. pp. 15, 132.

[42] José G. Rigau-Pérez, 'The Introduction of Smallpox Vaccine in 1803 and the Adoption of Immunization as a Government function in Puerto Rico', *Hispanic American Historical Review* (1989), pp. 393-424.

[43] Julio le Riverend, *La Habana* (Madrid, 1993), *passim.*

[44] Clark et al., *Porto Rico...*, pp. 55-71.

Temporary migrations of prosperous minorities constituted another response to disease. When disease loomed in the cities the solution of the upper classes was to 'summer' elsewhere: the *carioca* upper class went out from the city of Rio de Janeiro to the hill-towns, like Petrópolis; that from Salta in North-west Argentina to visit the mineral baths at San Lorenzo.[45] The upper class had a special fear of tuberculosis, as a social leveller that afflicted all social classes, nationalities and ethnic groups. One extreme response was to welcome disease and, indeed, to invite more when epidemic disease hit immigrants, but barely touched largely immune local populations. Thus 'Our good friend', yellow fever, 'the true, perhaps the only, patriot of the empire' was welcomed in the mid-nineteenth century by some Brazilians because it killed off so many Portuguese.[46] Similarly, nationalist Mexican physicians, hostile to the yellow fever campaigns conducted by the Rockefeller Foundation in the early 1920s, contended that 'The fever that devastates us is not just yellow but golden. It is not stegomyia that produces the virus, but the Oil Companies and the institutions working with them, not in the form of mosquitoes but in the form of doctors...'.[47]

The overall picture was uneven. By the World Depression most Latin American governments possessed the knowledge and the basic competence to confront the most acute problems of epidemic and to handle those endemic diseases which were believed 'controllable'. Imbued with positivistic and progressive (and, in places, radical and socialist) ideas, the medical profession and the public health apparati usually received the collaboration of national policy-making elites as well as much of international and national business and the early trade unions. However, the risk of breakdown and decomposition of the state, as highlighted by the Mexican Revolution, remained. Efficacy at national level was not always complemented by efficiency at state/departmental or city level or in strategically located sea and river ports. Obsolete responses to outbreaks of disease proved as resilient as other archaic features of Latin American societies.

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[45] James Scobie, *Secondary Cities of Argentina*, p. 99; Jeffrey E. Needell, *A Tropical Belle Epoque. Elite Culture and Society in turn-of-the-century Rio de Janeiro* (Cambridge, 1983), p. 149.

[46] June E. Hahner, *Poverty and Politics. The Urban Poor in Brazil, 1870-1920* (Albuquerque, NM., 1969), p. 142.

[47] Cited in Solorzano Ramos, 'The Rockefeller Foundation in Mexico...', p. 187.

External Forces and Domestic Influences

The insertion of Latin America into the international economy meant that external forces played an important part in shaping Latin American policies in hygiene and sanitation. Overseas charitable agencies, official missions commissioned by governments in developed countries and US philanthropic foundations all played a part. The British, the leading external influence in most of Latin America till the First World War, played a small part in influencing trends in health issues, as was illustrated by the work of the National Vigilance Association. The French, who exercised a profound influence in medical education and tropical medicine, played a more important role that was exemplified by the export of a mission of scientists from the Institut Pasteur founded in 1885 to Rio de Janeiro. The United States countered French influences, and displaced them finally following the Fall of France in 1940. The work of the Rockefeller Foundation missions consolidated an informal philanthropic presence in numerous countries. A shift from France as the main external force in health issues to the United States was symbolised by the experience of the Panama Canal between the 1880s and 1920s.

A successor of the British voluntary agencies that combated the international trade in black slaves, the National Vigilance Association, struggled against the 'white slave' trade, especially in Argentina,[48] sponsoring an anti-white slavery conference in 1899. The Association became inescapably involved in debates about how best to confront venereal diseases. Should legal bordellos, supervised by police and medical personnel, be allowed, perhaps even encouraged? In Buenos Aires advocates of licensed prostitution claimed, echoing European debates, that it could reduce venereal infections among troops and other vulnerable male youth, prevent the birth of defective children, compensate for the failure of philanthropic organisations to find work for poor mothers, promote better health practices among the poor, and create new sources of municipal revenue. During the polemics of the 1890s and 1920s British women philanthropists, struggling against prostitution whether licensed or not, sponsored moral reform movements to protect European women ensnared by the 'white slave trade', and pressed the League of Nations to take energetic action. Singleminded in its concern for European prostitutes, the Association was open to charges of a racist indifference to the plight of Argentine prostitutes and those distant from the port of Buenos Aires, and also a lack of concern for Latin American prostitutes recruited to

[48] Victor Hugo coined the term.

work in Europe.[49] The impact of the National Vigilance Association was limited. The debate about the 'white slave trade' indicated the fragility of British philanthropic pressure in an increasingly self-confident sovereign republic, where the Association built few durable alliances with national political parties, professional groups and business elites, where British diplomats and businessmen had very different priorities, and where medical professionals debated the merits of licensed prostitution rather then its total abolition.

Official pressure exerted by France upon Brazil had more significance than philanthropic pressure upon Argentina from Britain, largely because a French mission to Rio de Janeiro secured allies among *carioca* professional elites and elements in federal government by being identified with science and progress. In the 1890s discoveries by the first generation of Brazilian semi-selftaught bacteriologists were not recognised in Paris, because they did not conform to strictly professional criteria: caution in building experimental systems, care in repeating experiments, and patience in performing necessary controls before publishing conclusions. Brazilian scientists wanted French endorsement and support; and the French wanted a locale in the tropics where they could mount experiments in collaboration with a nucleus of capable local scientists. The Pasteur mission went to Rio de Janeiro in 1901, and played a vital part in raising levels of science and establishing a high degree of professionalism in bacteriology (especially studies of yellow fever) and tropical medicine. Composed of bacteriologists from the Pasteur Institute with experience in the French Asian and African colonies, China and Portugal, the mission was financed by the French government, following merchant pressures on the Chamber of Deputies. Afraid of the damage to imperial trade that long quarantine periods in the tropics caused, French merchants wanted the government in Paris to evaluate the recommendations of the mission led by Walter Reed to Cuba.[50] In 1902-3 the Pasteur Mission gave Brazilian scientists the recognition they desired by confirming that Adolfo Ruiz had successfully induced yellow fever in three healthy volunteers by bites of infected Stegomyia mosquitoes at the isolation hospital in São Paulo. The Mission also met the anxieties of French merchants by recommending that strict sanitary measures aimed at preventing the transmission of contaminated mosquitoes and their eggs and larvae between ports be

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[49] Donna J. Guy, *Sex and Danger in Buenos Aires. Prostitution, Family and Nutrition in Argentina* (Lincoln, Neb., 1991; Guy, 'Medical Imperialism gone awry: the campaign against legalized prostitution in Latin America', in Teresa Meade and Mark Walker (eds.), *Science, medicine and Cultural Imperialism* (London, 1991), pp. 75-94.

[50] On the Reed mission, see below, pp. XXXXX.

applied, while unnecessary quarantines were relaxed.[51] The Pasteur mission had the effect of both reinvigorating Brazilian scientific expertise and consolidating links between Brazil and France in the experimental sciences, public health policy and postgraduate medical education.

Official French missions to Latin America were complemented and rivalled by US philanthropic missions. Vaunting itself as the vanguard institution of international 'scientific philanthropy', the Rockefeller Foundation played an important role in various countries - Brazil, Mexico, Colombia, Chile, Puerto Rico, Jamaica, Peru and elsewhere - from the First World War. The International Health Board/Division (IHB/D)[52] of the Foundation diffused an ideology of professionalism, and aimed to secure the recognition and support of power elites and the confidence of public opinion.[53] The IHB/D created health institutions that had clear lines of responsibility and issued standardised reports. It founded organisations to combat targeted diseases, like hookworm, and public health laboratories that identified the microscopic organisms that caused infection and sometimes evolved into broader public health services. Underlying the export of public health measures was, as Anne-Emanuelle Birn stresses, the export of assumptions of 'Western' science regarding care, repair and pain mitigation and an ideological and philosophical orientation that stressed a Cartesian duality between the mind and the body, a mechanistic view of the body and an allopathic duality between prevention and cure.[54] Beginning from an assumption that the promotion of the highest quality of scientific research was linked with making the greatest progress in preventing disease, the IHB/D fostered the training of Latin Americans in the United States, and gave a stimulus to the diffusion of medical knowledge; and the IHB/D placed a special stress on epidemiological activities, that included enquiries into public health administration. From 1921 the Foundation funded scholarships for Mexican medical students to attend Johns Hopkins University, and financed the

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[51] Ilana Lowy, 'Yellow Fever in Rio de Janeiro and the Pasteur Mission (1901-1905): the transfer of Science to the Periphery', *Medical History*, vol. 34, no. 2, Apr. 1990, pp. 144-63.

[52] The name became IHD from April 1927. However, for clarity, all references in this paper will be in the form IHB/D.

[53] E. Richard Brown, *Rockefeller Medicine Men. Medicine and Capitalism in America* (Berkeley, 1979), esp. pp. 18-24.

[54] Anne-Emanuelle Birn, 'Local Health and Foreign Wealth: the Rockefeller Foundation's Pubic Health Programs in Mexico, 1924-1951' (unpub. PhD thesis, Johns Hopkins University, 1993), esp. p. 13.

Spanish translation and edition of the *Journal of the American Medical Association*. Stereotyping French cultural influence as responsible for neglect of experimental science, part-time magisterial teaching and an overemphasis on verbal expression, the Foundation promoted changes in medical and nursing education and midwifery training and practice.[55] The IHB/D diffused research findings and financed vital personnel, such as two leading Cuban epidemiologists who conducted early work against yellow fever in the Yucateño town of Mérida, an epidemic centre seen as a menace to the ports of Cuba, Mexico and Central America. In 1923 the Foundation assisted a campaign involving the screening of houses, petrolisation and the use of fish that was intended to 'eradicate' yellow fever from the Mexican regions of Yucatán and Campeche. This campaign had a particular symbolic resonance in much of Mexico, because the spread of yellow fever was believed to have been the cause of the decline of the Mayan civilisation.[56]

The presence of the IHB/D in Latin America was not unambiguous. Aligning its priorities with those of the 'international scientific community', the Foundation set out to foster a climate sympathetic to foreign investment and international trade, rather than specifically to back the interests of the Rockefeller empire. Projecting its work as authoritative, rational and as a force promoting social harmony, the Foundation was careful that the formulation and execution of its programmes should not slip from the hands of a manifestly undemocratic group of professional managers.[57] In the inter-war period various of the employees of the IHB/D, imbued with a condescension born of 'scientific racism', treated Latin Americans as victims of 'extensive biological dilution of the European race'. Foundation personnel began from blinkered assumptions that the indigenous populations were

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[55] Marcos Cueto, 'Visions of Science and Development. The Rockefeller Foundation's Latin American Surveys of the 1920s', in M. Cueto (ed.), *Missionaries of Science. The Rockefeller Foundation and Latin America* (Bloomington, Ind., 1994), pp. 1-22. The claim of the United States to superior 'science' in midwifery was especially specious. Whereas Spain began to regulate midwifery in the empire during the eighteenth century, and various European countries trained midwives and integrated them into health-care arrangements, no such systematic drive occurred in most of the United States, where some state medical services allowed the medical profession to 'commandeer' the practice of obstetrics and recommended a general ban on midwifery. Birn, 'Local Health and Foreign Wealth', pp. 196-7.

[56] Solorzano Ramos, 'The Rockefeller Foundation...', pp. 156, 221, 339.

[57] Robert Arnove (ed.), *Philanthropy and Cultural Imperialism: the Foundations at Home and Abroad* (Boston, Mass, 1980), *passim*.

morally and scientifically backward, and, that contrary to archaeological evidence of Aztec cultures, notions of sanitation, disease control and personal cleanliness, were alien to them.[58]

The Foundation met with a wide diversity of response. In the 1920s the IHB/D expected to encounter the resistance of the monopolist of national philanthropy in Colombia, the Roman Catholic Church; it found, however, only collaboration, until it backed lay nursing initiatives against the religious orders in the 1940s.[59] During the 1920s the IHB/D met in Colombia with a blind faith in the benefits of US friendship, while in the 1930s it experienced a trend towards pragmatic nationalism.[60] In Brazil the IHB/D encountered much sympathy among the nuclei of modern public health expertise, together with some suspicion that the Foundation constituted the 'advance guard' of imperialist penetration, and some concern when it proposed technical rather than politically acceptable solutions. Foundation employees rejected, for example, fumigation practices against yellow fever, that they regarded as political showpieces which concealed management deficiencies, and pressed to replace them with less politically appealing but more persistently intrusive anti-larval work, like control of mosquito breeding places.[61] In Argentina the IHB/D came up against the relentless opposition of Peronism in the late 1940s and 1950s, and gradually withdrew its support from the work of the Nobel Prize-winning physiologist, Bernard Houssay, as he approached retirement and his more distinguished associates died or retired.[62]

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[58] Birn, 'Local health and Foreign Wealth', esp. p. 94.

[59] Compare Peru, where the Daughters of Charity and the Sisters of St. Joseph of Cluny pioneered hospital attention, but where in Lima a crisis in the religious life from the mid-1820s was an endemic problem. Jeffrey Kleiber, S.J., *The Catholic Church in Peru, 1821-1985 A Social History* (Washington, D.C., 1992), pp. 23, 82, 135. The Daughters of Charity earned the sobriquet 'God's Geese' from their large, winged coifs.

[60] Abel, *Health-care in Colombia...*, *passim*.

[61] Steven C. Williams, 'Nationalism and Public Health. The Convergence of Rockefeller Technique and Brazilian federal Authority during the time of Yellow Fever, 1925-30', in Cueto (ed.), *The Rockefeller Foundation...*, pp. 23-51.

[62] Cueto, 'The Rockefeller Foundation's medical policy and Scientific Research in Latin America. The Case of Physiology', in Cueto (ed.) *The Rockefeller Foundation...*, pp. 126-43.

In Mexico the IHB/D met with pragmatic nationalism, a strong xenophobia and a cordial welcome, according to the timing of its arrival and local conditions. The IHB/D believed that Mexico could follow the US model for the control of hookworm, because the Mexican government was organised along tripartite lines, with responsibilities divided between the federal, state and municipal governments. Aiming at a discreet anonymity during anti-hookworm campaigns in 1923, the Foundation was especially careful not to be overidentified with the United Fruit Company or the Aguila Oil Company (of Veracruz), which were the foci of nationalist agitation. Nevertheless, treatment of hookworm with cheropodium evoked a nationalist response from medical professionals, who argued that cheropodium should be used only as a last resort owing to its extreme toxicity, that the pharmaceutical companies failed to provide medicine chests to treat adverse reactions to the drugs they sold, and that the problem of reinfection was given insufficient emphasis by officials of the anti-hookworm campaign, in spite of its importance in terms of costs, health education, community sanitation and personal hygiene. Foundation officials also confronted the resistance of well-informed federal government officials, notably Miguel Bustamante, a public health leader for over half a century, who was the main architect of a plan in the 1920s to establish permanent rural hygiene services in place of the mobile health brigades that vaccinated peasants and rural labourers against typhoid and smallpox, treated the rural population for intestinal parasites, and gave general medical examinations. Determined to defend what he perceived as national public health sovereignty, Bustamante clashed briefly with IHB/D representatives. He argued that Mexico had absorbed the lessons of international public health from the distilled experience of the League of Nations, American Public Health Association and Johns Hopkins School of Hygiene and Public Health, and had the capacity to evolve its own public health programme. However, the relationship between the federal government and the Foundation was never one of overt hostility. Indeed, when a renewal of the agrarian radicalism of the 1910s threatened to erupt in Morelos in 1924, the Mexican government endorsed the selection by the IHB/D of the region for a campaign. And, although President Lázaro Cárdenas (1934-40) criticised the role and character of IHB/D-managed sanitary units, he continued prudently to fund IHB/D projects so as not to offend the Foundation, while funding exclusively state-managed rural health units more generously. By avoiding confrontation, Rockefeller officials hoped subtly to influence the conceptualisation and practice of public health reform in Mexico, and probably succeeded.[63]

Some authors have argued that the IHB/D promoted security, stability,

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[63] Birn, 'Local health and Foreign Wealth', esp. pp. 99, 112, 124-5, 154-7, 176, 190, 204, 240, 282.

property, modernisation (and, in Mexico in the late 1910s and early 1920s, the Obregón faction); and addressed the symptoms of the problem of poverty, not the causes. To take one such comment: 'When the people demanded a public health campaign against malaria, the Rockefeller Foundation offered a campaign against yellow fever; when the peasants perceived that their wellbeing was linked to the ownership of the land, the Rockefeller Foundation advised the Mexican government to carry out a campaign against hookworm... The immediate health needs of the peasants, such as improvement of nutrition, water supply, wage increases, better sanitary conditions, and hygienic housing were translated by the Rockefeller Foundation into a campaign combatting vectors, filling in swamps and insecticide spraying.'[64] Foundation officials overlooked the problem that sanitary techniques like draining rice fields to eliminate mosquito breeding sites threatened peasant livelihoods, and were blind to resentments among rural labourers that the best pit latrines installed by the IHB/D during the anti-hookworm campaigns were of a higher standard than their housing. Furthermore, the scientific credentials boasted by the Foundation were not unimpeachable. The Foundation's advocacy in the early 1920s of the Noguchi vaccine against yellow fever for Mexican soldiers proved to be ill-advised, when a few years later the vaccine was shown to be based upon scientific error and to be useless.[65]

The construction of the Panama Canal consolidated US influence in northern Latin America and the Caribbean. Not only did it constitute a display of US engineering prowess, it embodied the first major blow to a French ascendancy in 'tropical' medicine. In the 1880s the isthmus of Panama was a symbol of death and disease throughout the Americas; by the 1920s the Canal Zone enjoyed a hemispheric reputation for salubriousness. In the late 1880s the French were determined to fulfil their contract to complete the isthmian canal. Recalling the decisive role that disease had played in the defeat of their compatriots by insurgents in Saint Domingue almost a century before, French physicians distributed quinine on a regular basis free among their compatriots as a preventive move against malaria (*paludisme* - marsh fever).[66] However, mismanagement and corruption

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[64] Solorzano Ramos, 'The Rockefeller Foundation...', pp. 228, 273-4, 341-2.

[65] Solorzano Ramos, 'The Rockefeller Foundation in revolutionary Mexico. Yellow Fever in Yucatán and Veracruz' in Cueto (ed.), *The Rockefeller Foundation...*, pp. 52-71.

[66] The detection in Algeria by Alphonse Laveran of tiny crescent-shaped bodies in a blood sample taken from a malaria patient had already taken place, but was not acted upon because miasma theory remained unshakeable.

thwarted the canal project; and the French had no contractual authority to enforce public health regulations. Devastating outbreaks of yellow fever and malaria played a decisive part in halting their project.[67] Though US personnel who replaced the French branded the engineer,[68] Ferdinand de Lesseps, 'the Great Undertaker', the US performance in hygiene and sanitation was itself erratic and uneven.

Yellow fever epidemics struck in 1885, 1886, 1902 and again less severely in 1905. Reformers such as Colonel William C. Gorgas exploited lurid images in the US press of 'yellow fever winds' that carried the supposedly airborne disease in the 'white men's graveyard', in order to raise levels of spending on sanitary works. Images of fever-breeding fogs ('Creeping Johnny'), swamps, poisonous aquatic plants, devouring jungles and enveloping bogs pervaded some US newspapers.[69] Coffin manufacturers prospered. The *Star and Herald* carried the poem *Yellow Eyes* by a one-time resident of the Panamanian port of Colón, James Stanley Gilbert:

> You are going to have the fever,
> Yellow Eyes!
> In about ten days from now
> Iron Bands will clamp your brow;
> Your tongue resemble curdled cream,
> A rusty streak the center seam;
> Your mouth will taste of untold things,
> With claws and horns and fins and wings;
> Your head will wear a ton or more,
> And forty gales within it roar! [70]

Three-quarters of US personnel panicked in 'the Great Scare' of 1905 and left Panama for home, even though the epidemic of that year was less grave than its predecessors. Only slowly, however, did press agitation arouse sufficient embarrassment at mismanagement that emergency sanitation services were created. Meanwhile, the Yellow Fever Commission and

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[67] John Major, *Prize Possession. The United States and the Panama Canal 1903-1975* (Cambridge, 1993), p. 27.

[68] Hero of Suez, failure in Panama.

[69] Miles P. Duval Jr., *Cadiz to Cathay - the Long Diplomatic Struggle for the Panama Canal* (2nd edn., Stanford, 1947), p. 306.

[70] Cited in David McCullough, *The Path between the Seas. The Creation of the Panama Canal 1870-1914* (New York, 1977), p. 453.

Colonel Gorgas worked to combat yellow fever. They took some practical, pragmatic steps: a hospital car on the Panama Railroad served as a *de facto* ambulance; and a refrigerator car and cold-storage plants were introduced.[71] Properties were inspected and fumigated on public health grounds. But conscientiousness was easily confused with overzealousness. Householders resisted repeated disinfections owing to sulphur and pyrethrum fumes; some properties were expropriated; and some Catholics were offended by an order that the holy water in Colón Cathedral should be changed daily after a dead mosquito was found there, and interpreted the instruction as evidence of a subtle form of Protestant persecution.[72]

From the 1880s major employers in the Panamanian isthmus responded to labour shortages by importing British West Indian labour. The pseudo-scientific assumption that blacks were immune to yellow fever remained potent; in fact, many black contract workers enjoyed an immunity because they had suffered a mild case of the disease, often in childhood. Large, unquantifiable numbers of blacks succumbed to yellow fever and malaria. To avoid panic, yellow fever was seldom listed as a cause of death, and gastritis was recorded instead.[73] The corpses of some West Indians were said to have been dumped.

The US authorities answered outbreaks of yellow fever, bubonic plague and malaria with an unpredictable mixture of rational measures, insensitive authoritarianism and panic. After the diagnosis of the death of a Barbadian docker in 1902 was confirmed by autopsy as bubonic plague, La Boca wharf was placed under immediate quarantine. Buildings, clothing and bedding were sprayed systematically with a solution of bichloride of mercury; chicken coops and animal pens were seized and burnt; and latrines were demolished. The authorities in Panama City paid a bounty of ten cents for each rat or mouse handed in. Yet these measures were insufficient to allay the anxieties of US trade union leaders about shipments of workers to 'that deathtrap', especially after a team of Japanese inspectors representing large Japanese

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[71] Miles P. Duval Jr., *And the Mountain will move. The Story of the Building of the Panama Canal* (Stanford, 1947), p. 179.

[72] McCullough, *The Path between the Seas*, pp. 448, 452.

[73] McCullough, *The Path between the Seas...*, esp. p. 173; Velma Newton, *The Silver Men. West Indian Labour Migration to Panama* (Kingston, Jamaica, 1987), pp. 126-8. Tuberculosis was also a commonplace disease among West Indian workers.

labour contractors denounced the isthmus as unsafe for Japanese workers.[74] In 1906 Chief Engineer John F. Stevens lamented that 'in the diseased imagination of the disjointed forces of white employees, hovered the angel of death in the form of Yellow Fever'.[75] The reputation of the Canal improved slowly after Walter Reed confirmed the finding of Carlos Finlay that the mosquito Stegomyia fasciata (Aedes aegypti) transmitted yellow fever. Only a visit by Theodore Roosevelt prompted the establishment of a separate Sanitation Department.

Once the Canal was built the authorities aimed to improve the working and living conditions of white, especially skilled, workers, for whom orderly communities with restaurants and sports facilities were provided; but many black workers lived outside the Canal Zone amidst inferior sanitation conditions and medical treatment. Confronted by problems of train derailments, dynamite explosions, landslides, boats sinking and falls of scaffolding in the construction of locks and gates, the Canal authorities expanded hospital provision. After Jamaican workers rioted over housing conditions and food quality in 1905, the authorities debated the merits of a guaranteed basic nutritional intake for black West Indians, together with daily doses of quinine, some family housing and a limited health service.[76] Action was taken at a leisurely pace between 1906 and 1912. Two factors limited the achievements of the Canal Zone authorities. One was wrangling over who should pay. There were fractious discussions over whether the United States or the cities of Panama and Colón had the responsibility for paying the capital and maintenance costs of their water and sewage systems.[77] Another was misconceived, misdirected policy. A combination of moralising zeal and health concern was manifest in the introduction in 1904 of unenforceable restrictions on gambling, the import of narcotics and the immigration of prostitutes. These concerns reached a peak in 1918 in the context of

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[74] McCullough, *The Path between the Seas...*, p. 453.

[75] Duval, *And the Mountains will Move...*, p. 188.

[76] Michael L. Conniff, *Black Labor on a White Canal, Panama, 1904-1981* (Pittsburgh, 1985), p. 31; Lancelot S. Smith, *The West Indian in Panama, 1850-1914* (Washington, D.C., 1980), pp. 45-53.

[77] Major, *Prize Possession...*, pp. 32, 43, 44. A daily bath was a privilege of the wealthy. The same water was used to wash children, then to launder clothes, scrub floors and clean pavements. Duval Jr., *And the Mountain will Move...*, esp. p. 147. Furthermore, nutrition changes were limited by the absence of refrigerated meat, fresh milk and fruit, butter (except tinned), and uncontaminated bread.

teetotaller fanaticism in the United States. Pressures for a bone-dry, dope-free, whore-free Canal Zone came from groups like the Women's Home Missionary Society, which urged the federal government 'to do all in your power to close the Brothels and the Saloons...for the protection of our boys'. To appease pressures at home the US authorities encroached on the powers of the nascent Panamanian state, so that even in the 1920s Panama remained a client state in health questions, and was denied the power to exercise all public regulations.[78] Yet the Canal Zone was acquiring a reputation for salubriousness and high quality hospital services. By 1923 senior Colombian surgeons were anxious to modernise hospital care in Bogotá, because their wealthiest patients were opting to go by air to Panama rather than enter clinics in the Colombian capital.[79]

Foreign pressures with regard to health questions had an enduring significance for Latin America. The impact of the Pasteur mission was more modest, and its presence more shortlived, than that of the Rockefeller Foundation. Yet the Pasteur mission to Brazil played a critical part in developing, accelerating and catalysing pre-existing trends in that country, and in placing Brazil in the Latin American vanguard in research and control of various 'tropical' diseases. The Rockefeller Foundation set out to promote the control of specific diseases by means of field investigations, practical demonstrations and laboratory research; to encourage the development of public health education; and to supply aid to government - national and local - in such ways as to put health work on a permanent basis.

Precisely because its aims were more ambitious, the Rockefeller missions had more difficulty than the Pasteur in achieving them. The French had only to enlist the co-operation of small scientific and governing elites; Rockefeller looked to co-operation that extended to sanitary inspectors and even parish clergy, who were less preoccupied than cosmopolitan city elites with 'Europeanising' (or 'Americanising') ideals, or with removing barriers to international trade, and were at times opposed to them. Perhaps more significant, at least till the late 1920s, was the Panama Canal, which demonstrated conclusively that where capital, technology and skilled management and labour were effectively marshalled, and then combined with political will and administrative commitment, major impediments to the control of endemic and epidemic diseases could be surmounted. The

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[78] Major, *Prize Possession...*, pp. 139, 146, 254.

[79] See my article, 'External Philanthropy and Domestic Change in Colombian Health Care: the role of the Rockefeller Foundation, ca. 1920-1950', to appear in *Hispanic American Historical Review*, vol. 75, no. 3, 1995, pp. 339-76

experience in health care of the Canal Zone had both intended and unintended effects: it served as a model for public hygiene and sanitation throughout 'tropical' Latin America - an object to be emulated both by US occupation governments in the Caribbean and Nicaragua (and the Philippines), and by independent republics; and it had the unintended effect of setting new standards of hospital care.

Policy in the City and the Countryside, especially Brazil

Of the national historiographies only the Brazilian is sufficiently advanced to yield a synthesis of public health achievement for the period between the mid-nineteenth century and the World Depression. Recent scholarship has explored several aspects of change in the city of Rio de Janeiro, and has begun to clarify the early stages of public health activity in the Brazilian countryside.

In the burgeoning nineteenth-century city of Rio de Janeiro bacterial, parasitic and viral diseases joined to debilitate and kill populations. As one of the first large urban conglomerations of the continent, Rio was a pioneer in tackling the consequences of population density and overcrowding and recognising the need for modern sewage and drainage systems and the regulation of cemeteries and abattoirs. In mid-century the City contracted a British company to lay plumbing throughout the city - 670 street corner spigots and piping to 2,000 houses, and additional water was channelled from mountain streams.[80] As the city grew, a trend towards residential segregation by social class was more marked. The poor were increasingly concentrated in congested *cortiços* (beehives). This was high-density, low-income housing where high rents reduced spending on essential food items, thus worsening nutritional deficiencies, which turned some diseases, like whooping cough, measles and gastroenteritis into killers. Incremental improvements were recorded. Private firms were contracted to empty accumulated kitchen garbage and fecal matter; and better constructed streets were built that sloped to the centre to carry waste away.[81]

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[80] High bacteria counts in uncovered reservoirs occurred.

[81] Sandra Lauderdale Graham, *The Domestic World of Slaves and Masters in nineteenth-century Rio De Janeiro* (Cambridge, 1988), p. 24; June E. Hahner, *Poverty and Politics. The Urban Poor in Brazil, 1850-1920* (Albuquerque, NM, 1986), esp. pp. 25, 210; Dalila de Sousa Kiple, 'Darwin and Medical Perceptions of the Black: a Comparative Study of the United States and Brazil, 1881-1918' (unpub. PhD thesis, Bowling Green State University, 1987), esp. pp. 113-4.

By the 1880s, the use of piped water was changing social customs. Laundering and bathing at home became more common, except when, as happened frequently, the water supply was cut. During the Brazilian *belle époque* the main concern of senior public hygiene personnel was to take measures that limited the spread of contagion. Thus, at intervals, populations were evacuated from infected tenement buildings; the size of funeral processions was limited; latrines were disinfected (and deeper ones built). Action was taken to put an end to heaps of decomposing rubble; and meat was treated as garbage if it was not consumed on the day that the animal was slaughtered.[82] Towards the end of the century the first moves were taken to establish maternity hospitals, because women, especially those with an impaired health, inadequate diet and heavy work, were subject to puerperal and neo-natal diseases. In 1901 the Institute of Protection and Infant Welfare was opened to help poor women and their children. These were circumstances in which pioneering women physicians made some headway, benefiting from the recognition by some male doctors that women patients were often reluctant to expose their bodies to men. Although the argument that the brain size of women precluded them from serious abstract study proved highly resilient, twelve women students (there were 139 men) had received state financial assistance from Dom Pedro II to study abroad, two of them pioneering women physicians, one a precocious fourteen-year-old. By 1907, according to official statistics, there were six women students of medicine in Brazil, 9 of obstetrics, 22 of dentistry, and 56 of pharmacy, a profession of declining prestige.[83]

Demanding the creation of a 'civilised city' and of a vigorous, healthy citizenry as prerequisites of material progress, city elites responded to demands from hygienists that urban policy should rescue Rio from 'tropicality' and 'climatic degeneracy'.[84] Physicians played an active role in city institutions. From the 1890s public health reform evolved as a major ingredient of urban reform from above, that went beyond sanitation campaigns aimed at reducing the risk of the spread of infectious disease from the slums. Draconian sanitation crusades involved compulsory vaccination

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[82] Lauderdale Graham, *House and Street...*, esp. pp. 82-4; Hahner, *Poverty and Politics...*; Teresa Meade, 'Cultural Imperialism in Old Republic Rio de Janeiro: the urban revival and public health project', in Meade and Walker (eds.), *Science, Medicine and Cultural Imperialism...*, pp. 95-119.

[83] June E. Hahner, *Emancipating the Female Sex. The Struggle for Women's Rights in Brazil 1850-1940* (Durham, NC, 1990), esp. pp. 96-100.

[84] Nancy Leys Stepan, *'The Hour of Eugenics'. Race, gender and Nation in Latin America* (Ithaca, New York, 1991), p. 89.

and notification of infectious disease, the combing of the city for mosquitoes and grey rats, the enforced isolation of victims, the disinfection of many houses and the demolition of some. In 1893 the main symbol of resistance to authoritarian sanitation policy, the *Cortiço Cabeça de Porco* (Pig's Head), was finally demolished by the police with support from the infantry and cavalry, after defying orders to close for fifty-three years.[85] Tackling the problem of under-reporting of mortality from yellow fever and bubonic plague, President Francisco Rodriguez Alves expanded the powers of the Federal Department of Health, established finally in 1894 after several failed attempts, to include double-checking reported causes of death.

Draconian action aroused protest. There was the resistance, of course, of the slum landlords. But there were also questions about the nature of the sanitation campaigns. Were they as scientific as their exponents claimed? Was public health legislation coherent and consistent? Were the campaigns illiberal? Was social regulation consistent with laissez-faire orthodoxies, even when applied only selectively? Warning that medicine could become an instrument of oppression, the Positivist Apostolate denounced moves towards a national sanitary code, questioned the efficacy of vaccines, and condemned coercion, while joining the French-based Ligue Internationale contre la Vaccination. There was widespread anger at the invasion of domestic privacy by the police; there was anger too at the invasion of the bodies of women by the medical authorities. Vaccination, it was argued, was an invasion of the last bastion of privacy, the human body, which was fast becoming an experimental laboratory. Some parts of the press contended that an expansion of federal controls concealed the determination of a *paulista* president to impose his will upon Rio, and fanned opposition to the invasion of private housing by what it called 'mosquito swatters'. These grievances reflected broader conflicts over the distribution of wealth and power. Elements in the civilian elite and in the officer corps manipulated popular discontent over housing, unemployment and food inflation, which exploded in the Vaccine Uprising of 1904. Violent clashes of troops and demonstrators, and skirmishes among rival military factions took place.[86]

Applying to the countryside the principles that enjoyed a qualified success in the cities was problematic. Measured by the mortality rates of the period, rural health conditions were worse than urban. But, except where entrepreneurs left documents, evidence about them is scanty until the beginnings of modern public health studies, complemented by the work of rural sociol-

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[85] Lauderdale Graham, *House and Street...*, esp. pp. 120, 127.

[86] Lauderdale Graham, *House and Street...*, esp. pp. 129, 133-5; Hahner, *Poverty and Politics...*, p. 179.

ogists, social anthropologists and nutritionists. An important exception was the pioneering survey of conditions in the *sertões* (backlands) of the Brazilian *nordeste* – Bahia, Pernambuco, Piauí and Goiás – made by Belisário Pena and Artur Neiva, members of the Cruz Institute created out of the Pasteur mission. Pena and Neiva drew the attention of informed opinion to the 'great endemics of the backlands', and clarified the reasons for high levels of infant mortality. They demonstrated that the high death rates associated with malaria and intestinal infections were aggravated by the prohibitively high cost of quinine, which caused parents to resort to herbal remedies. The survey awakened sufficient public interest for Carlos Chagas to be financed to study the insect transmitter of *Trypanosoma cruci* (Chagas' disease) on the banks of the Preto River, a tributary of the São Francisco, in Minas Gerais. Pena's polemical pamphlet, *Saneamiento do Brasil (Cleaning up Brazil)*, published in 1918, recommended legislation and a process of administrative action to combat hookworm, malaria and, to a lesser extent, Chagas' disease.

Inspired by the work of Pena, Chagas and Neiva, the federal health service began sustained work in the countryside in the 1920s. Supported by the Rockefeller Foundation and backed by publicists arguing that good health conditions were essential to the full entry of the population of the hinterland into the national polity, culture and markets, the federal initiative confronted the tenacious opposition of rural oligarchies that resisted intrusion from centralising elites. Disaffected elements of the urban middle class expressed alarm about the cost and efficacy of the campaigns, and claimed that gloomy reports of health conditions in the interior tarnished the international image of the country. National and regional elites were divided over the 'proper' level of state involvement, the authority that should be delegated to the federal and state bureaucracies and the timing of campaigns. The 'coffee oligarchy' had effectively resisted state surveillance of social, including health conditions, on the plantations before the First World War; but, as the flow of European immigrants threatened to dry up during the War, so the pressure to improve the health of the existing workforce grew. Sanitary services were extended to rural areas of the coffee-producing state of São Paulo, and to handle diseases like trachoma brought in by immigrants from Southern Europe. These measures preceded the establishment in 1925 of a Special Inspectorship of Labour Hygiene. Taking into account under-reporting of deaths especially in the hinterland, the *paulista* progress in public health during the 1920s was impressive: the rate of mortality of the state as a whole fell from 21.0 per 1,000 in 1915 to 14.2 in 1929, and that of the city from 19.0 per 1,000 in 1921 to 12.7 in 1930.[87]

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[87] Luiz A. de Castro Santos, *Power, ideology and public health in Brazil, 1889-1930* (unpub. PhD thesis, Harvard Univ., 1987), pp. 161, 165-6, 225 n.114.

Campaigns led by the federal health service to 'rescue' the *caboclos* – backlanders – began in the 1920s. The elites of the prosperous Centre-South where yellow fever and other diseases were controlled had an interest in sending campaigns to the North-East, because the risk of reinfection from its ports remained very real. However, outside the Centre-South numerous obstacles stood in the way of a strong public health movement: underfunded state governments, appointments of directors of sanitation without public health training or experience, the absence of laboratory facilities for systematic research, and, in Bahia, the power of the Escola Tropicalista Baiana, which enjoyed national prestige for pioneering the study of 'tropical' diseases in the mid-nineteenth century, but which tenaciously resisted the absorption of modern bacteriology. Furthermore, lack of cohesion among regional elites, the weakness of political party structures and, in 1928, violence in the middle São Francisco valley between the state government and rural power-holders, aborted effective political change.

The limits to policy change were considerable. First, a knowledge of modern science and its application arrived haphazardly.[88] Secondly, the professionalisation of the public health apparatus was a tortuous process, delayed by underfunding and political resistance. Thirdly, regulation without the means of enforcement – on garbage, dirty water and human excrement – was an ever-present problem. On the coffee-producing slopes of the Centre-South dirty clothes were customarily washed in streams that supplied drinking water further downhill. Finally, the compilation of reliable statistics upon which policy could be based was an arduous task. Mortality statistics were seriously flawed, because many deaths were not registered and their causes were often inaccurately diagnosed. Given the urban concentration of physicians,[89] there was a problem of accurate diagnosis of death in rural areas. It seems probable that tuberculosis, for example, was under-reported because it was not diagnosed. Construction of statistics was, of course, hazardous among populations where pre-scientific concepts of disease causation – evil winds, evil eyes, witchcraft accusations and supernatural forces – prevailed. A drive towards greater precision in scientific diagnosis was not always accompanied by a drive (or a successful one) to precision in

[88] A knowledge of microbian theories arrived in Medellín long before microscopes. Carolina Reyes Cárdenas, 'Higiene y salud en Medellín, 1900-1930', *Estudios Sociales* (Medellín) no. 7, June 1994, pp. 13-43.

[89] In 1940 4.1 per cent of physicians in Mexico served the rural population, which represented 58 per cent of the total population.

the administrative apparatus responsible for health.[90]

Public health reformers saw themselves as conducting several simultaneous battles: science versus ignorance; science versus erudition; science versus the advocacy of the minimalist state and low taxation; science versus the entrenched interests of the rural oligarchs and *coronéis*. By the First World War the city of Rio had accomplished significant changes. It possessed not only the veneer of sanitation that reassured international elites but something of the substance. However, this was achieved at a considerable cost in rehousing and relocating large parts of the poor population. In the current state of the subject, it cannot be determined whether the estrangement of sections of the urban poor posed insuperable obstacles to further public health initiative. By 1930 the rural position was improving too. Though more patchy than the urban, the rural achievement constituted a basis for action. In the coffee-producing areas the impact of the public health authorities had been relatively intense; but elsewhere they were felt more lightly and randomly. Reformers had now to confront new challenges thrown up by the World Depression and the Revolution of 1930. It seems likely that the very administrative centralisation which assisted reformers in achieving important goals in the 1920s hampered their projects in the 1930s as, under Getúlio Vargas, the federal health bureaucracy lost much of its momentum and did little but undertake routine tasks.[91]

'Tropical Medicine', the Diffusion of Scientific Knowledge and 'Traditional' Healing and Curing

Changes in public health took place within the framework of transitions in 'tropical medicine' and the diffusion and application of scientific knowledge. Following the advances in the biological sciences associated with Koch and Pasteur, 'tropical medicine' made considerable headway . New explanations of disease made possible new diagnostic tests and preceded the development of new vaccines. The institutionalisation of educational institutions in tropical medicine gave a further spur to research and to its diffusion through specialist periodicals and congresses. Latin American scientists were, to a large extent,

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[90] A scarcity of specialist statisticians was one factor in the collapse of Colombian public health statistics during the World Depression.

[91] De Castro Santos, *Power, ideology and public health...*, esp. pp. 234-5, 333, 337; Steven C. Williams, 'Nationalism and Public Health: the convergence of Rockefeller Foundation Technique and Brazilian Federal Authority during the time of yellow fever, 1925-30', in Cueto (ed.), *The Rockefeller Foundation...*, pp. 23-51.

the beneficiaries of a new distilled knowledge from the late 1880s, and made significant contributions to that corpus of knowledge from the 1900s. Gradually, as science gained prestige, resources were found to finance public health laboratories. However, the impetus to change was limited by punctuated growth and the pressures of other interests upon state budgets. Meanwhile, although the middle classes grew in size and income during the era of *desarrollo hacia afuera* and formed an expanding clientele for professional physicians and nurses, much of the rest of the population was excluded from the benefits of growth, remaining outside the market economy or enjoying incomes too small to generate a surplus that would pay for the services of professionals. Thus while both public health and private professional initiative gained a significant momentum, Luso-Hispanic, Amerindian and Afro-Latin American practices of medicine were strikingly tenacious, since they remained the only available and affordable option for large sections of the population .

Conceptual problems arise with the term 'tropical' medicine - Saint Lazaire and Swansea experienced yellow fever in 1861;[92] there were serious problems of malaria in Central Italy in the 1920s; and yellow fever sporadically afflicted parts of the temperate River Plate region until a final outbreak in 1857. Yet the term is helpful in being distinctive. It is probably the one area of scientific medicine where the disease was conceived in environmental terms from its inception. Germ theory was vital to the identification of the part played by the human carrier and the insect host in the transmission of diseases like yellow fever and typhoid.[93] For most of the nineteenth century medical science favoured a noncontagionist view of the causation of yellow fever, transmission being effected not by person-to-person contact (contagion), but by the movement of the miasma - a morbid influence - through the atmosphere. This orthodoxy was challenged by the view that yellow fever was a contagious disease of imported origin; and this, in turn, gave way to the Finlay-Reed demonstration of the role of the infected mosquito. The whole panoply of modern protective measures - preventive immunisation, coastal surveillance and sustained anti-mosquito measures - began to take shape, but was not complete without the discovery that the determinative agent of yellow fever was a virus. This accomplishment ushered in a decade in which procedures were devised for inducing efficient artificial immunity against the disease and serological tests were used for diagnostic purposes.

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[92] William Coleman, *Yellow Fever in the North. The Methods of Early Epidemiology* (Madison, Ws., 1957). esp. pp. 3-24.

[93] Equally, the part played by the louse in propagating typhus fever, especially significant to the military, was identified.

The study of 'tropical' medicine was progressively institutionalised in Europe and the United States: in London (in 1899), Liverpool (1899), Hamburg (1900), Brussels (1906), and in other colonial capitals - Rome, Madrid and Lisbon. In the United States a school was founded at Tulane University, New Orleans; and in 1924 a School of Tropical Medicine affiliated to Columbia University was founded in Puerto Rico. In the last decades of the nineteenth century no specialist journals existed that were devoted to 'tropical' medicine. In the United Kingdom scientific knowledge was diffused through service journals and in the United States bulletins of the US Department of Agriculture. Only belatedly was the publication of articles on 'tropical medicine' in French and German vanguard journals emulated by their counterparts in the Britain and the United States, with the *British Medical Journal* acquiring some significance in this area in the 1890s and the *Lancet* less. There followed a spate of new journals, with even the foundation of the *Philippine Journal of Science* in 1906, which was to become the *Philippine Journal of Tropical Medicine*. In the United States specialist journals got off to a more hesitant start than in Britain; and they had a less continuous existence, probably, because Britain, with a vast empire, had more subscribers. In 1914 the active membership of the Royal Society of Tropical Medicine and Hygiene was about 600; that of its counterpart in the United States 15.[94]

In Latin America too the beginnings of modern scientific and medical publication can be detected. Positivist periodicals devoted to the popularisation of the sciences, like the Mexican *El mundo científico*, published from 1877, pressed for political action and deplored official indifference to typhus epidemic in the City of Mexico.[95] Gradually each of the larger and intermediate Latin American countries acquired a national (and in places a regional) medical journal usually associated with the medicine faculties. Colombian medical journals published in Bogotá and Medellín in the early decades of the twentieth century carried articles on local public health issues - epidemics, improvements of the water supply, and such themes as the sanitation of boats on the River Magdalena - together with translations and summaries of articles in English (including some from Indian and Australian journals), French, Italian and German, plus contributions

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[94] Eli Chernin, 'The early British and American journals of tropical medicine and hygiene: an informal survey', *Medical History*, vol. 31, no. 1, Jan. 1992, pp. 70-83.

[95] Charles Hale, *The Transformation of Liberalism in late nineteenth-century Mexico* (Princeton, NJ., 1985), p. 153.

from other Spanish-speaking countries.[96] The specialist journals, together with international meetings and specialised congresses, propagated professional standards, accelerated the exchange of information, and promoted a growth of awareness of such themes as the transmission of disease by insects (filariasis, human malaria, Texan fever), the life-cycles of micro-organisms and parasites, the biology of vectors and the epidemiology of disease. The international context was ripe for the export of bacteriology and stressed the value of rigorous laboratory examination.

As has been noted above, Brazilian claims to have isolated the germ of yellow fever were rejected in Europe, because they failed to meet high standards of bacteriological enquiry, with a particular emphasis on laboratory study and the isolation of the microbe. Similarly, the Cuban researcher Carlos Finlay failed to reach a wide audience, probably because he worked alone, in a country lacking a recognised scientific tradition, and published his epidemiological findings when tropical medicine was identified with bacteriological study and was judged by the quality of laboratory investigation. A gifted sanitarian and epidemiologist, Finlay was unable between 1882 and 1900 to corroborate his claims in the laboratories, and could not prove convincingly the etiological link between the bacillus and yellow fever.[97] Only with the mission of Walter Reed during the First US Occupation were empirical investigation and verification possible and the role of the stegomyia mosquito irrefutably established.[98] Successful research was translated into policy, and with draconian action yellow fever disappeared from Cuba between 1902 and 1904, only to re-enter from New Orleans in 1905, and again to be brought under control by 1909. Thereafter no further deaths from the disease were registered in the island.[99] The forecast of Finlay that a large wave of European immigration would accompany an improved sanitary record was vindicated. The Cuban research findings were rapidly made available elsewhere. Observation of Cuban experience proved invaluable to

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[96] The content of these Colombian journals will be the subject of a future publication by the author.

[97] Lowy, 'Yellow Fever in Rio...', pp. 144-63.

[98] A. McGehee Harvey, 'Johns Hopkins and Yellow fever: A Study of Tragedy and Triumph', in A. McGehee Harvey (ed.), *Research and Discovery in Medicine* (Baltimore, 1976), pp. 34-48.

[99] Emilio Roig de Leuschenring, *Médicos y medicina en Cuba. Historia, biografía, costumbrismo* (Havana, 1965), pp. 116-7, 131; Juan Pérez de la Riva, *El barracón y otros ensayos* (Havana, 1979), pp. 514-5; Rafael María de Labra y Martínez, *Cuba como país de inmigración* (Madrid, 1910), p. 26.

puzzled Brazilians, who wanted to know why sanitary measures taken against yellow fever in Campinas were more successful than elsewhere in the state of São Paulo. The answer was that in Campinas they included drainage of mosquito-breeding places.

The beginnings of modern public health laboratories complemented scientific breakthroughs. The Brazilian President Francisco Rodriguez Alves appointed Osvaldo Cruz, who had studied microbiology at the Institut Pasteur in Paris, as technological director of the Instituto Sôrothérapico (serum therapy) de Magnuinhos producing plague serums and vaccines.[100] The scientific success of Cruz and the Institute was confirmed by international awards and the discovery of a 'new' tropical disease induced by trypanosoma – Chagas' disease – identified by a student of Cruz, Carlos Chagas, in 1909. These changes, which embodied a qualitative transformation in Brazilian bacteriology, took place during the transition from the heavily bacteriological approach in public health which prevailed till the 1910s to a more eclectic approach combining environmental and ecological with bacteriological factors. (This was reflected in a change of slogan from 'isolate the microbe' to 'eradicate the vector'.) Brazilian success in reducing yellow fever (984 reported cases in 1902, 42 in 1906, 0 in 1909) and bubonic plague weakened public and professional opposition to bacteriological theories and enhanced national self-esteem, and assured the funding, and, therefore, the survival of the renamed Cruz Institute.

Meanwhile, Puerto Rico, which had the peculiar status of an 'unincorporated territory' of the United States, set certain trends for northern Latin America and the Caribbean. Owing to the Hurricane of San Ciriaco, a crisis of homelessness, starvation and irretrievable damage to coffee farms accompanied the transition of sovereignty in Puerto Rico from Spain to the United States between 1899 and 1901. The US occupation authorities were alerted to health issues. Anxious both to maintain the supply of drinking-water in San Juan and to avert epidemic, the US authorities used a carefully mounted relief programme as a means of displaying their efficient benevolence.[101] Public health expenditure in the island quintupled between 1910 and 1930. By 1930 the island public health administration possessed biological laboratories, a chemical laboratory for food inspection and an x-ray laboratory. Separate bureaux dealt with prevention of bubonic plague, malaria control, social medicine, rural sanitation, sanitary engineering,

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[100] Nancy Stepan, *The Beginnings of Brazilian Science* (New York, 1976).

[101] Stuart R. Schwartz, 'The Hurricane of San Ciriaco: Disaster, Politics and Society in Puerto Rico, 1899-1901', *Hispanic American Historical Review*, vol. 72, no. 3, Aug. 1992, pp. 303-34.

health education and vital statistics. Teachers' training institutes stressed health education, especially hookworm prevention. And the first pre-natal and baby clinics, anti-tuberculosis and anti-syphilis clinics were established. However, even Puerto Rico suffered shortages of essential personnel outside the cities of San Juan and Ponce, so that water chlorination plants fell into disuse for lack of engineers to repair them.[102] In the 1930s Colombian and Venezuelan public health officials and postgraduate students were sent to the island to study public health institutions and trends.

The limits to the influence of Western 'scientific' medicine should not be understated. In the 1950s large populations still resorted to healers in Amerindian, Luso-Hispanic and Afro-Latin American traditions; yet for the decades examined here a literature on Amerindian traditions is very restricted; that on Luso-Hispanic themes barely exists; and that on Afro-Latin American topics is too slender to synthesise.[103] The evidence upon Mexican Amerindians and mestizos indicates intermittent local resistance to centralised public health policies between the 1920s and 1940s. Rural populations supported protests organised by *curanderos* and *brujos* against physicians who posed challenges to their incomes and authority and to established patterns of health delivery. Indeed, during the 1930s, peasant opposition to compulsory smallpox vaccination culminated in attacks against itinerant nurses as they arrived on horseback at villages. Mexican Amerindians hesitated before attending health units for preventive measures, for three reasons: because they associated healing with illness, a shameful event; because visiting a physician was time-consuming and costly, involving delays and appointments only during the workday; and because health care professionals, unlike neighbourhood *curanderos*, belonged to a distinct and alien social class. The Mexican rural poor and Rockefeller scientists differed in their perceptions of hookworm: the one seeing it as an unavoidable fate like hunger, the other conceiving it as a disease, and, therefore, conscientiously setting out to 'create the disease in the minds of the people', through illuminated house-to-house talks on the life-cycle of the hookworm, which, Foundation officials hoped, would inculcate germ theory in the minds of peasants.[104]

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[102] Clark et al., *Porto Rico...*, pp. 55-71.

[103] Medical practitioners were seldom interested before the 1960s in the content and internal logic of 'folk' medicine and its connections with religion. It was often left to social anthropologists and public health specialists to pioneer studies of these areas.

[104] Birn, 'Local Health and Foreign Wealth', esp. pp. 118, 209-10, 214.

In the absence of sustained study of Afro-Latin American traditions, it can be assumed provisionally that the conditions of the remaining slaves of the 1870s and of former slaves in the last quarter of the nineteenth century, did not differ significantly from that in earlier decades, except where public health policies had an impact across all socio-ethnic categories. Afro-Latin American and Afro-Caribbean populations were vulnerable to a wide range of epidemic and endemic diseases. Dysentery had preyed on the Atlantic slave ships and markets in Cartagena, Salvador, Rio, Havana and elsewhere. Among Afro-Caribbean slaves beriberi was commonplace as a consequence of thiamine deficiency and pellagra because of niacin deficiency, with infantile beriberi, frequently a fatal disease, being received by babies from their mothers, the victims of an impaired reproductive ability, through their milk. Marasmus, which causes a child to waste away, and turiashiakor, a disease caused by protein-energy malnutrition, hit children once their mothers stopped nursing them. Slaves were especially vulnerable to waves of cholera that hit Cuba and Puerto Rico in the 1850s, returning to Cuba in 1867.[105] European physicians, quite numerous in the Caribbean where they treated sailors and soldiers during the revolutionary and colonial wars, seldom treated slaves. Indeed, European physicians were especially repulsed by the ulcerous eruptions associated with yaws, which, endemic along the West African littoral, grew to epidemic proportions on slave vessels and was commonplace among slave populations. Yaws was treated almost exclusively by black attendants because African medicine was more efficacious than European, and because white doctors, afraid of contagion, were unable or unwilling to look into the character and efficacy of black folk remedies.[106] The congestion, dietary imbalance and multiple disease environment on slave ships in the Middle Passage composed a lethal cocktail which the genesis of modern nautical medicine could do little to ameliorate.[107] Some success was

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[105] K.F. Kiple, 'Cholera and race in the Caribbean', *Journal of Latin American Studies*, vol. 17, 1983, pp. 157-77; David L. Chandler, 'Health and Slavery: a study of health conditions among slaves in the viceroyalty of New Granada and its associated slave trade, 1600-1800' (unpub. PhD thesis, Tulane University, 1980).

[106] Richard B. Sheridan, *Doctors and Slaves. A medical and demographic history of slavery in the British West Indies, 1680-1834* (Cambridge, 1985), pp. 76. 83.

[107] Disease in the Middle Passage included dysentery, diarrhoea, elephantiasis, hookworm, leprosy, malaria, ophthalmia, scurvy, smallpox, syphilis, tapeworm, typhoid fever, trypanosomiasis, yaws and yellow fever. Ulcers, wounds and sores arose from accidents and whipping. Malnutrition was commonplace. Sheridan, *Doctors and Slaves...*, p. 116.

registered with the use of citrus fruits and other antiscorbutics for scurvy and inoculation for smallpox.

The position on land was little better than at sea. The heavy, enervating work demanded by sugar-cane (compared to coffee, cotton or tobacco) took its toll on the plantations. While in Jamaica planters allocated some land as provision grounds to amplify food supplies to slaves, and perhaps to improve their diet, the pressure to maximise profits from sugar-cane in Cuba and other islands reduced the acreage available for food staples, compelling slaves increasingly to rely on supplies of imported foodstuffs (jerked beef from the province of Buenos Aires to Cuba, salted codfish from the Eastern Seaboard of the United States elsewhere) that were disrupted by warfare and shortages of shipping. High levels of slave mortality were linked with food and water supplies contaminated by human, animal and vegetable waste, as well as by lack of hygiene, a poor diet, excessive workloads, accidents, suicides and brutal punishments. This was a fatal disease environment, in which planters and physicians often misinterpreted poor health and nutrition as evidence of laziness, and punished slaves who failed to perform their work quotas by food deprivation, thus causing further sickness. Even an enlightened physician could neither alleviate working and living conditions nor keep slaves in hospital for treatment when managers claimed they were feigning illness; and the enslaved patient was hesitant to entrust his life to a stranger.[108]

The condition of urban slaves was little better. In the city of Rio de Janeiro, tuberculosis, especially pulmonary tuberculosis, was endemic among the poor. Both slaves, especially new arrivals being 'seasoned', and the free blacks, as well as European immigrants, were victim to tuberculosis, which spread especially among female domestic workers in dark, overcrowded homes. Dysentery was second to tuberculosis among infectious-parasitic diseases as a cause of slave mortality. Vaccination programmes were too incomplete to prevent the arrival of smallpox in eight major epidemics between 1825 and 1850, hitting especially new arrivals from Africa, slaves re-sold in Rio from Pernambuco in the north-east and Amerindians brought to work in the city. Tetanus was the fourth cause of slave mortality (however, more than one disease was diagnosed as tetanus.) Contemporary description spoke of an epidemic of pernicious fevers desolating Macacú in the province of Rio before reaching the city in 1829-30. And malaria seems to have been endemic. Of the ethnic groups resident in Rio, Africans had the lowest rates of yellow fever, a disease which terrorised the city at intervals. The death rate among slaves began to fall only after the abolition of the international

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[108] Sheridan, *Doctors and Slaves...*, esp. pp. 28-30, 73, 78, 83, 99, 116-8, 155, 164, 187-9, 335, 342.

slave trade in 1850. Each neighbourhood of Rio had an African surgeon working usually in the open air, dispensing free advice, selling medicines, with amulets to drive out evil spirits.[109]

By the First World War the conditions existed for the rapid diffusion of information regarding new scientific research and its practical application to physicians in most countries of the continent. By the 1920s national elites in the larger and intermediate countries had established or were debating the creation of public health laboratories. The view that preventive action against various diseases was less costly than curative, was now an orthodoxy among informed opinion. Just as compulsory primary schooling figured on the statute book in most countries of the continent by 1930, but could not be enforced, so enlightened regulation in health issues was adopted, but was implemented only patchily. Similarly, while new scientific knowledge percolated to professionals in major urban centres, the radius of its impact was circumscribed, because most urban workers and peasants were deterred from employing the services of professional physicians and nurses by their paucity, their fees, social distance, and, for rural populations, their urban residence.

Some Notes on Health, Nutrition and Housing

Problems of health cannot be considered without some reference to related problems of nutrition, housing and poor public services.[110] The deficient

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[109] Other common diseases were typhus (often confused with typhoid fever), whooping cough (pertusis), measles, scarlet fever, diphtheria, mumps, chicken pox, poliomyelitis, influenza, ophthalmia, filariasis, leprosy, jaws, syphilis, *sarma* (perhaps scabies), elephantiasis, beriberi, diarrhoea, intestinal parasites and other gastrointestinal disorders, pneumonia, pulmonary tuberculosis and other respiratory conditions, and diseases of the nervous system, the manifestations of sleeping sickness, encephalitis, meningitis, epilepsy and nutritional diseases. Mary C. Karasch, *Slave Life in Rio de Janeiro, 1808-1850* (Princeton, 1987), pp. 19, 87, 146-84, 264. The ratio of life expectancy of the Brazilian male slaves was 0.68 to that for the total male population in 1872. Thomas W. Merrick and Douglas H. Graham, *Population and Economic Development in Brazil 1800 to the present* (Baltimore, 1979), p. 57.

[110] In parts of the city of Buenos Aires privies filtered human waste back into the water table, which lay close to the surface of the soil. Only the building of railways and tramways which raised urban land values gave a spur to the improvement of the basic services, like installing water and sewer

evidence available suggests that nutritional patterns were very unequal, and not uniformally bad. A colonial tradition of food regulation to maintain social harmony in the cities outlived the upheavals of independence in some cities. Patterns of inspection of public markets and granaries survived, together with inspection for accuracy of weights and measures. And *juntas de beneficencia* (charity boards) supplemented the Catholic Church as donors of food charity.[111] Some random examples over time and space indicate the main problems of nutrition.

Peru illustrated the possibilities of a well-developed trade in a wide range of comestibles from different altitudes. Food scarcities were never critical in Lima until the crisis caused by the War of the Pacific (1879-83). Seafood (especially *ceviche* – lime-marinated fish salad) was widely consumed; and wheat was imported from the Central Valley of Chile. Warfare, however, prompted shortages; and emergency measures to control prices and protect merchants were insufficient to prevent looting. Food prices did not fall to pre-war levels after the war, because growing numbers of miners and plantation workers without subsistence plots exerted new pressures upon food supplies. Vegetables virtually disappeared from the market stalls of Lima from 1892, and food prices doubled over the next seven years.[112] The Argentine city of Salta around the year 1900 showed a more positive picture. Artisans and shopkeepers, as well as the upper class, had a balanced diet of roast meat, *empanadas*, fruit, vegetables and corn.[113] Nor was the picture in pre-revolutionary Cuba entirely gloomy. The World Bank report for Cuba of 1950-1 stressed that the diet on the island in the 1940s – years of good sugar-cane prices – had been reasonably balanced, if unvaried, and that in the 1950s it could be improved at little additional cost, if experiments in the Philippines with artificially enriched rice were followed. (The polished rice consumed generally in Cuba lost some 50 per cent of its mineral and vitamin

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pipes, paving streets with cobblestone or granite, and organising rubbish collection. James R. Scobie, *Buenos Aires, Plaza to Suburb* (New York, 1974), pp. 21-32.

[111] John C. Super, 'The Formation of Nutritional Regimes in colonial Latin America', John C. in Super and Thomas C. Wright, *Food, Politics and Society in Latin America* (Lincoln, Neb., 1985), pp. 1-23.

[112] Vincent C. Peloso, 'Succulence and sustenance: region, class and diet in nineteenth century Peru' in Super and Wright (eds.), *Food, Politics and Society...*, pp. 46-64.

[113] James R. Scobie, *Secondary Cities of Argentina*, p. 89.

content.)[114] However, Argentina and Cuba were among the most prosperous countries of Latin America. In the poorest parts of Latin America, like Guatemala, the picture was more gloomy. Among sample families in Magdalena Milpas Altas, the greatest single item of expenditure was cereals: the percentage of income spent on beans – a cheap staple – rose as income declined; and meat, fruit and dairy products were luxury items.[115]

The public health authorities spread the beginnings of a modern nutrition consciousness. The first nutritional studies were conducted in the cities. By 1914 there was some awareness in Rio that nutritional deficiencies were exacerbated by parasitical infections, bacterial infections like cholera and diphtheria and viral (protozoal) diseases like smallpox and malaria. Babies, which represented about two-thirds of recorded deaths from gastrointestinal diseases, often received a lamentably inappropriate diet. Some were fed with watered wine, soup of pasta, beans, bananas and dried beef, but not milk. An official calculation in 1914, beginning from an 'average family' of seven (with two servants – *sic*) estimated that daily food spending cost triple the monthly earnings of a textile worker. This idealised 'average family' was assumed to consume fresh meat, fish, maize, potatoes and dairy products.

By the early 1940s there was a clear awareness in Mexico that underperformance by labour (and also the problem of wounds healing slowly) was rooted in malnutrition. Early studies of rural sociology in Mexico are especially interesting. Nathan Whetten's classic synthesis of his own research and that of Mexican and US sociologists of the 1940s argued that it was possible to nourish Mexicans adequately on the Mesa Central without following US dietary models, that is, without stressing dairy and meat products. This was because pulque, the drink produced by fermentation of the maguey plant, contained protein and vitamin B, while sesame, cabaleza and guaje seeds and charales, parote and peanuts were rich in calcium, protein, iron, niacin and thiamine. Eating tortillas and plants and drinking pulque did not lead to pronounced clinical nutritional deficiencies, except for riboflavin.[116] Whetten also hinted at the way in which the solution of one public

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[114] *Report on Cuba. Findings and Recommendations of an Economic and Technological Mission of the International Bank for Reconstruction and Development...1950* (Baltimore, 1951), p. 251.

[115] Nathan Whetten, *Guatemala. The Land and the People* (New Haven, 1961), p. 207.

[116] In Guatemala, Amerindians in the 1950s relied heavily on maize, eating 0.75 lb. maize per day per person. Laboratory tests indicated a serious loss of nutrients – thiamins and riboflavin - in the process of converting maize

health problem could lead to a dietary deficiency. Knowledge among the urban middle class of Mexico City of the dangers posed by drinking dirty water led to the fashion of consuming bottled soft drinks, which was perhaps desirable from the perspectives of urban employment and industrialisation, but which deferred the development of a nutritionally desirable packed fruit juice industry that would create farming jobs.[117]

Poor health conditions were inextricably linked with defective housing, especially problems of overcrowding, ventilation and poor cooking facilities. The problem of inadequate urban housing was exemplified by the *conventillos* (high-density, low-income housing, including tenement dwellings) that were sensationalised by the press and novels of turn-of the-century Buenos Aires. Little attention was given to residential areas of the urban poor, like the Barrio las Ranas where several thousand people existed in shacks of wooden boards and galvanised sheets, and livelihoods were earned from scavenging in the city garbage dump. But the *conventillos* were the objects of some official attention in the last decades of the nineteenth century as loci of infectious diseases and natural habitats for smallpox. One main policy problem was that a disease had to be declared to be present before a sanitation policy could be applied. Thus little preventive action was taken; and sanitary services proved to be slow, delayed and unnecessarily expensive. The conditions were taking shape for the Great Tenants' Strike of 1907.[118]

The position was worse in rural housing. Inadequacies were exemplified by Mexico and Guatemala. In Mexico 44.9 per cent of all rural housing was classified as huts in 1939. On the Mesa Central primitive shelters had structures consisting entirely of cactus stalks and leaves in areas of plentiful cacti; but where cacti did not exist homes were often made of piles of loose stones covered with thatched roofs of straw, sticks and leaves. Pneumonia

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into tortillas. Whetten, *Guatemala...*, p. 199.

[117] Nathan Whetten (with foreword by Manuel Gamio), *Rural Mexico* (Chicago, 1948), pp. 310-4.

[118] Scobie, *Buenos Aires. Plaza to Suburb*, p. 19; Leandro H. Gutiérrez and Juan Seriano, 'Workers' Housing and Living Conditions in Buenos Aires, 1880-1930', in Adelman (ed.), *Essays in Argentine Labour History*, pp. 35-51. Perhaps conditions were inferior in smaller cities and towns. In Córdoba planks, straw and corrugated zinc formed the basic structure of modest homes during the Liberal era. Mark D. Szuchman, *Mobility and Integration in Urban Argentina. Córdoba in the Liberal Era* (Austin, Tx., 1980), p. 59.

was commonplace, because of freezing weather, lack of bedding (straw thrown on the floor) and lack of adequate clothing, especially among women. (Men often had *serapes* – woollen blankets). Meanwhile, in the floodlands of Oaxaca, Chiapas and Campeche, the failure to use mosquito netting in the 1940s and the lack of screens on houses exposed local populations to malaria-carrying mosquitoes.[119] In Guatemala too, poor housing conditions aggravated bronchitis and pneumonia, which together constituted the second most common cause of death. Building materials were inadequate to keep out the cold; and smoke from cooking fires irritated the respiratory passages of peasants and rural labourers.[120]

Apparent improvements in housing could be counter-productive. In the city and province of Buenos Aires a shift in the late nineteenth century from sun-dried adobes and straw thatch to kiln-based bricks and tiles made higher ceilings possible. These meant more ventilation, but also more draughts.[121] In Puerto Rico there was concern in the early twentieth century that a transition from traditions of thatch roofs and bark wall huts to new cabins of boards and corrugated iron encouraged tuberculosis.[122]

Conclusions

By 1950 there was cause for both cautious optimism and considerable concern. Latin America had some positive experience of adapting foreign organisational models to local needs and of putting imported technology to local requirements. On the other hand, no country or group of countries had evolved an autonomous base in scientific research and development. In some respects policy in the continent was skewed to external requirements. And, as agencies like PAHO and UNICEF expanded their presence, there was a risk that this discrepancy would grow. Disputes over resources were often resolved in favour of maintaining or expanding provision at existing institutions, such as specialist hospitals, rather than developing the many neglected areas of primary health care which demanded ever more urgent consideration at the onset of the 'demographic explosion'. Life expectancy continued to rise; and levels of infant mortality to fall. But, while a bias for hope might be registered for the continent as a whole, cause for considerable

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[119] Whetten, *Rural Mexico*, esp. pp. 286-7, 335-6.

[120] Whetten, *Guatemala...*, p. 219.

[121] Scobie, *Buenos Aires...*, p. 127.

[122] Clark, *Porto Rico...*, pp. 45-51.

gloom was justified for those who were excluded from the benefits of change for reason of location, social class, gender, ethnic or age group and pronounced income maldistribution.

These are themes that, for the most part, historians are only beginning to examine. The current state of research is very uneven, and the subject has usually been addressed only tangentially by historians. Some future developments are suggested by the colonial historiography, which has considerable strengths, especially in the study of Afro-Latin American and Amerindian traditions of healing and curing, and the evolution of syncretisms between them, 'official' medicine and folk Luso-Hispanic traditions. Meanwhile, the work of Marcos Cueto and his associates on the health and agriculture missions of the Rockefeller Foundation suggests several fruitful lines of enquiry, for example, into the role of foreigners in diffusing incremental changes, stressing the importance of cost-effectiveness in policy, and emphasising a scrupulous thoroughness in both scientific experiment and laboratory investigation of outbreaks of disease. Considerable scope remains for the study, using French archives, of the diffusion of French models.[123] Not all innovation, however, radiated from the United States and France. There were major sub-centres of research within the continent. The work of Bernardo Houssay and his group of physiologists in Peronist Argentina, the evolution and significance of the National Institute of Cardiology in Mexico City and the development of 'yellow fever studies' in Brazil and Colombia deserve more attention. Furthermore, there were major sub-centres of policy innovation too. The experiences of Cuba, Puerto Rico and the Panama Canal Zone have been referred to here. But the significance of experiments in patient care and hospital development – both general and specialist – in the Southern Cone, and of the health dimension in social security policies, especially in Uruguay, merit further attention.

Recent historiography of Latin America suggests various lines of investigation. Developments in historical demography and social history indicate ways in which patterns of mortality and morbidity – adult and child – could be fruitfully explored, in conjunction with investigations into the incidence of disease over time, by socio-ethnic category and social class. The explosion of peasant studies since the 1960s raises various questions. How far were hygiene and sanitation priorities of agrarian radicals? How

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[123] The fascinating discussion of Thomas F. Glick of the impact of Spanish Republican refugees on Mexican institutions in pharmacology, physiology and neurosurgery is weakened by the lack of an analysis of the cumulative impact of both French influences and the revolutionary intelligentsia in shaping an intellectual environment that was recipient to scientific research. Glick, 'Science and society in twentieth century Latin America...'.

significant were permanent demands for public health services? To what extent were they linked with pressures for better veterinary practice? How far was better public health provision interpreted as an imposition from above, and regarded suspiciously by peasants and rural labourers as an instrument of control by capital-city elites? The growth of studies of urban labour gives rise to another set of useful questions. How far were health improvements among urban workers the consequences of trade union struggles? Did early measures of 'worker hygiene', which prefigured later moves towards occupational health, represent conquests of labour militancy or instruments of co-option and control by governments in conjunction with professional leaders and progressive elements of business? The more modestly expanding business historiography has tended both to neglect the significance of health care as a device for protecting foreign managers and for controlling Latin American labour, and to overlook the role of merchant elites in influencing urban health policy, especially with regard to epidemics. Both the literature on the history of the Catholic Church and that on the history of women have usually understated the significance of female religious orders, especially in nursing – a theme that deserves subtle exploration. Recent writing on genetics hints at ways in which modern paediatrics grew out of 'puericulture' – a rich theme in the history of childhood. And the literature on the history of the state, increasingly strong on the evolution of economic policy mechanisms, remains lamentably weak on that of social policy institutions. A wealth of official documents emanating from city, national and international agencies, of reports by the officials of philanthropic organisations, and of medical journals awaits the prospective researcher.

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