Introduction: Environment, Health and History

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The environment and health are not always considered in the same breath. In 2009, when the *Lancet* published a special issue on the impact of climate change on health, commentators noted that this was a first: the health impact of global warming had not been given sustained consideration before.[1] Why are issues which appear to be closely connected, and have been connected in the past, so often discussed apart? This book historicises the changing nature of the connection, or lack of it, over time. It examines how and why health and the environment have been considered separately or together and why the relationship has changed. This introductory chapter is in three sections .First, we survey how health and the environment have related over time,with brief allusion to where the book chapters fit into that time frame; then we examine how historians have written about health and the environment; and finally, we summarise the arguments which our authors make in this book.

We can characterise the relationship in three broad time phases: from very early on, environment and health concerns were entwined and this relationship was exemplified in the nineteenth century public health movement. But then environment and health concerns drew apart in the early twentieth century; environmentalism emerged as a separate movement which had little of a health dimension. In more recent times the two strands have begun to be considered together: the revival of environmentalism since the 1960s and 70s has impacted on and helped determine new forms of public health.

Environment and health entwined to the 1890s

The interconnection between health and the environment was strongly marked in ancient medicine: the tradition that the atmosphere and the environment might affect patterns of disease dates back thousands of years. Hippocrates in *Airs, Waters, Places*, in the fifth century B.C., commented that physicians should have:

> due regard to the seasons of the year, and the diseases which they produce, and to the states of the wind peculiar to each country and the qualities of its waters...the localities of towns, and of the surrounding country, whether they are low or high, hot or cold, wet or dry...and of the diet and regiment of the inhabitants.[2]

The Hippocratic idea of the four humours (blood, yellow bile, black bile, phlegm); four qualities(hot, cold, dry and wet) and four seasons inextricably brought environment and health together. This, however, was a fatalistic doctrine; it accepted the connection but argued that it could not be modified.

The connection between health and the environment continued to be accepted much later- into the fifteenth and sixteenth centuries. Disease and geography drew attention to the interconnection between malaria and marshy areas, a connection epitomised in the 'mal-air' ,in the name of the disease.[3] In fact, historians have drawn attention to the 'Colombian exchange' between the Old World and the New, where new environments were crucial to the spread of different diseases. [4] This was a dual exchange. Columbus and his explorers brought diseases such as measles to the New World; they, in turn, imported diseases like syphilis into Europe. A different form of transfer took place from the seventeenth century. This was a movement of scientific ideas. Historians such as Grove have argued that it was colonial scientists who recognised that the consequences of deforestation were soil erosion and shortage of water, and were in essence developing a conservationist mentality.[5]

It was in the seventeenth century too that enquiry into the relationship between disease and place began, stimulating a new 'medical arithmetic' which recorded mortality alongside variables such as climate, air quality and elevation. [6] Theory initially moved cautiously from observed correlations to speculation about causes: were the agents miasmatic emanations or contagious particles, and what were the material or metereological triggers for epidemics? Urban panic ultimatelytrumped lack of certainty, and preventive strategies were implemented in the burgeoning eighteenth century cities, including drainage, cleansing of streets and stenches, and removal of burial sites. [7] ***Harding*** in our volume considers health and housing in this period. However it was in the nineteenth-century urban public health movement that disease and environment became most closely entwined. Now though another variable was introduced, when in the 1820s the French statistician Villermé first detected the association between poverty, place and death rates. [8] The classic investigations of nineteenth-century living conditions therefore brought together not only accumulated beliefs about salubrity and hygienic practices, but also empirical study of the environment of poverty. Thus in Britain Edwin Chadwick's seminal survey began with the housing of the 'labouring classes', then moved to the streets outside before returning to 'internal economy' and 'domestic habits'. [9]

The main outline of the public health story is well known, through the rapid growth of cities from the late eighteenth century under the impact of industrialisation, the poor living and working conditions, and the epidemics of infectious disease which resulted. [10] The public health movement focussed on this poor environment as a cause of disease: miasmatic theories stressed the role of bad air and living and working conditions. The answer was seen in sanitation, in changing the environment and especially in providing clean water. In England the nineteenth century public health Acts (1848 and 1875 for example) focussed on the environment. These aimed at changing and regulating the environment; they emphasised

clean water and the disposal of waste; housing; the regulation and improvement of working conditions and factories. Historians have argued about the rationale for such an emphasis. Clearly it was not simply altruism, but rather a fear of the urban mass and of contagion; the maintenance of economic advantage and of social cohesion drove the environmental focus. Hamlin has argued that public health took the path of the 'technical fix'. Sanitarianism, the doctrine of drains and clean water, precluded wider social reform, on the lines of the revolutionary political and health movements of 1848 in continental Europe.[11] In this volume, ***Hamlin*** focuses attention on a non industrial society at this period, that of famine era Ireland. What was the connection between environment and health there?

Environment and Health apart 1890s- 1960s

From the end of the nineteenth century, ideas about public health and the environment moved apart. Science had much to do with it. The rise of bacteriology, the work of Koch and Pasteur from the 1880s and the rise of laboratory medicine, brought in their train what Starr has called 'a new concept of dirt'. [12] Worboys has shown that the new theories of disease were only gradually applied and there was considerable overlap with older ways of thinking, but they did focus attention on the role of the individual rather than of the wider environment.[13] Public health acts were no longer housing acts as well. Social and political events also underpinned this development. In the UK, the fear of degeneration in the wake of the Boer War brought both positive and negative versions of eugenics , the positive focussing on the development of welfare systems, the negative on the removal of the unfit from society. The individual mother was often the centrepiece of welfare initiatives and there was stress on the role of personal hygiene. As Porter has commented, it was the domestic or inner environment which had to be changed rather than the wider environment; the element of personal culpability was stronger.[14] But the element of separation was sometimes blurred:

Schott's paper shows how metereology continued to figure in German public health textbooks and the same was also true of standard British teaching texts.[15]

Also at this time, 'the environment' as a subject of interest developed rapidly and separately from health concerns. Most obviously this was through Romanticism - the work of Turner, Wordsworth, Rousseau and others and the fascination with ' wild places'. Intellectuals such as Morris and Ruskin looked back to medieval society to justify their rejection of economic liberalism. Their stance was tied to a 'back to the land' radicalism, exemplified by Henry George's *Progress and Poverty* and later by the Garden City movement. 'Problem solving' organisations concerned with the environment rapidly multiplied across Europe, typified in England by the Commons Preservation Society (1865), the Society for the Preservation of Ancient Buildings (1877) and the National Trust(1894). The movement, it has been argued, was divided between reformists and utopians. Should natural places be preserved for the people or from the people? There was no compromise with the industrial world and therefore little consideration of public health issues.[16] In fact the interests of environmentally inclined thinkers were often at odds with those of public health. Thirlmere reservoir in the Lake District was added to supplement Manchester's water supply in 1894 despite opposition from nature conservationists such as Morris, Ruskin and Octavia Hill. [17] Robert Roberts, in his recollections of an Edwardian childhood in the north of England, shows the existence of a popular environmental tradition as well.

> One sunny Wednesday afternoon, my mother took me to Peel Park. We sat on a high esplanade and looked far over the countless chimneys of northern Manchester to the horizon. On the skyline, green and aloof, the Pennines rose like the ramparts of Paradise. 'There!', she said, pointing, 'Mountains!' I stared, lost for words. [18]

Health figured little in these turn of the century environmental movements. And later, in the interwar years, some aspects of environmentalism became discredited, in part because of a nascent connection with health. The environment became central to political ideologies, most notably those of Nazi Germany. The Nazis espoused both environmental and health promoting ideas, with a stress on 'back to the land' initiatives and on anti smoking laws. Bramwell has called them' the first radical environmentalists in charge of a state'.[19] That association with political extremism later helped to discredit such ideas until the revival of the 1960s. ***Schott*** shows the interconnections between public health ideas and environmentalism in the early twentieth century period in Germany.

Elsewhere, the connection between environmentalism and health was on the wane at the state level or as a matter of public health concern. In the UK, environmentally focussed health treatments fell out of the mainstream (***Adams)***; environmental movements such as the growing belief in the beneficial power of sunlight (***Carter)*** were voluntaristic in nature. The revival of interest in the environment in the immediate post war years had more connection with urbanisation and town planning than with health. In the UK, there was a concern to control environmental sprawl. Initiatives such as the Green Belt (1938 initially, just before the war); the Town and Country Planning Act (1947); and the introduction of national parks (1949) were part of the post-war expansion of the state, but had little of a health component.

Meanwhile, public health both as an ideology and as a mode of professional practice went down a different route. In the UK, the legacy of the reforming doctrine of social medicine, which had considered the environment and had started to talk about the ecology of health, was twofold. One was a technical form of public health with a focus on chronic disease epidemiology and ultimately on the methodology of the randomised controlled trial (RCT).The other was health promotion, whole community ideas, which were to lead to a rapprochement between ideas about public health and those about the environment. In the

short term however, the relocation of public health in England from local government to the health service at the local level resulted in the separation of formal public health professionals from the local environment. Environmental health and occupational health as areas with connections with the old nineteenth century environmental vision, were left separate and took a different professional route.[20]

Environment and Health reunited after the 1960s?

A new style of environmentalism emerged in the post war years, which developed different forms of connection with health. In this collection chapters by ***Clarke*** and by ***Bonah*** show how the new post war technocratic developments were used to understand and to portray the environment rather than being separate from it. The reconfiguration took different forms in different national contexts, as Clarke shows. In Britain, the 'great smog' of 1952 which led to the Clean Air Act of 1956 provides a model of post-war environmental interest with a health component. This looked both backwards and forwards - back to the environmentalism of nineteenth century public health, but also forward to a new public health focussed on individual lifestyle and organised round single issue pressure groups. [21] The connection with smoking underlines the change which was taking place. The issue there was individual rather than a generalised industrial pollution. The Royal College of Physicians' first report on smoking published in 1962, was originally intended to deal with air pollution as well. But that subject was dropped; smoking was more easily characterised as a matter of individual responsibility, whereas air pollution raised much more difficult and general issues of industrial culpability. [22] In the US at the same period, as Sellers has shown, the reconfiguration of environmentalism was less about clean air and more about water and sanitation. The expansion of Long Island near New York and the lack of public health infrastructure brought that issue to the fore.[23] In different national cultures and institutional structures, the revival of environmentalism was differently configured. ***Warren*** discusses

provocatively the impact of the post war lifestyle changes and the move to a sedentary and indoor lifestyle.

Environmentalism in its recognisably modern form began to develop from the 1960s. Part of the rise of 'new social movements', it questioned, as did the anti nuclear movement with which it had close connections, the role of science and technology. The oil crisis of the 1970s brought a realisation of the limits to economic expansion. Rachel Carson's *Silent Spring* (1962) was iconic, and the use of Agent Orange during the Vietnam war drew attention to the environmental impact of modern warfare. Ecology became a household word, and there was a realisation too about the health effect of pesticides on humans and on wild life. The rise of the car was no longer seen as an automatic and liberating good. Buchanan's *Traffic in Towns* in the 1960s questioned the pro car stance as did activism against lead in petrol in the 1970s. Environmentalism went mainstream with the establishment of environmental groups such as Greenpeace (1971) and Friends of the Earth (1971). Britain had its Department of the Environment (1970); the Green Party was set up in 1975. The campaign in 1971 to get Schweppes to drop non returnable bottles marked a new style of direct action, media conscious campaigning.

There was also a revival of the population concerns of the nineteenth century through the 'limits to growth' debate. Ehrlich's *The Population Bomb* (1968) was criticised for being more concerned about population growth in the Third World than in the US. There were underlying eugenic concerns with conservation issues too. Beinart and Coates have shown how conservationism could be authoritarian and not in tune with African countries' own concerns. White conservationists in South Africa were opposed by blacks because of their intrusion into traditional settlement patterns.[24] .This was environmentalism as a 'wilderness without people' rather than a lived experience.

Environmentalism became a global movement, and the interconnections with health also began to be reforged at that level. ***Sellers*** paper illustrates this and show the connection between local, national and international levels of action. This trend can be traced through the Club of Rome's *Limits to Growth* (1972); the UN World conference on the environment in the same year, and, in the 1980s, the Brundtland report, *Our Common Future* (1987). Environmental tragedies like Bhopal (1984) and Chernobyl (1986) drew attention to the global health effects of local environmental accidents. In this book, ***Rumiel'***s chapter shows how earlier medical anti nuclear activism transmuted later into climate activism.

The new public health movement of health promotion brought health and the environment together. The Ottawa Charter of 1986 mentioned the two as part of the same continuum. The WHO's Healthy Cities initiative which began in 1986 exemplified the new interconnection. It operated at the local level and aimed to integrate health and the environment, consciously looking back to nineteenth century public health.[25] Health and sustainability were discussed together at the Earth Summit in 1992 and through the activities of Agenda 21. Latterly health and climate change have been discussed. The chapter by ***Palmlund*** outlines these recent developments . Commentators have talked about the 'risk continuum' of recent public health: the environment generates risks but it is up to the individual to deal with them.

Historians, the environment and health

How have historians written about health and the environment? Historical work has tended to mirror the division between health and the environment which has been emphasised in the foregoing survey. Perhaps surprisingly , earlier work such as that by Crosby or McNeill's *Plagues and Peoples* took a macro approach which did encompass the relationship between broad environmental changes and those in patterns of disease and mortality.[26]

Otherwise, two schools of historical enquiry have resulted, which are only now beginning to consider each other and to interact. Environmental history over the last two decades has been one of the growth areas of historical work. General surveys abound as this subject has made its way onto student curricula.[27] But its concerns have been with the environment, often with an absence of people and certainly with an absence of health issues. The journal *Environmental History*, supported by the Forest History Society and the American Society for Environmental History, provides an example. A recent issue (January 2010) had papers on: Thoreau; the gender divide in conservation; deforestation ; and the Atlantic alliance. [28] A recent major UK conference on the theme of the 'environments' had just four papers which dealt with environment and health.[29] A special review of environmental history published to coincide with the conference covered ten books, none of which had a direct health focus.[30] Historians of environmentalism and ' conservation' in Africa such as Beinart have drawn attention to the tensions between conservationist aims and those of indigenous populations ; this divide has been replicated in the writing of environmental history which has reinforced the absence of health concerns.[31]

Mainstream environmental history also tended to mirror the movement's own preoccupation with rural values and was not much concerned with the city. So intersections with health history developed in three areas which have overlapping interests: urban history; occupational health; and the contemporary history of policy and social movements after 1945. As Bill Luckin has commented, American environmental history initially concerned itself with the great West and the plains: ' the city loomed small in US environmental history'.[32] But later work such as Cronon's *Nature's Metropolis* and Melosi's *Sanitary City* began to bring both areas of interest together, as did Hamlin's history of UK public health in the Chadwick period. [33] The public health concern for pollution and the anti smoke organisations which sprang up in Britain and the US by the end of the nineteenth century

have been the subject of historical studies which draw together the connection between clean air and urban health.[34]

American environmental historians such as Sellers and Mittman have developed the tradition of occupational as well as public health history. [35] Their concern has been for the working environment and its impact on human health at local and global levels. Other historians have begun to look at the domestic environment, in a sense mirroring the way in which public health itself began to focus on that environment after the nineteenth century heroic period.[36] A major environmental history initiative funded in the UK by the Arts and Humanities Research Council (AHRC) focussed on the theme of ' waste' and aimed to bring histories of health and of the environment together. The theme of ' waste' served to underline both the traditional forest and soil themes of mainstream environmental history and the role of waste as an issue at the local environmental level through recycling.[37] The most lively possibilities in recent work have been in the history of environmental campaigning and the rise of environmental issues in public health.[38] These dovetail with an interest in health history in 'new social movements' and post-war health campaigning. [39] But it is clear that there is much more that could be done to make the two historical strands of work aware of each other. Environmental history has also been a multi disciplinary enterprise, bringing together demographers, historians, epidemiologists and geographers. Epidemiologists have themselves been using historical data to answer contemporary questions[40] One of the aims of this book is to integrate the work of health historians in this mix.

The contents of this book

The first chapters examine the changing relationship between environment and health in Europe at three different points in time: seventeenth-century London, Ireland during

the great famine, and *fin de siècle* Germany. These were defining moments in the history of medical response to epidemic diseases. Plague-era London was where the intellectual foundations for the modern 'medicine of the environment' were laid, as Thomas Sydenham revived Hippocratic inquiry into the relationship between epidemics and place, and proto-demographers like William Petty and John Graunt first problematised the spatial patterning of mortality. [41] Ireland under the potato blight saw agricultural catastrophe trigger a mortality crisis of huge proportions, driven by malnutrition and infectious disease; yet the response was framed by political economy and medicine failed to articulate a new preventive agenda that linked environment, nutrition and health. By the end of the century an epidemiological transition was underway in Western Europe, along with a paradigm shift in the science of disease causation, just as the technical achievement of urban sanitarianism was at its zenith. What would be the place of environment as 'bacteriological revolution' gained acceptance? In the contributions which follow the authors bring into view the material and medical contexts through which understanding of environment and health were refashioned during these pivotal phases.

Harding's study ranges beyond the established work of early modernists on the impact of plague. [42] Her method proceeds in three steps. First, she deploys the urban historian's techniques of reconstructing the physical presence of the city during its seventeenth century expansion, examining its spread beyond the central parishes into the intra- and extra-mural suburbs. Alert to housing types, building layouts and landlord proclivity for subdivision she builds a picture of patterns of habitation and their accompanying social differentiation. Next she examines cause of death recorded in bills of mortality and parish records to reconstruct Londoners' sickness profiles, classifying diseases with an eye to subsequent spatial analysis. This leads her to posit three potential relationships between housing and health: poor water provision and sewerage as a cause of gastro-enteric

disease, overcrowding as a factor in the spread of infection, and the impact of damp and poor building quality on the endemicity of 'consumption'. Drawing on qualitative sources she then records the perceptions of contemporaries about the health risks of dwelling in the 'Stinking parts of the city'. The opacity and fragmentary nature of the underlying sources render impractical the sort of regression analysis which would isolate the impact of housing from other causal factors, such as poverty and nutritional status. Nonetheless the broad conclusion is clear: a century of urban growth and the spread of poor quality habitations coincided with high mortality from a range of diseases in which housing was implicated as a causal factor. This urban context was also one of the seedbeds from which the 'political arithmetic' of epidemiology would eventually grow.

While Harding's work treats the built environment as an unproblematic meeting place for urbanists and demographers, Hamlin's study emphasizes awkward contradictions between the epistemologies of environmental and medical history, the overall meeting place of this book. In thinking about health and disease the disciplinary traditions of the former incline towards the material and the *longue durée,* while those of the latter emphasize the political and economic contingencies that frame sickness and its responses. There could be no more poignant or contentious event through which to examine these interpretive tensions than the Irish famine of 1845-52. Hamlin begins by reflecting on the gulf between 'nature' and' culture' in contemporary and subsequent readings of the famine. Historiographically this is a touchstone issue for nationalistic accounts, which depict the heavy death toll not as the outcome of agricultural disaster but of colonial callousness in land, trade and relief policies. Yet the famine was also a medical event in which deaths from infectious diseases probably exceeded those caused directly by malnutrition. Using his characteristic methodology of close reading of medical texts, Hamlin argues that in the pre-famine decades Irish doctors articulated a political medicine which addressed major questions of land policy

and population health; at the same time their status made them arbiters of generous poor relief for 'fever' sufferers. Why then did the potential for a concerted medical response to the famine go unrealised? The reason lay with the reformed Irish poor law, which effectively subordinated doctors to bureaucrats in relief policy and choked off political medicine. This insight yields an important counterpoint to Hamlin's work on Britain in the same period, when doctors fell in behind Chadwick and resolved the problems of environment and health through the 'technological fix' of sewers and drains. [43] Similar possibilities beckoned in Ireland, through bog reclamation programmes to readjust the balance of population and cultivable land. But these never took off. Thus Hamlin's 'agroecological' account of the crisis gives full play to contingency while also remaining rooted in the biological.

Shifting perceptions of the interplay between environment and health at the cusp of the twentieth century are Schott's subject. Though nominally an investigation of the *Handbuch der Hygiene*, a multi-volume technical handbook begun in the 1890s, the study's agenda is to explore the complex influences exerted on public health by urban growth, intellectual currents in medicine and the broader cultural milieu. Today the meaning of the term 'hygiene' has narrowed from its classical sense, the preservation of good health, to evoke mere domestic cleanliness. In the context of the *Handbuch* though, it was a capacious trope. This was the moment when the new bacteriology challenged miasmatic theory and the environmental management it implied, yet these two ways of knowing (Koch versus Pettenkoffer, in the German context) sat uneasily alongside each other in the manual. Further volumes issued in the 1900s were to introduce 'social hygiene, signifying a move from population-level interventions to targeting risk groups. Thus far then, Schott illuminates from Germany's perspective the familiar progression of public health through its different modes, and he adds a further dimension to the work done by scholars such as Worboys in complicating the 'bacteriological revolution's' chronology. [44] More importantly, Schott's

prosopographical reflection on the *Handbuch*'s authors also permits him to recover the mental world of those who articulated these transitions. Loosely they manifested the Germanic 'progressivism' of an aspiring bourgeoisie, hitherto politically marginalised by Bismarckian conservatism. Their creed incorporated a technocratic and scientific response to the shock growth of second-wave industrial cities, melded with the incipient environmentalist and anti-urban critique of the 'Lebensreform' movement. These lifestyle- and nature-oriented campaigns will figure in later chapters too, in both British and American contexts. However Schott's argument here is quite specific: their German manifestation fed into a new aspiration to healthful city living in which hygiene was reinvented as a secular gospel of salvation. This turn might have laid the basis for an enduring environmental movement, as regions gradually addressed the challenge of urban pollution, and voluntary groups advocated the preservation of the natural landscape. Ultimately though, it foundered, because, Schott argues, here staking a position which is different to that of Bramwell's focus on Nazi environmentalism, depression and Nazi economic policy prioritised growth over environmental considerations.

If the turn of the twentieth century saw environmental matters diminish within public health, it also saw an intensification of popular interest in the health-giving properties of nature and the elements. In the manner of Schott's 'Lebensreform' activists, a host of groups emerged in Western nations to promulgate hiking, helio-therapy, fresh air, clothing reform, diet, exercise and so on. [45] This is perhaps paradoxical, given that the same period saw the building of health systems founded on curative biomedicine. The next section explores this phase, illuminating the contexts in which the healing powers of sun, airs and waters retained their place.

Carter's subject is sunshine, and that short, distinctive period when bodily exposure to solar rays was considered medically desirable. In discussing how this came about he

tracks the development in Britain of cultural institutions and practices which idealised the tanned body and the outdoors life. As in Germany, the motive force was a reaction against the perceived degeneracy of urban industrial society, and the manifestations took different forms. There were the Boy Scouts, whose texts extolled a hardy masculinity distinguished by bronzed skin, and there were 'back to nature' advocates of camping, who sought to nourish both physique and psyche through the recapture of Arcadian innocence. Carter's concern though, is to locate these tendencies within broader public health discourses, in which heliotherapy gained a degree of medical respectability. They appealed particularly to the interests of social hygienists, who delineated the role of place and class in patterns of mortality, and incorporated eugenicist ideas about hereditary determinants of the ills of urban society. Solar therapy therefore became allied to the larger project of improving the housing and living conditions of city dwellers, which incorporated slum clearance and smoke abatement as well as the great outdoors. Its advocates appear at the same time visionary environmentalists, perceiving the need for clean energy in place of polluting coal, and creatures of a moment in modernity when liberal urban governments sought to control and make visible the lives of 'degraded' and unhealthy citizens.

Where Carter emphasizes the intellectual threads of anti-urbanism and eugenics which ran through the 'physical culture' movements, Adams stresses their embeddedness in leisure and tourism. Her subject is the water cure and its associated venue, the British spa town, for which the interwar years represented a last flourish before decline. Hydrotherapies had enjoyed a long history, with the spa reaching its apogee in the late-Victorian period, when, alongside the time-honoured ingestion of healing waters a panoply of other therapies were adopted. The bracing or soothing qualities of different spas were determined by considerations of climate and water quality, and clients enjoyed new modes of bathing using jets and showers, alongside dietary and exercise regimens created by medical hydrologists.

Why then did this form of healing wane with the advance of state medicine? Adams traces the growth of the spa as commercial entity, with advertising designed to attract middle-class consumers away from seaside towns. Therapeutic relief of stress and nervous disorders was packaged alongside sports facilities, pleasant public spaces and sophisticated shopping opportunities. This though was a prospectus that sat uneasily with the concurrent economic strategy, of attracting working-class visitors by tapping into statutory funding under the new National Health Insurance scheme. The spas' bid for incorporation into state medicine turned on the claim that they could speedily return rheumatism sufferers to productive work, but this was ultimately rejected by government. Adams notes that although the given reason was cost containment, class prejudices were implicated too, as doubters feared the new clientele would spoil the refined atmosphere of the resort. Thus although spa treatments persisted in the early years of the National Health Service they were superseded by physiotherapy and movement-oriented hydrotherapy. These shifted the emphasis onto bodily exercise, in place of the holistic combination of climate, water and place.

In the next section the discussion turns away from the industrialised nations, to parts of the world where conquest of infectious disease through control of environment remained a focus of policy. New directions had been heralded by the disciplines of tropical medicine which established themselves during the high tide of European empire. Scientists like Manson, Laveran, Ross Bruce had explicated the insect vectors of diseases such as filariasis, trypnasomiasis and malaria. [46] In their wake came entomologists, parasitologists and helminthologists for whom a new environmental health was implied, and one which was heavily determined by colonial imperatives. Thus the site of control moved from the city streets to the rural spaces on which the agricultural productivity of empire depended. Early interventions included both vector management strategies like bush clearance and marsh drainage, and parasite eradication efforts, such as Jamot's 'atoxylisation' of sleeping sickness

patients in Tanzania. By the mid-century, with the end of empire imminent and with 'colonial welfare' eliding into 'development', a more ambitious programme emerged: eradication through large-scale chemical warfare against insects.

The subject of Clarke's chapter is the mass spraying of DDT against malaria, and her purpose is to recover an episode in British environmental science which has hitherto been obscured by the historiography. This has tended to emphasize the globalised nature of the campaign in the hands of the World Health Organisation (WHO), and to assume that blind faith in the agrichemical solution effectively set back critical research in malariology. Clarke's story refines and revises this view by uncovering the field's vigorous research culture in Britain in the 1940s and 1950s. Her case study allows her to unpick the network of interests which converged to drive this science: imperial economics, military capacities, academic and applied research institutes, chemical manufacturing and so on. The ensuing alliance of malariologists and Colonial Office, lubricated by government funding for development, engendered a research programme which interrogated various aspects of eradication in the field. Much of this was practical: devising optimal techniques for aerial spraying or assessing the efficacy of insecticides other than DDT; however, some projects were evaluations of specific interventions, whether through systematic monitoring of reinfestation rates, health outcomes or economic analysis. What this reveals is understandings which were far removed from the hubristic faith in technological panacea which is sometimes attributed to the WHO campaign. Indeed, by the late-1950s, British researchers had articulated the fundamental paradox of the environmental strategy: the apparent impossibility of completely eradicating insect populations in even limited areas meant that sustained heavy spraying was needed. But this was both financially unviable and risked breeding resistance.

While a critical science had begun to undermine technocratic confidence by the mid-century, the same period also saw that faith affirmed in media representations. Bonah's concern is the depiction in film of environmental management as health intervention. His contention is that cinematic sources can reveal much of the mentalities which underpinned this strategic shift in tackling infectious diseases in colonial or low-income settings. The argument builds on several case study movies produced with industrial, military, governmental or international sponsorship, whose subject matter encompassed not only DDT but the earlier technique of anti-larvicidal oil spraying, as well as pest control. At one level this material is helpful in recording different applied techniques and revealing the various interests concerned with public information and education. However, Bonah goes further in exploring connoted meanings within the films, embedded in the language, imagery and staging of these essays in chemical triumphalism. The first point to emerge is the potency of the military metaphor, and this focuses attention both on the direct importance of war in furnishing technologies of eradication, but also in constructing environment as the habitat of dangerous vectors which must be targeted and destroyed. Allied to this was a vision of 'chemical modernity', premised on the liberating power of science and incorporating population health within the broader narrative of reconstruction. Thus behavioural approaches to malaria prevention such as bednet use and pharmacotherapies were sidelined and earlier physical interventions by drainage and reclamation gave way before the chemical fix. And the 'dreams' of eradication also obscured the part played by economic underdevelopment in sustaining the disease. [47]

In the final section the contributors bring contemporary historical perspectives to bear on those issues which have emphatically reunited environment and health in the West. They also have weighty political currency: the hazardous materials we touch or inhale; our sedentary domestic lifestyles and their deleterious health effects; and, looming over all this,

the prospects of nuclear winter or climate change disaster. Linking these papers is a concern with that same nature/culture dichotomy which Hamlin's chapter identifies as the great challenge facing medico-environmental historians. Our instincts are to historicise, to set, say, anti-nuclear campaigners or global warming activists within their social and cultural frame, and to treat the 'science' as text, as contingency. Yet as scholars of environment, and as historians in the civic realm, can we really disregard the empirical and material as we contemplate these issues? Whether explicitly or implicitly, this group of authors pin their colours to 'nature' as their intellectual foundation, and develop arguments which unashamedly pack a moral punch.

Sellers takes as his starting point the necessity of incorporating contemporary understandings of the toxicity of dangerous substances in historical analysis. His subject is the health risks of lead, both to workers and to consumers, and he urges that the globalised economy demands of medical historians a fundamental rethink. The paradigm of 'occupational health' history proves to be too Western and too oriented to labour politics to be applicable now. On the one hand the production process has increasingly been externalised, removed to cheap, lightly regulated locations where it is invisible to consumers. On the other, there is complacency about the risk from lead now that atmospheric pollution is resolved, so that dangers associated with familiar commodities such as painted toys go unseen. Sellers argues instead for a cross-national approach to analysis, which connects local experiences of work hazards, with global patterns of consumption, via national regimes of surveillance and measurement. He explores this through discussion of smelting works on the US/Mexico border serviced by Mexico's lead mines. That in Texas initially escaped the attention of interwar hygienists, thanks to its peripheral position and American distaste for international regulatory trends. After 1945 though, the combined disciplinary expertise of engineers, epidemiologists and toxicologists legitimised notions of 'safe' levels of lead.

Meanwhile prosperity and suburbanisation encouraged an ideal of the 'clean' US factory, physically separated from the workforce. Just over the border though, risky production was stepping up to fuel world demand, as Mexican workers thronged to industrial locations where development imperatives meant occupational health was a low priority. We need to acknowledge our common histories and interdependencies, Sellers suggests, if we are to build genuinely responsible policy in this area.

While occupational health has been a constant in the history of public health, the relationship between housing and wellbeing has slowly disappeared from twentieth-century Western narratives. Warren's chapter seeks to overturn complacency about the risks which accompany indoor dwelling. His case is that however advantageous the spacious, hygienic shelter of the home had been in the eras when infectious disease menaced, it has become increasingly perilous over the last hundred years. The story begins in the early twentieth century, with American and British critics of the domestic lifestyles which cut off humanity from the more wholesome natural world. In part this is familiar terrain for readers of earlier chapters, with the postures of characters like John Harvey Kellogg not too far removed from Schott's 'Lebensreformers' or Carter's helio-advocates Yet Warren heeds the possibility that they were far-sighted Cassandras glimpsing future public health threats. The case unfolds in three strands. First, the real physical risks of life inside are documented through a case study of rickets, whose resurgence he links not to the familiar issue of dietary deficiency, but to the in-dweller's inadequate exposure to sunlight. Second, he considers the onward march of the climate controlled environment, and while acknowledging some health benefits (air-conditioning as shelter from heat risk), he sees dangerous auguries for human adaptation in our growing intolerance of temperature extremes. Third, he explores the growing social isolation that accompanies the retreat into a private life dominated by electronic media. What chance now to accumulate the social capital so necessary for mental wellbeing and the

diminution of health inequalities? Of course, readers may find in Warren's dire predictions of an enfeebled post-human stock a contemporary iteration of the anti-urbanism articulated a century before by champions of the outdoors life. Alternatively, his essay just may be an early map of the new agenda for environmental history, soon to become an urgent priority.

The risks which Rumiel addresses are much more familiar: the threat to human well-being posed by military and civilian uses of nuclear power. She presents case studies of two physician organisations which emerged in the 1960s and 1980s in opposition to the threat of atomic war, and which are explicable as manifestations of Cold War politics. Why though did this campaign transmute to a more broadly based opposition to nuclear energy? Rumiel postulates that one answer was the signal influence of the Chernobyl disaster. The notorious Soviet reactor meltdown dramatised safety issues and provoked anxieties for populations living in proximity to generators. It also galvanised a similar confluence of expertise to that Sellers noted in the realm of lead exposures, with public health doctors now standing alongside other scientific disciplines in assessing costs and benefits of nuclear energy. The question which this provokes is what place public health criteria should have in an environmental arena dominated by physicists and engineers, and shaped by economic and strategic concerns. The engagement of medical protagonists had derived initially from a sense of professional duty, but enthusiasm alone was not enough to ensure effectiveness. To be heard at the table, physicians needed to capitalise on events and to build bridges with other experts to convey their message.

As we reach the millennium, the apocalyptic passions once surrounding the nuclear debate seem antique when set against the immensity of climate change. Our collection closes with Palmlund's history of the international politics driving today's overriding environmental concern. Like Rumiel, her project is to track the place of medicine in this policy discourse, and she too finds it disappointingly marginal in the risk accounting. She first provides a brief

chronology of the arrival of climate science in the political arena, from the early transnational awakenings over ozone depletion, to the now global awareness of the effect of greenhouse gases. Parallel to this, international organisations arose to sustain the scientific consensus and broker negotiations about emissions reductions. Meteorology, agriculture and alternative energy technologies loomed large in these new networks, and where social impacts were discussed the emphasis was squarely on growth economics and prospects for development. Where then was health? Following preliminary warnings in the professional journals of a range of risks, such as heatwave mortality, the resurgence of vector-borne diseases and the stress on health systems of extreme weather events, the WHO belatedly entered the field. Palmlund though warns against any false optimism. The natural sciences still dominate the debate, she argues, and doctors have barely begun to model the effects and plan public health responses.

With environmental reform increasingly stalled by industry sceptics, North/South hostilities and the backsliding of short-termist politicians, Palmlund's apocalyptic reading suggests that now, more than ever, a new political medicine is called for. The histories recounted in this collection counsel caution when contemplating the prospects for this. Whether in famine-era Ireland or the malarial regions of colonial Africa, science has to make its way among competing interests, and is indeed constructed by them. Yet the environmental imperative has traditionally been the core narrative of public health, whose first statement began with the drainage systems of Mohenjo Daro and reached a dramatic climax with 'Enter Mr Chadwick' in Rosen's classic narrative. [48] As Charles Webster has argued , public health interests then gave a powerful example in facing down vested interests and elevating environmental health from a position of neglect to the centre of politics. [49] In recent times, that historical legacy had been adapted in the public health field-'sanitarian becomes ecologist' ,in John Ashton's words.[50] The nineteenth century was important for the

interaction of environment and health, but that relationship, so our book both argues and illustrates, has a wider and shifting set of historical relationships which also need to be taken account of in framing future strategies.

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[1]P. Wilkinson , KR Smith,M. Davies ,H. Adair ,B.G. Armstrong ,M. Barrett ,N. Bruce , A.Haines , I.Hamilton ,T. Oreszczyn , I.Ridley,C. Tonne ,Z. Chalabi (2009) 'Public health benefits of strategies to reduce greenhouse-gas emissions: household energy', *Lancet* Dec 5,374(9705),1917-29. Epub 2009 Nov 26;A.Markandya ,B.G. Armstrong , S.Hales A. Chiabai , P.Criqui ,S. Mima ,C. Tonne , P.Wilkinson (2009)'Public health benefits of strategies to reduce greenhouse-gas emissions: low-carbon electricity generation', *Lancet* ,Dec 12,374(9706),2006-15;A.Haines, A.J. McMichael ,K.R. Smith , I. Roberts , J.Woodcock ,A. Markandya ,B.G. Armstrong, D.Campbell-Lendrum ,A.D. Dangour ,M. Davies , N. Bruce ,C. Tonne ,M. Barrett ,P.Wilkinson (2009) 'Public health benefits of strategies to reduce greenhouse-gas emissions: overview and implications for policy makers.' *Lancet*, Dec 19,374(9707):2104-14. Epub 2009 Nov 26. Review

[2] Hippocrates reference

[3] M. Dobson (1997) *Contours of death and disease in early modern England* (Cambridge: Cambridge University Press).

[4] A. Crosby (2003) *The Columbian Exchange : Biological and Cultural Consequences of 1492* (Westport, Conn : Greenwood Press, 30th anniversary edition).

[5] R. Grove(1996) *Green Imperialism : Colonial expansion, Tropical Island Edens and the Origins of Environmentalism* (Cambridge: Cambridge University Press).

[6] J.C. Riley (1987) *The eighteenth –century campaign to avoid disease*, (London: Macmillan); A.Rusnock (2002) *Vital accounts: quantifying health and population in eighteenth-century*, (Cambridge, Cambridge University Press)

[7] Riley *The eighteenth –century campaign to avoid disease*; M.Foucault (1974) 'The birth of social medicine', in J.Faubion (ed.) (1994) *Michel Foucault: Power. Essential works of Foucault 1954-1984 Volume Three*, (London: Penguin), pp.135-56

[8] A. La Berge (1992) *Mission and method: the early nineteenth century French public health movement* (Cambridge: Cambridge University Press), pp.54-75.

[9] E. Chadwick (1842) *Report on the Sanitary Condition of the Labouring Population of Great Britain* ed M. W. Flinn (1965) (Edinburgh : Edinburgh University Press).

[10] A. Hardy (1993) *The Epidemic Streets: infectious disease and the rise of preventive medicine, 1856-1900* (Oxford : Clarendon Press).

[11] C. Hamlin (1998) *Public Health and Social Justice in the Age of Chadwick. Britain,1800-1854* (Cambridge : Cambridge University Press).

[12] P. Starr (1982) *The Social Transformation of American Medicine* (New York : Basic Books), p.189.

[13] M. Worboys (2000) *Spreading germs :disease theories and medical practice in Britain, 1865-1900 (*Cambridge : Cambridge University Press).

[14] D. Porter (1999) *Health, Civilisation and the State. A history of public health from ancient to modern times* (London : Routledge) , p.143.

[15] W. Wilson Jameson and F. T. Marchant (1920) *Hygiene, specially intended for those studying for a diploma in public health* (London: J and A Churchill).

[16] See for example C. F. Mathis, ' Environmental campaigning in the nineteenth century', paper given at the 79th Anglo American conference of historians July 2010.

[17] H. Ritvo (2009) *The Dawn of Green :Manchester,Thirlmere and Modern Environmentalism* (Chicago : University of Chicago Press).

[18] R. Roberts Ragged Schooling ref.

[19] A. Bramwell (1994) *The Fading of the Greens. The Decline of Environmental Politics in the West* (New Haven and London : Yale University Press); A.Bramwell (1989) *Ecology in the twentieth century : a history*(New Haven : Yale University Press) ; R. Proctor(1999) *The Nazi War on Cancer* (Princeton: Princeton University Press).

[20] J. Lewis (1986) *What Price Community Medicine? The Philosophy, Practice and Politics of Public Health since 1919* (Brighton : Wheatsheaf Books).

[21] Parker, R.(1986) 'The struggle for clean air ' in P. Hall, H. Land ,R. Parker and A. Webb (eds.) *Change, Choice and Conflict in Social Policy* (Aldershot: Gower) first published 1975 and reprinted 1978, pp.371-409 ; V. Berridge and S. Taylor (2005) *The Big Smoke : fifty years after the 1952 London Smog. Proceedings of a witness seminar* (London: Centre for History in Public Health) http://www.ccbh.ac.uk/witness_bigsmoke_index.php

[22] V. Berridge (2007) *Marketing Health .Smoking and the Discourse of Public Health in Britian,1945-2000* (Oxford : Oxford University Press), p.63.

[23] C. Sellers (2006) 'Worrying about the water; sprawl, public health and environmentalism in post World War Two Long island' seminar given at Centre for History in Public Health, LSHTM 7 April.

[24] W. Beinart and P. Coates (1995) *Environment and History : The Taming of Nature in the USA and South Africa* (London: Routledge) ; W. Beinart and L. Hughes(2009) *Environment and Empire* (Oxford : Oxford University Press); W. Beinart (2008) *The Rise of Conservation in South Africa* (Oxford : Oxford University Press).

[25] V. Berridge, D.A.Christie and E. M. Tansey (eds.) (2006) *Public health and the 1980s and 1990s: decline and rise?* (London Wellcome Centre at UCL). http://www.ucl.ac.uk/histmed/publications/wellcome_witnesses_c20th_med/vol_26 .[26] W. H. McNeill (1977) *Plagues and peoples* (Oxford: Basil Blackwell).

[27] I. Simmons (2008) *Global Environmental History* (Edinburgh : Edinburgh University Press); J. McNeill *Something New under the Sun: an environmental history of the twentieth century world* (New York : W. W. Norton and Co) ; S. Mosley (2010) *The Environment in World History* (London : Routledge).

[28] *Environmental History* (2010)15(1) January

[29] Programme of the 79th Anglo-American conference of historians 'Environments' July 2010.

[30] See *Reviews in history* <reviews- in- history>@lists.sas.ac.uk

[31] Beinart and Hughes , *Environment and Empire;* Beinart, *The Rise of Conservation.*

[32] B .Luckin (2006) 'Environmental activism, environmental history' paper given to Centre for History in Public Health seminar LSHTM, 19 January. See also D. Schott, B. Luckin and G. Massard-Guilbaud (eds) (2005*) Resources of the City : Contributions to an Environmental History of Modern Europe* (Aldershot: Ashgate).

[33] W. Cronon (1991) *Nature's Metropolis : Chicago and the Great West* (New York :W. W. Norton) ; M. Melosi (2000) *The Sanitary City : Urban Infrastructure in America from colonial times to the present* (Baltimore :Johns Hopkins University Press).

[34] S. Mosley (2008) *The Chimney of the World : A history of smoke pollution in Victorian and Edwardian Manchester* (London :Routledge) ; B. Luckin (1986) *Pollution and Control : A Social History of the Thames in the Nineteenth Century* (Bristol ; Adam Hilger) ; A. Wohl (1983) *Endangered Lives: Public Health in Victorian Britain* (Lon don : Methuen).

[35] G. Mitman, M. Murphy and C. Sellers (eds.)(2004) *Landscapes of Exposure : Knowledge and Illness in Modern Environments . Osiris* special issue, 19 ; P.Weindling (1986) *The social history of occupational health*(London : Croom Helm/Society for Social History of Medicine)

[36] M. Jackson (ed.)(2007) *Health and the modern Home* (London : Routledge) ; C. Mills (2007) 'Coal, clean air and the regulation of the domestic hearth in post war Britain' in Jackson (2007); S. Mosley (2003) 'Fresh air and foul: the role of the open fireplace in ventilating the British home,1837-1910',*Planning Perspectives,* 18,1-21 ; Mosley, 'The Home Fires : Heat, Health and Atmospheric Pollution in Britain,1900-45', in Jackson(ed.) *Health and the modern Home*, pp. 196-223..

[37] T. Cooper (2008) 'Challenging the ' refuse revolution' : war , waste and the rediscovery of recycling', *Historical Research* ,81, 214, pp.710-31

[38] See Berridge and Taylor (2005) *The Big Smoke ;* Berridge, Christie and Tansey (2006) *Public health.*

[39] See for example ,J-F.Mouhot 'Environmental NGOs and environmental campaigning in Britain since 1945' paper given at the 79th Anglo American conference.

[40] K .G. Kuhn, D Campbell-Lendrum, B. Armstrong and C. R. Davies (2003) 'Malaria in Britain : Past, present and future', PNAS 100,17,pp.9997-10001; C.Carson, S. Hajat, B. Armstrong and P. Wilkinson (2006)' Declining vulnerability to temperature related mortality in London over the twentieth century', *American Journal of Epidemiology,* 164, pp.77-84 ; T. McMichael(2001) *Human Frontiers, Environments and Disease: Past Patterns, Uncertain futures* (Cambridge : Cambridge University Press).

[41] Riley *The eighteenth –century campaign to avoid disease,* pp.1-19, at 9.

[42] P.Slack (1985) *The impact of plague in Tudor and Stuart England,* (London: Routledge & Kegan Paul).

[43] Hamlin, *Public Health and Social Justice.*

[44] G. Rosen (1958) *A History of Public Health*,(edn. 1993, Baltimore: Johns Hopkins University Press), chs vi, vii; Worboys *Spreading Germs*.

[45] See inter alia: Porter, *Health, Civilisation and the State*, 303-9; J. Matthews (1990) 'They had such a lot of fun: The Women's League of Health and Beauty between the Wars', *History Workshop Journal*, 30, 22-54; I. Zweiniger-Bargielowska (2007) 'Raising a Nation of 'Good Animals': The New Health Society and Health Education Campaigns in Interwar Britain', *Social History of Medicine*, 20, 73-89.

[46] DM Haynes *(*2001) *Imperial Medicine: Patrick Manson and the Conquest of Tropical Disease*, (Philadelphia, University of Pennsylvania Press).

[47] R .Packard (2007) *The Making of a Tropical Disease: a Short History of Malaria*, (Baltimore: Johns Hopkins University Press), pp.175-6.

[48] Rosen ,*History of Public Health*, pp.1, 175.

[49] C.Webster (1992) 'Public health in decline', *healthmatters*, 11, 10-11.

[50] J. Ashton (1991) 'Sanitarian becomes ecologist : the new environmental health', British Medical Journal, 26 January,302, pp?