Introduction

This book traces conceptions of air and health from ancient civilisations to the present day, and explores the conceptions alongside historical developments in public health. Through examination of these changing relationships the book identifies and critically examines contemporary problems – scientific, philosophical and ethical – in public health theory and practice.

The introduction first explains why the theme of air and health was chosen, and then expands on the aims of the book. Next there is a discussion of some of the academic strengths and weaknesses posed by adopting an interdisciplinary approach, and one that spans such a long time-scale. Then, to place the book in context, there are introductory sections on what is meant by public health, environmental health and environmentalism. Although the public health focus is the UK, and a synopsis of the current situation in England and Wales is provided, international dimensions are also considered. Finally, outlines to the chapters are presented both as a guide to the shape of the book and also as a point of reference.

Why 'air and health'?

The environment appears to be making a comeback. After centuries of widespread environmental damage, attention is finally being directed to the importance of conservation to, and preservation of, the earth's natural resources.[1] Concern for valued natural resources – air, wild forests and endangered species – has become more acute due to recent fears that damage might be long-term or even irreversible. But how deep is the recent resurgence in interest in the natural environment, and does it matter what underpins it?

There is one form of rational and uncomplicated response to this question. Humans have harmed the environment and eventually this impacts back on mankind. Examples abound of how the damaged environment inevitably affects those who degraded it as well as those who did not: polluted water supplies causing birth defects; climatic disasters linked to global warming; and loss of plants with

medicinal potential from destroyed rain forests [1]. A rising awareness of the consequences of environmental damage to human health and well-being has driven us to focus again on the environment and how we treat it. At last, recognition of human-induced environmental damage is being taken seriously.

But there is also another interpretation of the problem, based on related premises but offering alternative explanations. The argument here is that the root of the problem lies in the way humans relate to the natural environment, and how this has changed over time. Many ancient civilisations, as well as some more contemporary worldviews, picture mankind's relationship to the natural environment holistically, as part of an integrated whole. The environment has inherent value within such cultures and perspectives, rather than instrumental value for human needs and aspirations, whether these be related to health or purely aesthetic. Respecting the natural environment is an integral part of any such philosophy, not a belated add-on [2].

This second interpretation is linked to the belief that technological fixes will be insufficient to address the environmental problems of today and those of tomorrow. While technology will undoubtedly play a necessary part in efforts to attenuate current environmental damage (recycling, greener fuels, natural energy sources and so forth) and ameliorate future damage, alone it will not suffice. Only dramatic changes to the way humans live their lives, alongside a different relationship between mankind and the natural world, will secure the safety of the planet and its inhabitants. The shallow environmentalism of the modern West must be replaced by a deeper environmental commitment, requiring wholesale changes in Western behaviour and politics [3].

While these two approaches to the same environmental crisis are well recognised, exploration of the broader connections between the approaches and developments in the history of science and medicine has been relatively thin. In particular, it should be possible to look at historical changes in, say, understanding of human health and well-being, and see whether these changes shed light on interpretations of the causes of – and thereby possible solutions to – the environmental ill health of today.

It is feasible to go down this investigative route using a number of different ideas or themes. After all, the roots of contemporary environmental problems may be reflected in different historical developments and processes. For example, the origins of environmental ills might be linked to changes in leisure and travel patterns, and the importance these are perceived as having for health and psychological development. Or it might be useful to examine the history of the pharmaceutical industry and the impact that development of drugs based on natural substances has had on respect for the environment. Yet, as fruitful as such investigations might be, it is hard not to hold that leisure patterns and the pharmaceutical industry are

in some respects too far removed from the environmental crisis to yield substantial and practical connections.

Instead, this book needed a theme closer to the natural world but still a health-related theme that could be historically followed against changing human relationships with the natural environment. Still, any one of a number of different themes could have been used, for instance water and health. Choice of theme, however, was somewhat dependent on the goals of this book and so it made sense to choose a health-related theme close to the area of medicine that has tended to tackle how the environment affects humans, namely close to public health. And with this goal in mind, the choice of theme for this book became more obvious: air and health.

Classically, human health has been associated with atmospheric air, from the harmonic humour of ancient civilisations, through the Old Testament's 'breath of life' and on to modern concerns about air pollution. Further, public health developed in the mid-nineteenth century against a backdrop of fears about the effects on the workforce of filthy air from unsanitary living conditions and factory smoke-filled skies. And attached to those fears was the charged debate over whether infectious diseases, the scourge of expanding economies of the nineteenth century, were transmitted by contagious persons or conveyed to individuals through the air as miasma.

So this book takes the theme of air and health, tracks conceptual changes in this theme against developments in public health and, in so doing, intends to illuminate the environmental problems now experienced.

Aims of this book

More specifically, this book has two main aims. The first is to explore historically the theme of air and health, and the relationship of this theme to developments in public health, particularly in England and Wales but also in other countries. Following this, the second aim is to use this exploration as a vehicle to examine critically generic issues in contemporary public health theory and practice, and to look at what these might tell us about the origins of today's environmental problems.

These aims present substantial challenges. Historiography, broadly speaking, can be based around two approaches: examining a particular idea or area in great depth over a specified (usually short) period; or taking a theme over a longer period and looking at links, for instance between ideas and practices. The former tends to be the preferred approach of academic historians, as attention to detail unravels the historical intricacies and helps inform how political, economic and other social processes shape change.

This book, however, adopts primarily the latter, largely because of the wider goal of using the theme to inform evaluation of contemporary issues. Attention

to the fine historical details of specific events or periods can be fascinating and enlightening but it can also foster criticism that the results are largely of academic interest rather than practical utility.

Of course, from a historical perspective tracing an idea or a theme over more than two thousand years is no easy task. Not only is the time-frame huge but it encompasses vastly differing epochs, cultures and civilisations. Some areas are inevitably covered in less detail than others, and trends in themes can be difficult to identify and defend. Also, efforts to compare periods on such a large scale are inevitably open to criticism of failing to understand ideas, beliefs and events in relation to the context in which they appear. This book bears these warranted pitfalls in mind, alongside related tendencies to interpret historical events in the light of what is known today: so-called Whig historiography [4].

But the historiographic difficulties are certainly not the only ones; there are problems of definition. The notion of air, for example, has had diverse meanings, from the expired breath of an individual to a spiritual ether, or, in more modern times, the space that connects us as human beings and communities. And, as is more than familiar to students of public health or medical sociology, the term 'health' is notoriously difficult to pin down, notwithstanding the countless attempts to do so.

Further difficulties of definition include the array of perceptions of what public health may be, what constitutes the environment and what should be the appropriate subject matter of environmental health. To some, public health represents any collective effort to improve the health or well-being of the public; to others it refers to nearly two centuries of doctor-led professional activity geared towards advocacy and promotion of the health of communities [5]. Similarly, to some, environmental health is about how the environment impacts on human health, say through pollution of water supplies. But to others environmental health is really about the health of the environment, and nothing to do with how that affects mankind.

These last difficulties are returned to later in the introduction, with a synopsis of developments in public and environmental health, but a final intellectual problem needs mentioning. This is way this book mixes academic disciplines in tackling its subject.

History, science and philosophy: a critical blend

In addition to a historical perspective, this book draws on other disciplinary approaches – epidemiology, philosophy and ethics. Mixing in this way is sometimes considered academically challenging, to say the least. Some would argue that historians should grapple with original texts, scientists should do experiments and philosophers should stick to philosophising. Intellectual territory can be defended on the grounds that a historian would not be expected to conduct a clinical trial,

scientists do historical research badly, and philosophical analysis requires logic and rigour rather than attention to cultural context.

Arguments in favour of academics focusing on that at which they are best do have weight and are supported by plenty of poor-quality work completed by those branching out of their own fields. On the other hand, there is no shortage of insubstantial work undertaken by those staying within their areas of apparent expertise. While resolution will not necessarily be found by reference to intellectual excellence, it is worth turning briefly to another element of the debate – tradition and change.

For much of the twentieth century those working within academic fields have generally preferred to stick within their boundaries. If one looks back further, however, things were quite different. Marx and Engels were – by modern categorisation – economists, political scientists and social historians [6]. Darwin was a naturalist, biologist and social anthropologist [7]. Further back to the Hellenic period, science and philosophy could not be separated.

The modern trend to academic demarcation says something, at least, about developments in education. As disciplines separated in the twentieth century, education and training became more compartmentalised, and specialists became more familiar and comfortable in their own fields. Tradition then bred tradition and, as is well known, tradition can be a hard nut to crack. In particular, developments in science led to the demarcation of scientific education from other educational areas. Understanding scientific ideas, scientific methods and scientific behaviour required a special kind of knowledge and way of thinking [8].

Things, however, changed in the latter part of the twentieth century, for instance the noteworthy emergence in the 1970s of the field of history and philosophy of science [9]. While this has never really been a field attracting much interest from scientists, it has provided a focus for historians and sociologists with an interest in how social forces shape scientific change and scientific knowledge, and for others with an interest in the philosophical and conceptual bases of scientific understanding. Here it is recognised that philosophers of science obviously need to be good philosophers but they also need a strong understanding of science [10]. Similarly, social historians of science have shown in-depth understanding of scientific and medical concepts and ideas [11].

More recently, important books have demonstrated an acute ability to cross disciplines. John Rawls's classic *A Theory of Justice* [12] combines political and moral philosophy; the Nobel Prize winner Amartya Sen mixes economics and philosophy in *Inequalities Re-examined* [13]; Alisdair MacIntyre explores history, ethics and social philosophy in *Whose Justice? Which Rationality?* [14]; and Tony McMichael brings together environmental science, public health and evolutionary history in *Planetary Overload: Global Environmental Change and the Health of the Human Species* [15].

While this book makes no claim to be placed alongside such visionary works, it shares the common ground of critically blending academic areas. It is done with the knowledge of some of the limitations of such an approach. But there are benefits. The world out there is not as conveniently demarcated as university departments, and to add new knowledge it can be helpful, and sometimes necessary, to draw on whatever tools are available.

There is a further parallel benefit. As has been mentioned before, this book is intended to be of practical use to those working in, or interested in, the areas addressed. To have such utility the text needs to be written with simplicity and lucidity. Combining different disciplines should facilitate this process, through encouraging a clear and accessible writing style. It is hoped that these needs have been met.

The development of public health in the UK and internationally

The history of public health is a relatively unexplored area. In the 1950s George Rosen wrote his seminal book *A History of Public Health* [16]. This long and broad text, covering worldwide public health efforts from ancient Greece onwards, was to remain the principal work of reference in the area for some decades. Despite its strongly medical flavour, Rosen's book stretches across many facets of improvements to the public's health, and endures as a remarkable achievement.

Over the last decade or so interest in the history of public health has been slowly growing. Public health, however, poses two related historical challenges. First, there is no consensus on what public health actually is. The historian Dorothy Porter, for example, provides a broad, socially deep-rooted definition of public health as 'collective action in relation to the health of populations' [17]. Others, however, see public health as a predominantly professionally led subspeciality of medicine.

A number of medically based public health bodies have drawn on a well-known definition of public health provided more than 80 years ago by C. E. A. Winslow, then Professor of Public Health at Yale [18]:

> Public health is the Science and Art of (1) preventing disease, (2) prolonging life, and (3) promoting health and efficiency through organized community effort for
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> a) the sanitation of the environment,
> b) the control of communicable infections,
> c) the education of the individual in principles of personal hygiene,
> d) the organization of medical and nursing services for the early diagnosis and preventive treatment of disease, and
> e) the development of social machinery to ensure to every individual in the community a standard of living adequate for the maintenance of health,
>
> so organizing these benefits as to enable every citizen to enjoy his birthright of health and longevity.

In 1988 the Institute of Medicine referred to Winslow's definition in a report on the future of public health in the USA [19] and, the same year, Donald Acheson led an inquiry into the future of public health in England and similarly described public health as 'the art and science of preventing disease, promoting health, and prolonging life through organised efforts of society' [20].

In 2002 the Faculty of Public Health Medicine (UK) was still using Acheson's definition and added that public health is 'concerned primarily with health and disease in populations, complementing, for example, medical and nursing concerns for the health of individual patients' and its 'chief responsibilities are monitoring the health of a population, the identification of its health needs, the fostering of policies which promote health, and the evaluation of health services' [21].

The second, related, historical challenge posed by public health is that in the global history of public health the UK (especially England and Wales) has probably received more than its fair share of attention. This is connected to the previous point in that the excessive focus is largely attributable to the perception of nineteenth-century England being the birthplace of public health. But this perception is based on England being the founding country of a certain kind of medically led professional public health; and it is also based on the power and impact of the British Empire at the time and – to a lesser degree – on British involvement in developments in bacteriology at the turn of the twentieth century.

Public health, however understood, has developed in all kinds of different ways in different countries. In the USA, for instance, organised public health did not really get going until around the 1920s, has never been medically driven, and over recent decades has been dominated by huge inequities in access to and provision of health services, discrepancies in quality of public and private services, and the impact of a legally oriented culture. By contrast, as Beaglehole and Bonita have discussed, the beginnings of modern public health in Japan are earlier, associated with the 1874 Isei decree covering legislative needs around public health and medical education. Japan continues to be of great interest in relation to its considerable advances in life expectancy. Countries such as France, on the other hand, have experienced limited state involvement in public health, leaving a modestly structured system today despite being pioneers of bacteriology and hygiene; and Germany has virtually no public health infrastructure although Rudolf Virchow was in the vanguard of thinking about poverty, education and health in the nineteenth century. Outside the Western world, low income countries, such as many in Africa, often have cash-strapped collapsing public health infrastructures while some – such as Cuba, China, and the south Indian state of Kerala – are repeatedly held up as exemplars of the positive impact of well-structured, politically motivated and socially driven public health systems in areas of limited economic resources [22].

Nevertheless, with the caveats and biases above taken on board, public health in the UK does stand out with its unique history. The first subspeciality of medicine with a focus on health and well-being at the population level was developed within the UK, and other countries that have followed have tended to do so in its colonial wake. But this was not how it always was, the medicalisation coming after those important early steps of orchestrated effort. At the 'birth' of public health in mid-nineteenth-century England it was sanitation engineers and lawyers, not doctors, who led the way, politically supported by the need for a healthy workforce at a time of industrial expansion and a growing Empire [23]. Ill health led to poverty, which necessitated expensive State assistance, which in turn engendered financial dependence. Alongside came demoralisation, and 'immoral behaviour' such as abrogation of personal responsibility and inattention to personal hygiene.

When the medical profession began to take control in the 1870s, public health developed more of the community caring feel associated with doctors. As a professional career public health was not, however, confined to the medically qualified until the turn of the century and the introduction of the Diploma in Public Health. Public health then focused on areas such as sanitation, working conditions and health, immunisations, air pollution, and health advocacy, especially for the poor [24].

During the course of the twentieth century there have been various changes to public health in the UK, with two standing out. Historians have described public health's heyday as the years between the two world wars, when public health departments were perhaps at their most powerful. But public health was sidelined somewhat by reconfigurations at the initiation of the NHS in 1948, and its influence diminished until the creation of the medical subspeciality in the 1970s.[2]

In concert with these developments were changes (of particular relevance to this book) in the ability of public health to engage in environmental matters. The demedicalisation of the environmental and social health components of public health since 1948 occurred through loss of control over sanitary officers (later environmental health officers or EHOs) and social workers, and then through separation of public health from local authorities as it was moved into health authorities within the NHS.

Despite public health's transient affirmation of three decades ago, during the whole second half of the twentieth century, public health has suffered from insecurity and uncertainty. It has often defined itself by its functions and roles, rather than through developing an underlying philosophy as a basis for action [25]. Hence it has tended to take on many functions around health service organisation, management and delivery, as well as commissioning. The problem is that when these roles or functions are threatened by new restructuring of health services, public health

almost inevitably can fall into a crisis of confidence and identity. 'If we're not doing *that*, what can we do?'

So we come to the latest restructuring of the NHS, as described in the following section. But returning to the introductory basis of this section, when considering developments in public health this book does indeed concentrate on England and Wales. However, most of the book covers theoretical aspects around changing conceptions of air and health that are of widespread relevance, and there is also further attention to international developments in public health in the conclusions.

There is no intention here to diminish the status of the histories of public health in many other countries, nor any desire to further promote the significance of the British experience, but it is largely to do with scope and application. It is just not possible to incorporate in any meaningful fashion the diverse histories of different countries, and this book also contains practical recommendations for UK public health based on its findings.

Recent changes to public health in the UK

Change is not new to public health in the UK. There have been numerous reorganisations since the profession's emergence in the mid-nineteenth century and now, 150 years later, public health is going through its latest, dramatic shift. As has often been the case before, changes to the public health function are part of a wider restructuring of the NHS.

The main driver of the recent changes has been the will to give more power to those working in primary care, power with regard to providing their own services, and also to commissioning hospital-based services (secondary, tertiary and quaternary services). In the pre-2001 system, health authorities[3] purchased virtually all services on behalf of the populations they represented, with public health departments located within those health authorities having a strong role in assessing the healthcare needs of their local populations. In an effort to contain spiralling costs the British Prime Minister Margaret Thatcher made failed attempts in the 1980s and 1990s to break the NHS monopoly and create a free, or freer, healthcare market.[4] The peculiar economic circumstances of the NHS made that difficult but the Labour Government of Tony Blair laid out a new direction at the turn of the millennium [26].

The new NHS would operate as a quasi-market with health authorities no longer the purchasers of services; instead, the buying would be carried out largely by new organisations called Primary Care Trusts (PCTs). Serving populations of around 100 000–200 000 people, by 2002/2003 PCTs would be responsible for purchasing approximately 75% of healthcare services for their local populations. As well as hoping to have an impact on costs, the financial power was being handed to the PCTs because it was thought that these organisations would know, and therefore

serve, the needs of their local populations better than their predecessors. Rather than being predominantly administrative organisations, PCTs would be community-orientated and contain professional executive committees comprising key members of local primary care staff – general practitioners (GPs), district nurses, community midwives and so on. The PCTs would be more suitably placed to know what local patients need than the somewhat isolated former health authorities.

In 2001 the UK Government set out the details of the transition in *Shifting the Balance of Power* [27]. Some aspects have since progressed further, for instance the gradual transfer of commissioning activities to general practices from 2005. The important 2001 document, however, also laid out the implications for public health. While minimal public health teams would be based in new Strategic Health Authorities (StHAs),[5] most public health workers would be relocated to public health departments in PCTs. Because of the shortfall in public health skills these new departments would be smaller than their parent departments, and public health networks would be set up across StHA sectors to share skills and support thinly spread expertise.

These latest changes to the NHS, which are only now bedding down, offer the opportunity to reassess and reinvigorate public health in the UK. They also provide the chance for public health to 'go back to its roots'. Moving public health teams or departments to PCTs puts public health closer to communities, closer to assessment of their health needs and action to meet these needs. This responds to criticism that public health was too separate from the community. There is a very real threat, however, that public health resources, dissipated and fragmented, may be used up working on provision of health services and other politically directed agendas, rather than attending to social and environmental determinants of health. Demoralisation of a workforce tired of change, and with insecurity over its future, has led many to look elsewhere. With other related changes in the profession (examinations, non-medical status, and director posts; see Chapter 12, 'Conclusions and recommendations'), public health in the UK really is at a crossroads. During the course of this book contemporary and historical developments in public health are looked at in relation to changing conceptions of air and health.

Environmental health and environmentalism

In the decades leading up to the NHS restructuring described earlier, there has been a general heightened interest in the natural environment, manifest in public health through increasing epidemiological studies exploring links between the environment and human health: air pollution and climate change are obvious examples. But the environment, and environmental health, mean different things to different people.

Environmentalism refers to the broad ideology that gives the natural environment a more central place in the way we think and act. Although there has, since around