Clay's Handbook of Environmental Health

Eighteenth edition

Clay's Handbook of Environmental Health

Eighteenth edition

EDITED BY
W.H.Bassett
DMA, FCIEH

Honorary Fellow, School of Postgraduate Medicine and Health Sciences, University of Exeter. Previously Chief Executive and Director of Housing and Environmental Health, Exeter City Council, UK

London and New York

First published 1933
by H.K.Lewis

Eighteenth edition 1999
by E & FN Spon,
11 New Fetter Lane, London EC4P 4EE

Simultaneously published in the USA and Canada
by Routledge
29 West 35th Street, New York, NY 10001

This edition published in the Taylor & Francis e-Library, 2002.

E & FN Spon is an imprint of the Taylor & Francis Group

British Library Cataloguing in Publication Data
A catalogue record for this book is available from the British Library

Library of Congress Cataloguing in Publication Data
A catalogue record for this book has been requested

ISBN 0 419 22960 4 (Print Edition)
ISBN 0-203-01631-9 Master e-book ISBN
ISBN 0-203-17275-2 (Glassbook Format)

This edition of Clay’s is dedicated to
John Herbert Morris, formerly Assistant Chief
Environmental Health Officer to the City of Leicester,
who passed away in June 1997.
A dear friend of and mentor to the editor and a
colleague who passed on his extensive knowledge so
effectively to students of environmental health.

Contents

Contributors

Peter Allen BA, DMA, DMS, FCIEH, FRSH
Head of Environmental Health Services
Oxford City Council

William H.Bassett DMA, FCIEH
Honorary Fellow
School of Postgraduate Medicine and Health Sciences
University of Exeter

Paul C.Belcher BA, MSc, MCIEH,
Principal Lecturer and Head of the Centre for Environmental Sciences
University of Wales Institute Cardiff

Alan Blythe FCIEH, M.Inst.WM, DMS, FBIM
Environmental Consultant
Wedmore, Somerset

James Connelly MBBS, MSc, MRC Psych., MFPHM
Senior Lecturer in Public Health Medicine
School of Medicine
University of Leeds

Jeff Cooper MSc, BSc, M.Inst.WM, FRGS
Producer Responsibility Co-ordinator
Environment Agency
London

Brian Etheridge BSc (Hons), MSc, DMS, MCIEH
Head of the Local Authority Unit
Health and Safety Executive
London

Liz Falconer MPhil, FIOSH, RSP, MIM
Lecturer
University of Salford

Norma J.Ford BSc, MCIEH
Senior Lecturer
University of Salford

Eric W.Foskett OBE, BSc (Econ.), DPA, FCIEH, FRSH
Formerly Director of Environmental Health, City of Manchester, and Past President, Institution of Environmental Health Officers, London

Robert D.Foster DMS, MCIEH
Chief Environmental Health Officer
King's Lynn and West Norfolk Borough Council, King's Lynn

Michael J.Gittins C.Eng, FCIEH, M.Inst.E, FRSH, MIOH
Formerly Chief Environmental Health Officer
Leeds City Council

Michael J.Greaves BSc (Hons), MCIEH
Regional Manager
Meat Hygiene Service
York

Veronica Habgood BSc, MSc, MCIEH
Senior Academic
School of Land and Construction Management
University of Greenwich
London

Michael Halls FREHIS, FRSH, M.Inst.WM
International Federation of Environmental Health
London

Andrew Hopkin MCIEH, MIM
Chief Environmental Health Officer
Derby City Council

Michael Joyce DMS, FCIEH
Formerly Chief Administrative Environmental Health Officer
Southern Group Public Health Committee
Armagh
County Armagh

Robert Lambourne
Director of Health and Environmental Services
Bristol City Council

John F.Leech BSc (Hons), MCIEH
Principal Environmental Health Officer
Exeter City Council

Ian D.MacArthur BSc (Hons), MCIEH
Assistant Secretary
Chartered Institute of Environmental Health
London

Richard T.Mayon-White MB, MRCP, FFCM
Consultant Public Health Physician,
Consultant in Communicable Disease Control,
Regional Epidemiologist and Senior Clinical Lecturer
University of Oxford

Chris Megainey BSc (Hons), MCIEH
Specialist in Environmental Pollution
London

Terence Moran JP, BSc (Env. Health), LLB, LLM, MCIEH, MIOA
Principal Lecturer and Head of Environmental Quality
Leeds Metropolitan University

Ray Oxby BSc (Hons), MCIEH, DMS, MIM
Head of Environment
North East Lincolnshire Council

Paul B.Paddock BSc (Jt Hons), BSc (Hons), MPhil., MCIEH, MIOSH
Principal Lecturer in Environmental Health
The Nottingham Trent University

Richard J.Palfrey MCIEH
Principal Environmental Health Officer
Exeter City Council

Stephen R.Palmer MA, MB, BChir., FFPHM
Director of the Welsh Combined Centres for Public Health
College of Medicine
University of Wales, Cardiff

Edward Ramsden MBE, FRSH, MCIEH, DMA, FCIS
Formerly Director of Environmental Health Services
Swansea City Council

Ray Ranson MA, MRSH, MIH, MCIEH
Consultant in Environmental Health
World Health Organization
London

Kath Ray BA, MA
Research Assistant
University of Salford

Denise M.Rennie BSc, MSc, MCIEH
Head of Environmental Management
University of Salford

Paul Robinson BA, DMS, MCIEH
Head of Education
Chartered Institute of Environmental Health
London

Roisin M.Rooney BSc (Hons), DMS, MCIEH
Senior Scientist (Environmental Health)
Communicable Disease Surveillance Centre
Colindale
London

Peter Rotheram BA, FCIEH, FRSH
Executive Secretary
Association of Port Health Authorities
Runcorn
Cheshire

Michael Squires MIOA
Senior Environmental Health Technician
Exeter City Council

John D.Wildsmith BSc (Hons), MSc, MCIEH
Senior Lecturer
Centre for Environmental Sciences
University of Wales Institute
Cardiff

Frank B.Wright LLB (Leeds), LLM (Leicester), FCIEH, FRSH, FRIPHH
Director of the European Health and Safety Law Unit
University of Salford

Considerable assistance has also been received from Ronnie Alexander (Chief Environmental Health Adviser to the Welsh Office), Mark Du Val (Assistant Chief Executive to LACOTS) and Rob Griffin (Principal Environmental Health Officer at the Department of Health). We are most grateful to them and all our contributors for their considerable help in preparing this edition of *Clay's*.

Preface

According to the *Report of the Commission on Environmental Health: Agendas for Change,* published by the Chartered Institute of Environmental Health in 1997, 'Environmental health, having invented itself in the nineteenth century, needs to reinvent itself at the start of the twenty-first century'. This proposition, along with others made by the commission, is discussed in a new chapter which opens this edition (Chapter 1). The commission's report is intended to stimulate a wide debate about the future focus and organization of environmental health, but new approaches to the objectives, strategies, organization and practice of the faculty have already emerged, and these are evident in many chapters of this new edition.

New approaches are also reflected in the inclusion of substantial new material, including new introductory chapters for the sections on health and safety, food safety and environmental protection (Chapters 24, 33 and 40). Each reflects the wider background against which the subjects must be studied and the new concepts and approaches that have emerged over the past few years.

The introduction to health and safety (Chapter 24) outlines the development of the present health and safety framework and discusses some of the principles that underpin it, including self-regulation, risk assessment, 'so far as is reasonably practicable', and the tolerability of risk. It also outlines the enforcement of health and safety law in other European countries. Local authority enforcement in the UK is then analysed, and this section includes information on the recent Memorandum of Understanding between the Health and Safety Executive (HSE) and local authorities. The chapter highlights the main elements necessary in a health and safety enforcement policy and ends with an outline of emerging trends, including those relating to employment and accidents, small businesses and the emergence of occupational health as a priority.

The introduction to food safety (Chapter 33) reflects the recent studies of the subject that have been carried out as a result of heightened public concern, and outlines the likely organizational changes that will result. These issues include:

- an outline of the existing infrastructure
- the James Report on a Food Standards Agency
- the white paper *The Food Standards Agency: a Force for Change*
- the Pennington Report on the outbreak of *E.Coli O157*
- the European Food Law green paper.

The changing structures and concepts for environmental protection are also identified in the introduction to the specialized chapters in this area (Chapter 40) and this includes information on:

- the present driving forces of environmental protection
- transboundary pollution and the global approach
- climate change
- stratospheric ozone depletion
- sustainability
- BATNEEC (best available techniques not entailing excessive cost), BAT (best available technique) and BPEO (best practicable environmental option)
- environmental assessment
- the role of economic measures.

This chapter also details the structure in each of the elements of environmental protection and the current technical position on each and, in addition to the main areas, this includes contaminated land, light pollution and indoor air quality.

There is a new chapter on risk assessment and risk management (Chapter 11) which identifies the principles and gives examples of their application in the practice of environmental health. The aim of this chapter is to give environmental health students and practitioners an appreciation of both the advantages and limitations inherent in the development of risk management strategies as a means of selecting environmental controls and interventions.

The chapter dealing with the enforcement of environmental health legislation in the UK (Chapter 8) has been rewritten to incorporate sections on the following topics:

- enforcement policies
- the enforcement concordat
- programming of inspections
- entry
- recording of information
- investigative powers
- notices
- charges for enforcement action
- cautioning
- prosecutions.

A further new chapter (Chapter 20) deals with the problems of non-infectious diseases with an environmental cause, particularly cancers. It examines the present arrangements for identifying the local epidemiological incidence and relating it to exposure to toxic materials. The chapter goes on to encourage the development of procedures to deal with this increasingly important challenge to public health.

Substantial changes have been made to many other chapters, the most significant being:

1. New organizational case studies are included (Appendix to Chapter 3), this time for Bristol city council and the borough of King's Lynn and West Norfolk.
2. The chapters on environmental health in Scotland and Northern Ireland (Chapters 4 and 5) have had major alterations to update the situation in those countries.
3. The new national initiatives to improve the standards of public health contained in *Our Healthier Nation—A Contract for Health are* discussed in Chapter 10.
4. The Imported Food Regulations 1997 have been included in Chapter 15.
5. The chapter outlining the law and administration of communicable diseases (Chapter 16) has been expanded to bring in more information about the structure and role of the Public Health Laboratory Service (PHLS) and its constituent parts.
6. The chapter on housing standards and enforcement (Chapter 23) has been substantially revised to take account of new legislation (including the Housing Act 1996 and the Housing Grants, Construction and Regeneration Act 1996) and also includes information on the proposals to amend the housing fitness standard.
7. In addition to its new introductory chapter (Chapter 33), the section on food safety has been recast and there is now a separate chapter dealing with meat hygiene following the establishment of the Meat Hygiene Service (MHS) (Chapter 39).
8. The chapter on air pollution (Chapter 42) has been rewritten to reflect current concepts, problems and solutions and now incorporates an outline of the new Air Quality Management Scheme as well as information on the relationship between air quality and road traffic.

All the remaining chapters have of course been updated but, in order to create space for the extensive new material, I have had to omit from this edition the chapter on statistical method. However, the text of that chapter (Chapter 14 in the seventeenth edition) is still relevant and applicable. Chapter 2 in the seventeenth edition, international aspects, has been split and information on this topic can now be found in other parts of the book as appropriate.

The text as a whole has been updated to reflect changes up to April 1999.

There are now 36 contributors, of whom 17 are involved for the first time. These authors are listed separately and we are extremely grateful to all of them for giving their knowledge, experience and time in this way.

With each new edition of Clay's we try to reflect the ongoing changes in the perception and scope of the environmental health faculty but, as always, I shall be very grateful for any comments since they are helpful in the planning of future editions.

As in UK law, the male pronoun is sometimes used alone for ease of reading. It should be taken to refer to both males and females.

W.H.Bassett
Exeter, April 1999.

Extract from the preface to the first edition

Under the ever-widening scope of public health administration, and in view of the high standard demanded of students presenting themselves for the examination of the Royal Sanitary Institute and Sanitary Inspectors' Examination Joint Board, the need has arisen for a handbook, more comprehensive and more in accord with the progressive demands of modern times, than has been available hitherto. At the request of the publishers, this volume has been prepared to meet that need.

Despite the number and variety of the subjects necessarily included in a book of this character, the author has endeavoured, as far as is practicable within the limits of a single volume of convenient size, to cover the whole range of the duties of a sanitary inspector, observing due proportion in the attention given to each subject, and while dealing fully and in detail with some subjects, omitting none that is of real importance.

The author has always felt that the subjects to be studied by sanitary inspectors are by no means of an uninteresting character. It has been his endeavour to make this book 'readable' and such as to rob systematic study of much of its inherent drudgery.

Few things are of more practical value to executive public health officers, either in examination or in practice, than the ability to illustrate answers or suggestions by sketches. In order to assist readers in this direction, the liberal illustration of technical matters has been made a special feature of the book; every illustration being from an original line drawing in which sectional details are shown, and which the reader may reproduce or develop for himself.

H.H.C.

London, April 1933.

Part One

Environmental Health—Definition and Organization

1 Introduction to environmental health

Ian D.MacArthur

WHAT IS ENVIRONMENTAL HEALTH?

It has been said that environmental health is everything and everything is environmental health. While this adage captures the enormity of the subject and may have a resonance with those who work within the field, it does not serve as a meaningful definition. Definitions are of fundamental importance. They set out the precise scope and restrictions placed on a concept or idea. They seek to clarify and to establish a common understanding of terms. The definitions of technical terms can stem from vested interest, and in attempting to define a subject more and more closely barriers and marked sectors can develop. In this sense, the term environmental health is quite different from other definitions in that its meaning can be so wide, and in many respects it is this catch-all nature that creates unease and misunderstanding. By separating the two dimensions we can illustrate the all-encompassing nature of the combined term: Albert Einstein noted that environment was 'everything that's not me', and the World Health Organization (WHO) considers health to be a state of complete physical, mental and social well-being.

Despite the broad challenge of these concepts several definitions exist for environmental health. In 1989, WHO defined it 'as comprising of those aspects of human health and disease that are determined by factors in the environment. It also refers to the theory and practice of assessing and controlling factors in the environment that can potentially effect health'. [1] A more recent attempt at defining the term emerged from a meeting of WHO European member states in 1993. Their proposed definition was: 'Environmental health comprises of those aspects of human health, including quality of life, that are determined by physical, biological, social and psychosocial factors in the environment. It also refers to the theory and practice of assessing, correcting and preventing those factors in the environment that can potentially affect adversely the health of present and future generations' [2]. This definition concludes that environmental health is in fact two things: first, certain aspects of human health; and second, a means by which to address these issues. As a concept and as a means of delivering practical solutions, environmental health provides a strong basis upon which decision-makers can work towards sustainable development.

Fig. 1.1 demonstrates the interface of environmental health. It shows that it is a discipline concerned primarily with human health and it notes that humans operate in different environments: the living environment, the home environment, the work environment and the recreational environment. The figure also sets out the various stresses that can impact on any of these environments. It is from this perspective that a holistic view can be taken of human health and the environments in which people live.

It has been clearly recognized that environmental

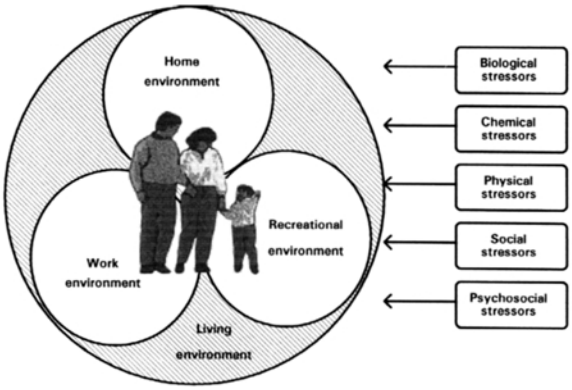

Fig. 1.1 The interface of environment health. (Source: [3].)

health is a wide-ranging discipline that relies upon intersectoral co-operation and action. It is therefore essential that all the potential contributors to the development and implementation of environmental health programmes can recognize their role. Environmental Health Officers (EHOs) and other professionals, although burdened with a very appropriate title, cannot deal with all aspects of environmental health. Environmental health as a concept is far larger than the roles traditionally played by EHOs employed in local authorities. Many professionals in the public and private sectors make invaluable contributions towards environmental health; they may not perceive themselves as environmental health professionals, but they nevertheless perform tasks that contribute to the whole. In particular, there are many public health doctors, occupational health and safety staff, and technical specialists who need to be brought into the environmental movement in an effort to maximize the use of the human resources available.

Professionals on the periphery of environmental health work would greatly benefit the system if they also understood the role of environmental health and could thus relate its principles to their work. It is becoming clear that general practitioners (GPs) will increasingly have to deal with illnesses that are largely due to environmental factors. It is therefore important that they understand the principles of environmental health and how their diagnosis and subsequent action can assist in developing effective environmental health interventions. In a similar way, a basic understanding of environmental health would also prove to be a valuable asset to urban planners. Building capacities in environmental health should not be restricted to the public sector workforce. There are many employed in the private sector, and not just those in mainline environmental management positions, who recognize and build the principal precautions of environmental health management into every day business practices.

THE PRINCIPLES OF ENVIRONMENTAL HEALTH

The development of the environmental health approach has grown organically rather than by design. However, it has demonstrated that it can bring rhetoric to life and adds considerable value to the process of improving human health and quality of life.

In a world that is subject to constant and turbulent change, it is surely important to retain some sense of core values or principles as touchstones for our work. Environmental health and the mechanisms to deliver it are founded upon such fundamental principles. They do not apply simply to environmental health at the community level, where the main focus is local government. These principles apply to all levels of government and all sectors that contribute to environmental health. They relate to many government issues and depend upon the way in which governments at all levels relate and interact among themselves and with communities. This is a major challenge as many governments still fail to understand the true nature of environmental health, and therefore the significance and value of its approach.

Environmental health is relevant in three time phases. It must work to repair past damage, to control present risk and to prevent future problems. The emphasis given to each phase is determined by a complex formula of factors, depending largely on an assessment of the risks and resources available. It is of course important and correct to address the most pressing issues relating to environmental health urgently, but emphasis should also be given to addressing, and so avoiding, future problems. This is the basis of the precautionary principle, which is becoming widely accepted in all policies and programmes and ensures that environmental health action remains at the leading edge of improving life quality of life.

Principle 1

The maintenance and improvement of the human condition is at the centre of all environmental health action. A similar principle is contained in *Agenda 21* [14]. The principle is a recognition that the main target of environmental action is the well-being of the human race and those factors in the environment, however wide, that may affect it.

Principle 2

The disadvantaged groups within society are often those that must live in the worst housing with poor environmental conditions, work in the most dangerous occupations, and that have limited access to a wholesome and varied food supply.

The disadvantaged do not from a single homogeneous group: different people are at a disadvantage in different contexts. For example, low income households in northern European countries may be at risk of poor health because of damp and cold housing conditions, fuel poverty and/or inadequate nutrition. This phenomenon has been clearly recognized by WHO, which acknowledges that access to the appropriate medical technology cannot in itself offset the adverse effects of environmental derogation and that good health will remain unobtainable unless the environments in which people live are health promoting.

A reduction in inequality requires equal access to environmental health services and an uptake of services that relates to need. The provision of high technology services should not be restricted to certain sections of the population because of social or economic disadvantage in the others, and services should be sensitive to the needs of minority groups. To achieve this, the disadvantaged within the population will require special assistance and attention.

Equity is therefore a core and primary element that underpins any action on environmental health.

Principle 3

The third principle that must be satisfied to ensure effective environmental health relates to a **range of governance issues that can be described as the conditions for civic engagement.** The adoption of the democratic principles of government is the cornerstone to the effective management of environmental health. For example, the European Charter of Environment and Health sets out the basic entitlements of individuals including the rights of full information, active consultation and genuine participation in environmental health decisions.

Democratic principles also require a two-way exchange, however. Every individual also has a duty to act responsibly in an effort to contribute to the protection of the environment. To achieve this partnership, responsible authorities must adopt a role for promoting environmental health and be responsive and answerable to the needs and desires of the communities they serve.

Environmental health protection is based on a model of democracy in which experts and elected politicians make decisions on behalf of the general public. This sometimes paternalistic and frequently closed style of decision-making is a legacy of the democratic system developed in the eighteenth and nineteenth centuries and strengthened throughout most of the twentieth. But times have changed. The populous is better educated and through the mass media better informed (or misinformed) about conditions in their communities and matters of scientific and national concern. Demands have increased for greater public participation in all aspects of society. People want not merely to be represented but to participate. This is particularly true of matters that affect their health, their quality of life, and the quality of their environment, particularly at community level. The twentyfirst century will be the age of **participatory democracy.**

Participation can promote environmental health quality because it provides a means of organizing action and motivating individuals and communities. It enables individuals and communities to shape policies and projects to meet their priorities. Involvement in planning gives people the possibility of influencing choices about the use of limited resources. Additionally, participatory political structures are a check on the abuse of the environment, since citizens with clear rights and knowledge and access to a legal system that allows speedy redress can exercise a powerful restraint against contravention of environmental health regulations. Mobilizing communities for action has become essential, but these groups are faced with formidable obstacles in the shape of prevailing organizational and practised patterns, the attitudes that underlie those patterns, and insufficient awareness and concern.

Participation is a two-way process. As well as actively taking part within decision-making processes, it is of equal importance that individuals and corporate bodies all take responsibility themselves to protect and promote the environmental health of their community.

The concept of participation relies heavily on local decision-making, and highlights another important element of civic engagement, that of **subsidiarity.** The meaning of this concept is often lost in the jargon of political science, but in essence it requires that decisions or actions be taken at the most appropriate level. This is one of the pledges outlined in the Helsinki Declaration on Action for Environment and Health in Europe 1994. The responsibility for identifying and resolving local environmental health problems is best devolved from central government to local authorities. The involvement of non-governmental organizations and an informed public in the decision-making process is both necessary and practicable. Developing effective subsidiarity policies relies upon levels of accountability being built into the system. It would be totally inappropriate for decisions to be made at the correct level within the system without the decision-makers being accountable to the communities affected by those decisions. It is therefore important that not only are decision-makers held accountable, but that they owe their accountability to the public. Accountability upwards to ministers can only disfranchise the public affected by the decision-making, and is likely to create a feeling of animosity and unwillingness to participate in the programmes or policies thus created.

Many of the problems that currently face environmental health will only be solved by communities acting as a whole, rather than as individuals. This is one of the key areas to challenge our traditional approach to solving environmental health problems, and it is certainly an area that requires research. The current global culture has developed into one of individual duty, responsibility and action. When this is accepted as the norm, it becomes difficult to instil a feeling of community and common good. It is clear then that if we are to solve some of our most pressing environmental health problems, community action must be called upon. In this sense communication and education policies become the main threads within the civic engagement principle and these will become increasingly important as technical, legal and economic management tools fail to address the root causes of the new problems we face. As the technical and financial arguments fail to win the necessary changes, ethical considerations and decisions will increasingly need to be made.

Principle 4

Another crucial element, the origins of which can be traced back to the days of Edwin Chadwick, is a practice of **co-operation and partnership** in pursuit of improvements in environmental health, not only between the health and environment sectors, but also with economic sectors and with all social partners. This is the principle that lies at the heart of effective environmental health management. Isolated decisions and actions cannot normally solve problems in environmental health: an intersectoral approach is needed. Intersectoral activity is at the core of good environmental health practice. Its usefulness, however, depends on how broadly it is interpreted and implemented. When intersectoral co-operation is understood to pertain only to the support of the programme of a particular sector, it fails. If interpreted and applied, intersectoral co-operation and co-ordination means that:

- the problems tackled are common ones in which all participants have a stake
- not only governmental agencies but also all the public and private sector organizations and interests active in the sector are involved
- policy-makers, technical and service staff and volunteers at both national and local levels have actual or potential functions to perform
- various participants may play leading and supporting roles with respect to specific issues
- co-operation consists not only of ratifying proposals, but also of participation in defining issues, prioritizing needs, collecting and interpreting information, shaping and evaluating alternatives, and building the capabilities necessary for implementation
- stable co-operative mechanisms are established, nurtured and revised according to experience.

Principle 5

The next principle of environmental health, which cuts across all of those already discussed, is the notion of **sustainable development** or sustainability. In a similar way to the term environmental health, this concept does not just encompass certain issues, but requires particular ways of managing them. In the policy-making process relating to environmental health there are three particularly important threads that serve to confirm the almost overlapping nature of environmental health and sustainable development. They are:

- **policy integration;** the bringing of environmental health considerations into all other areas of policy and the tying together of different policy fields and different levels of government
- **partnership;** consultation with and participation by all groups in society in the planning and implementation of sustainable development policies
- **appropriate scale;** the handling of policy at the level of government (from local to international) at which each environmental health issue itself occurs, with a bias or emphasis towards the subsidiarity principle.

Principle 6

International communication and travel is making the world an ever smaller place. Environmental health professionals have long recognized the fragility and proportions of the planet, and that the contaminants in our environment do not respect national boundaries. **Environmental health issues are truly international in their character.**

The world of environmental health is also small. The worldwide community of professionals who dedicate their working lives to improving and protecting the places we live in for the common good are but a speck compared with those who work to exploit and deplete the world's resources in pursuit of wealth creation. However, the diminutive character of the world's environmental health community brings great advantages. We can and must communicate with ease. Although our languages may be different and our heritage and culture places us in different systems, our problems and approaches are mutual. Our commonwealth of knowledge can provide us with an irresistible resource for solving many of the perplexing dichotomies we are faced with in our daily work.

International co-operation and collaboration is therefore a key principle for environmental health and is one that should not be overlooked, despite the distraction of our immediate surroundings and problems.

THE COMMISSION ON ENVIRONMENTAL HEALTH—*AGENDAS FOR CHANGE*

One of the most significant influences on the subject of environmental health in recent times has been the work carried out by the UK Commission on Environmental Health and its subsequent report *Agendas for Change* [4]. This commission was established by the Chartered Institute of Environmental Health (CIEH) in 1996. The CIEH recognized that the famous names of public health —such people as the Chadwicks, the Pastors and the Rowntrees—all reacted to the conditions of the industrial revolution, a revolution that created physical (and ultimately social) changes in our environment. It was those people who created and founded the institutional structures and approaches to environmental health problems that still remain today throughout the world. Yet why should a system established in the 1800s be suitable for today's society, a society that still bears the physical hallmarks of the Victorian age but operates in a completely different and more complex manner than any before it?

The CIEH also looked towards the production of a National Environmental Health Action Plan (NEHAP) as a means of reforming environmental health services. At the 1994 European Ministerial Conference on Environment and Health, which was held in Helsinki, all countries agreed to write NEHAPs. The UK was one of the first countries to embark upon this process. The result, however, was more a report of the status quo that did not put forward any holistic vision of environmental health. While the NEHAP process has been of benefit in other parts of Europe, the CIEH saw it as a missed opportunity and looked towards the Commission on Environmental Health to fill the gap and create a new leading vision for environmental health.

There have undoubtedly been significant changes and developments in both the professionals and the systems of environmental health over the past 100 years, but it was becoming increasingly clear to the CIEH that environmental health had evolved within an institutional strait-jacket, and that the structures of environmental health were now unable to reach the root causes of the ills that troubled society in the midst of an information age. It was recognized that change was needed now and that this should be a defining moment.

The year 2000 represents a psychological gateway to new perspectives and understanding, the significance of which should not be underestimated. In addition to reviewing what we have achieved, history has shown that when society enters a new century, never mind a new millennium, there is a surge of activity and development in all aspects of society. The CIEH therefore considered it to be fitting that the world of environmental health should take a moment for reflection towards the end of the twentieth century to debate a vision of a new age of environmental health.

It was against such a background and with the understanding that the time was right for a radical rethink of where environmental health was going that the CIEH took the unprecedented decision to establish a wide ranging Commission on Environmental Health. The commission was given the following terms of reference:

- to consider the principles of environmental health and their application to the health of individuals and the pursuit of sustainable development of communities
- to examine the relationship between environmental health and relevant socioeconomic factors
- to recommend a framework for action in the UK to reinforce and take forward the principles of environmental health with the involvement of the whole community.

Under the chairmanship of Dr Barbara McGibbon, the commission consisted of 13 individuals from fields related to environmental health and environmental health management. They met a total of 7 times in 18 months to review their terms of reference, and published their report, *Agendas for Change,* in July 1997 [4]. It sets out a new vision for environmental health that recognizes the social, economic and environmental aspects of human activity.

The new environmental health calls for different approaches that move away from regulation and control towards co-operation partnership and management. These are the tools for lasting solutions. Fig. 1.2 illustrates the new approach, which

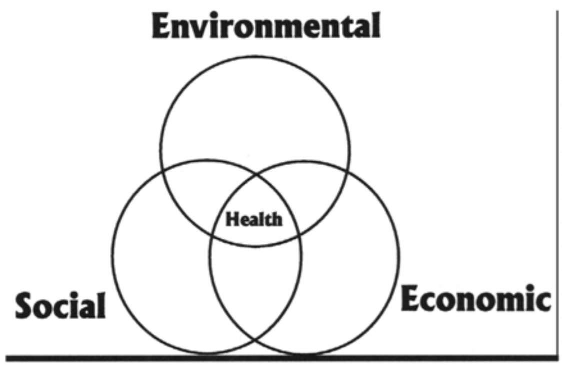

Fig. 1.2 The social, economic and environmental axis. Reproduced from [5].

recognizes that many of the environmental health problems that face society today are created by society and can only be tackled by the whole of society taking action. It is relatively easy to get individuals to take action when it is a matter of individual health. However, the new challenge is how to get whole communities to act, not for individual benefit but for the advantage of society as a whole. The example of road transport and air quality illustrates this point well, as it is only when a complete modal shift in transport patterns occurs that air quality has a chance of improving. Individuals acting in isolation and not using their cars will not make a significant difference to air quality and will ultimately simply inconvenience those people. It will only be through working in partnership, in co-operation with the various stakeholders, that we can expect positive results. Managed solutions will be more sustainable. *Agenda for Change* is a wide-ranging report that contains many themes and 21 recommendations specific to the UK situation. The commission recognized that:

1. there is a strong need for the integration of public and environmental health
2. there is a need for clear local accountability in service delivery
3. that many positive contributions were being made to environmental health under the heading of 'Agenda 21' and 'Local Agenda 21'
4. that sustainable development processes provide many of the elements of good environmental health and that these elements need to be nurtured to ensure sustainable change [4].

THE NEED FOR CHANGE

A healthy environment

The fundamental message of the commission's report is that human beings can only be healthy in a healthy environment. It recognizes that we cannot insulate ourselves from our surroundings—the air we breathe, the water we drink, the food we eat, the buildings and the landscapes we inhabit. Directly or indirectly, they will affect our health and well-being. These may seem unexceptional statements yet they carry implications for policy-making that are far from understood. They mean, for example, that we need a far more integrated and comprehensive approach to policy formulation, one that embraces health impacts even where they may not be obvious. The problem—and one of the reasons why this integrated approach does not yet exist—is that the target seems to be constantly shifting.

The relationship between environment and health is a complex one, but only recently has this complexity been recognized. In the space of a generation our attitudes to the environment, and to the illness or health it may generate, have undergone a revolution. Our mind set—our expectations and attitudes—have changed fundamentally. We think of the planet as our home and conceive of it as a unity. Hence the new global agenda, one that deals in both economic opportunities—the global market—and in environmental limits, and the costs that breaching these limits may entail. We are aware of human rootedness in the environment, that the health of the biosphere, of air and water and soil, is a vital determinant of human health and well-being. We also realize that human well-being is a complex, variable and vulnerable state, encompassing physical, social and psychological factors that are not easily separated.

The holistic approach

To express such thinking, we have begun to evolve a new terminology: speaking of interdependence and interconnectedness, of the importance of a **holistic** perspective. From professionals, this demands a flexibility of response that may run counter to specialisms. For the public, it can mean that patience with established procedures is lower and expectations much higher. People do not merely expect that their environment should not damage their health, although they do expect that. They also increasingly expect that it should promote their health and well-being [6].

All these changes have occurred within the career-span of an individual, roughly the time it would have taken for a person to progress from professional education and training in environmental health to a senior position in the field. But this is not merely an issue for environmental health specialists, since the very nature of the changing agenda—the broadening of concerns, the perception of new links between previously separate areas —means that everybody working in the fields of environment and health is affected.

In the 1990s, most of us recognize these points in principle. Many professionals and policy-makers no doubt try to place their work in a wider context. But at some point they come up against an obstacle. More often than not this is institutional, in the broadest sense: the fact that the framework for defining and delivering environmental health has not kept pace with the revolution in knowledge or attitudes. Where changes in the mechanism of delivery have occurred, they have often been piecemeal, inconsistent or driven by forces that have intrinsically little to do with the concept of a genuinely health-promoting environment: cost-effectiveness theories, for example, or *laissez-faire* governance.

We are, in effect, driving an old vehicle into a new era. The question is therefore: do we leave it to creak along, attempting the odd roadside repair, or send it back to the design shop for a complete overhaul?

The commission's approach

In considering its approach to this question, the commission identified several ways to carry out a root and branch assessment of what environmental health might mean towards 2020. It considered: looking at the characteristics of 'environmental health'; examining the agreed schedule of environmental health interests; or examining illnesses related to environmental deficiencies or pollution. However, the lack of a simple definition of environmental health, and the complicated interactions between environment, behaviour and biology, make the whole topic extremely complex.

Environmental health professionals have increasingly attempted in recent years to link what they do to what they think they ought to be doing. Hence the evolution and, to a degree, the codification of various principles to guide those working in the field—a kind of philosophical underpinning of the practice of what professionals recognize as environmental health. Five major principles have been identified as key components of environmental health and have informed the commission's approach.

- precautionary approach
- intersectoral collaboration
- addressing inequalities and inequities
- community participation
- sustainable development.

It has become clear that the majority of the forces that will shape and form how environmental health must work in the next century come from outside the worlds of the environmental or health professions. It was with this in mind that the commission concentrated on the 'agendas' that are driving change in environmental health. These forces include: a new interest in quality of life rather than length of life; social inequity; new attitudes to health, safety and risk; sustainable development; globalization; economic management; the information revolution; and balancing subsidiarity and the desire of direct public participation in policy-making and implementation.

These and other similar issues form the complex web that environmental health as a discipline must recognize and about which it must negotiate so that it continues to have added value in the years to come.

CHALLENGES, DANGERS AND OPPORTUNITIES

The challenge

We are standing on the threshold of change; in many senses the run in to the new millennium will provide a defining moment for a re-think on environmental health. Environmental health has in fact been here before. A similar moment in history occurred in the eighteenth and nineteenth centuries, when urbanization and industrialization brought millions of people together in crowded, sprawling and insanitary settlements. In response, society underwent a period of rapid change. New models for the delivery of public services were introduced—the municipal corporations of the 1830s and new the Boards of Health. A new concept of health arose: the idea of public health. New philosophies for the delivery of education and other public services began to take shape, and a new form of democracy evolved—extended suffrage, which became universal in the early twentieth century.

Nearing the end of the twentieth century, we are at a comparable watershed. In the West, urbanization and industrialization are largely behind us. Our horizons are increasingly global, not merely national. We deal, typically, in symbols and abstractions, in information rather than in manufactured objects. Engineered solutions are no longer the answer (although they still have a role to play); solutions have to be managed. They also have to be discussed with those they affect. And the problems themselves have assumed less tractable, more qualitative dimensions to do with lifestyles, quality of life, and psychological health. More importantly, perhaps, the manageable, predominantly urban concept of public health that was developed in the nineteenth century has been replaced by a much bigger concept, that of the global biosphere. As a result, we are grappling with the much bigger issue of the future of life and health on earth, a question that rarely occurred to the Victorians.

We are therefore living in a world that knows what it has come after but has much less idea of what it is coming before. Environmental health, having invented itself in the nineteenth century, therefore needs to reinvent itself at the start of the twenty-first. And although many of the new threats are global, the problem, and the response, will often be regional or local, even individual.

The dangers

The worst case scenario for the future takes as its social backdrop a picture of sharpening inequalities, continuing environmental degradation, a decaying family and community fabric, increasing stress and the deterioration of the state in to a kind of reactive, coping mechanism. Against such a background, the emphasis within environmental health would be on cure rather than prevention, hard technological solutions rather than a softer people-based response, and probably professional compartmentalization rather than integration, since the former offers surer career gains to individuals.

If prevention does remain a low priority and the integrated planning and delivery of services is drowned out by calls for quick fixes, many diseases associated with modern lifestyles, such as cardiovascular disease and cancer, will take much longer to conquer. For example, the research needed to understand them will be slower to materialize and might well face a powerful rearguard action by well-organized industrial lobbies.

The environmental impact on health is an inevitable by-product of human activity, and it is therefore the nature of that activity, and the attitudes that go with it, that hold the key. So it will be to the soft technologies—the technologies of mind, reason and social organization—that we must increasingly look for solutions. Hard 'engineered' technologies are at best a partial answer, at worst a diversion. The answers offered are much more difficult. They require vision, ambition and leadership; they also require debate, consensus and agreement. In the worst case scenarios described, these solutions will be more, not less, difficult to realize.

The opportunities

The commission's view for 2020 assumes first and most importantly that healthy people and healthy environments go together. This may sound a truism, but if so it is not widely acknowledged. Science and technology, together with our capacity to create artificial environments, have contrived to obscure that message and to replace it with another one: that we are somehow above nature, that we don't need it and if it doesn't suit us, we can change it.

Over the past three decades this idea has been overtaken by events and also by a profound change in attitudes. Increasingly, we can see why it is mistaken and how and where the mistakes have been made. In effect, we are talking about a wide ranging extension of sympathies, intelligence and sense of identity, slowly reaching and covering the rest of the biosphere. We are in the middle of this process now, so as yet it is only partial. By 2020, it will be part of the standard mental equipment of inhabitants of the urban developed world. And such people will need far less reminding that environmental health is synonymous with human health.

Implicit in much of the commission's deliberations is the conviction that the best organizational model for the delivery of good environmental health is a local one. The 2020 vision is thus of a community-based service responding to the needs of a particular place—a real setting, not a bureaucratic abstraction. Those needs should be identified by, through and with the people that live in that place.

These new structures will have a number of distinguishing characteristics. They will be flexible, inclusive and task-oriented. They will have both a community and a professional presence, but the professionals will be on tap rather than on top. They will be trained to think laterally as well as technically. They will work to secure meaningful participation, to link up organizations that had previously worked in isolation and they will be a major ingredient in the delivery of an integrated and multidisciplinary programme for a preventive approach to environmental health.

Another two themes that feature in the 2020 vision are inequality and sustainability. First, urgent attention should be paid to reducing the disparities in wealth between social classes that relate so closely to disparities in environmental quality and health. The 2020 vision is therefore of a society where goods, whether they are measured in terms of monetary income or quality of life and physical and mental well-being, are much more equitably distributed than at present. The commission recognized that equality and efficiency go together. An unequal and divided society is a malfunctioning society, and malfunction carries a heavy and measurable penalty, in ill-health, in deteriorating environment and in the resulting social and financial burden. Second, is sustainability. Put simply, this relies on the assumption that we inject the health dimension, along with the green dimension, into our planning for sustainable development, even when this involves managing our lifestyles better than we do now.

What next?

Clearly the pressures for change are now irresistible. We cannot leave the current model of environmental health in neglect; adaptation and reform are needed now. Yet to declare that the current model of environmental health is now well past its sell-by date is not enough. Nor is it enough to say what changes are needed. We also need to try and clarify how change is to come about and by whom, and in whose interests it will be effected.

AGENDAS FOR CHANGE

The agendas

The agendas for change identified by the commission start from the premise that quality of life is fundamental to health. Both health and quality of life are subject to serious inequalities, but both also raise questions of lifestyle, which carry important implications for the environment. In addressing the two sets of issues—individual health and the integrity of the environment—the argument starts in the particular and the personal, moves on to the environmental and the global, and ends in the social, economic, professional and organizational—the areas where solutions must ultimately be found. The agendas that draw from the principles of environmental health are listed in Table 1.1. Although presented as a list, any of these agendas could be the starting point: these are cross-cutting themes and each provides an entry point into a larger agenda.

Quality of life

It has been long established that health relies upon quality of life as well as the absence of disease. Discomfort, dysfunction and dissatisfaction are primary indicators of poor life quality.

A different, though related, approach is the attempt to reformulate human and social goals in terms other than the purely economic. The emphasis on economic growth is largely a product of the later twentieth century. However, in that time we have learnt that whatever its positive

Table 1.1 The agendas for change

- Quality of life
- Inequality
- Lifestyle
- Globalization
- Democracy
- Information
- Integration
- Sustainability

effects, a higher economic standard of living also carries a number of negative effects on quality of life. It does not necessarily bring greater equality; it tends to degrade environments; and it does not necessarily lead to greater contentment. In fact, an exclusive concentration on economic objectives may destroy the very things—family, community, the social fabric—on which our physical and mental health relies.

A number of studies over the past two decades have shown that people feel better—less stressed, more content, less aggressive—in the presence of natural landscape features: greenery, trees, water. Their mental performance improves, they feel refreshed, relaxed and reinvigorated, and with these feelings comes improved physical health. These elusive, qualitative issues probably underpin the movement of people from the cities in search of better health and quality of life. Many people of course do not have such choices.

Inequality

By and large, the poorest people live in the worst housing, suffer the most degraded living environments, work in the worst jobs, have the lowest level of educational attainment, and eat the least wholesome food (and pay proportionally more for it). To say that poor environments and unhealthy lifestyles go together is not to say that they **always** go together, that individuals, through effort or initiative, cannot transcend them; but people born into such circumstances have the dice loaded against them.

The equality issue—the gap between the haves and the have nots—has emerged as one of the dominant themes of the 1990s. This is a gap that matters in human terms, and numerous examples exist of real health differentials (see *An Independent Inquiry into Inequalities in Health in England* (TSO, London, 1998, ISBN 0-11-322173-8)). Growing social and environmental inequality exact an enormous toll on health and life prospects. Resolving these issues will require a political commitment. Ultimately the only way to remedy environmental and health indicators of relative deprivation is a conscious and sustained drive to reduce social inequalities in all policy areas. To prioritize it in health alone condemns the initiative to futility.

Lifestyle

There are two main components to the lifestyles agenda, both of which depend on the idea that there is such a thing as an identifiable Western lifestyle and that this carries implications for the health of individuals, society and the global environment. The first is that such lifestyles are unhealthy, and that they tend to reinforce social and environment inequality. And the second is that they are unsustainable—that the Western lifestyle cannot be transferred wholesale to the rest of the world without enormous damage to the biosphere.

To many people, consumerism represents a lifestyle that must be curbed if the environment is to be protected. Western lifestyles make heavy demands on energy and resources and thus carry far reaching implications for environmental health. Green or ethical consumerism has proved a powerful force for change since the late 1980s. As a result, many people in commerce have been forced to reconsider how they do business and have injected the green dimension into purchasing and sales policies. Yet although the marketplace has proved capable of reform, local and national governments have also been weakened by the power of the markets. What we have gained as consumers, we appear to have lost as citizens. A major theme of the commission's report is that to protect our health we have to protect the environment, and this will not happen unless people are prepared to become more actively involved. Healthy and sustainable lifestyles, like green consumerism, require knowledge and empowerment.

Globalization

At the same time as new information technology has compressed distances, the market economy is extending its reach. The new global economy is dominated by transnational corporations and brand names that are recognized throughout the world. Its prevailing ideology is liberalization and deregulation: free trade.

Contrasting strongly with the apparently unstoppable spread of globalism has been the rise in concern for the local. This takes many forms. There is a new interest in a sense of place and local distinctiveness, for example. Environmentalism has bred a radical, often passionate, attachment to particular landscapes. The global and the local are increasingly at odds with each other, sometimes in open conflict. If there are sensible alternatives to the process of globalization, they need to be explored urgently.

Democracy

Several factors have prompted the search for a new democratic model. They include the loss of local control to the new global economy; the difficulty of reconciling long-term issues of sustainable development with short-term political preoccupations; and the development of local action around specifically local environmental or health issues [7]. A widespread cynicism also attaches to politics and politicians. Local government has been emasculated: its powers and competencies have been undermined. At the same time there is an impatience with established procedures, particularly among younger people, and a new vogue for direct action. People are also, by and large, more educated, better informed and less deferential. Over the past three decades there has been a rapid expansion of civil society—the network of charities, voluntary organizations, and campaigning and pressure groups through which much political activity is focused and directed.

Cumulatively, such pressures point towards a new model for devolving power and involving people: a new model of community ownership. Although its likely shape remains unclear, there are many clues. There is demand for greater participation, although not necessarily in existing forms of government. There is a search for what might be called appropriate decision-making technology, for decisions to be taken at the most appropriate level. This often turns out to be the lowest level —the one nearest to those whose lives will be affected—compatible with efficiency and a strategic view. Hence, in part, the growth of interest in subsidiarity. There is talk of stakeholders and empowerment. And there is the emphasis placed on community. Yet there are also powerful ideological, bureaucratic and economic tendencies pushing in the opposite direction, towards centralization.

All of these issues bear on environmental health, yet environmental health and environmental protection are still based on a model inherited from the municipal corporation and boards of the nineteenth century in which experts and elected politicians make decisions on behalf of the public. This Victorian model, often distant and lacking transparency, sometimes paternalistic, is in urgent need of an overhaul.

Information

One of the key features of modern society is the explosion in the volume and complexity of information and the difficulty we have in handling it. Developments in information technology—the Internet, computer databases and so on—while creating new opportunities for participation, will add to this problem of management and interpretation that applies across the range of environmental health issues.

People need good quality information that is independently and expertly validated and clearly communicated with which to make their own judgements. And education in environmental health is central to understanding the information and encouraging informed individual and community action. Without that education and good quality information, the range of problems identified will grow more acute.

Integration

To meet the challenges of the outlines in the commission’s vision will require new approaches to policy-making and implementation. These will stress flexibility, teamwork, partnership and co-operation. Within and between agencies, we will require new forms of co-operation. We need multi-professional partnerships and the involvement of the public. We need to develop local models of integration between different bodies which could then be disseminated by national government. Such local initiatives will need underpinning by enabling legislation, funding and resources.

Professional staff will need to be flexible in their approach and multidisciplinary in their skills: able to see the whole picture, to see how their own function dovetails with those of others and vice versa. They must also have the knowledge and the skills to be able to involve the public in the new forms of participatory structures suggested above. This means a move away from the 'statute-led' nature of much of environmental health work.

Sustainable development

Of all the issues that have emerged in recent years, the challenge of sustainability is probably the most crucial, cutting across traditional disciplinary boundaries, requiring new forms of management and posing questions that are fundamental to human health. Several key ideas underpin the sustainability agenda. There is the attempt to place local behaviour in a global context and to see how global concerns can be expressed locally. There is the precautionary principle, acting where proof of harm may be lacking. There is the need to think as nature 'thinks', in other words like a living system, in cycles and not straight lines. And there is the need to operate across organizational or specialist boundaries because it is the impact of an activity on the environment—not the successful prosecution of a specialist function—that matters.

The challenge of sustainable development is enormous. We cannot talk about sustainable development without also talking about environmental health. In recent years we have seen several international and national initiatives that try to bring together sustainability and health, e.g. the WHO's Health for All strategy and Healthy Cities project, the UK government's Health of the Nation strategy and the Local Agenda 21 process [6]. One of the priorities in environmental health must be to recognize the links between these programmes and ensure that they are managed in an integrated way.

HEALTH AND SUSTAINABILTY

Principle 1 of Agenda 21, The Global Charter on Sustainable Development, states: 'Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life style in harmony with nature' [7].

Human health is central to sustainability. Without health, sustainability cannot be achieved. With over 200 explicit references to health in Agenda 21, ranging from health care services to health and housing, the need for a co-ordinated strategy is essential. The process of preventing ill health, promoting good health and caring for those in ill health is a complex balance of social, environmental and economic factors that must be considered together and planned for holistically [6].

Although in many parts of the world health can be said to be improving, health gains are not always evenly distributed, and often small sections of society benefit while there are negative impacts on other sections. This is true for health effects locally. For instance, motor vehicles can provide benefits for users but impose health risks on others. In international terms, the burning of imported fossil fuels may provide useful power in one country while imposing health costs from pollution in another. Sustainable development requires us to look at how we, as individuals and as a society, use resources so that we can maximize the health benefits from them, now and in the future.

Health is at the centre of quality of life and the well-being of future generations. Poverty, inequality and environmental pollution affect the health of individuals and communities. Health is therefore an objective, poor health an indicator of activities that are not sustainable. The challenge to the Agenda 21 process at the local level is to develop a common vision of health in which communities and health workers recognize and share the vision so that a common approach can be agreed and the methods to achieve this vision understood.

The sustainable development process is very similar to that of the environmental health approach. Both recognize that there is a range of problems (social, environmental and economic) that impinges on health and that must be addressed collectively. To do this it is important to understand the relationships between the various partners involved, such as local government, health authorities, business, communities, academe, and the voluntary sectors. It is important to understand the roles played by each participant involved in health promotion and care, and to realize that they share a common agenda.

The environmental health approach and that advocated by Agenda 21 are based on a set of common principles and processes that lead to a collective objective. These principles and processes are [5]:

- equity
- sustainability
- health promotion
- intersectoral action
- community involvement and engagement
- local political support and ownership of decisions made
- international action
- consensus building
- precautionary principle
- partnership and participation
- global responsibility
- integrated approach
- supportive environments.

INTERNATIONAL ORGANIZATIONS DEALING WITH ENVIRONMENTAL HEALTH

The International Federation of Environmental Health

The International Federation of Environmental Health is not an organization that can directly influence domestic environmental health legislation. The International Federation of Environmental Health was initiated by the then Institution of Environmental Health Officers. It was not the first attempt to create an organization linking environmental health professionals internationally. In the USA and Canada, the International Federation of Sanitarians was established in the 1960s and continued for several years before being wound up.

The International Federation of Environmental Health was inaugurated in 1985 and was incorporated as a UK company in 1986. It acts as a federation of national organizations of environmental health professionals, which are full members, and as such has no individual members. It does, however, have a grade of associate members, which are mainly academic institutions that have an environmental health interest, such as organizations engaged in training environmental health professionals.

The federation is a relatively new organization, but by mid-1998 it had 26 full members and 36 associate members and continues to expand. It has a wide spectrum of objectives, which include encouraging the co-operation of environmental health organizations; the exchange of information and experience; and the promotion of contact between individual members of constituent bodies.

The federation endeavours to influence national environmental health policies by asking member organizations to follow policies adopted by it. Thus, the federation adopted a policy development suggested by the Swedish Environmental Health Officers Association relating to the assignment of wider public roles in environmental protection; it also adopted a policy suggested by the Californian Environmental Health Association to the effect that when governments negotiated trade agreements under GATT (General Agreement on Tariffs and Trade) there would be no undesirable environmental consequences to either party. The first policy statement, advocating support for the principles in the WHO declaration of Alma Ata, was adopted at the inaugural World Congress on Environmental Health held in Sydney, Australia, in 1988, while at the 3rd World Congress in Kuala Lumpur in 1996 the holistic principal for environmental health practice and administration was adopted.

One of the foundation concepts of the federation is that environmental health problems are not constrained by man-made boundaries. Each member organization is assumed to accept an awareness of international and global problems. There are, however, more localized issues, and to deal with these member organizations are drawn together in regional groups with the object of general local thought and action on regional issues and to keep the Federation Council aware of such regional and local problems. The regional groups are encouraged to promote the participation of the associate members.

The federation aims to make effective links with international organizations such as WHO, the United Nations (UN), the European Union (EU), and the International Labour Office (ILO), and to represent a global view on environmental health issues. The federation takes the view that environmental health problems are best solved by sharing knowledge and experience and that all environmental health professionals' organizations have much to teach each other just as they have much to learn from others.

The European Union (see also chapter 7)

Two things flow from the EU's position of regarding central government as always being the competent authority. Firstly, the channel of communication is initially from the EU to central government. The appropriate government departments receive an intimation from their counterpart directorates of new developments in the form of requests for information and comments on draft proposals.

Secondly, personal contact grows up between UK civil servants and their EU equivalents. This personal contact is to be commended as it promotes confidence and informal discussion as a precursor to more detailed and serious negotiations—each side is better able to bring pressure on the other.

When dealing with a development, the UK department has to be able to frame appropriate responses. This is done out of ministry technical or professional resources, or by consultation with outside bodies. Both of these processes are suspect. There is no guarantee that the information available within the department is as expert as the civil service believes it to be, and an incomplete, or inaccurate, response may be generated. Furthermore, the process of consultation may be flawed by being inadequate. Departments tend to accumulate lists of people and organizations that they think must be consulted, and those lists may not represent the best sources of comment on a particular issue.

Departments have, of course, a duty to make effective representation to directorates so as to preserve the UK's interests; every other member state is similarly occupied. This means that departmental pressures on directorates have to be effective, which, in turn, demands the best sources of information.

Thus the first, and possibly the most effective, means of influencing EU policy lies with the appropriate department and secretary of state. Hence, because non-civil service interests often suspect that the representations being made are inadequate, they resort to the legitimate practice of lobbying secretaries of state, ministers, MPs, and civil servants to try to make sure that their views are heard and taken into consideration. In addition, some of the pressure is also put on members of the European Parliament (MEPs), including those MEPs who do not represent a UK constituency but may be a member of a particular European Parliament committee, and EU civil servants. For example, the Chartered Institute of Environmental Health has developed strong links with a number of European civil servants.

In attempting to put pressure on the EU's legislative process, interested parties are doing no more than they do in connection with domestic legislation where lobbying to effect changes in policy is recognized as being part of the democratic process. It is fair for all views to be aired when legislation is being prepared, and not simply those that government finds convenient in supporting its case. What has to be watched is the potential for corruption and misrepresentation.

There are other ways in which directorates may be influenced. Being part of an international organization, the EU's bureaucrats are usually impressed by approaches from an international organization that presents views that purport to represent a wider picture than a purely national one. Because of this, it is advantageous for an organization to be a member of a pan-European group in addition to belonging to domestic bodies.

An interested body may make representations in Brussels of its own case, although it will need to understand that the case will probably be seen as special pleading.

It is important for interested organizations to influence bodies that have similar interests so that together they can adopt a united stance on issues that affect them. Such organizations usually promote their views in print, and are prepared to promote a specific activity to secure the backing of the EU.

The Food and Agriculture Organization

The Food and Agriculture Organization (FAO) is the oldest agency of the United Nations (UN). Founded in 1945, it arose out of the consideration of the problems of feeding the world population in post-war circumstances. Its headquarters are in Rome and this is an acknowledgment that the FAO walks a path pioneered by an Italian organization **—the International Agriculture Institute.** The FAO also had roots in the League of Nations, which in the 1930s looked at problems of nutrition and its relation to issues of health. The first director of the FAO was Lord Boyd Orr, a British biologist and nutritionist.

The activities of the FAO are far reaching and include a scientific programme to develop better plant breeding, pest control, and the elimination of certain animal diseases.

The principal impact of the FAO on environmental health is through its interest in animal health, and through the international control and standardization of food composition through the **Codex Alimentarius.** The latter influences UK legislation directly and indirectly through the EU. As noted above, the EU tries to ensure that its legislation is compatible with other international recommendations. Not all members of the UN are members of the FAO.

The World Health Organization

WHO is an agency of the UN. It was formed in 1948 in Geneva, Switzerland, following a preliminary International Health Congress held in New York in 1946. The 1946 conference took over the United Nations Relief and Rehabilitation Administration, which had been set up after the Second World War by the Allies to enable them to stabilize civil administration in areas liberated from German occupation.

Critics of the former international organizations were not slow to point out their imperfections, as though perfection could easily be achieved in countries that were medically and environmentally deprived and lacking in economic resources and an experienced and dedicated civil service.

> The World Health Organization is independent; and its decisions, unlike those of the health organizations of the League of Nations, do not need to be endorsed by a higher authority. Its constitution is wide enough to permit it to undertake any health work within the limits of its budget. [8]

One specific weakness was that earlier agencies found their work slow to be effective because each agreement negotiated had to be subject to further ratification by the government of each member state. The new constitution of WHO overcame this by taking powers to make its decisions binding on its members. That power was conceded because provision was also made for members to be able to influence the 'legislation' that WHO produces. Member states may propose reservations which, if accepted, are incorporated into the measure. If such reservations are not accepted and not withdrawn, the measure is not then binding on the proposers.

The WHO organization operates through 11 divisions and 5 'offices'. From the environmental health aspect, 3 divisions—Communicable Diseases, Environmental Sanitation, and Epidemiology and Health Statistics—are of particular significance.

WHO secured worldwide collaboration in dealing with certain communicable diseases through the International Sanitary Regulations 1951. These modernized and replaced the 13

International Sanitary Conventions that existed between 1851 and 1938, and it is interesting to note the designation 'regulations' in substitution for 'conventions' as an indication of the changed status of the legislation.

WHO has to operate in an area in which boundaries are unclear, and in which other agencies have an interest. For this reason, WHO works co-operatively with other UN agencies, especially the FAO in respect of nutrition and zoonoses, and the ILO with regard to occupational health issues.

The International Labour Office

The ILO provides a forum for the discussion of labour and other social issues, and has developed a concensus on appropriate policies and standards. It created an International Labour Code, which laid down minimum standards of national labour legislation and administration.

For member countries, it provides technical assistance, expert missions, and study grants, and it has developed comparative labour statistics, methods of carrying out manpower surveys, vocational training programmes, and the rehabilitation of disabled workers.

The ILO operates by adopting conventions and recommendations. The conventions are designed as model legislation which member states are expected to ratify as soon as possible. Those states that do not are expected to report annually on their actions on matters that are the subject of conventions. Recommendations are a form of authoritative guidance to members [9, Vol. 9, p. 28]

A weakness of the ILO has been that it has to form conventions and recommendations in such a way as to enable the least developed countries to adopt them. As a consequence, some more developed countries decline to ratify conventions or to follow recommendations that prescribe standards that are lower than those they have already adopted for themselves.

Nevertheless, the ILO wishes to ensure that when local legislation is claimed to be superior to a convention, it really is. When the Health and Safety at Work, Etc. Act 1974 was introduced in the UK, the ILO wished to send an inspecting delegation there. In due course the delegation came and saw examples of the enforcement of the legislation, in both the industrial and commercial sectors, dealt with by the local authorities.

The UK is usually represented at conferences and committees by senior members of the Health and Safety Executive (HSE). While the ILO was intended to satisfy many of the aspirations of the trade union movements that had developed strongly in the first half of the twentieth century (and were especially and increasingly interested in welfare and safety), it also caused some diminution in those movements' domestic influence because of the formal contacts between the ILO and member governments.

As there is a close connection between the occupational environment and health, it is not surprising to find that the early actions of the ILO were the calling of conferences to improve the health of seamen.

A brief reference should be made to the apparent clash of activities in the field of health and safety at work between the EU and the ILO. Both of these organizations have an interest in the health, safety and welfare of workers, but in each case that interest is derived from different sources.

The ILO's interest stems from the fact that it has been specially created to promote better health, safety and welfare of people while they are at work, and has no prima-facie concern with the competitiveness or otherwise of the employing company. On the other hand, the EU is most concerned that no employer is able to achieve a competitive advantage by reducing the cost of health and safety activities. The stance of the EU is thus to require the achievement of a minimum standard of health and safety provision.

The UN Environmental Programme

The UN Environmental Programme (UNEP), an agency of the UN, has its headquarters in Nairobi, Kenya, and regional offices elsewhere in the world. It is much less well known than it should be and appears in many ways to be overshadowed by WHO.

The UNEP is particularly concerned with issues relating to the degradation of the environment, especially those that affect developing countries.

The resources of such countries in terms of trained technicians, finance and equipment are frequently inadequate. Living standards are low and result from a low gross national product, which not only keeps the people poor, but restricts their ability to earn foreign currency with which better resources could be purchased.

In many developing countries, the need for foreign currency has led to the exploitation of natural resources with little regard to the geological, hydrological, biological or ecological consequences. Such countries have also been exploited by some industrialized countries, which have deposited hazardous waste materials there that cannot be dumped at home. To make the situation worse, many developing countries are in 'harsh climate' zones and in areas where there are frequent natural disasters.

With the acknowledged transboundary effects of many environmental problems, difficulties such as the reduction of tropical rain forests not only have a local effect but also impinge on the global environment. The UNEP has responded to this and is particularly concerned with the following issues:

1. protecting the atmosphere by combating climate change and global warming, ozone layer depletion, and transboundary air pollution
2. protecting the quality of fresh water sources
3. protecting ocean and coastal area resources
4. protecting land resources by combating deforestation and desertification
5. conserving biological diversity
6. managing biotechnology in an environmentally sound way
7. managing hazardous wastes and toxic chemicals in an environmentally sound manner
8. protecting human health and the quality of life, especially the living and working environments of poor people, from environmental degradation.

The possible short- and long-term effects of some global environmental changes have been discounted in some non-academic circles. For example, little thought appears to have been given to the effect on insect breeding by relatively modest increases in average temperature. The work of the UNEP on transboundary and even global environmental issues is bound to have an effect on many countries, both developed and developing countries.

APPROACHES TO THE ORGANIZATION OF ENVIRONMENTAL HEALTH

The organizational approach to the environmental health function differs widely throughout the world despite the fact that the tasks to be performed, particularly in the more industrialized countries, have a large measure of uniformity. Even within Europe a marked variation can be seen. The countries of the 'new' Europe are incredibly diverse. Their diversity relates not only to their geographical and cultural differences but also, and perhaps more importantly, to the range of social and economic conditions that prevail in these countries. As a result, the perspectives and priorities that are adopted on environmental health issues, particularly on how environmental health services are delivered, demonstrate a wide degree of variance throughout Europe. Some countries have well-established environmental health services that can trace their origins back 100 years or more, while others are only now developing services for environmental health work.

Since the disintegration of the former Soviet Union, and the subsequent removal of Moscow's control over some of the countries in central and eastern Europe, the international community has focused largely on the environmental damage that the former administrations had bequeathed to the newly independent states and the other countries of central and eastern Europe. To date, this work has concentrated mainly on the assessment of the actual physical environmental damage and the prioritization of direct capital investment. Economic reforms in eastern Europe will have a direct effect on the environment. The transition to a market economy from one of central control planning leads to a broad change of attitude and will give countries of eastern Europe the opportunity to begin to reform business practices. The wasting of resources that was commonplace in previous industrial practice should now be heavily resisted. The removal of subsidies on the various natural resource commodities will provide a sufficiently large financial incentive for the introduction of good housekeeping practices and the implementation of pollution control strategies.

The creation of a market economy cannot on its own be left to ensure environmental improvement, however. A mixture of economic, social and regulatory reforms is required to create a comprehensive strategy of control that can be balanced and adapted to changing circumstances while recognizing the importance of economic growth, and yet be truly effective in controlling environmental health problems. To develop such strategies it will be necessary for investments to be made in areas other than direct financing of capital intensive programmes. Investments also have to be made in the areas of education and institution building.

Environmental health policies and strategies are of no value unless they can be implemented and monitored by suitably qualified and motivated personnel situated in appropriate institutions with the necessary capacities. Environmental health services are primarily charged with these tasks. Environmental health services act as the interface between policy-makers and those who are the subject of the policy control. Environmental health services also have a direct relationship with the general public in dealing with their complaints and concerns in relation to environmental health issues. There is therefore a need for services to be appropriately targeted and sympathetically responsive to public needs while at the same time representing the views of the controlling authority, whether that be at local, regional or national level.

In recognition of the current trends, and rather than concentrating on individual hazards, the European Regional Office of the World Health Organization (WHO EURO) is carrying out work to support the reorganization and development of infrastructures for environmental health services throughout Europe (see [10] and [11]). A survey was carried out between March 1993 and March 1994 of some 26 countries from all over the European Region to ascertain how environmental health services were organized and delivered. Through this work it has become apparent that every country has established or is developing it own unique systems for the administration of environmental health. Their individuality reflects the different cultural, social and historical perspectives that mould any arm of government, and it is therefore dangerous to draw conclusions about their suitability or comparisons against 'model' systems. Nevertheless, some common elements can be identified, analysed and grouped into four main types of system.

First, a system of services delivery that is common in many countries of central and eastern Europe is where strong central and vertical controls are retained (Fig. 1.3). Typically the ministries of health and environment have weak links at national level and are concerned mainly with their own particular area of expertise. The actual services are provided at regional level within the country through its respective regional inspectorates of hygiene and epidemiology and environment. These units have little or no autonomy and are staffed by public health doctors and engineers as appropriate. In such systems, local authorities or communes normally have little or no statutory control in respect of environmental health.

The second system for the delivery of environmental health services can be found in many of the southern European countries. This system has a level of co-ordination at a regional level before services are delivered to the public. Individual

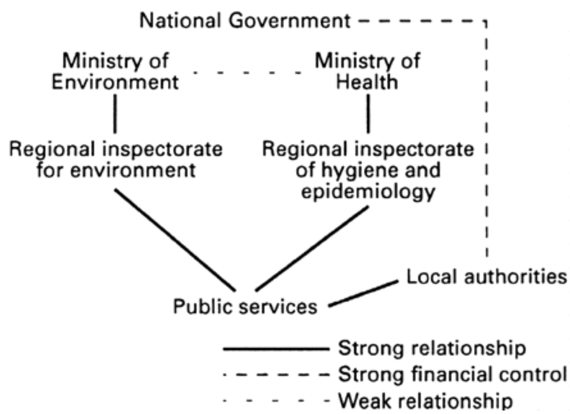

Fig. 1.3 Organization of environmental health services in Europe—approach 1

ministries still set their own agendas with weak communication and dialogue between them. They are then represented at a regional office. However, in this instance the regional office is representative of all the relevant ministries. They are then coordinated to fit in with the needs of the locality through a government appointee commonly known as the 'prefect' or through a 'prefectual council'. Once more, local municipal and commune authorities have little or no involvement in service delivery (Fig. 1.4).

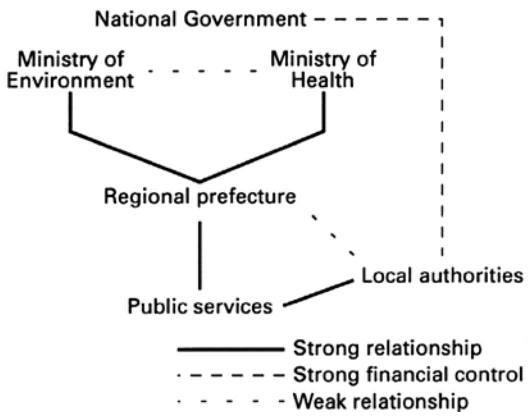

Fig. 1.4 Organization of environmental health services in Europe—approach 2

Fig. 1.5 Organization of environmental health services in Europe—approach 3

The third system of control for environmental health service delivery is formed by both local and nationally controlled regional offices. Local authorities deliver services relating to local environmental health problems, working within national guidelines and legislation. Regional offices of national ministries deal with strategic matters of national importance, and any matters for which the technical expertise does not exist at the local level (Fig. 1.5).

The final system that can be found in Europe for the delivery of environmental health services is based upon a system of federal government. In this situation a country is subdivided into different states that are bound by a few national statutes, but generally each state can set its own legislation and systems of control and administration for environmental health control.

A useful publication to assist further study of the variations in European organization for environmental health is the *European Environmental Yearbook* [12]. This presents a summary of information on a wide range of environmental issues in the 15 EU member states and provides a comparative study of the way in which organizations have been developed to deal with, for example, waste energy, pollution, and so on.

PROFILE OF THE ENVIRONMENTAL HEALTH OFFICER

The early parts of this chapter look forward to and discuss a new vision for the environmental health function. The existing organizational arrangements in the UK are discussed in Chapter 3. What follows here is a profile of the environmental health officer's role (EHO) as described by WHO within the present framework. Although this work is some 12 years old, the profile nevertheless gives a sound picture.

Following a consultation by WHO on the 'Role, Functions and Training Requirements of Environmental Health Officers (Sanitarians) in Europe' in 1978, it was concluded: 'Experience of those countries in the Region which have officers with specialized training in environmental health who are recognized as constituting a specific profession clearly demonstrates their value. Thus it would be to the advantage of all Member states to introduce into their environmental health service staff of this kind whom the consultation called in English "environmental health officers".'

That conclusion was followed by a further series of considerations by WHO, one of which looked at the development of environmental health manpower [13], and contained the following professional profile of the environmental health officer:

1. The environmental health officer is concerned with administration, inspection, education and regulations in respect of environmental health.
2. The numbers of environmental health officers should be sufficient to exercise adequate surveillance over health-related environmental conditions; this surveillance should include necessary monitoring activities. They must have a close association with the people in their area and be readily accessible to them, providing professional advice and guidance, and thereby gaining the community's confidence and encouraging its participation in improving environmental health. They should be members of multidisciplinary primary health care teams delivering comprehensive health care at community level.
3. Environmental health officers act as public arbiters of environmental health standards, maintaining close contact with the community. They must at all times be aware of the general environmental circumstances in their districts, and must know what industrial hazards to health may arise there and what resources are available in the event of emergency.
4. They are professional officers capable of developing professional standards and applying them to their own work in relation to that of non-professionals involved in environmental health. Also, their role will obviously touch on aspects with which physicians, veterinarians, toxicologists, engineers, nurses and others deal in a more specialized manner.
5. One of their vital functions is to maintain effective liaison with other professional officers who have a contribution to make in the promotion of environmental health, e.g. with regard to water resources management, waste management, housing, rodent, insect and other pest control, and protection of the recreational environment.
6. Environmental health officers would carry out the well-established duties of sanitarians/sanitary inspectors, including inspection of housing and food hygiene, and also monitor and control the new hazards arising from intensive industrialization, e.g. pollution by chemical and physical agents, which could harm the health of a community.
7. Even greater emphasis than in the past should be placed on the preventive role of environmental health officers in relation to environmental hazards to health.
8. They will obviously not possess the expertise of physicians in personal health, of veterinarians in animal health, of microbiologists in microbiology or of sanitary engineers in the provision of water supplies. However, they will have sufficient background and practical knowledge of these areas to understand the principles involved, and may develop some specialist expertise. They will be able to work easily with the other professionals. Their wider experience will enable them to formulate an approach on a broader base, to contribute to the decisions to be made, or to make these decisions alone in cases where they have the necessary authority. They must understand the environmental aspects of the problems that are the concern of other professionals, so that they may contribute to their solution.
9. They must be able to plan and co-ordinate activities between different professional disciplines, official agencies and authorities. They need to have continuing links with other professionals involved in environmental and health-related work. The other professionals with whom liaison will be appropriate include physicians, physicists, microbiologists, chemists, civil/building/sanitary engineers, veterinarians and lawyers.

10. In some countries and situations, the environmental health officers will initiate the collaboration; in others, they will provide the information and advice that are sought. This liaison role will extend beyond the other professionals to technicians and a range of other specialists, including those concerned with the public health laboratory services. While being able to act independently in both advisory and enforcement capacities, exercising self-reliance and initiative, they should also be able to function as members of a team with other professionals in implementing environmental health programmes.
11. In industry and commerce, environmental control specialists interpret legislation, promote and maintain standards, and solve the problems that may come to light through, for example, a system of internal control or 'self-inspection'.
12. An important part of their functions must be to acquaint themselves with actual or potential environmental hazards and to ensure that appropriate action is taken to deal with them, e.g. to safeguard the public from the hazards associated with microbiological contamination of food and with chemical residues in food substances, and to monitor and control potential and existing environmental hazards, with the backing of strong legislation.
13. A combination of training in public health and toxicology should enable them to cope with such problems as soil pollution due to degradation-resistant agricultural pesticides, leachates from industrial wastes, fall-out from the plumes of chemical works, liquid radioactive wastes from industry and research; chemical pollution of the work environment from solvents and from dust arising from processes using silica, asbestos and lead; pollution of the home environment due to such products as cosmetics, detergents, paints, pesticides and gas used as fuel; heavy contamination of water resources by mercury, antimony, barium, cobalt and other metals due to industrial wastes, pesticides used in agriculture, etc.; and new problems in food safety such as the irradiation of food.
14. Environmental health officers in the public service should have the following basic functions:
    (a) improving human health and protecting it from environmental hazards
    (b) enforcing environmental legislation
    (c) developing liaison between the inhabitants and the local authority, and between the local and higher levels of administration
    (d) acting independently to provide advice on environmental matters
    (e) initiating and implementing health education programmes to promote an understanding of environmental principles.
15. Because of the range of functions, environmental health officers will operate in a managerial capacity and in collaboration with other environmental agencies and services.

The increasing complexities of environmental health problems require a continuing development of expertise and an updating of knowledge. To maintain a leading role in dealing with environmentally related health problems, environmental health officers must be in a position to respond to challenges presented by new hazards in the environment, and exercise influence in promoting and regulating environmental health activities. Their training should equip them with the necessary expertise to act at any level—national, provincial (or intermediate) or local—or within any sector, private or public.

Thus environmental health officers are trained as generalists across the range of the 15 basic environmental health activities identified above and therefore occupy a key position in the environmental health service. An important part of their functions must be to acquaint themselves with actual or potential environmental hazards, and to ensure that appropriate action is taken to deal with them. In some cases, they may have the required authority and expertise. In others, they may need to press particular agencies to take appropriate action. There will also be occasions when they will need to consult other professional officers, and to make use of laboratory and other expert scientific services. A vital part of their functions will, therefore, be to maintain effective liaison with other relevant professional officers who have a contribution to make in the promotion of environmental health. Environmental health is very much a team concept, and this must be recognized in any organizational arrangements.

REFERENCES

1. WHO (1989) *Environment and Health: A European Charter and Commentary,* WHO, Copenhagen.
2. CIEH (1995) *The UK Environmental Health Action Plan—A Response by the CIEH,* Chartered Institute of Environmental Health, London.
3. MacArthur, I.D. and Bonnefoy, X. (1998) *Environmental Health Services in Europe—Policy Options,* WHO, Copenhagen.
4. CIEH (1997) *Agenda for Change—Report of the Environmental Health Commission,* Chartered Institute of Environmental Health, London.
5. WHO EURO (1997) *Sustainable Development and Health: concepts, principles and framework for action for European cities and towns,* World Health Organization Regional Office for Europe, Copenhagen.
6. LGMB (1996) *Health and Sustainable Development—Local Agenda 21—Roundtable Guidance,* Local Government Management Board, Luton.
7. WHO (1997) *Health and Environment in Sustainable Development—Five Years After the Earth Summit,* World Health Organization, Geneva.
8. Brockinton, W.F. (1952) *The World Health Organization,* Pelican, London, p. 210.
9. *Encyclopedia Britannica* (1980 edition), Encyclopedia Britannica Inc., Chicago.
10. WHO (1995) *Concerns for Europe's Tomorrow,* WHO Regional Publications, European series No. 53, WHO, Copenhagen.
11. WHO (1998) *Environmental Health Services in Europe—An Overview of Practice in the 1990s,* WHO, Stationery Office, London.
12. IES (1991) *European Environmental Yearbook,* Institute for Environmental Studies, Doc Ter International UK, London.
13. WHO (1987) *Development of Environmental Health Manpower,* Environmental Health series No. 18, World Health Organization Regional Office for Europe, Copenhagen.
14. UN (1992) *Earth Summit. Agenda 21: The United Nations Programme of Action from Rio,* UN Department of Information, New York.

References

Contents

1 Introduction to environmental health

1. WHO (1989) Environment and Health: A European Charter and Commentary, WHO, Copenhagen.

2. CIEH (1995) The UK Environmental Health Action Plan—A Response by the CIEH, Chartered Institute of Environmental Health, London.

3. MacArthur, I.D. and Bonnefoy, X. (1998) Environmental Health Services in Europe— Policy Options, WHO, Copenhagen.

4. CIEH (1997) Agenda for Change—Report of the Environmental Health Commission, Chartered Institute of Environmental Health, London.

5. WHO EURO (1997) Sustainable Development and Health: concepts, principles and framework for action for European cities and towns, World Health Organization Regional Office for Europe, Copenhagen. 6. LGMB (1996) Health and Sustainable Development—Local Agenda 21—Roundtable Guidance, Local Government Management Board, Luton. 7. WHO (1997) Health and Environment in Sustainable Development—Five Years After the Earth Summit, World Health Organization, Geneva. 8. Brockinton, W.F. (1952) The World Health Organization, Pelican, London, p. 210. 9. Encyclopedia Britannica (1980 edition), Encyclopedia Britannica Inc., Chicago. 10. WHO (1995) Concerns for Europe's Tomorrow, WHO Regional Publications, European series No. 53, WHO, Copenhagen. 11. WHO (1998) Environmental Health Services in Europe—An Overview of Practice in the 1990s, WHO, Stationery Office, London. 12. IES (1991) European Environmental Yearbook, Institute for Environmental Studies, Doc Ter International UK, London. 13. WHO (1987) Development of Environmental Health Manpower, Environmental Health series No. 18, World Health Organization Regional Office for Europe, Copenhagen. 14. UN (1992) Earth Summit. Agenda 21: The United Nations Programme of Action from Rio, UN Department of Information, New York.

2 Historical development of environmental health in the UK

1. Hutchins, B.L. and Harrison, L. (1911) History of Factory Legislation, P.S.King & Son, London.

2. Gale, A.H. (1955) Epidemic Diseases, Pelican, London.

3. Finer, S.H. (1956) The Life and Times of Sir Edwin Chadwick, Methuen, London.

4. Frazer, W.M (1950) A History of Public Health, Ballière, Tindall & Cox, London.

5. Burnett, J. (1960) Plenty and Want, Pelican, London.

6. Engels, F. (1968) Condition of the Working Class in 1844, Allen & Unwin, London.

7. Ashby, E. and Anderson, M. (1979) Politics of Clean Air, Clarendon Press, Oxford. 8. Hallworth, J. and Davies R.J. (1910) The Working Life of Shop Assistants, National Labour Press, Manchester. 9. Robens Committee (1972) Safety and Health at Work, Cmnd 5034, HMSO, London. 10. Simon, E.D. and Fitzgerald, M. (1922) The Smokeless City, Longmans, London. FURTHER READING Brockinton, W.F. (1952) The World Health Organization, Pelican, London. Frazer, W.M. (1950) A History of Public Health, Baillière, Tindall & Cox, London. Haig, N. (1987) EEC Environmental Policy in Britain, Longmans, London.

3 The organization of environmental health in England and Wales

1. DETR (1998) White Paper: A Mayor and Assembly for London: the Government's Proposals for Modernizing the Governance of London, Cmnd 3897, Stationery Office, London.

2. LACOTS (1998) LAC 5 98, 6 March 1998, LACOTS, London.

3. Local Government Ombudsman (June 1997) Local Government Ombudsman—Report of Cases 1996, 21 Queen Anne's Gate, London, SW1H 9BU.

4 . A u d i t C o m m i s s i o n (J u n e 1 9 9 0) Environmental Health Survey of Food Premises, Bookpoint, Abingdon.

5. Audit Commission (December 1990) Safer Food: Local Authorities and the Food Safety Act 1990, Bookpoint, Abingdon.

6. Audit Commission (July 1991) Towards a Healthier Environment: Managing Environmental Health Services, Bookpoint, Abingdon.

7. Audit Commission (September 1991) Healthy Housing: the Role of Environmental Health Services, Bookpoint, Abingdon.

8. IEHO and Audit Commission (April 1993) The Audit Commission Study of Environmental Health: an Assessment by Chief EHOs, CIEH, London.

9. Audit Commission (1997) It's a Small World —Local Government's Role as a Steward of the Environment, Bookpoint, Abingdon.

10. The Citizen's Charter—Raising the Standard (July 1991), Stationery Office, London.

11. WHO (1978) Role, Functions and Training Requirements of Environmental Health Officers (Sanitarians) in Europe, WHO Regional Office for Europe, Copenhagen.

12. DETR (February 1998) Modernizing Local Government: Local Democracy and Community Leadership, DETR, London.

13. Kreisel, W. (1989) Affecting change— environmental health in the 1990s. Address to the NEHA AEC.

14. CIEH (1997) Agendas for Change—Report of the

Environmental Health Commission, CIEH, London. 15. DTI (1994) Report of the Interdepartmental Review Team, Department of Trade and Industry, London. 16. LGMB (1996) Regulation: a Guide to Good Practice in Local Government, Local Government Management Board, Arndale House, Arndale Centre, Luton, LU1 2TS. 17. UN (1992) Earth Summit. Agenda 21. The United Nations Programme of Action from Rio, UN Department of Information, New York. 18. Report of the Committee of Enquiry (1986) The Conduct of Local Authority Business, Cmnd 9797, Stationery Office, London. 19. Audit Commission (1988) The Competitive Council, Management Paper No. 1, Stationery Office, London. 20. The Report of the Committee of Enquiry into the Future Development of the Public Health Function (1988) Public Health in England, Cmnd 289, Stationery Office, London. 21. DoH (1997) White Paper: The New NHS, Department of Health, Stationery_Office, London. 22. DoH (February 1998) Our Healthier Nation: A Contract For Health, Department of Health, Cmnd 3852, Stationery Office, London. 23. Bassett, W.H. (1992) Setting sail for new joint efforts. Municipal Journal, 22, 29 May-4 June. 24. DoH (1992) The Health of the Nation: A Strategy for Health in England, Department of Health, HMSO, London. 25. Cabinet Office (1998) Service First: The New Charter Programme, Cabinet Office, London. 26. En-Charter (1999) How to Improve Environmental Health Services—A Good Practice Guide, 2nd edn, Service First Publications, London. 17. Buckland, W. and Coupland, S. (September 1998). Best Value: A Framework for Consistency, E.H.Journal, pp. 267–70.

5 The organization of environmental health in Northern Ireland

1. DoE/DoH (1996) The United Kingdom Environmental Health Action Plan, the Department of the Environment and the Department of Health, HMSO, London.

2. CIEH (1997) Agendas for Change, Report of the Environmental Health Commission, CIEH, London.

3. UN (1992) Earth Summit. Agenda 21: The United Nations Programme of Action from Rio, United Nations Department of Information, New York.

FURTHER READING

Dickson, B. (1994) The Legal System of Northern Ireland—The Law in Action, SLS Publications, Belfast.

DoENI (1996) A Corporate Framework for the Department of Environment for Northern Ireland, Department of Environment (Northern Ireland), Belfast.

DoENI (1996) Your Guide to the Department of Environment for Northern Ireland and its Agencies, Department of Environment (Northern Ireland), Belfast.

8 Enforcement of environmental health law

1. Hawkins K. 1984 Environment and Enforcement: Regulation and the Social Definition of Pollution, Clarendon Press, Oxford.

2. Hutter, B.M. (1988) The Reasonable Arm of the Law. The Law Enforcement Procedures of Environmental Health Officers, Oxford Socio-Legal Studies, Clarendon Press, Oxford.

3. Carter, H. (1992) The criminal law as a tool for environmental protection. Environmental Law, 6(1).

4. Vogel, D. (1986) National Styles of Regulation, Cornell University Press, USA.

5. Carson, W.G. (1970) White collar crimes and the enforcement of factory legislation. British Journal of Criminology, 10, 383–98.

6. Audit Commission (1991) Towards a Healthier Environment, Managing Environmental Health Services, Audit Commission, HMSO, London.

7. DTI (1994) Local Government Enforcement, Report of the Interdepartmental Review Team, Department of Trade and Industry, HMSO, London, p. 35. 8. Rowan-Robinson, J. and Ross, A. (1994) Enforcement of environmental regulation in Britain: strengthening the link. Journal of Planning and Environmental Law, March, 200. 9. HSE (1996) Choice Of Appropriate Enforcement Procedure 1996, LAC 22/1, Health and Safety Executive. Local Authority Unit, London. 10. Richardson, G., Ogus, A. and Burrows, P. (1982) Policing Pollution, Oxford Socio-Legal Studies, Clarendon Press, Oxford. 11. Health and Safety at Work, Etc. Act 1974: Enforcement Policy Statement, HSC(G)2, 17 July 1995. 12. Robens Committee (1972) The Report of the Commission on Safety and Health at Work, Cmnd 5034, HMSO, London. 13. Sayre, F.B. (1933) Public welfare offences. Columbia Law Review, 33, 55. 14. Croal, H. (1988) Mistakes, accidents and someone else's fault: the trading offender in court. Journal of Law and Society, 15(3). FURTHER READING Bassett, W.H. (1998) Environmental Health Procedures, 5th edn, E. & F.N.Spon, London. Moran, T. (1977) Legal Competence in Environmental Health, E. & F.N.Spon, London.

9 Fundamentals of information technology and its application in environmental health

1. Audit Commission (1994) High Risk/High Potential, HMSO, London.

2. Audit Commission (1990) Preparing an IT Strategy: making IT happen, Management Paper No. 7, February 1990, HMSO, London.

3. Ford, N., Page, G. and Rennie, D. (1992) Environmental Health Information Sources: How To Use Them, Chartered Institute of Environmental Health, London.

4. Audit Commission (1991) Towards a Healthier Environment: managing environmental health services, HMSO, London.

5. Edwards, C., Ward, J. and Bytheway, A. (1995) The Essence of Information Systems, 2nd edn, Prentice Hall Europe, London.

FURTHER READING

Gunton, T. (1988) End User Focus, Prentice Hall International (UK) Ltd, Hemel Hempstead.

Lucy, T. (1995) Management Information Systems, 6th edn, DP Publications Ltd, London.

10 Health and environmental promotion

1. Naido, J. (1992) The Politics of Health Education—The Limits of Individualism, Routledge & Kegan Paul, London.

2. Ewles, L. and Simnett, I. (1992) Promoting Health—A Practical Guide to Health Education, John Wiley, Chichester.

3. Hancock, T. (1995) Supportive Environments for Health, WHO, Copenhagen.

4. Department of Health (1991) The Health of the Nation: a consultative document for health in England, HMSO, London.

5. Department of Health (1992) The Health of the Nation: a strategy for health in England, HMSO, London.

6. Report of a Joint Committee of the Central and Scottish Health Services Council (1964) Health Education, HMSO, London.

7. Ewles, L. (1993) Paddling upstream for 50 years. Health Education Journal, 52(3). 8. Department of Health (1998) Our Healthier Nation: a contract for health, HMSO, London. 9. Anon (1998) Green paper. Environmental Health News, 13(5). 10. Kickbusch, I. (1986) Health promotion strategies for action. Canadian Journal of Public Health, 77(5), 321–326. 11. Allen, P. (1991) Off the Rocking Horse, Greenprint, London. 12. Black, D. (1981) Inequalities in health. British Medical Journal, 2 May. 13. WHO (1977) Health for All by the Year 2000, World Health Organization, Geneva. 14. Allen, P. (1994) Local authority action. Royal Society of Health Journal, 14(2). 15. Report of the Committee of Inquiry into the Future Development of the Public Health Function (1988) Public Health in England, HMSO, London. 16. UN (1992) Earth Summit. Agenda 21: The United Nations Programme of Action from Rio, United Nations Department of Information, New York. 17. LGMB (1993) Local Agenda 21: Principles and Process: a step by step guide, Local Government Management Board, Luton. 18. CIEH (1997) Agendas for Change, Chartered Institute of Environmental Health, London. 19. Wilson, D. (1983) The Lead Scandal, Education Books, London. 20. Department of Health (1993) On the State of the Public Health, HMSO, London. 21. MacArthur, I.D. and Bonnefoy, X. (1998) Environmental Health Services in Europe— Policy Options, WHO, Copenhagen. 22. Buzan, T. (1982) Use Your Head, BBC Publications, London. 23. Mehrabian, A. (1980) Silent Messages, Wadsworth Publishing, California. 24. Cockerill, M. (1989) Live from

No. 10, Faber & Faber, London. FURTHER READING Foster, M. (1993) Camden and Islington HIV Prevention Strategy, Camden Borough Council, London.

Mackay, J. (1993) The State of Health Atlas, Simon & Schuster, London.

O'Neil, P.D. (1990) Health Crisis 2000, WHO, Geneva. Tones, B.K. and Tilford, S. (1994) Health Education: effectiveness and efficiency, 2nd edn, Chapman & Hall, London.

11. Lichtenstein, S., Slovic, P., Fischoff, B. et al. (1978) Judged frequency of lethal events. Journal of Experimental Psychology (Human Learning and Memory), 4, 551–578.

12. Ford, N.J. and Rennie, D.M. (1987) Consumer understanding of food irradiation. Journal of Consumer Studies and Home Economics, 11, 305–320.

13. Slovic, P. (1987) Perception of risk. Science, 236, 280–285.

14. Slovic, P., Fischoff, B. and Lichtenstein, S. (1980) Facts and fears: understanding perceived risk, in Societal Risk Assessment: How Safe is Safe Enough? (eds R.C. and W.A. Albers), Plenum Press, New York.

15. Douglas, M. and Wildavsky, A. (1983) Risk and Culture: an essay on the selection of technological and environmental dangers, University of California, Berkeley.

16. Wynne, B. (1982) Rationality and Ritual: The Windscale Inquiry and Nuclear Decisions in Britain, British Society for the History of Science, Chalfont St Giles.

17. Roberts, H. Smith, S.J. and Bryce, C. (1995) Children at Risk? Safety as a Social Value, Open University Press, Buckingham.

18. Crossland, B., Bennett, P.A., Ellis, A.F. et al. (1992) Report of a Royal Society Study Group. Estimating engineering risk, in Risk Analysis, Perception and Management, The Royal Society, London.

19. Watson, S.R. (1981) On risks and acceptability. Journal of the Society for Radiological Protection, 1(4), 21–25.

20. Lewis, H.W. (1978) Risk assessment review group report to the United States Nuclear Regulatory Commission, NUREG CR 0400, US Nuclear Regulatory Commission, Washington, DC. 21. Groeneweg, J. (1996) Controlling the Controllable, 3rd edn, DSWO Press, Leiden. 22. EC Directive on the hygiene of foodstuffs 93/ 94/EEC. 23. Gardiner, K. and Falconer, L. (1996) Introduction to occupational health, in Management of Health Risks (ed. L.Falconer), Croner Publications, Kingston upon Thames. 24. Andrews, J.D. and Moss, T.R. (1993) Reliability and Risk Assessment, Longman Scientific and Technical, Harlow. 25. Hensley, G. (1970) Reliability

analysis of mechanical equipment and systems. Nuclear Engineering and Design, 13, 222. 26. Kirwan, B. (1994) A Guide to Practical Human Reliability Assessment, Taylor & Francis, London. 27. MAFF (1998) The Food Standards Agency: A Force for Change, Cm 3830, The Stationery Office, London. 28. Tait, J. (1988) Nimby and Niaby: public perception of biotechnology. International Industrial Biotechnology, 8, 5–9. 29. HSE (1993) Successful Health and Safety Management, HS(G)65, HSE Books, London. 30. BS EN ISO 14001 (1996) Environmental Management Systems, British Standards, Milton Keynes. 31. Cox, S.J. and Tait, N.R.S. (1991) Reliability, Safety and Risk Management, an integrated approach, Butterworth Heinemann, Oxford. 32. Fischoff, B. (1995) Risk perception and communication unplugged: twenty years of process. Risk Analysis, 15(2), 137–144. 33. Sandman, P.M., Weinstein, N.D. and Miller, P. (1994) High risk or low—how location on a risk ladder affects perceived risk. Risk Analysis, 14(1), 35–45.

12 Pest control

1. Health and Safety Commission (1991) The Safe Use of Pesticides for Non-Agricultural Use: Approved Code of Practice, HMSO, London.

2. Webster, J.P. (1996) Wild brown rats (Rattus norvegicus) as a zoonotic risk on farms in England and Wales. Communicable Disease Report, 6(3), R46–R49.

3. Meyer, A.N., Shankster, A., Langton, S.D. and Jukes, G. (1995) National commensal rodent survey 1993. Environmental Health, 103(6), 127–135.

4. Pond, K. and Battersby, S. (1997) Time for the piper: rat infestations in sewers. Environmental Health, 105(7), 183–185. FURTHER READING Bassett, W.H. (1998) Environmental Health Procedures. 5th edn, E. & F.N.Spon, London. British Standards Institute (1992) BS 5502:1992, Buildings and Structures for Agricultural Use Part 30: Code of Practice for Control of Infestation. Building Research Establishment (1996) Reducing the Risk of Pest Infestations in Buildings, BRE, Aylesbury. Burgess, N.R.H. (1990) Public Health Pests, Chapman & Hall, London. Cornwell, P.B. (1979) Pest Control in Buildings: a guide to the meaning of terms, 2nd edn, Hutchinson, London. Judge, L. (1996) The brown-tailed moth (Euproctis chrysorrhoea). The Safety and Health Practitioner, May, 22–23. Kettle, D.S. (1990) Medical and Veterinary Entomology, CAB International, Wallingford. Local Government Management Training Board (1992) Pest Control: a reference manual for pest control staff, LGMB, Luton. National Britannia Library (1998) Insect Pests of Food Premises, National Britannia Ltd, Caerphilly. Munro, J.W. (1966) Pests of Stored Products, Hutchinson, London. Saul, H. (1996) Year of the rat. New Scientist, 2050, 32–38. Sprenger, R.A. (1991) Hygiene for Management, 5th edn, Highfield Publications, Doncaster. Various information papers and monographs produced by the Building Research Establishment and the Ministry of Agriculture, Fisheries and Food.

13 The control of dogs

1. Fred's Fact File, http://www.okima.com/dogs/ facts.html

2. Moore, S.R. and Dhaliwal, P. (1992) Campaign on dogs. Environmental Health, 100(6), 152- 154. 3. Price Waterhouse (1991) Resource Implications of s. 149–151 Environmental Protection Act 1990 (Dog Control) for the Department of the Environment, Price Waterhouse, London. 4. Association of District Councils (1992) Dealing With Stray Dogs, ADC, London. 5. Brown, C. (1997) Microchip: the high-tech, low-cost solution to strays. Environmental Health, 105(8), 219–220. 6. Primary Production Department, Singapore, Dog Licensing and Control Laws, http:// www.gov.sg/mnd/ppd/cawc/doglaw.htm 7. British Columbia Dial a Law. Noise, Untidy Premises and Dog Control. http:// www.acjnet.org/dialalaw/bc/bc640.html 8. Department of the Environment/Welsh Office/ Home Office (1991) Environmental Protection Act 1990, Part IV. Control of Stray Dogs. Circular 6/1991, DoE, London. 9. UK looks set to adopt US standards on Pit Bull Terriers (1992) Environmental Health News, 8(28), 4. 10. R. v. Knightsbridge Crown Court, ex parte Dunne [1993] Q.B.D. and Brock v. Director of Public Prosecutions [1993] Q.B.D. The Times Law Reports, 23 July 1993. 11. Washington County, Oregon. Laws You Need to Know if You Own a Dog. http:// www.co.washington.or.us/deptmts/at/dog/ dog_laws.htm 12. National Canine Defence League. The Dangerous Dogs Act 1991. http:// www.fido.k9.co.uk/ncdl/index.htm 13. Anon (1997) Taking the Lead on the Isle of Wight. Environmental Health, 105(1), 22. 14. Castlereagh Borough Council. Licensing and Dog Control, http://www.castlereagh.gov.uk/ env/lr.htm. 15. Newark and Sherwood District Council. Dogs and the Law. http://www.nottscc.gov.uk/cc/ s1300370.htm 16. Gillespie, S.H. (1993) Human toxicariasis. CDR Review, 3(10), R140–R143. 17. Boyes, R. (1997) Victory over rabies brings hidden peril. The Times, 26 November. 18. Advisory Group on Quarantine (1998) Quarantine and Rabies: a reappraisal, MAFF, London.

19. Savage C. (1999) Quarantine Wars. Environmental Health, 107(01), 8–10.

FURTHER READING

Association of District Councils (1992) Dealing with Stray Dogs, ADC, L ondon. (Through LGA , London.)

British Medical Association (1995) The BMA Guide to Rabies, Radcliffe Medical Press, Oxford and New York.

Chartered Institute of Environmental Health Officers (1991) Dogs—Control by Local Authorities: Report of Dogs Survey 1991, CIEH, London.

Department of the Environment/Welsh Office (1989) Action on Dogs: The Government's proposals for legislation. A Consultation Paper, HMSO, London.

Department of the Environment/Welsh Office/ Home Office (1992) Environmental Protection Act 1990, Part IV. Control of Stray Dogs. Circular 6/1992, DoE, London.

Department of the Environment/Welsh Office (1996) The Dogs (Fouling of Land) Act 1996. Circular 18/1996. DoE. London. Department of Health and Social Security/Welsh Office (1977) Memorandum on Rabies, HMSO, London. Dog Owner's Guide (USA). http:// www.canismajor.com/dog/guide.html Health and Safety Executive (1993) The Occupational Zoonoses, HSE, London. Home Office/Department of the Environment/ Welsh Office/Scottish Office (1990) The Control of Dogs: a Consultation Paper, HMSO, London. k9netuk—The Complete UK Dog World. http:// k9netuk.com/contents.html National Canine Defence League. http:// www.k9netuk.com/ncdl/index.html People and Dogs Society, http://www.gurney.co.uk/ pads/index.htm Price Waterhouse (1991) Resource Implications of s. 149–151 Environmental Protection Act 1990 (Dog Control) for the Department of the Environment, Price Waterhouse, London. Tidy Britain Group (1993) Local Authority Survey —Control of Dog Fouling, Tidy Britain Group at the Pier, Wigan.

4. Health and Safety Executive (1986) How to Use Hair Preparations Safely in the Salon, HSE Books, Sudbury, Suffolk.

5. Noah, N.D. (1983) A Guide to Hygienic Skin Piercing, PHLS Communicable Disease Surveillance Centre, Colindale.

6. Health and Safety Executive (1985) Risk of Infection from Skin Piercing Activities, LAC(T) 5.6.1, HSE Books, Sudbury, Suffolk.

7. Health and Safety Executive/Home Office/ Scottish Office (1993) Guide to Health, Safety and Welfare at Pop festivals and Similar Events, HMSO, London.

8. Home Office (1990) Guide to Fire Precautions in Existing Places of Entertainment and Like Premises, HMSO, London.

9. National Outdoor Events Association (1997) Code of Practice for Outdoor Events, NOEA, Wallington, Surrey.

10. Home Office/Scottish Home Office and Health Department (1990) Guide to Safety at Sports Grounds, HMSO, London.

11. Sports Council/Football Trust (1994) The Guide to Safety at Sports Grounds, Sports Council, London.

12. Department of the Environment (1984) The Treatment and Quality of Swimming Pool Water, HMSO, London.

13. Department of the Environment/Department of Health/Public Health Laboratory Service (1983) The Bacteriological Examination of Drinking Water Supplies, Report 71, HMSO, London.

14. Swimming Pools and Allied Trades Association (1983) Standards for Spa Pools, SPATA, Croydon.

15. Public Health Laboratory Service (1994) Hygiene for Spa Pools, PHLS, Colindale.

16. Health and Safety Executive/Sports Council (1988) Safety in Swimming Pools, Sports Council, London.

17. Health and Safety Executive (1983) Prevention of Falls to Window Cleaners, Guidance Note GS25, HSE Books, Sudbury, Suffolk.

18. Institution of Electrical Engineers (1997) Requirements for Electrical Installations, IEE, Stevenage.

19. Health and Safety Executive (1983) Ozone Health Hazards and Precautionary Measures, Guidance Note EH38, HSE Books, Sudbury, Suffolk. 20. Health and Safety Executive (1998) Occupational Exposure Limits, Guidance Note EH40, HSE Books, Sudbury, Suffolk. 21. Health and Safety Executive (1987) Chlorine from Drums and Cylinders, Guidance Booklet HS(G)40, HMSO, London. 22. Department of the Environment (1980) Swimming Pool Disinfection Systems Using Chlorine Gas—Guidelines for Design and Operation, HMSO, London. 23. Health and Safety Executive (1998) Entry into Confined Spaces, 101, HSE Books, Sudbury, Suffolk. 24. Royal Society for the Prevention of Accidents (1992) Swimming Pool User's Safety Code, RoSPA, Birmingham. FURTHER READING Anon (1993) Pool Manager's Handbook, Olin (UK), Droitwich. Association of Professional Piercers (1994) Procedure Manual, APP, San Francisco. Chamberlain, M. (1985) Swimming pools—established safety standards. The Safety Practitioner, March. Department of the Environment (1975, reprinted 1980) The Purification of Swimming Pool Water, HMSO, London. Department of the Environment (1981) Swimming Pool Disinfection Systems Using Calcium Hypochlorite, Chloroisocyanurates, Halogenated Dimethylhydantoins and Solid Ancillary Chemicals—Guidelines for Design and Operation, HMSO, London. Department of the Environment (1982) Swimming Pool Disinfection Systems Using Chloroisocyanurates—A Survey of the Efficacy of Disinfection, HMSO, London. Department of the Environment (1982) Swimming Pool Disinfection Systems Using Ozone with Residual Chlorination—Monitoring the Efficacy of Disinfection, HMSO, London. Department of the Environment (1982) Swimming Pool Disinfection Systems Using Ozone with Residual Free Chlorine and Electrolytic Generation of Hypochlorite—Guidelines for Design and Operation, HMSO, London.

Department of the Environment (1982) Swimming Pool Disinfection Systems Using Sodium Hypochlorite and Calcium Hypochlorite—A Survey of the Efficacy of Disinfection, HMSO, London.

Department of the Environment (1982) Swimming Pool Disinfection Systems Using Sodium Hypochlorite—Guidelines for Design and Operation, HMSO, London.

Department of the Environment (1983) Swimming Pool Disinfection Systems Using Electrolytically Generated Sodium Hypochlorite —Monitoring the Efficacy of

Disinfection, HMSO, London. Noise Council (1995) Code of Practice for the Control of Noise from Outdoor Pop Concerts, Noise Council, London. Pool Water Treatment Advisory Group (1995) Pool Water Guide, PWTAG, Diss, Norfolk. Swimming Pools and Allied Trades Association (1980) Standards for Swimming Pools—Water and Chemical, SPATA, Croydon.

15 Port health

1. Salisbury Manuscripts 1602/1603, Calender State Papers Domestic 1635/1636, Calender Treasury Papers 1708 and 1714.

2. Howard, J. (1789) Lord Liverpool's Papers 1786. (Account of the Lazarettos Privy Council: Levant Company to Pitt 1792). 3. Maclean, C. (1796) The Source of Epidemic and Pestilential Diseases, Calcutta. 4. Southwood Smith, T. (1866) The Common Nature of Epidemics, London. 5. General Board of Health (1849) First Report on Quarantine. 6. Howard-Jones, N. (1975) The Scientific Background of the International Sanitary Conference 1851–1938, WHO, Geneva. 7. International Maritime Organization (1984) Supplement to the Recommendation on The Safe Use of Pesticides in Ships, IMO, London. 8. WHO (1985) Weekly Epidemiological Record, Vol. 60, World Health Organization, Geneva. 9. Lamoureux, V.B. (1967) Guide to Ship Sanitation, World Health Organization, Geneva. 10. Schofield, C. and Shillito, D. (1990) Guide to the Handling of Dusty Materials in Ports, 2nd edn, British Materials Handling Board, Ascot.

9. Public Health Laboratory Service (1994) Report of a Strategic Review of the PHLS, PHLS, London.

10. Hutchinson, E.J., Joseph, C.A. and Bartlett, C.L.R. on behalf of the Working Group for Legionella Infections, PHLS CDSC, London (1996) EWGLI: a European surveillance scheme for travel-associated Legionnaire's disease. Eurosurveillance, 1(5).

11. CDSC (1995) Draft European Community Communicable Disease Surveillance and Prevention Charter, DG5, European Community, Brussels.

12. CDSC (1997) Salmonella java phage type Worksop in young children associated with fresh fortified milk. Communicable Diseases Report, 7(31).

13. CDSC (1997) Preliminary report of an international outbreak of Salmonella anatum infection linked to baby formula milk. Eurosurveillance, 3(3). 14. CDSC (1997) Salmonella anatum infection in infants linked to dried milk. Communicable Diseases Report, 7(5). 15. CDSC (1996) Salmonella goldcoast. Communicable Diseases Report, 6(11). 16. CDSC (1997) Salmonella goldcoast and Cheddar cheese: update. Communicable Diseases Report, 7(5). 17. CDSC (1995) An outbreak of Salmonella agona due to contaminated snacks. Communicable Diseases Report, 5(7). 18. Killalea, D., Ward, L.R., Roberts, D. et al. (1996) International epidemiological and microbiological study of an outbreak of Salmonella agona infection from a ready to eat savoury snack. British Medical Journal, 313. 2 November.

17 Food-borne disease

1. Public Health Laboratory Service Salmonella Committee Working Party (1995) The prevention of human transmission of infections, infestations and bacterial intoxications. Communicable Disease Report Review, 5, R158–172.

1a. Old, D.C. and Threfall, E.G. (1998) Salmonellae, in Topley and Wilson's Microbiology and Microbial Infections, Volume 2, 9th edn (eds L.Collier, A.Balaw and M.Sussman), Oxford University Press, Oxford. 2. Chief Medical Officer (1988) Advice on Raw Eggs Consumption, Press Release 88/445.5, December, Department of Health, London. 3. Department of Health (1995) Food Handlers Fitness to Work. Guidance for Food Businesses, Enforcement Officers and Health Professionals. Prepared by an Expert Working Party convened by the Department of Health, DoH, London. 4. The Pennington Group (1997) Report on the Circumstances Leading to the 1996 Outbreak of Infection with E.coli O157 in Central Scotland: the Implications for Food Safety and the Lessons to be Learned, Stationery Office, Edinburgh. 5. Ministry of Agriculture, Fisheries and Food (1997) Government's response to the

Table 17.3 Factors contributing to 1479 outbreaks of food poisoning, England and Wales, 1970–82

Source: [9]; reproduced with the permission of the publishers and the author.

Note: The total at the foot of the table represents the total number of outbreaks for each type of organism

being examined; some outbreaks have more than one cause. The percentages given are for each causal factor in

the total number of outbreaks due to each organism.

Pennington final report. MAFF Food Information Bulletin, No. 84, May.

6. Anon (date unavailable) EHEC/VTEC. Lancet, 351(9108).

6A. LACOTS (1998) E.coli 0157—Research Information, Circular LAC 23 98 5, LACOTS, Croydon.

7. Anon (1997) World Health Organization Workshop, the Stationery Office, London.

8. Department of Health (1994) Management of Outbreaks of Foodborne Illness. Guidance Produced by a Department of

Health Working Group, HMSO, London.

9. Roberts, D. (1993) Factors contributing to outbreaks of food poisoning, in Food Poisoning and Food Hygiene (eds C.B.Hobb and D. Roberts), 6th edn, Edward Arnold, London.
FURTHER READING
Advisory Committee on the Microbiological Safety of Food (1993) Report on Salmonella in Eggs, HMSO, London. Advisory Committee on the Microbiological Safety of Food (1995) Veromytotoxin Producing Escherichia Coli, HMSO, London. Department of Health and Social Security (1986) Report of the Committee of Inquiry into an Outbreak of Food Poisoning at Stanley Royd Hospital, HMSO, London. Palmer, S.R., Lord Soulsby, Simpson, D.I.H. (1998) Zoonoses, Oxford university Press, Oxford. Wall, P.G., de Louvois, J., Gilbert, R.J. and Rowe, B. (1996) Food poisoning notifications, laboratory reports and outbreaks—where do the statistics come from and what do they mean? Communicable Disease Review, 6, R93–100.

18 Communicable disease control

1. Committee of Inquiry into the future development of the Public Health Function (1988) Public Health in England, Cmnd 289, HMSO, London.

2. Palmer, S.R., Lord Soulsby and Simpson, D.I.H. (1998) Zoonoses, Oxford Medical Publications, Oxford.

3. Langmuir, A.D. (1963) The surveillance of communicable diseases of national importance. New England Journal of Medicine, 268, 182–92.

4. Palmer, S.R. (1990) Review article: epidemiology in search of infectious diseases: methods in outbreak investigation. Journal of Epidemiology and Community Health, 43, 311–14. FURTHER READING Benenson, A.S. (ed.) (1995) Control of Communicable Diseases Manual, 16th edn, American Public Health Association, Washington. Detels, R., Holland, W. and McEwen, O.G. (eds) (1997) Oxford Textbook of Public Health, 3rd edn, Oxford Medical Publications, Oxford. Giesecke, J. (1994) Modern Infectious Diseases Epidemiology, Edward Arnold, London. Noah, N. and O'Mahony, M. (eds) (1998) Communicable Disease Epidemiology and Control, John Wiley, Chichester. Russell, A.D., Hugo, W.B. and Ayliffe, G.A.J. (1992) Principles and Practice of Disinfection, Preservation and Sterilization, Blackwell Scientific, Oxford.

1. CIEH (1993) The Health of the Nation for Environmental Health, Chartered Institute of Environmental Health, London.

2. CDC (1990) Guidelines for Investigating Clusters of Health Events, Centers for Disease Control, Atlanta.

3. ATSDR (1995) Toxicological Profiles, Agency for Toxic Substances and Disease Registry, Atlanta.

FURTHER READING

Bithell, J.F. and Stone, R.A. (1989) Statistical methods for analysing the geographical distribution of cancer cases near nuclear installations. Journal of Epidemial Community Health, 43, 79–85.

Jacobs, R. (1992) Polychlorinated Biphenyls, Dioxins and Furans: Human Health Effects and Population Studies, Welsh Office, Cardiff.

Johnson, B.L., Andrews, J.S. Jr, Xintaras, C. and Mehlman, M.A. (1998) Advances in Modern Environmental Toxicology, Volume 25, Hazardous Waste: Toxicology and Health Effects, Princeton Scientific Publishing, New Jersey.

21 Housing conditions, diseases and injuries

1. Hill, A.B. (1977) Short Textbook of Medical Statistics, Hodder and Stoughton, London.

2. Burr, M.L., St Leger, A.S. and Yarnell, J.W.G. (1981) Wheezing, dampness and coal-fires. Community Medicine, 5, 205–9.

3. Platt, S.P., Martin, C.J. and Hunt, S.M. (1989) Damp housing, mould growth and symptomatic health state. British Medical Journal, 298, 1673–8.

4. Strachan, D.P. (1988) Damp housing and childhood asthma: validation of reporting of symptoms. British Medical Journal, 297, 1223–6.

5. Strachan, D.P., Flannigan, B., McCabe, E.M. et al. (1990) Quantification of airborne moulds in the homes of children with and without wheeze. Thorax, 45, 382–7.

6. Burr, M.L., Mullins, J., Merrett, T.G. et al. (1991) Indoor moulds and asthma. Journal of the Royal Society of Health, 108, 99–101.

7. Dales, R.E., Zwanenburg, H., Burnett, R. et al. (1991) Respiratory health effects of home dampness and mould among Canadian children. American Journal of Epidemiology, 134, 196–203.

8. Dales, R.E., Burnett, R. and Zwanenburg, H. (1991) Adverse health effects among adults exposed to home dampness and moulds. American Journal of Epidemiology, 134, 505–10. 9. Lloyd, E.L. (1991) The role of cold in ischaemic heart disease: a review. Public Health, 105, 205–15. 10. Mant, D.C. and Muir Gray, J.A. (1986) Building Regulations and Health, Building Research Establishment, DoE. 11. Kellet, J.M. (1989) Health and housing. Journal of Psychosomatic Research, 33, 255–68. 12. Barker, D. and Osmond, C. (1987) Inequalities in health in Britain: specific explanations in three Lancashire towns. British Medical Journal, 294, 749–52. 13. Britten, N., Davies, J.M.C. and Colley, J.R.T. (1987) Early respiratory experience and subsequent cough and peak expiratory flow rate in 36 year old men and women. British Medical Journal, 294, 1317–19. 13a. http://www.qub.ac.uk/cm/eth/CAPT/index/htm 14. Freeman, H.L. (ed.) (1985) Mental Health and the Environment, Churchill Living-stone, London. 15. Richman, N. (1974) The effects of housing on pre-school children and

their mothers. Developmental Medicine and Child Neurology, 16, 53–8. 16. Rutter, M., Yule, W., Quinton, D. et al. (1975) Attainment and adjustment in two geographical areas III. Some factors accounting for area differences. British Journal of Psychiatry, 126, 520–33. 17. Gabe, J. and Williams, P. (1986) Is space bad for your health? The relationship between crowding in the home and emotional distress in women. Sociology of Health and Illness, 8, 351–71.

11. Ranson, R.P. (1998) Accident Prevention Policy and Strategy: Guidance for Local Authorities, World Health Organization, Copenhagen.

FURTHER READING

Benson, J. et al. (1980) The Housing Rehabilitation Handbook, The Architectural Press, London.

Ineichen, B. (1993) Homes and Health, E. & F.N. Spon, London.

Ormandy, D. and Burridge, R. (1988) Environmental Health Standards in Housing, Sweet & Maxwell, London.

Ranson, R. (1992) Healthy Housing—A Practical Guide, World Health Organization and Chapman & Hall, London.

World Health Organization (1961) Health Aspects of Housing, WHO Technical Report Series No. 225, WHO, Geneva. World Health Organization (1965) Environmental Health Aspects of Metropolitan Planning and Development, Report of an Expert Committee, Technical Report Series No. 297, WHO, Geneva. World Health Organization (1974) Use of Epidemiology in Housing Programmes and in Planning Human Settlements, Report of an Expert Committee, Technical Report Series No. 544, WHO, Geneva. World Health Organization (1977) Development of Environmental Criteria for Urban Planning, Technical Report Series No. 51, WHO, Geneva. World Health Organization (1979) Health Aspects Related to Indoor Air Quality, EURO Reports and Studies No. 21, WHO, Geneva. World Health Organization (1983) Indoor Air Pollutants: exposure and health effects, EURO Reports and Studies No. 78, WHO, Copenhagen.

6. Department of the Environment (1993) Local House Condition Surveys, HMSO, London.

7. Department of the Environment (1996) Private Sector Renewal: A Strategic Approach, Circular 17/96, HMSO, London.

8. Department of the Environment, Transport and the Regions (1998) Housing Fitness Standard: Consultation Paper, HMSO, London.

9. White paper (1987) Housing: the Government's Proposals, Cmnd 214, HMSO, London.

10. Department of the Environment (1993) HMOs: Guidance to Local Authorities on Managing the Stock in their Area, Circular 12/93, HMSO, London.

11. Department of the Environment (1992) HMOs: Guidance on Standards of Fitness, Circular 12/92, HMSO, London.

12. Chartered Institute of Environmental Health (1994) Amenity Standards for HMOs, Professional Practice Note, CIEH, London.

13. Thomas, A.D. (1981) Local Authority Agency Services: their role in home improvement, Research Memo No. 88, University of Birmingham CURS, Birmingham.

14. Leather, P. et al. (1985) Review of Home Improvement Agencies, University of Bristol SAUS, Bristol.

15. Leather, P. and MacIntosh, S. (1991) Monitoring Assisted Agency Services, Department of the Environment, HMSO, London.

16. Chartered Institute of Environmental Health (1994) Licensing of Permanent Residential Mobile Home Sites, Professional Practice Note, CIEH, London.

17. Department of the Environment (1989) Caravan Sites and Control of Development Act 1960, Section 5, Model Standards: Permanent Residential Mobile Home Sites, HMSO, London.

18. Department of the Environment (1989) Caravan Site and Control of Development Act 1960, Section 5, Model Standards: Holiday Caravan Sites. HMSO. London. 19. R. v.

South Hams District Council and another, exparte Gibb (1994) 4 A11 ER 1012. 20. Department of the Environment (1994) Gypsy Sites Policy and Unauthorized Camping, Circular 1/94, HMSO, London. 21. Department of the Environment (1994) Gipsy Sites Policy and Unauthorized Camping, Circular 18/94, HMSO, London. FURTHER READING Anon (1997) Bridging the Gap, Hanover Housing Association and Care and Repair, Castle House, Kirtley Drive, Nottingham, NG7 1LD. Association of District Councils (1988) The Challenge of Multiple Occupancy, Local Government Association, London. Association of District Councils (1989) A Time to Take Stock: recommendation to improve the condition of the housing stock 1989, Local Government Association, London. British Standards Institute (1990) Guide on the Siting of Holiday Caravans and Park Homes, BS 6768, BSI, London. Chartered Institute of Environmental Health (1995) Fire Safety for Houses in Multiple Occupation—An Illustrated Guide, CIEH, London. Chartered Institute of Environmental Health (1995) Travellers and Gypsies: An Alternative Strategy, CIEH, London. Department of the Environment, Transport and the Regions (1997) Private Sector Housing Renewal Strategies—A Good Practice Guide, HMSO, London. Moran, T. (1998) Legal Competence in Environmental Health, E. & F.N.Spon, London. Ormandy, D. and Burridge, R. (1988) Environmental Health Standards in Housing, Sweet Maxwell, London.

24 Introduction to occupational health and safety

1. The Health and Safety at Work, Etc. Act 1974 (1974) c. 37, HMSO, London.

2. The Committee on Safety and Health at Work (Robens Committee) (1972) Command 5034, HMSO, London.

3. Health and Safety Executive (1988, revised 1992) The Tolerability of Risk from Nuclear Power Stations, HSE Books, Sudbury, Suffolk.

4. The Health and Safety (Consultation with Employees) Regulations 1996, SI 1996, No. 1513.

4a. The Safety Representatives and Safety Committees Regulations 1977, SI 1977, No. 500.

5. European Commission's Senior Labour Inspectors Committee (1997) Labour Inspection (Health and Safety) in the European Union, EU, Luxemburg.

6. Health and Safety Commission (1997) Health and Safety Commission Plan of Work 1997/ 98, MISC085, HSE Books, Sudbury, Suffolk. 7. Health and Safety Commission (1998) Health and Safety Commission Plan of Work 1998/ 99, HSE Books, Sudbury, Suffolk. 8. HELA (1998) HELA Training Strategy 18 Months On, HSE Books, Sudbury, Suffolk. 9. HELA (1997) Local Authorities Report on Health and Safety in the Service Industries, HSE Books, Sudbury, Suffolk. 10. HELA (1998) National Picture of Health and Safety in Local Authority Enforced Industries: HELA National Picture, HSE Books, Sudbury, Suffolk. 11. HELA (1997) HELA Strategy for Small Firms, MISC100, HSE Books, Sudbury, Suffolk. 12. Health and Safety Executive (1997) Health and Safety in Small Firms, MISC071, HSE Books, Sudbury, Suffolk. 13. Department of Health (1998) Our Healthier Nation: A Contract for Health, Consultation Paper, Cm 3882, Stationery Office, London. 14. Hodgson, J.T., Jones, J.R., Elliot, R.C. and Osmant J. (1993) Self-reported work-related illness: results from a trailer questionnaire on the 1990 Labour Force Survey in England and Wales, Research Report 33, HSE Books, Sudbury, Suffolk.

6. The Health and Safety (Consultation with Employees) Regulations 1996. S.I. 1996. No. 1513, HMSO, London.

7. The Health and Safety (Emissions into the Atmosphere) Regulations 1983. S.I. 1983. No. 943, HMSO, London.

8. The Health and Safety (Leasing Arrangements) Regulations 1992. S.I. 1992. No. 1524, HMSO, London.

9. The Noise at Work Regulations 1989. S.I. 1989. No. 1790, HMSO, London.

10. Supply of Machinery (Safety) Regulations 1992. S.I. 1992. No. 3073, HMSO, London.

11. Council Directive 89/392/EEC 'on the approximation of the laws of the Member States relating to machinery'. OJ No. L183, 29.6.89, p9.

12. The Employer's Health and Safety Policy Statement (Exceptions) Regulations 1975. S.I. 1975. No. 1584, HMSO, London.

13. The Safety Representatives and Safety Committee Regulations 1977. S.I. 1977. No. 500, HMSO, London. 14. The Health and Safety (Enforcing Authority) Regulations 1998. S.I. 1998. No. 494, HMSO, London. 15. Bassett, W.H. (1998) Environmental Health Procedures, 5th edn, E. & F.N.Spon, London. 16. Council Directive on the approximation of the laws, regulations and administrative provisions of Member States relating to the provision of safety signs at places of work (77/576/EEC) as amended by Directive 79/ 640/EEC. 17. Council Directive on the approximation of the laws, regulations and administrative provisions of the Member States on the protection of the health of workers exposed to vinyl chloride monomer (78/610/EEC). 18. Council Directive on the introduction of measures to encourage improvements in the safety and health of workers (89/391/EEC). 19. Neal, A.C. and Wright, F.B. (eds) (1992) The European Community's Health and Safety Legislation, Chapman & Hall, London.

7. Health and Safety Executive (1994) A Pain in the Workplace—Ergonomic Problems and Solutions HS(G)121, HSE Books, Sudbury, Suffolk.

8. Dewis, M. and Stranks, J. (1990) Tolley's Health & Safety at Work Handbook, 3rd edn, Tolley Publishing Company, Croydon, Surrey.

9. Health and Safety Executive (1992) Health and Safety in Retail and Wholesale Warehouses HS(G)76, HSE Books, Sudbury, Suffolk.

10. Health and Safety Executive (1992) Prevention of Falls to Window Cleaners, Guidance Note GS 25, HSE Books, Sudbury, Suffolk.

11. British Standards Institution (1991) BS 8213 Part 1 Windows, Doors and Rooflights: code of practice for safety in use and during cleaning of windows, BSI, London.

12. Health and Safety Executive (1984) Safety in the Use of Escalators PM34, HSE Books, Sudbury, Suffolk.

13. Health and Safety Executive (1984) Escalators: periodic thorough examination PM45, HSE Books, Sudbury, Suffolk. 14. Health and Safety Executive (1992) Passive smoking at Work IND(G)63L, HSE Books, Sudbury, Suffolk. 15. Health and Safety Executive (1992) Display Screen Equipment at Work, Guidance on Regulations L26, HSE Books, Sudbury, Suffolk. 16. Health and Safety Executive (1992) Working with VDUs IND(G)36L, HSE Books, Sudbury, Suffolk. 17. Health and Safety Executive (1991) Seating at Work HS(G)57, HSE Books, Sudbury, Suffolk. 18. Health and Safety Executive (1990) Work Related Upper Limb Disorders: a guide to prevention HS(G)60, HSE Books, Sudbury, Suffolk. 19. International Labour Office (1994) Visual Display Units: radiation protection guidance, ILO Publications, Geneva. 20. Waterhouse, P. (1990) Fire, in Safety at Work (ed. J.Ridley), 3rd edn, Butterworths, London.

27 Protection of persons

1. Health and Safety Executive (1992) Personal Protective Equipment at Work, Guidance on Regulations L25, HSE Books, Sudbury, Suffolk. 2. Atherley, G. (1978) Occupational Health and Safety Concepts, Applied Science Publishers, London. 3. Chartered Institute of Environmental Health (1991) Acquired Immune Deficiency Syndrome: guidance notes for environmental health officers, CIEH, London. 4. Coates, T. and Clarke, A.R.L. (1990) Occupational diseases, in Safety at Work (ed. J.Ridley), 3rd edn, Butterworths, London. 5. Else, D. (1981) Occupational Health Practice, 2nd edn, Butterworths, London. 6. Health and Safety Executive (1994) A Short Guide to the Personal Protective Equipment at Work Regulations 1992, ING(G)174L, HSE Books, Sudbury, Suffolk. 7. BS EN 352-2 (1993) Hearing Protectors, Ear Plugs, British Standards Institution, London. 8. BS EN 352-1 (1993) Hearing Protectors, Ear Muffs, British Standards Institution, London. 9. BS EN 24869-1 (1993) Acoustic Hearing Protectors. Sound Attenuation of Hearing Protectors, British Standards Institution, London. 10. Health and Safety Executive (1989) Noise Guide No.1, Legal Duties of Employers to Prevent Damage to Hearing, HSE Books, Sudbury, Suffolk. 11. Health and Safety Executive (1996) Noise Guide No.5, Types and Selection of Personal Ear Protectors, HSE Books, Sudbury, Suffolk. 11a. BS 4555 (1970) Dust Respirators, British Standards Institution, London. 12. BS 4275 (1974) Recommendations for the Selection, Use and Maintenance of Respiratory Protective Equipment, British Standards Institution, London. 13. BS 4667 (1974) Specification for Breathing Apparatus, British Standards Institution, London. 14. Health and Safety Executive (1990) Respiratory Protective Equipment: a practical guide for users, HS(G)53, HSE Books, Sudbury, Suffolk.

15. BS EN 166 (1996) Personal Eye Protection: Specifications, British Standards Institution, London.

16. BS 7028 (1988) Guidance for the Selection, Use and Maintenance of Eye Protection for Industrial and Other Uses, British Standards Institution, London. 17. Hartley, C. (1990) Occupational hygiene, in Safety at Work (ed. J.Ridley), 3rd edn, Butterworths, London.

28 Plant and systems of work

1. Health and Safety Executive (1994) Essentials of Health and Safety at Work, 3rd edn, HSE Books, Sudbury, Suffolk.

2. BS 5304 (1988) British Standard Code of Practice for the Safety of Machinery, British Standards Institution, London.

3. The Factories Act (1961) 9 & 10 Elizabeth 2, c34, HMSO, London.

4. The Offices, Shops and Railway Premises Act (1963) c41, HMSO, London.

5. The Provision and Use of Work Equipment Regulations (1992) S.I. no. 2932, HMSO, London.

6. The Health and Safety at Work, Etc. Act (1974) c37, HMSO, London.

7. The Prescribed Dangerous Machines Order (1964) S.I. no. 971, HMSO, London.

8. Health and Safety Executive (1990) Health and Safety in Kitchens and Food Preparation Areas, HS(G)55, HSE Books, Sudbury, Suffolk.

9. Health and Safety Executive (1986) Pie and Tart Machines, HS(G)31, HSE Books, Sudbury, Suffolk.

10. Health and Safety Executive (1979) Safety in Working with Lift Trucks, HS(G)6, HSE Books, Sudbury, Suffolk.

11. Health and Safety Commission (1988) Rider Operated Lift Trucks—Operator Training. Approved Code of Practice and Supplementary Guidance, HSE Books, Sudbury, Suffolk.

12. Health and Safety Executive (1991) The Control of Legionellosis Including Legionnaire's Disease, 2nd impression 1994, HSE Books, Sudbury, Suffolk. 13. BS 7592 (1992) Methods for Sampling for Legionella Organisms in Water and Related Materials, British Standards Institution, London. 14. BS 6068-4.12 (1998) Method for Detection and Enumeration of Legionella Organisms in Water and Related Materials, British Standards Institution, London. 15. Notification of Cooling Towers and Evaporative Condensers Regulations (1992) S.I. no. 2225, HMSO, London. 16. Westminster City Council (1988) Broadcasting House Legionnaire's Disease, WCC, London. 17. Electricity at Work Regulations (1989) S.I. no. 635, HMSO, London. 18. Health

and Safety Executive (1989) Memorandum of Guidance on the Electricity at Work Regulations 1989, HS(R)25, HSE Books, Sudbury, Suffolk. 19. Health and Safety Executive (1989) Electrical Equipment Certification Guide, HSE(M), Health and Safety Executive Electrical Equipment Certification Service, HSE Books, Sudbury, Suffolk. 20. Manual Handling Operations Regulations (1992) S.I. no. 2793, HMSO, London. 21. Health and Safety Executive (1992) Manual Handling—Guidance on Regulations, L23, HSE Books, Sudbury, Suffolk. The Provision and Use of Work Equipment Regulations 1998, S.I. no. 2306, HMSO, London.

29 Toxic and dangerous substances

1. Chemicals (Hazard Information and Packaging) Regulations (1994) SI 1994 No. 3247 (as amended 1997 by SI 1460), HMSO, London.

2. Health and Safety Executive (1996) Information Approved for the Classification and Labelling of Substances and Preparations Dangerous for Supply, 3rd edn, L/76, HSE Books, Sudbury, Suffolk. 3. Health and Safety Executive (1996) Information Approved for the Classification, Packaging and Labelling of Substances Dangerous for Carriage, L/90, HSE Books, Sudbury, Suffolk. 4. Health and Safety Commission (1993) The Approved Code of Practice on Regulation 6. Safety data sheets for substances and preparations dangerous for supply, HSE Books, Sudbury, Suffolk. 5. Control of Substances Hazardous to Health Regulations (1994) SI 1994 No. 1657, HMSO, London. 6. The Control of Substances Hazardous to Health (Amendment) Regulations (1998) SI 1998 No. 1357, Stationery Office, London. 7. Health and Safety Commission (1988) Approved Code of Practice: control of substances hazardous to health—control of carcinogenic substances, HSE Books, Sudbury, Suffolk. 8. Health and Safety Executive (1988) Introducing Assessment—a simplified guide for employers, IND(G) 136(L) Rev., HMSO, London. 9. Health and Safety Executive (1998) Occupational Exposure Limits 1998, Guidance Note EH40/98, HSE Books, Sudbury, Suffolk. 10. Health and Safety Executive (1989) Monitoring Strategies for Toxic Substances, Guidance Note EH42, HSE Books, Sudbury, Suffolk. 11. Health and Safety Executive (1980) Entry into Confined Spaces, GS5, HSE Books, Sudbury, Suffolk. 12. Health and Safety Executive (1990) Asbestos: Exposure Limits and Measurement of Airborne Dust Concentrations, Guidance Note EH10, HSE Books, Sudbury, Suffolk. 13. Health and Safety Executive (1993) General Method for the Gravimetric Determination of Respirable and Total Inhalable Dust, MDHS14, HSE Books, Sudbury, Suffolk. 14. Heal th and Safe ty Execut ive (1990) General Methods for Sampling Gases and Vapours, MDH70, HSE Books, Sudbury, Suffolk.

15. Control of Asbestos at Work Regulations (1987) SI 1987 No. 2115, HMSO, London.

16. Control of Asbestos at Work (Amendment) Regulations (1998) SI 1998 No. 3235 HMSO, London.

17. Health and Safety Executive (1990) Asbestos Fibres in Air: Determination of personal exposure by the European

Reference version of the membrane filter method. Methods for the Determination of Hazardous Substances, MDHS39, HSE Books, Sudbury, Suffolk. 18. Health and Safety Commission (1999) Approved Code of Practice. The control of asbestos at work, 3rd edn, HSE Books, Sudbury, Suffolk. 19. Health and Safety Commission (1993) Approved Code of Practice. Work with asbestos insulation, asbestos coating and asbestos insulating board, 3rd edn, HSE Books, Sudbury, Suffolk. 20. Control of Asbestos in the Air Regulations (1990) SI 1990 No. 556, HMSO, London. 21. Asbestos (Prohibitions) Regulations (1992) SI 1992 No. 3067, HMSO, London.

30 Accident prevention and investigation

1. Ministry of Labour and National Service (1956) Industrial Accident Prevention, Report of the Industrial Safety Sub-Committee of the National Joint Advisory Council, HMSO, London.

2. Bamber, L. (1990) Principles of the management of risk, in Safety at Work, 3rd edn (ed. J.Ridley), Butterworths, London.

3. Health and Safety Executive (1991) Successful Health and Safety Management, HS(G) 65, HSE Books, Sudbury, Suffolk.

4. Gordon, J.E. (1949) The epidemiology of accidents. American Journal of Public Health, 39, 504–15.

5. Heinrich H.W. (1959) Industrial Accident Prevention, 4th edn, McGraw-Hill, New York.

6. Bird, F.E. and Loftus, R.G. (1976) Loss Control Management, Institute Press, Loganville, Georgia.

7. Hale, A.R. and Hale, M. (1972) A Review of the Industrial Accident Research Literature, Committee on Safety and Health at Work Research Paper, HMSO, London. 8. Petersen, D.C. (1978) Techniques of Safety Management, 2nd edn, McGraw-Hill, New York. 9. Health and Safety Executive (1996) A Guide to the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995, HSE Books, Sudbury, Suffolk. 10. Bassett, W.H. (1998) Environmental Health Procedures, 5th edn, E. & F.N.Spon, London. 11. Health and Safety Executive (1996) The Management of Health and Safety at Work: Approved Code of Practice, L/21, HSE Books, Sudbury, Suffolk. 12. Health and Safety Executive (1998) Five Steps to Risk Assessment, IND G 163 (rev.) 163L, HSE Books, Sudbury, Suffolk. 13. Bamber, L. (1990) Risk management techniques and practices, in Safety at Work, 3rd edn (ed. J.Ridley), Butterworths, London. 14. Electrical, Electronic, Telecommunications and Plumbing Union (1979) Safety, Health and Welfare: Code of Practice—Television and Audio Servicing Industry, EETPU, London. 15. Health and Safety Executive (1990) Writing your Health and Safety Policy Statement, HSE Books, Sudbury, Suffolk. 16. The Committee on Safety and Health at Work (Robens Committee) (1972) Cmnd 5034, HMSO, London. 17. Health and Safety Commission (1977) Safety Representatives and Safety Committees, HSE Books, Sudbury, Suffolk.

31 Ionizing radiation

1. Goldfinch, E.P. (ed.) (1989) Radiation Protection—Theory and Practice, Institute of Physics, London.

2. Martin, A. and Harbison, S.A. (1986) An Introduction to Radiation Protection, 3rd edn, Chapman & Hall, London.

3. National Radiological Protection Board (1998) Living with Radiation, NRPB, 5th edn, Harwell.

4. United Nations Environment Programme (1985) Radiation Doses, Effects and Risks, UNEP, Nairobi, Kenya.

5. Ionizing Radiation Regulations (1985) S.I. 1985 No. 1333, HMSO, London.

6. Health and Safety Commission (1985) Protection of Persons against Ionizing Radiation Arising from any Work Activity, HSE Books, Sudbury, Suffolk.

32 Non-ionizing radiation

1. National Radiological Protection Board (1994) A Critique of Recommended Limits of Exposure to Ultraviolet Radiation with Particular Reference to Skin Cancer, NRPB for the HSE, HSE Books, Sudbury, Suffolk.

2. Health and Safety Executive (1995) Controlling Health Risks from the Use of Ultraviolet Tanning Equipment, INDG209, HSE Books, Sudbury, Suffolk.

3. Swerdlow, A.J., English, J.F.C., Mackie, R.M. et al. (1988) Fluorescent lights, ultraviolet lamps and the risk of cutaneous melanoma. British Medical Journal, 297, 10 September, 647–50. 4. British Standards Institution (1997) Personal Protection Equipment for Eye and Face Protection during Welding and Allied Processes, BS EN 175, BSI, London. 5. British Standards Institution (1997) Safety of Household and Similar Electrical Appliances. Particular Requirements: Microwave Ovens, BS EN 60335-2-25, BSI, London. 6. National Radiological Protection Board (1998) Health Issues in the Siting of a Low Frequency Transmission Mast, NRPB-R222, NRPB, Harwell. 7. Health and Safety Executive (1986) Safety in the Use of Radiofrequency Dielectric Heating Equipment, Guidance Note PM51, HSE Books, Sudbury, Suffolk. 8. International Labour Office (1994) The Protection of Workers from Power Frequency Electric and Magnetic Fields, ILO Publications, Geneva. 9. British Standards Institution (1991) Radiation Safety of Laser Products, Equipment Classification, Requirements and User's Guide, European Standard EN 60825, BSI, London. 10. Health and Safety Executive (1996) The Radiation Safety of Lasers Used for Display Purposes, HS(G)95, HSE Books, Sudbury, Suffolk. 11. International Labour Office (1994) The Use of Lasers in the Workplace: A Practical Guide, ILO Publications, Geneva.

33 Introduction to food safety

1. Richmond Committee (1990) Report of the Committee on the Microbiological Safety of Food. Part 1, HMSO, London.

2. Richmond Committee (1991) Report of the Committee on the Microbiological Safety of Food. Part 2. HMSO. London. 3. James, P. (1997) Food Standards Agency— An Interim Proposal by Professor Philip James, the Cabinet Office, London. 4. White Paper (1998) The Food Standards Agency: A Force for Change, Cmnd 3830, Stationery Office, London. 5. LACOTS (1997) Home Authority Principles, LACOTS, Croydon, Surrey. 6. LACOTS (1998) LAC 5 98 5, LACOTS, Croydon, Surrey. 7. MAFF (1991) Report of the Committee on the Microbiological Safety of Food. Part 2. Recommendations and Government's Response, HMSO, London. 8. Audit Commission (1990) Environmental Health Survey of Food Premises, Information Paper No. 2, HMSO, London. 9. Audit Commission (1990) Safer Food: Local Authorities and the Food Safety Act 1990, HMSO, London. 10. The Pennington Group (1997) Final Report on the Circumstances Leading to the 1996 Outbreak of Infection with E.coli O157 in Central Scotland, Stationery Office, Edinburgh. 11. MAFF (1997) The General Principles of Food Law in the European Union, EU Commission green paper, COM (97)176, Stationery Office, London.

1. White Paper (1989) Food Safety: Protecting the Consumer, HMSO, London.

2. Bassett, W.H. (1998) Environmental Health Procedures, 5th edn, E & FN Spon, London.

3. The Pennington Group (1997) Final Report on the Circumstances Leading to the 1996 Outbreak of Infection with E.coli O157 in Central Scotland, Stationery Office, Edinburgh.

4. European Commission (1992) The Internal Market After 1992. Meeting the Challenge, European Commission London Office, London.

5. Department of Health (1996) A Guide to the General Temperature Control Regulations, HMSO, London.

1. Food Safety Act 1990 (1990) Code of Practice No. 3: Inspection Procedures—General, HMSO, London.

2. Food Safety Act 1990 (Revised 1997) Code of Practice No. 9: Food Hygiene Inspections, HMSO, London.

3. Department of Health (1993) Food Law Inspections and Your Business, HMSO, London.

4. LACOTS (1993) Guidance on Food Hygiene Inspections, General Guidance Notes to Assist Local Authorities Undertaking Programmed Food Hygiene Inspections, LACOTS, Croydon, Surrey.

5. LACOTS (1993) Contents FS 6 93, General, Food Hygiene (General) Regulations 1970 (As Amended), Chief Officer Circular 25, LACOTS, Croydon, Surrey. 6. Department of Health (1993) Overzealous Enforcement of Food Hygiene Legislation, HMSO, London. 7. International Commission for Microbiological Specifications of Food (1989) Application of the hazard analysis critical control point (HACCP) system to ensure microbiological safety and quality. HACCP in Microbiological Safety and Quality, 4, Blackwell Scientific, Oxford. 8. Munce, B.A. (1988) Hazard Analysis and Food Safety. Paper given at inaugural World Congress on Environmental Health, Sydney, Australia, 26–30 September. 9. International Commission for Microbiological Specifications of Food (1988) Micro-organisms in Food, Sampling for Microbiological Analysis; Principles of Specific Applications, 2nd edn, Blackwell Scientific, Oxford. 9a. Committee on the Microbiological Safety of Food (1990) The Microbiological Safety of Food. Part 1, HMSO, London. 10. The Microbiological Food Surveillance Group (1999) study of recently reported, future and ongoing microbiological surveillance, Food and Safety Information Bulletin, No. 106, MAFF, London. 11. LACOTS (1995) Guidance on Food Hygiene Risk Assessment, LACOTS, Croydon. 12. LACOTS (1989) Guidance Notes on the Inspection of Food Production Factories for Local Authorities, LACOTS, Croydon. 13. British Standards Institute (1987) Quality Systems. ISO 9000, BSI, London. 14. Institute of Food Science and Technology (1998) Food and Drink Manufacture—Good Manufacturing Practice. A Guide to Responsible Management 4th edn, IFST, London. 15. Food Safety Act 1990 (1990) Code of Practice No. 1: Responsibility for Enforcement of the Food Safety Act 1990, HMSO, London. 16. LACOTS (1994) Guidance on Food Safety Enforcement Policies, LACOTS, Croydon, Surrey. 17. Food

Safety Act 1990 (1990) Code of Practice No. 7: Sampling for Analysis or Examination, HMSO, London.

18. MAFF (1993) Guidelines on Use By Dates, MAFF Consumer Protection Division, Room 30A, Ergon House, c/o Nobel House, 17 Surrey. Smith Square, London, SW1P 3JR. 19. LACOTS (1998) Guidance on Food Complaints, 2nd edn, LACOTS, Croydon, Surrey.

1. Food Safety Act 1990 (revised 1997) Code of Practice No. 9: Food Hygiene Inspections, HMSO, London.

2. Restaino, L. and Wind, C.E. (1990) Antimicrobial effectiveness of handwashing for food establishments. Dairy Food and Environmental Sanitation, 10(3), 136–41.

3. World Health Organization (1989) Health Surveillance and Management Procedures for Food Handling Personnel, WHO Technical Report Series No. 785, WHO, Geneva.

4. Department of Health, Clean Food NHS Catering, HMSO, London.

5. Department of Health (1995) Food Handlers —Fitness to Work, Department of Health Publications, Wetherby.

6. Fuqua, R.G. (1988) A practical environmental sampling plan for dairy processing plants. Dairy and Food Sanitation, 8(10), 521–3.

7. Noah, N.D. (1981) Foodborne outbreaks of hepatitis A. Medical Laboratory Sciences, 38, 428. 8. Reid, T.M.S. and Robinson, H.G. (1987) Frozen raspberries and hepatitis A. Epidemiology and Infection, 98, 109–12. 9. Report of the Committee on the Microbiological Safety of Food (1991) The Microbiological Safety of Food, Part II, HMSO, London. 10. Council Directive Relating to Machinery (89/ 392/EEC) (1992) Department of Health Bulletin for Environmental Health Departments, 1(4). 11. MAFF (1990) New Power Rating System for Microwave Ovens, Food Safety Directorate News Release, FSD 57/90, MAFF, London. 12. Department of Health (1989) Chilled and Frozen. Guidelines on Cook Chill and Cook Freeze Catering Systems, HMSO, London. 13. West, A. (1989) Design requirements of cookchill, in Hygiene—The Issues for the '90s, Campden Food & Drink Research Association Symposium Proceedings, 7–8 November 1989, pp. 142–8. 14. Department of Health (1994) Assured Safe Catering—A Management System for Hazard Analysis, HMSO, London. 15. Department of Health (1993) Assured Safe Catering. A Summary of the Main Points, Department of Health Publications, PO Box 410, Wetherby, West Yorkshire, LS23 7LN. 16. Chartered Institute of Environmental Health (1992) National Guidelines for Outdoor Catering, CIEH, London. 17. Institute of Food Science and Technology (1998) Food and Drink Manufacture—Good Manufacturing Practice. A Guide to Responsible Management, 4th edn, IFST, London.

37 The preservation of food

1. Food Safety Act 1990 (1990, revised 1994) Code of Practice No. 12: Quick Frozen Foodstuffs. Division of Enforcement Responsibilities: Enforcement of Temperature Monitoring and Temperature Measurement, HMSO, London.

1a. The UK Association of Frozen Food Producers (1994) Guide to the Storage and Handling of Frozen Food, UK AFFP, London.

2. FAO/WHO (1992) Strategies for Assessing the Safety of Foods Produced by Biotechnology: Report of a Joint FAO/WHO Consultation, World Health Organization, Geneva.

3. Ministry of Agriculture, Fisheries and Food (1990) Food Irradiation, Some Questions Answered, MAFF Food Safety Directorate Information Issue No. 2, HMSO, London.

4. World Health Organization (undated) Golden Rules for Safe Food Preparation, WHO, Geneva.

5. Department of Health (1994) Guidelines for the Safe Production of Heat Preserved Foods, HMSO. London. 6. Schafheitle, J.M. (1990) The sous-vide system for preparing chilled meat. British Food Journal, 92(5), 23–7. 7. Sous-Vide Advisory Committee (1991) Code of Practice For Sous-Vide Catering Systems, SVAC, Tetbury, Gloucestershire. 8. Department of Health (1989) Guidance for Environmental Health Departments on the Prevention of Botulism, letter to CEHOs and chief post health inspectors, EL(89)P145. 9. Advisory Committee On The Microbiological Safety Of Food (1993) Report On Vacuum Packaging And Associated Processes, HMSO, London. 10. Ministry of Agriculture, Fisheries and Food (1992) Advisory Committee On The Microbiological Safety Of Food Report on Vacuum Packaging And Associated Processes: Recommendations and Government’s Response, MAFF, London. 11. Chilled Food Association (1998 3rd edn) Guidelines for Good Hygienic Practice in the Manufacture of Chilled Foods, Chilled Foods Association, London. 12. Slocum, P. (1990) Cold chain distribution and other transport matters. Paper given at the Leatherhead Food RA Symposium on Food Safety Legislative Aspects, 7 November. 13. Ministry of Agriculture, Fisheries and Food (1990) Plasticizers: Continuing Surveillance, MAFF Food Surveillance Paper No. 30, HMSO, London. 14. Ministry of Agriculture, Fisheries and Food (1990) Cling Film, MAFF Food Safety Directorate Information, Issue No. 7.1, special edn, HMSO, London. 15. Seafish Industry Authority (1985) Guidelines for the Handling of Fish Packed in a Controlled

Atmosphere, SFIA, Edinburgh.

38 Food safety: controls on risk foods other than meat

13. British Standards Institution (1990) British Standard Code of Practice for the Pasteurization of Milk on Farms and in Small Dairies, DAC 17, BSI, London.

13a. Dairy Industry Federation (1995) Guidance for Good Hygiene Practice in the Manufacture of Dairy-Based Products, DIF, London.

14. The Creamery Producers Association (1988) Guidelines for Good Hygienic Practice in the Manufacture of Soft Fresh Cheeses, CPA, London.

15. Milk Marketing Board (1989) Guidelines for Good Hygienic Practice for the Manufacture of Soft and Fresh Cheeses in Small Farm Based Production Units, MMB, Thames Ditton.

16. Specialist Cheese Makers Association (1997) Code of Best Practice, SCMA, Newcastle under Lyme.

16a. Specialist Cheese Makers Association (1998) Self Audit System, SCMA, Newcastle under Lyme.

17. Vought, K.J. and Tatini, S.R. (1998) Salmonella enteritidis contamination of ice cream associated with a 1994 multi-state outbreak. Journal of Food Protection, 61(1), 5–10. 18. Milk Marketing Board (1992) Code of Practice for the Hygienic Manufacture of Ice Cream, MMB, Thames Ditton. 19. Ice Cream Alliance/Ice Cream Federation (1997) A Guide to the Safe Handling and Service of Ice Cream, Ice Cream Alliance, London. 20. Department of Health (1994) Shellfish Hygiene Directive and Fish Hygiene Directive: EHO Guidance, HMSO, London. 21. Bartholomew, B.A., Berry, P.R., Gilbert, R.J. and Murray, C.K. (1987) Scombrotoxic fish poisoning in Britain: features of over 250 suspected incidents from 1976 to 1986. Epidemiology and Infection, 99(3), 775–82. 22. Chartered Institute of Environmental Health (1997) A Student's Guide to Fish and Fish Inspection, CIEH, London. 23. Torry Research Station (1975) Recommended Practices for the Processing, Handling and Cooking of Fresh, Hotsmoked and Frozen Trout, Torry Research Station, Aberdeen.

39 Food safety: meat hygiene

1. The Food Safety Act 1990. Code of Practice No. 17: Enforcement of the Meat Products (Hygiene) Regulations 1994, HMSO, London.

2. Bassett, W.H. (1998) Environmental Health Procedures 5th edn, E. & F.N.Spon, London.

3. Meat Hygiene Service (Clean Livestock Policy), MHS, York.

3a. Hudson, W.R., Mead, G.C. and Hinton, M.H. (1996) The relevance of abattoir hygiene assessments to microbial contamination of British beef carcasses. Veterinary Record, 139(24), 587.

4. Government/Industry Working Group on Meat Hygiene (1997) Forward Programme for the Red Meat Industry, MAFF Publications, London. 5. Government/Industry Working Group on Meat Hygiene (1997) Forward Programme for the Poultry Industry, MAFF Publications, London. FURTHER READING Gracey, J.F. (1998) Meat Plant Operations, Chalcombe Publications, Lincoln. Gracey J.F. and Collins D.S. (1992) Meat Hygiene, 9th edn, Baillière Tindall, London. Meat Hygiene Service (1995) Meat Hygiene Service Operations Manual, Volume 1— Procedures, MHS, York. Meat Hygiene Service (1995) Meat Hygiene Service Operations Manual, Volume 2— Legislation and Codes of Practice, MHS, York. MAFF (June 1998) Bovine Spongiform Encephalopathy in Great Britain—A Progress Report, MAFF, London. Wilson W.G. (1997) Wilson's Practical Meat Inspection, 6th edn, Blackwell Scientific, Oxford.

1. Department of the Environment, Transport and the Regions (1997) The United Kingdom National Air Quality Strategy, Stationery Office, London.

2. Government White Paper (1990) This Common Inheritance—Britain's Environmental Strategy, Stationery Office, London.

3. Committee on the Medical Effects of Air Pollution (1997) Quantification of the Effects of Air Pollution on Health in the United Kingdom, Department of Health, London.

4. UK Climate Change Impacts Review Group (1991) The Potential Effects of Climate Change in the United Kingdom, First Report, Stationery Office, London.

5. Department of the Environment (1997) The Producer Responsibility Obligations (Packaging Waste) Regulations 1997—User's Guide, Stationery Office, London.

6. The Chartered Institute of Environmental Health (1993) Light Pollution Survey, CIEH, London.

7. Environmental Transport Association (1997) Road User Exposure to Air Pollution— Literature Review, ETA, Weybridge.

8. World Commission on Environment and Development (1987) Our Common Future, Oxford University Press, Oxford.

8a. European Parl iament/Counci l (1998) Review of the European Community Programme of Policy and Action in Relation to the Environment and Sustainable Development 'Towards Sustainability', Decision No. 2197/98/EC, OJ L 275, pp. 1–12. 9. Government White Paper (1995) Making Waste Work: A Strategy for Sustainable Waste Management in England and Wales, Stationery Office, London. 9a. Department of the Environment, Transport and the Regions (1998) Less Waste More Value, DETR, Wetherby. 10. Department of the Environment (1994) Paying for our Past, HMSO, London. 11. Department of the Environment (1994) Planning Policy Guidance Note PPG23: Planning and Pollution Control, HMSO, London. 12. Department of the Environment (1991) General Guidance Note GG1(91): An Introduction to Local Authority Air Pollution Control, HMSO, London. 13. Royal Commission on Environmental Pollution (1988) Best Practicable Environmental Option, 12th Report, HMSO, London. 14. Royal Commission on Environmental Pollution (1976) Air Pollution Control: An Integrated Approach, 5th Report, HMSO, London. FURTHER READING DETR (1999) Environment Handbook, HMSO, London. Environment Agency (1996) The Environment of England and Wales: a Snapshot, Environment Agency, London. Regular updates to it are made on the EA's website: www.environment/ agency.gov.uk Harrison, R. (ed.) (1990) Pollution: Causes, Effects and Control, 2nd edn, Royal Society of Chemistry, Letchworth. National Society for Clean Air and Environmental Protection (1999) NSCA Pollution Handbook, NSCA, Brighton. Pearce, D. et al. (1989) Blueprint for a Green Economy, Earthscan, London.

(UK) Ltd, Harrow Weald Lodge, 92 Uxbridge Road,

Harrow Weald, Middlesex, HA3 6BZ.

14. British Standards Institution (1994) Integrating/Averaging Sound Level Meters, BS EN 60804:1994, BSI, Milton Keynes.

14a. Health and Safety Executive (1990) Noise Assessment Information and Control, Noise Guide No. 3, HSE Books, Sudbury, Suffolk.

15. Greater London Council (1966) Traffic Noise Survey, GLC, London.

16. British Standards Institution (1994) Specification for Sound Level Meters, BS EN 60651:1994, BSI, Milton Keynes.

17. British Standards Institution (1989) Sound Calibrators, BS 7189:1989, BSI, Milton Keynes.

18. British Standards Institution (1984) Guide to Human Exposure to Vibration in Buildings, BS 6472:1984, BSI, Milton Keynes.

19. British Standards Institution (1984) Noise Control on Construction and Open Sites, BS 5228:1984, BSI, Milton Keynes.

20. Department of the Environment (1973) Planning and Noise, Circular 10/73, HMSO, London.

21. Department of the Environment (1994) Planning and Noise, Policy Guidance Note (PPG) 24, HMSO, London.

22. Department of the Environment (1985) The Use of Conditions in Planning Permission, Circular 1/85, HMSO, London.

23. Department of the Environment (1990) Mineral Planning Guidance: the control of noise at surface mineral workings, MPG 11, HMSO, London.

24. Department of the Environment (1988) Environmental Assessment, Circular 15/88, HMSO, London.

25. Department of the Environment (1988) Environmental Assessment of Projects in Simplified Planning Zones and

Enterprise Zones, Circular 24/88, HMSO, London.

26. Bassett, W.H. (1998) Environmental Health Procedures, 5th edn, E. & F.N.Spon, London.

27. Chartered Institute of Environmental Health (1997) Noise Management Guide— Guidance on the Creation and Maintenance of Effective Noise Management Policies and Practices for Local Authorities and their Officers, CIEH, London. 28. Chartered Institute of Environmental Health/ Association of Chief Police Officers (1997) Noise—Good Practice Guidance for Police and Local Authority Co-operation, CIEH/ ACPO, London. 29. National Society for Clean Air and Environmental Protection (1997) Noise Survey 1997, NSCA, Brighton. 30. Noise Advisory Council (1971) Neighbourhood Noise, HMSO, London. 31. Noise Advisory Council (1974) Noise in the Next Ten Years, HMSO, London. 31a. Department of the Environment (1976) The Control of Pollution Act 1974. Implementation of Part 3: Noise, Circular 2/76, HMSO, London. 32. Grimwood, C. (1992) Noise abatement zones —A method of preventing deterioration in environmental noise levels? Proceedings of the Institute of Acoustics, 14, part 4. 33. Fields, J.M. and Walker, J.G. The response to railway noise in residential areas in Great Britain, Journal of Sound and Vibration, 85(2), 177–25. 34. Department of Transport (1995) Calculation of Railway Noise, HMSO, London. 35. Department of Transport and the Welsh Office (1988) Calculation of Road Traffic Noise, HMSO, London. 36. Department of Transport (1991) Consultation Paper: Control of Aircraft Noise, HMSO, London. 37. Department of Transport (1993) Review of Aircraft Noise Legislation, Announcement of Conclusions, HMSO, London. 38. British Standards Institute (1980) Safety Signs and Colour Specification for Colour and Design, BS 5378:1980, BSI, Milton Keynes. FURTHER READING Health and Safety Executive (1990) Noise at Work Assessment, Information and Control, Noise Guides 3–8, HMSO, London. National Society for Clean Air and Environmental Protection (1994) 1994 Pollution Handbook, NSCA, Brighton.

Open University The Control of the Acoustic Environment, OU, Milton Keynes.

Penn, C.N. (1979) Noise Control, Shaw and Sons, London.

Sharland, I. (1972) Woods Practical Guide To Noise Control, Cambridge University Press, Cambridge. Williams, M. (1988) Noise and Vibration Measurements for Environmental Health Off icers , Brüel and Kjaer (UK) Ltd, Harrow.

1. Elsom, D M. (1992) Atmospheric Pollution— A Global Problem, 2nd edn, Blackwell, Oxford.

2. World Commission on Environment and Development (1987) Our Common Future, Oxford University Press, Oxford, p. 8.

2a. Department of the Environment (1989) Sustaining Our Common Future, HMSO, London.

3. Cmnd 1200 (1990) This Common Inheritance. Britain's Environmental Strategy, HMSO, London.

4. Organization for Economic Co-operation and Development (1989) Economic Instruments for Environmental Protection, OECD, Paris.

5. Department of the Environment (1974) The Monitoring of the Environment in the United Kingdom, HMSO, London.

6. Department of the Environment, Transport and the Regions (1997) Review and Assessment of Air Quality for the Purposes of Part IV of the Environment Act 1995, DETR, London.

7. Department of the Environment (1994) Expert Panel on Air Quality Standards. Benzene, HMSO, London.

8. Department of the Environment (1994) Expert Panel on Air Quality Standard. 1,3Butadiene, HMSO, London. 9. Department of the Environment (1994) Expert Panel on Air Quality Standards. Carbon monoxide, HMSO, London. 10. Department of the Environment (1996) Expert Panel on Air Quality Standards. Nitrogen dioxide, HMSO, London. 11. Department of the Environment (1994) Expert Panel on Air Quality Standards. Ozone, HMSO, London. 12. Department of the Environment (1995) Expert Panel on Air Quality Standards. Particulates, HMSO, London. 13. Department of Health (1997) Committee on the Medical Effects of Air Pollution. Handbook on Air Pollution and Health, HMSO, London. 14. Department of Health (1995) Committee on the Medical Effects of Air Pollution. Nonbiological Particles and Health, HMSO, London. 15. Department of the Environment (1995) Expert Panel on Air Quality Standards. Sulphur dioxide, HMSO, London. 16. Department of Health (1995) Advisory Group on the Medical Aspects of Pollution Episode. Health Effects of Exposure to Mixed Pollutants, HMSO, London. 17. Department of Health (1998) The Quantification of Health Effects in the United Kingdom, HMSO, London. 18. Pearce, F. (1987)

Inside science. Acid rain. New Scientist, 5 November. 19. Gribbin, J. and Gribbin, M. (1996) Inside science. The greenhouse effect. New Scientist, 6 July. 20. Department of the Environment (1996) Review of the Potential Effects of Climate Change in the United Kingdom. United Kingdom Climate Change Impacts Review Group. Second Report, HMSO, London. 21. The Times (1997) Industrial nations agree to cuts in greenhouse gases, The Times, 11 December, p. 9. 22. Gribbin, J. (1988) Inside science. The ozone layer. New Scientist, 5 May. 23. Department of the Environment (1996) The Potential Effects of Ozone Depletion in the United Kingdom. United Kingdom UVB Measurements and Impacts Review Group, HMSO, London.

24. Department of the Environment (1991) The Ozone Layer, HMSO, London.

25. Evelyn, J. (1661) Fumifugium: or the Inconvenience of the Aer and Smoake of London Dissipated, reprinted by the National Society for Clean Air in 1961, The Dorset Press, Dorset.

26. Elsom, D M. (1987) Atmospheric Pollution, HMSO, London.

27. Cmnd 9011 (1953) Committee on Air Pollution. Interim Report, HMSO, London.

28. Cmnd 9322 (1954) Committee on Air Pollution. Report, HMSO, London.

29. Department of the Environment, Transport and the Regions (1997) The United Kingdom National Air Quality Strategy. HMSO, London.

30. Cmnd 3323 (1996) United Kingdom National Environmental Health Action Plan, HMSO, London.

31. Department of the Environment, Transport and the Regions (1997) Part IV The Environment Act 1995, Local Air Management, Circular 15/97, HMSO, London.

32. Department of the Environment, Transport and the Regions (1997) Framework for review and assessment of air quality, LAQM.G1(97), HMSO, London.

33. Department of the Environment, Transport and the Regions (1997) Developing local air quality strategies and action plans: the principal considerations, LAQM.G2(97), HMSO, London.

34. Department of the Environment, Transport and the Regions (1997) Air quality and traffic management, LAQM.G3(97), HMSO, London.

35. Department of the Environment, Transport and the Regions (1997) Air quality management and land use planning, LAQM.G4(97), HMSO, London.

36. Department of the Environment, Transport and the Regions (1998) Monitoring for air quality reviews and assessments, LAQM.TG1(98), HMSO, London. 37. Department of the Environment, Transport and the Regions (1998) Preparation and use of atmospheric emission inventories, LAQM.TG2(98), HMSO, London. 38. Department of the Environment, Transport and the Regions (1998) Selection and use of dispersion models, LAQM.TG3(98), HMSO, London. 39. Department of the Environment, Transport and the Regions (1998) Review and assessment: pollution specific guidance, LAQM.TG4(98), HMSO, London. 39a. Statutory Instrument 1997 No. 3043 Environmental Protection. The Air Quality Regulations 1997, HMSO, London. 40. Royal Commission on Environmental Pollution (1994) Eighteenth Report. Transport and the Environment, HMSO, London. 41. Department of the Environment (1994) PPG23 Planning and Pollution Control, HMSO, London. 42. Department of the Environment (1994) PPG13 Transport, HMSO, London. 43. Department of the Environment (1996) Revised PPG6 Town Centres and Retail Developments, HMSO, London. 44. Department of the Environment (1992) PPG4 Industrial and Commercial Development and Small Firms, HMSO, London. 44a. Statutory Instrument 1988 No. 1199 Town and Country Planning (Assessment of Environmental Effects) Regulations 1988, HMSO, London. 45. Department of the Environment (1995) The Use of Conditions in Planning Permissions, Circular 11/95, HMSO, London. 45a. Department of Transport (1994) Design of Roads and Bridges. Environmental Assessment under EC Directive 85/337, HMSO, London. 46. US National Commission on Air Quality (1981) To Breath Clean Air, USNCAQ, Washington, DC. 47. Middleton, D.P. (1996) Clean air and environmental protection. Physical Models of Air Pollution for Air Quality Reviews, 26(2), 28–31.

48. Bower, J. (1997) Air quality management, in Issues in Environmental Science and Technology (eds R.E.Hester and R.M. Harrison), Volume 8, Royal Society of Chemistry, Letchworth, pp. 41–65.

49. World Health Organization (1980) GEMS:Analysing and Interpreting Air Monitoring Data, WHO, Geneva.

50. Bassett, W.H. (1998) Environmental Health Procedures, 5th edn, E. & F.N.Spon, London.

51. Royal Commission on Environmental Pollution (1976) Fifth Report. Air Pollution Control: an Integrated Approach, HMSO, London.

52. British Standards Institution (1969) Notes on the Ringelmann and Miniature Smoke Charts, BS 2742:1969, BSI, London.

53. British Standards Institution (1983) Method for Measurement of Particulate Emissions including Grit and Dust, BS 3405:1983, BSI, London. 54. Hawksley, P.G.W., Badzioch, S. and Blackett, J.H. (1961) Measurement of Solids in Flue Gases, British Coal Utilization Retailers Association, Leatherhead. 55. Department of the Environment (1981) Chimney Heights, Third Edition of the 1956 Clean Air Act Memorandum, HMSO, London. 56. British Standards Institution (1969) Methods for the Measurement of Air Pollution, BS 1747:1969, BSI, London. 57. Department of Health (1993) Arrangements to Deal with Health Aspects of Chemical Incidents, National Health Service Management Executive Health Service Guidance NSG (93)38, Department of Health, London. 58. Schofield, S., Cummins, A. and Murray, V. (1995) Toolkit for Handling Chemical Incidents, Medical Toxicology Unit, London.

43 Waste management

1. Poor Law Commissioners (1842) Report on an Enquiry into the Sanitary Condition of the Labouring Population of Great Britain, HMSO, London, p. 14.

2. Report of the Working Party on Refuse Storage and Collection (1967) HMSO, London.

3. Technical Committee on the Experimental Disposal of House Refuse in Wet and Dry Pits (1961) Pollution of Water by Tipped Refuse, HMSO, London.

4. Key Report (1970) Report of the Technical Committee on the Disposal of Toxic Waste, HMSO, London.

5. Department of the Environment (1996) Managing Waste: The Duty of Care. A Code of Practice, HMSO, London.

5a. Department of the Environment (1991) Environmental Protection Act 1990 Section 34, 'The Duty of Care', Circular 19/91, HMSO, London.

5b. Department of the Environment, Transport and the Regions (1998) Planning and Pollution Control, PPG 23, Stationery Office, London.

5c. Department of the Environment (1994) Landfill Completion—a technical memorandum providing guidance on assessing the completion of licensed landfill sites, Waste Management Paper No. 26A, HMSO, London.

5d. Department of the Environment (1994) Licensing of Waste Management Facilities, Waste Management Paper No. 4, HMSO, London.

5e. Department of the Environment (1994) Environmental Protection Act 1990 Part 2. Waste Management Licensing, Circular 11/ 94, HMSO, London. 5f. Department of the Environment (1994) Sustainable Development—The UK Strategy, HMSO, London. 5g. Department of the Environment (1995) Making Waste Work: A Strategy for Sustainable Waste Management in England and Wales, HMSO, London. 6. Department of the Environment, Transport and the Regions (1998) Less Waste More Value: consultation paper on a waste strategy for England and Wales, Stationery Office, London. 6a. Environment Agency (1998) Proposals for a National Waste Survey, EA, Bristol. 6b. Environment Agency (1998) An Action Plan for Waste Management and Regulation, EA, Bristol. 6c. Government White Paper (1990) This Common

Inheritance—Britain's Environmental Strategy— HMSO, London. 7. Department of the Environment (1991, revised 1998) Recycling of Waste, Waste Management Paper No. 28, HMSO, London. 7a. Department of the Environment (1992) The Environmental Protection (Waste Recycling Payments) Regulations, Circular 4/92, HMSO, London. 7b. Department of the Environment (1988) The Control of Pollution Act 1974—The Collection and Disposal of Waste Regulations, Circular 13/88, HMSO, London. 8. Health and Safety Executive (1985) Safety in the Use of Refuse Compaction Vehicles, Guidance Note PM52, HMSO, London. 9. Department of the Environment (1991) Code of Practice on Litter and Refuse, HMSO, London. 9a. Tidy Britain Group (1992) Guidelines for Category Zonation of Local Authority Land in Accordance with the Code of Practice on Litter and Refuse, Tidy Britain Group, Wigan. 10. Royal Commission on Environmental Pollution (1993) Seventeenth Report, Incineration of Waste, HMSO, London. 11. Department of the Environment (1986, revised 1990) Landfilling Wastes, Waste Management Paper No. 26, HMSO, London. 11a. Department of the Environment (1991) Landfill Gas—a technical memorandum providing guidance on the monitoring and control of landfill gas, Waste Management Paper No. 27, HMSO, London.

12. London Waste Regulation Authority (1989) Clinical Waste—an Appraisal, LWRA, London.

13. World Health Organization (1985) Management of Waste from Hospitals, WHO, Geneva.

14. United States Environmental Protection Agency (1986) Guide for Infectious Waste Management, EPA, Washington, DC.

15. Health and Safety Commission (1982, revised 1994) The Safe Disposal of Clinical Waste, HMSO, London.

16. Department of the Environment (1983, revised 1995) Clinical Wastes: a Technical Memorandum on Arisings, Treatment and Disposal, Waste Management Paper No. 25, HMSO, London.

17. British Standards Institution (1987) BS 3316:1987 Part 4. Code of Practice for the design, specification, installation and commissioning of incinerators for the destruction of hospital waste, BSI, London. 18. Department of the Environment (1986) The Government's Response to the 11th Report of the Royal Commission on Environmental Pollution, HMSO, London. 19. Department of the Environment (1978) Waste from Manufacturers of Pharmaceuticals, Toiletries and Cosmetics, Waste Management Paper No. 19,

HMSO, London. 20. Department of the Environment (1988) Third Report of the Hazardous Waste Inspectorate, HMSO, London. 21. Department of the Environment (1987) Special Wastes—a technical memorandum providing guidance on their definition, Waste Management Paper No. 23, HMSO, London.
FURTHER READING Bassett, W.H. (1998) Environmental Health Procedures, 5th edn, E. & F.N.Spon, London. London Waste Regulation Authority (1989, revised 1994) Guidelines for the Segregation, Handling and Transport of Chemical Waste, LWRA, London.

6b. Institution of Environmental Health Officers (1991) Report of the IEHO Survey on Radon in Homes 1990, IEHO, London.

7. Bowie, S.H.U. and Plant, J.A. (1983) Natural Radioactivity in the Environment, Applied Environmental Geo-chemistry, Academic Press, London.

8. National Radiological Protection Board (1994) Radiation Doses—Maps and Magnitudes, 2nd edn, At A Glance Series, NRPB/HMSO, London.

9. Documents of the NRPB (1990) Board Statement on Radon in Homes, 1(1), HMSO, London.

10. Lubin, J.H. and Boice, J.D. (1997) Metaanalysis of residential radon case control studies. Journal of the National Cancer Institute, 89, 49–57.

11. Department of Health (1998) Our Healthier Nation: A Contract for Health, Cm 3852, Stationery Office, London.

12. Colgan, P.A. (1996) Radon policy around the world. Radiological Protection Bulletin, 181, 12–13.

13. Green, M. and Miles, J. (1997) Progress on radon surveys, in Environmental Radon Newsletter, 13 (Winter).

14. Department of the Environment, Transport and the Regions (1998) Housing Fitness Standard: Consultation Paper, HMSO, London.

15. Documents of the NRPB (1990) Radon Affected Areas: Cornwall and Devon, 1(4), HMSO, London.

16. Documents of the NRPB (1992) Radon Affected Areas: Derbyshire, Northamptonshire and Somerset, 3(4), HMSO, London.

17. Documents of the NRPB (1993) Radon Affected Areas: Scotland and Northern Ireland, 4(6), HMSO, London.

18. Documents of the NRPB (1996) Radon Affected Areas: England and Wales, 7(2), HMSO, London.

18a. Health and Safety Commission (1988) Exposure to Radon—the Ionizing Radiations Regulations 1985, Approved Code of Practice Part 3, HMSO, London. 19. National

Radiological Protection Board (1987) Interim Guidance on the Implications of Recent Revisions of Risk Estimates and the ICRP Como Statement, NRPB 659, HMSO, London. 20. Health and Safety Executive (1989) LAC Legal (L) 2/6/90 Ionizing Radiations Regulations 1985 (IRR 85) Exposure to Radon in Buildings, HMSO, London. 21. Health and Safety Executive (1992) Information Document HSE 560/20, HMSO, London. 21a. Local Authority Associations (1994) Progress on Radon in Council Enforced Workplans, LAA, London. 22. Department of the Environment (1995) The Housholder's Guide to Radon, 4th edn, HMSO, London. This publication has now been reissued in a series of three, free coordinated booklets: Radon, a Guide for homebuyers and Sellers; Radon, a Householder's Guide; and Radon, a Guide to Reducing Levels in Your Home, DETR, Wetherby. 22a. Nazaroff, W.W., Doyle, S.M., Nero, A.V. and Sextro, R.G. (1988) Release of entrained radon-222 from water to air by domestic use, in Radon Entry Via Potable Water: Radon and its Decay Products in Indoor Air (eds W.W.Nazaroff and A.V.Nero), Wiley & Sons, New York, pp. 131–57. 23. Department of the Environment (1996) The Housing Grants, Construction and Regeneration Act 1996, Circular 17/96, HMSO, London. 24. Lee, T. (1993) British Attitudes to Radiation and the Paradox of Radon, HMSO, London. 25. Lee, T. (1994) Householder's Response to the Radon Risk: Summary Report, HMSO, London. 26. Bradley, J. (1997) Why not remediate?, in Environmental Radon Newsletter, 10 (Spring).

16. Water By-laws Advisory Service (1991) Water Fittings and Materials Directory, WBAS, Slough.

17. British Standards Institution (1987) Code of Practice for the Design of Concrete Structures for the Retaining of Aqueous Liquids, BS 8007:1987, BSI, London.

17a. British Standards Institution (1996) Extraction of Substances which may be of Consequence to Public Health, BS 6920, part 2, section 2.5, BSI, London.

18. European Union (1991) Council Directive of 21 May 1991 concerning urban waste water treatment (91/271/EEC). Official Journal of the European Communities, L135, 30 May 1991.

18a. British Standards Institution (1971) Specification for Biological Percolating Filters, BS 1438:1971, BSI, London.

19. British Standards Institution (1983) Design and Installation of Small Sewage Treatment Works and Cesspools, BS 6297:1983, BSI, London.

20. Riley, C.T. and Jones, K.B.C. (1970) Origins and Nature of Farm Wastes, Symposium on Farm Wastes, University of Newcastle upon Tyne.

21. Carson, R. (1956) Silent Spring, Hamish Hamilton, London.

22. European Union (1975) Council Directive of 8 December 1975 Concerning the Quality of Bathing Water (76/160/EEC). Official Journal of the European Communities, L31, 5 February, 1976.

23. House of Commons Environment Committee (1990) Pollution of Beaches, 4th Report, HMSO, London.

24. Public Health Laboratory Service (1959) Sewage contamination of coastal bathing waters in England and Wales. Journal of Hygiene, 57.

25. Medical Research Council (1959) Sewage Contamination of Bathing Beaches in England and Wales, Memorandum No. 37, HMSO. London. 26. Royal Commission on Environmental Pollution (1984) Tackling Pollution— Experience and Prospects, Cmnd 9149, HMSO, London. 27. World Health Organization (1989) Microbiological/Epidemiological Studies

on the Correlation between Coastal Recreational Water Quality and Health Effects, revised protocol submitted by WHO Secretariat, ICP/ CEH083/10, WHO, Geneva. 28. US Environmental Protection Agency (1986) Ambient Water Quality Criteria for Bacteria, EPA 440/5-84-002, USEPA, Washington, DC. 29. United Nations Environment Programme (1990) The State of the Marine Environment, UNEP, UN, Geneva. 29a. Cabelli, V.J. (1983) Health Effects Criteria for Marine Recreational Waters, EPA-600/ 1- 80-031, US Environmental Protection Agency, Health Effects Research Laboratory, Research Triangle Park, North Carolina. 30. Water Research Centre (1994) Health Effects of Sea Bathing, Final Report to the DoE, WM1 9021, DoE 3412/2 January, HMSO, London. 31. Marine Conservation Society (1994) The Reader's Digest Good Beach Guide, David & Charles, Exeter. (New edition published every year and available on the World Wide Web: www.readersdigest.co.uk.) FURTHER READING Dawson, A. and West, P. (eds) (1993) Drinking Water Supplies: A microbiological perspective, HMSO, London. World Health Organization (1993-7) Guidelines for Drinking Water Quality, 2nd edn, vols 1-3, HMSO, London.