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URBAN DESIGN
Health and the Therapeutic Environment
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Climate change and the degradation of the environment are fundamental considerations in any discussion of urban design in the twenty-first century. There is a growing awareness of the relationship between environment and well-being. There is a sense in which the health and well-being of the individual is linked to the health of the wider community and, indeed, to the health of the supporting environment. This book focuses on sustainable development and citizen well-being to determine how far they are compatible and then analyses the urban environment that might result from the application of these ideas. In other words, is the ‘sustainable city’ likely to be a ‘healthy city’ for its citizens, and is the therapeutic environment also sustainable? If so, what is the form of such an urban environment?

This is the fifth book in this series on urban design. In order to meet the requirements for studying the agenda for this book I have worked with Dr Paola Signoretta, a social scientist who has a research interest in health and the environment. Paola has provided the statistical and geographical background for the study of health in the city, outlining the light that social science can throw on this topic. I have also worked with a psychotherapist, Kate McMahon Moughtin, whose current interest is ecopsychology and the role of environment in personal and social well-being. Kate has provided the insights from psychology and ecofeminism that illuminate the text and which are so vital in the development of a conceptual framework for well-being in a sustainable urban environment.

There is much ‘gloom and doom’ in some of the writing on climate change: apocalypse seems not too far away. Paola, Kate and I would not wish to suggest that environmental damage or climate change are not serious and urgent problems for humankind to address. While recognizing the scale of the problem we wish to draw attention to the many innovative ideas and projects that confront these challenges. Ours is a holistic approach to the daunting task of planning and developing healthy therapeutic environments at a time of acute climate change. We have therefore used a series of inspirational case studies as the main structural framework of the book. These case studies, we believe, act as beacons in the human endeavour to create a healthy therapeutic environment.

Despite a sense of growing despair and frustration amongst environmental scientists to the hesitant global response to the dangers of climate change, there are some hopeful
developments. The Committee on Climate Change, chaired by Lord Turner in a first report to the UK government has recommended swinging cuts to the UK’s CO₂ emissions by 2050. These recommendations appear to be broadly acceptable to the UK government and main opposition parties. The EU has agreed similar targets for Europe. The US election of President Obama has raised the prospect of American leadership in the global endeavour to confront serious environmental problems. US leadership is absolutely essential for a successful conclusion to those efforts aimed at controlling climate change. The ‘credit crunch’ in late 2008 and the deepening global recession, though painful for many, provide a short respite from voracious consumption. Such a respite may afford breathing space, the time to think and prepare for a greener and healthier future for humankind.
ACKNOWLEDGEMENTS

We are greatly indebted to the Leverhulme Trust, who have given generous financial support for the two years' research work carried out in preparation for this book. We are also deeply indebted to those people who have given so generously of their time to our work on the case studies. Nick White of the Hockerton Housing Project spent a long time with us at the project but in addition he gave us many insights into ecological living. In Freiburg we were given a most wonderful reception. No effort was spared in providing us with the information we sought. Our time in Freiburg was beautifully organized by Ms Nicole Horstkötter of the Buro des Oberbürger Meisters Stadt Freiburg and Ms Claudia Kaiser of Freiburg Wirtschaft Touristik. Christine Wilson MD of the Department of Environmental Health Sciences, the University Medical Centre, organized a visit to the impressive Institute for Environmental Medicine, where we met Johannes Naumann MD, Head of the Department of Environmental Medicine, who spent time with us outlining the research work of the Institute. Dr Wilson was also able to include our attendance, at the last moment, at a guest lecture on Tibetan Medicine by the Personal Physician to the Dali Lama, a truly enlightening experience. We were also very fortunate to be invited to attend a lecture given to visiting planners from Louven by the Director of City Planning, Mr W. H. Daseking. Mr Daseking's lecture set the scene on the planning of Freiburg, solar city of Germany, which was supplemented by a most informative conducted tour of Riesenfeld by Ms Lorenz of the Planning department. We are much indebted to Mr Daseking, Ms Lorenz and their colleagues in Planning for the generous way in which they shared their knowledge with us. Finally, Mr T. Dresel of Solar Region Freiburg spent most of an afternoon with us: he was a mine of information but also a man with a great sense of humour. It is always a pleasure to learn and laugh at the same time. In Copenhagen the reception was also fulsome and most useful for our work. Amongst those who gave generously of their time and knowledge were Mr Hans Christian Christiansen of the Environmental Protection Agency, who was able to advise on those people most likely to help with our research agenda. Mr Juul, Mr Mads Lind and Ms Winnie Brandt Madson were most informative about physical planning, health planning and recreation planning. It was their advice that structured the visit to Denmark: for that and their interest in, and support for, our project we wish to thank...
them. In Nottingham our study of the Meadows Ozone project was helped considerably by Ms Gill Callingham of the Planning department of Nottingham City Council and Ms Jackie Dobson of the Meadows Ozone Committee. We would not have realized the importance of this project without the input of Mr Alan Simpson, MP for Nottingham South: we are much indebted to Alan for the time he spent with us and for sharing with us his considerable knowledge of our subject. Finally, we wish to record our appreciation of Mr Peter Whitehouse for his efforts in keeping going two ancient computers and also his help in the mammoth task of presenting the figures for this book in digital form, acceptable to the publisher.
The twin aims of this book are: firstly, to explore the nature of an environment which is therapeutic, in the sense that it is conducive to health, happiness and well-being; secondly, to suggest ways in which such an environment can be designed. The title of this book contains four concepts: ‘design’, particularly urban design; ‘health’; ‘therapeutic’; and ‘environment’. For the purpose of this book the subject of urban design is set holistically in an environmental context. A discussion of the changing and developing definitions of urban design has appeared elsewhere in the Urban Design series (Moughtin and Mertens, 2003). A central concern of urban design is the organization of the public realm – that is, the design of the intricate mosaic of public and semi-public places, which forms the backbone of the city in its region.

Is there agreement among the lexicographers on the respective definitions of the related concepts of ‘well-being’, ‘therapeutic’ and ‘health’? There seems to be some agreement on ‘well-being’. The Oxford English Dictionary defines ‘well-being’ as: ‘The state of being or doing well in life; happy, healthy, or prosperous condition; welfare.’ The definition in the American Heritage Dictionary is very similar: ‘The state of being healthy, happy, or prosperous; welfare.’ In the definition of ‘therapeutic’ both dictionaries mention healing but there is a significant difference of emphasis. The Oxford English Dictionary defines ‘therapeutic’ as: ‘The art of healing. That branch of medicine which is concerned with the remedial treatment of disease.’ The American definition of therapeutic does not mention medicine, stating simply: ‘Having healing or curative powers; gradually or methodically ameliorative.’ The difference is not just in emphasis. It is as if the English dictionary tacitly accepts the medicalization of what is therapeutic, whereas the American definition is less specific and broader in scope. These subtle differences are carried over in their respective definitions of ‘health’. The Oxford English Dictionary restricts itself to: ‘Soundness of body; that condition in which its functions are duly discharged … The general condition of the body.’ The American dictionary is wider in its definition of health: ‘The state of an organism with respect to functioning, disease, and abnormality at any given time … any state of optimal functioning, well-being or progress.’ This definition would seem to include any living thing, including plant life, within its remit. The definition by the World Health Organization (WHO) in 1946 succinctly expresses a positive
concept of health: ‘A state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.’ This book considers the therapeutic environment with the WHO notion of health clearly in mind. It also follows closely the concept of health derived from the Old English word ‘haelon’, meaning ‘wholeness’. In the Oxford English Dictionary this definition of health is found in the word ‘hale’: ‘to make hale or whole’ or ‘sound in health; not infirm; vigorous; robust.’ In practice, this proactive dimension of health as advocated by the WHO is sometimes neglected. This book reasserts the value of a holistic analysis of health and well-being in terms of the community and the environment.

The word environment can take on different meanings. In The Oxford English Dictionary it is defined as: ‘The conditions or influences under which any person or living thing lives or is developed.’ The American Heritage Dictionary’s definition of environment has a slightly different emphasis: ‘Surroundings; the total of circumstances surrounding an organism or group of organisms.’ This book will adopt the holistic and ecological flavour that the American definition gives to environment.

The following books are the platform for this study of the therapeutic environment; other important texts are cited in the bibliography. The starting point for this research was David Halpern’s thorough examination of the relationship between mental health and the built environment. Halpern (1995) sets the scene for any research carried out in the field of planning and well-being. Farmer’s *Green Shift* (1996), documenting the changing attitudes to environmental, or green issues is essential background reading for any work attempting to connect human well-being with the environment. Beatley (2000), in *Green Urbanism: Learning from European Cities*, outlines successful attempts by some European cities to face up to the environmental crisis while pursuing planning and design solutions that promote the health and well-being of their citizens. It clearly shows that there is a growing understanding of the relationship between sustainable development and health. Although Beatley’s book is written for the market in the USA, we in Britain can learn much from it. *Healthy Urban Planning* by Barton and Tsourou (2000), and the more detailed *Shaping Neighbourhoods: A Guide for Health, Sustainability and Vitality* by Barton et al. (2003), specifically aim to tease out health implications for planning and urban design. These are invaluable texts. So too is *Adapting Buildings and Cities for Climate Change* by Roaf et al. (2005), which has a pertinent section on ‘health and climate change’.

Of particular relevance are the categories of environment Gesler uses in his analytical studies

![Figure 0.1 Maggie’s Dundee by Gehry.](image-url)
of ‘healing places’, namely: natural environment, built environment, social environment and symbolic environment. Gesler’s notable works include: Therapeutic Landscapes (1993) and Putting Health into Place: Landscape, Identity and Well-being, edited by Kearns and Gesler (1998). However, we do not adopt Gesler’s use of the term ‘landscape’. Landscape, in this book, will be used in its more traditional sense to mean ‘a view, or vista of scenery on land’ or ‘a piece of country scenery’. In Chapter 8, landscape will be used to describe a genre of painting, for which purpose the term originated.

Urban Design: Health and the Therapeutic Environment starts with the fundamental question: what is meant by health and well-being? Relating to this exploration, the work of Roszak is relevant, particularly Ecopsychology: Restoring the Earth: Healing the Mind (1995) and The Voice of the Earth, An Exploration of Ecopsychology (2001). Also significant is The Science of Well-Being (2005), edited by Huppert et al. There is a clear explanation of the relationship between health, well-being and the developing mind in Sue Gerhardt’s book on neuroscience, Why Love Matters (2004); it is central to an understanding of this area. Important for the thrust of the argument presented in this book is Layard’s Happiness (2005), which highlights the correlation between a contented society and social cohesion: he also points out the environmental conditions for fostering social cohesion. Finally, de Botton’s The Architecture of Happiness (2006) brings together concepts of well-being and building form in a style which is direct and clear. The effects on health and well-being, however, are often intangible, not conducive to a number-crunching exercise. In some respects Frank Gehry’s wonderful building Maggie’s Dundee falls into this category: it is a centre providing care and support for people with cancer, their carers, family and friends. This architectural gem, with its undulating roof, its exciting internal space, its landmark towers and its command of a very beautiful view of nature is a perfect setting for the centre: it gives to the centre its ability to provide constructive and pioneering care in a place of great beauty and calm (Figures 0.1 and 0.2). It is our contention that ‘being at one with nature’ is the foundation of health and well-being. The remainder of the book traces the development of this notion and outlines its implications for urban design.

This book is in three parts. Part I, the theoretical background, has four chapters: it explores the theories about the nature of the therapeutic environment – that is, about the kind of environment which promotes health and well-being. Ideas are often best explained by example. It is therefore our intention to include case studies to illustrate key points. Where better to begin such a procedure than in Chapter 1, ‘Epidaurus’, a city that was devoted to health and well-being. Chapters 2 and 3 are
the main theoretical chapters. Chapter 2, ‘The geography of health’, presents statistical and other evidence for patterns of health and disease. Chapter 3, ‘With place in mind’, widens the theoretical argument, discussing the relationship between mind, body and nature at large. Part 1 ends with Chapter 4, a case study of Cuba: the chapter revisits the theories in the light of experience in a small and rather poor country.

Part 2 has five chapters: it relates the theories of health and the therapeutic environment to Britain and its cultural traditions. Part 2 begins with Chapter 5, ‘Bath’, a case study of a very British city with a reputation for healing dating back over 2000 years. Chapter 6, ‘The age of protest’, examines the development of ideas linking health and nature in late eighteenth and early nineteenth century literature. It will concentrate on the writing of the poets and their angry protest at the destruction of the environment, the condition of the poor and the barbarity of urban conditions. Chapter 7, ‘New Lanark’, is a case study of a mill town developed by Robert Owen at the end of the eighteenth century. Many of Owen’s ideas have resonance today – for example, his care for the well-being of his workforce and the equal care he gave to the design and planning of the built environment in which his people lived. Chapter 8, ‘The city sanitized’, examines urban developments and landscape in the nineteenth and early twentieth centuries: it builds on the theme established in Chapter 6 and the ideas of Robert Owen, while introducing an account of the sanitary reforms of Chadwick, which form the physical foundation of health and well-being in Britain today. Part 2 ends with ‘Port Sunlight: the persistent suburb’, a case study of a garden village on Merseyside that was planned at the end of the nineteenth century. Port Sunlight, together with the other garden villages and garden suburbs designed and built at the end of the nineteenth and beginning of the twentieth centuries, are the models for so much of suburban Britain in the last century. To many they still present an ideal to which they aspire.

The design of the therapeutic environment is the theme of Part 3 of this book: it has six chapters exploring the notion of the healthy city within a changing cultural and ecological context. Earlier chapters established the close connection between the health and well-being of individuals, the health of the community of which they are part and the health of the environment in which they live. The environment that sustains human and, indeed, all life forms on earth is under considerable pressure: some would describe it as already sick and diseased, in desperate need of expensive
regeneration (Brown, 2007). For this reason Part 3 begins, in Chapter 10, ‘The environmental challenge’, with an analysis of the environmental pressures, the changes they might occasion, most worryingly in climate, and their impact upon urban design. The chapter ends on a positive note with a case study of ecological living in a wonderfully designed group of houses at Hockerton near Nottingham. Chapter 11, ‘The bioregion’, discusses the organic relationship between the city and its bioregion: it develops the idea introduced earlier that the health and well-being of a population is partly dependent upon the community’s intimate and immediate connection to a healthy and natural environment. This chapter presents the case that the bioregion is the geographical area most suitable for the planning and management of the natural environment together with the human activities it supports. The chapter is informed by the Italian experience of sustainable development, particularly the research into ‘local self-sustainable development’ by the Italian Territorialist School. Chapter 12, ‘City structure’, starts with the geometry of Fresnel; it then examines some aspects of the math of chaos, particularly fractal geometry, and its use in explaining the complexity of nature. Using analogies from nature, a model for city structure is outlined. It is suggested that the main components of the city be arranged in ribbons of low-density suburban developments intertwined with productive green wedges. The main case study for the chapter is Copenhagen, a city with a long tradition of linear planning. It is currently taking part in Europe’s Healthy Cities Programme and is engaging in some interesting projects to improve the health and well-being of its citizens. Chapter 13, ‘The healthy quarter or garden suburb’, examines the nature of the healthy city quarter, one that fosters the well-being of its community. The development of such city quarters on ‘greenfield’ sites presents an exciting challenge for designers. However, of greater significance is the restructuring of existing city quarters to make them suitable for twenty-first century conditions. Most of the UK’s population live in existing housing stock, much of it at least 60 years old. Many of these districts will become increasingly unfit for purpose as we move towards mid-century. It is argued in the chapter that now is the time to consider this daunting task of city refurbishment, in tandem with building much needed new city quarters. The Meadows in Nottingham is the case study for this chapter. The Meadows is a deprived inner city area with an ambitious community intent on making the neighbourhood carbon neutral: a project worthy of support. The Ozone project in the

Figure 0.4 Heliotrop House, Freiburg by Rolf Disch.
Meadows leads directly into Chapter 14, ‘The solar city of Freiburg’. Freiburg has had great success in its development and use of renewable energy technology. The Heliotrop House by Rolf Disch, built in 1994, is the symbol of Freiburg’s endeavour in this field of alternative energy production (Figures 0.3 and 0.4). The cylindrical house rotates towards the sun, always assuming the best alignment depending on the time of day and the day of the year. The Heliotrop House generates four to six times the amount of electrical energy it uses.

Just as important, however, are the lessons that can be learned from Freiburg’s ecological planning in Rieselfeld and Vauban. The focus of the short concluding Chapter 15 is the form and design of the home, its relationship to the immediate neighbourhood and to the surrounding natural landscape. At the centre of both sustainable development and the therapeutic environment are the needs of the family. The home is the locus of personal and family security: it is the place where future generations are nurtured.
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PART 1

THEORETICAL BACKGROUND
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The focus of this chapter is the Sanctuary at Epidaurus, the most celebrated healing centre of the ancient world. The Sanctuary at Epidaurus was a city structure designed to promote health and well-being. It was built over many generations by some of the most well-known architects of the day. Like most great achievements in urban design it was not the product of one designer’s mind but the effort of a community spanning many generations. For over 1000 years people came to Epidaurus, this beautiful but remote spot, to worship at the sanctuary of Asclepius and to seek healing through spiritual renewal (Figure 1.1). The authority of Asclepius as the most important healing god in antiquity brought to the sanctuary and to the city-state of Epidaurus great financial prosperity. This wealth and prosperity in the fourth and third centuries BC was the economic foundation for an ambitious building programme involving some of the best architects, artists and craftsmen of the time. Some of the questions addressed by this chapter include the following. How did Epidaurus achieve its healing sense of place? What was so special about it that attracted so many in pursuit of health, well-being or spiritual renewal, the act of recreation? More specifically, is there anything we can learn that is applicable two millennia later when medical knowledge is so much greater?

In urban design, planning and geography, there have been countless studies on the meanings places have for people. Places can have many meanings: the main square in the city centre that gives a sense of civic or municipal pride; the great piazza at the focus of a religious organization, the goal of pilgrimage, that gives meaning and purpose to life; or the more humble village green that gives a sense of security and belonging (Moughtin and Mertens, 2003). Some places like Epidaurus develop health as their meaning, their raison d’être. As discussed in the Introduction to this book, Gesler (1993, 2003) identifies four healing environments, each of which contribute to the ‘therapeutic landscape’; they are the natural environment, the built environment, the symbolic environment and the social environment. Using this simplified description of a complex concept, ‘the environment’, it is possible to analyse a place in terms of the
contribution of each aspect of the environment to the making of the ‘therapeutic landscape’, or in the case of this book the ‘therapeutic environment’. The central concern of urban design is the built environment: it is the area of health planning, over which those engaged in the city design professions have most direct effect. It is therefore apposite for a book focused on urban design to start with the built form of Epidaurus before moving on to other equally important environmental factors in the development of Epidaurus as a therapeutic environment.

THE BUILT ENVIRONMENT

Epidaurus is now an archaeological site of tremendous riches (Figures 1.2 and 1.3). So important is the site that it was included in the World Heritage List in 1988. The great semicircular theatre, in a fine state of preservation, still hosts festivals and dramatic performances (Figure 1.4). Fortunately Pausanius visited Epidaurus in the middle of the second century AD. Pausanius, with the skills of a travel writer, recorded a thorough and accurate description of the sanctuary as it was then. His document is drawn on heavily for an appreciation of the urban form of Epidaurus (Pausanius, Penguin Edition, 1971, translated by Peter Levi). The excavation of the site has revealed some of the fine architectural detailing and the sculpture with which the buildings were decorated (Figure 1.5). In addition, the reconstruction of the site by scholars brings to life what must have been a truly wonderful city. Such reconstructions help us to imagine, to some extent, the grandeur of Epidaurus (Figure 1.6).

According to Pausanius (1971, ibid.: 193–4), the sacred grove of Asclepius was surrounded by boundary stones and ‘inside that enclosure, no men die and no women bear children: the ritual law is the same as it is on Delos’. The entrance to the site was from the north at the meeting point of the roads from the port of Epidaurus on the sea and from Argos inland (Figure 1.2). The Propylea or portal was erected in the fourth century BC. It was fronted by six marble Ionic columns and had six Corinthian columns on the inside. Visitors passed through this grand portal then processed along the Sacred Way to the centre of the composition, the temple of Asclepius built under the supervision of the architect Theodotos in about 380 BC. The other main buildings of the inner sanctuary of Asclepius were the Tholos (rotunda) built in 370–330 by Polycleitos the Younger and the Abaton (dormitory) (Figure 1.3).

The Tholos, a circular building, was surrounded externally by a colonnade nearly 22 metres in diameter with 26 Doric columns. Behind the colonnade was the circular wall of the sekos decorated with paintings by the famous artist Pausias. ‘A round building in white stone called the Round House … is worth a visit … Inside is
Figure 1.2 Plan of the Sanctuary of Asclepius.
a picture by Pausias in which Eros has discarded his bow and arrows, and carried a lyre instead, "Drunkenness" is also there, painted by Pausias drinking from a wine-glass; you can see a wine-glass in the painting and a woman's face through it. (Pausanius, 1971, ibid.: 194). Seeking health and well-being at Epidaurus obviously did not exclude fun and pleasure. The Tholos was probably one of the most perfect and gracious monuments of ancient Greece, or in the words of Pausanius, 'worth a visit'. The precise function of the Tholos is unclear, though some think its subterranean labyrinth was the tomb of Asclepius.

To the north of the Tholos was the Abaton (dormitory) where the visitors slept in order to see the god in their dreams and so be healed. The Abaton, in part two storeys, was 70 metres long, taking the form of a stoa (Figure 1.3). At the north of the Abaton was the sacred fountain mentioned by Pausanias (ibid.: 195), 'a fountain-house worth seeing for its fine ornament, particularly the roof'.

The third of the sacred monuments was the Temple of Asclepius. Inside was the image of the god 'The statue of Asclepius is half the size of Olympian Zeus at Athens, and is made of ivory and gold; the inscription says it was made by Thrasymedes of Paros, son of Arignotos. He sits enthroned holding a staff, with one hand over the serpent's head, and a dog lying beside him' (ibid.: 194). The temple was built in the Doric order, nearly 25 metres long by 13 metres wide. It was peripetral – that is, surrounded on all four sides by a colonnade. It had six columns on its front and back, beneath the pediments, and 11 along its sides. The temple was built about 380 BC under the supervision of architect Theodotos, who was also involved with the construction of the famous Mausoleum of Halicarnassus, one of the seven wonders of the ancient world.

Other buildings within the main boundary of the Sanctuary include the Xenon or Katagogoein (hotel), the Stadium, the fourth century Gymnasium, a huge construction of about 75 by 70 metres. Later during the Roman period an Odeion was built in the interior of the gymnasium. By far the most magnificent monument, still in a state of good preservation, is the Theatre, designed by Polycleitos the Younger and built in the fourth century BC. This elegant structure dominates the site (Figures 1.2 and 1.4). The illustrations speak for themselves; nevertheless, the last word on the magnificence of the Theatre is left to Pausanius (ibid.: 195). 'The Epidaurians have a theatre in their sanctuary that seems to me particularly worth a visit. The Roman theatres have gone far beyond all others in the whole world; the theatre at Megalopolis in Arcadia is unique for its magnitude; but who can begin to rival Polycleitos for the beauty and composition of his architecture?" Polycleitos sited his building on the slopes of Mount Kynortion in a location with exceptionally good acoustics. Its seats cut into the rock and face north, so that the audience could contemplate the vast array of great monuments in the sanctuary and the magnificent panorama of the wooded landscape surrounding them. This is still a view to lift the
jaded spirit. The theatre had seating for about 14,000 people. The auditorium in the form of a segment of a circle greater than a semicircle partly encloses the orchestra, which is a complete circle approximately 20 metres in diameter. Despite the great size of the theatre its form is perfectly harmonious and its acoustics without flaw. To repeat Pausanius, even today, 2500 years since it was built, it is still ‘worth a visit’.

Greek buildings were designed as a harmony of parts, all in proportion and with due measure: a perfect backcloth for the ideal healthy, harmonious life. ‘Medicine must indeed be able to make the most hostile elements in the body friendly and loving towards each other … it was by knowing the means by which to introduce “Eros” and harmony in these that, as the poets here say and I also believe, our forefather Asclepius established this science (art) of ours.’ So said Plato in Symposium through the mouth of Eryximachus, a member of an old family of doctors (Papadakis, 1976). For a different translation see Plato: The Symposium, translated by Christopher Gill (1999: 19). Plato goes on to mention music, gymnastics and agriculture as means to achieve health and well-being or the balanced life.

The Sanctuary at Epidaurus is a magnificent example of city planning built over many generations on a grand but human scale: it is a subject for urban design in its own right. Like any spa town or recreation centre built since its foundation there was much to occupy the time of the visitor. Pleasure was mixed with spiritual or healthy renewal: the surrounding groves and mountain landscape were a source of exercise and fresh air, while the Gymnasium and Stadium were both a source of alternative more formal or demanding exercise. In addition, the Theatre, the Library together with the frequent sports events and festivals were sources of entertainment, amusement and diversion. Set in its dramatic landscape, the Sanctuary of Epidaurus was fully equipped physically for the holistic practise of medicine, as it was then known.

THE NATURAL ENVIRONMENT

Many societies around the world believe that nature has healing powers. For example, we will read later, in Chapter 6, about the poetry of the eighteenth century in England, which extolled the virtues and restorative powers of nature. There are many today who feel that spending time out of doors or communing with nature in some remote place restores physical, mental and spiritual balance: that, somehow, being surrounded by undisturbed nature is a healing process. According to the ‘biophilia hypothesis’, which advances the notion that since humanity evolved in close association with nature, indeed as part of it, people therefore have an affinity for, and are comforted by, nature. We in Britain have developed an ideology that contrasts the restorative powers of the rural idyll and its healthy
with wild and untouched nature. It was approached by land or sea through the small port town of Epidaurus, located on the Argive peninsula (Figure 1.1). The two nearest and most powerful states were Athens, which was 30 miles by sea from the port of Epidaurus, and Corinth, which was a distance of 18 miles by land. The Sanctuary of Epidaurus was a further nine miles inland from the port and connected to it by dirt track, which meandered through a wild, harsh and rugged wilderness. The softer landscape that was the immediate location of the Sanctuary was a perfect setting for the recreation of body and mind, exemplifying the romantic notion of the healing powers possessed by idyllic rural settings.

Specific elements taken from nature are thought to possess healing powers. Chief amongst them is water. Most of the world’s great centres of healing are associated with a stream, a river, a lake, or hot and cold springs. Many are sited near a spring with allegedly medicinal powers. In some cases the spring magically appears. Lourdes is a particularly good example of a holy shrine built around the site of such a spring. In this country we have St Winifred’s Well in Holywell, North Wales (Figure 1.7). In Holywell, St Winifred literally ‘lost her head’ to an unwelcome and rather barbarous suitor. At the place where head and body were miraculously reunited a spring arose. Since that time St Winifred’s Well has attracted to its very beautiful rural precincts many seeking cures or solace. Water is also associated with the process of cleansing the body and soul, with rebirth and baptism: more simply, it may be appreciated for its aesthetic qualities or for the pleasure and fun it affords the users (Moughtin and Mertens, 2003, op. cit.).

Vitruvius (Dover edition, 1960), writing in the first century AD (Book 6: 225–42), discusses the properties of water and its importance for building. He also described water as ‘the chief...
requisite of life’. In particular, Vitruvius pointed out that settlements, including of course those involved in promoting health such as Asclepion sites, should be near fresh spring water and away from sources of pestilence. Epidaurus was fortunate in this wonderful gift from nature, water. Such a gift was vital for any settlement in Greece, a land not blessed with plentiful rain. The water of Epidaurus, like Evian water, possessed special properties, but more importantly it was an essential part of the ritual of purification: to the Greek its use represented a purification of the soul in preparation for communion with god and achieving the eventual goal of becoming whole or healthy.

THE SOCIAL ENVIRONMENT

Healing is a communal act. It involves physician, patient, family, friends and members of the wider community. The actors in the process of healing play various roles. This process and the roles played vary from culture to culture. However, what appears to be important for healing, in all situations, is that there is equality between those healing and those being healed. That is, there must be ‘feelings of mutual respect and trust’ between doctor and patient (Gesler, 2003, op. cit.: 15). It is this ideology of equality in social relationships which is essential for a healing environment.

At the Sanctuary of Epidaurus, the social environment – that is, the context of social relations – was part of the therapeutic process. Central to the healing process is the doctor/patient relationship. In the world of Epidaurus the term doctor was not so clearly defined as it is today. An understanding of the role and authority of the ancient Greek physician must start with the god Asclepius, the father of the medical profession. In a world of slavery in which human life was of little value, the cult of

Figure 1.6 Temple of Asclepius (Source: Fletcher, 1950)
Asclepius in antiquity was without parallel in its care for the well-being of humanity. The cult recognized the dignity of the individual and raised the level of humanity. Asclepius, who became a worthy healer, was an exception in the Greek pantheon of gods: most others displayed much malice, cunning, jealousy and could be relied upon to make fearful incursions into the world of human beings – they were by any standards a fairly obnoxious lot. Asclepius was born of god and woman; being half human he was different. He had angered the gods and was dispatched to the underworld, only to be resurrected later. Like Christ, Asclepius was approachable. Unlike Christ he was a family man. According to Homer, Asclepius had two sons: Poladeiros, an expert in internal diseases, and Machaon, an expert surgeon. He also had two daughters: Hygieia, goddess of public health, and Panacea, with an unfortunate reputation, a word now associated with ‘a remedy, cure or medicine reputed to heal all diseases’. The family rivalry or competition between medicine and prevention of disease through public health measures still lingers on. Even a book such as this one assumes that city design can affect the health and well-being of a population. Panacea, the daughter of Asclepius, provides a timely warning that urban design, however well conceived and delivered, is not by itself a universal remedy.

The Greek name for physician, Asklepiadai, appeared about 600 BC. Later, in the fourth century BC, the term changed to Hippocratics. The physicians formed a brotherhood, which was bound over to the rule of Hippocrates. The fundamental concepts were incorporated into the Hippocratic oath, which still forms the basis of medical ethics. The original oath swears by ‘Apollo Physician, Asclepius, by Health, by Panacea … I will use treatment to help the sick according to my ability and judgement, but never with a view to injury and wrong-doing. Neither will I administer a poison to anybody when asked to do so nor will I suggest such a course’ (Kasas and Struckman, 1990). Physicians sought professional respectability by close association with Asclepius. Hippocrates himself was considered eighteenth in succession to Asclepius. Asclepius was a figure that the physicians and patient could identify with on a human level. So that both god and physician practised the same medicine, healing became a very human act. The place where Hippocrates is said to have practised medicine in Cos, beneath a tree, is a simple non-threatening and

Figure 1.7 St Winifred’s Well, Holywell, North Wales.
very natural setting (Figure 1.8). At Epidaurus, in addition to the priestly class, there would have been the physicians taking ‘advantage of the great crowds of sick people flocking there to practise and perfect their Science’ (Papadakis, 1976, op. cit.).

Those who visited Epidaurus to worship Asclepius included distinguished ‘men of letters’. The shrine was visited by: Arisarchos, the tragic poet; Theopombos, the writer of comedies; Aritides, the famous orator; Crantor, the philosopher; and Sophocles, the great tragedian (ibid.). The last words of Socrates, possibly the greatest of all philosophers, after draining the poisoned cup, were ‘Crito, we owe a cock to Asclepius. Pay it and do not neglect it.’

This list of well-known figures associated with the shrine illustrates the importance of Epidaurus to social life in Greece and is also an indication of the shrine’s reputation. But it was not just the famous or wealthy who visited Epidaurus. According to Gesler (2003, op. cit.), ‘Evidence points to its role as a social leveller. We can see this by asking who came to the sanctuary and who was permitted to come in. The sick gained entry of course, but also those who were not sick and came to worship the god, those who wanted to stay well, and those who simply wanted to join the daily round of activities. It was said that Asclepius excluded no one, apart from those near death or close to giving birth.’

THE SYMBOLIC ENVIRONMENT

The environments discussed so far are easy to grasp: it is also easy to understand their direct relevance in the healing process. The built and natural environments can be seen, heard, felt, smelt and tasted: they can be directly experienced by the five senses. The third aspect of environment – the social environment – is one to which we belong: it too is part of our everyday experience. These objects and structures that envelop us become most potent when given meaning. Many of the objects, places, landscapes, even notions, which colour our perception, symbolize something important in our lives. This symbolic or meaningful environment is less immediately tangible than the other three environments, which are more readily accessible to the senses, but it is equally important for the development of a healing place.

As architects and designers we are well aware of the power of symbolism – that is, for
example, the symbolic importance of the public square at the centre of the town, or the hearth at the centre of the home. Of equal importance is the portal, gateway or threshold, or indeed the large protecting roof of the Arts and Crafts home, symbolising shelter and protection. But what do these intangible and intriguing qualities of the environment mean for health and well-being? And what are they precisely? The physical objects are probably the easiest symbols to examine and identify. These are the main areas of concern for this book, dealing as it does with physical design. However, it would be superficial to concentrate entirely on physical design and ignore or underestimate the importance for health and well-being of the less tangible aspects of the symbolic environment, and indeed for their direct effect on design itself.

Amongst these less tangible aspects of the symbolic environment is the reputation of a great healing centre, which may be based upon: a myth associated with a miracle; the reputation for care of the local cottage hospital; the selfless efforts in palliative care of a hospice; or the powerful symbol of high-tech equipment and knowledge base in the great centres of medical excellence in a university teaching hospital. More simply, it may be the reputation of the family doctor with a wonderful bedside manner.

Epidaurus, the most famous healing centre of the Ancient World, is located in an area associated with religious practices and healing dating back to the Heroic Age of Homer – that is, to the Mycenaean period. From prehistoric times Apollo Maleatas was worshipped in this location on Mount Kynortion. The pilgrims of Asclepius had to offer a preliminary sacrifice to Apollo Maleatas, the offerings being shared between the two shrines. The cures were also attributed to the joint healing powers of Apollo, Maleatas and Asclepius. The cult of Asclepius at Epidaurus dates from the end of the sixth century BC, though it is thought that Asclepius may have lived in the thirteenth century BC. He is associated with the Argonautic Expedition, ‘The ancient, great poets, Homer, Hesiod and Pindar mention Asclepius as an excellent hero physician, whose sons, Machaon and Podalairios, took part in the war on Troy’ (Papadakis, 1976, op. cit.). This great healing place was, by then, at the height of its reputation, occupying a place that was already hallowed ground with a thousand years of history. This ancient tradition lent to this site and its sanctuary great symbolic meaning as a place of healing, so vital in the pursuit of its function.

Every great traditional place of healing is associated with a myth. The main method of healing at Epidaurus was dream healing. According to Gesler (1993, op. cit.), ‘The Greeks believed that when people were asleep the soul was freed from the body so that it could soar into spiritual realms and commune with the gods.’ The therapy associated with Epidaurus has parallels in the post-Freudian and post-Jungian modern world of psychotherapy and ecopsychology, subjects to which we will return in Chapter 3. According to Struckmann:

‘The priest-physician used programmes well thought out in psychological terms, employing various techniques of suggestion: they may well have used hypnosis and the laying on of hands, rather like mesmerism. During the period of incubation, there were also probably periods of fasting. Patients fell into their therapeutic sleep in the Abaton in the mysterious light of flickering oil-lamps. It remains questionable whether or not drugs were used to induce revelations in sleep. Vessels for burning scented herbs have been found as well as medicinal containers.’ (Kasas and Struckman, 1990, op. cit.).

There were those who were prepared to disbelieve the miraculous events associated with
the Sanctuary of Epidaurus. Aristophanes (445–387 BC) mockingly describes therapeutic treatments in the Sanctuary of Asclepius in his comedy Wealth, which was performed in Athens in 388 BC (see Box 1.1).

At the time Aristophanes was writing Wealth, Athens was in a weakened economic position: most people were poorer than for some time. No one could improve the situation in any fundamental way and since no man was to blame then it must have been the work of the gods. Aristophanes’ solution to the problem was the enigmatic course outlined in his play. In the play Zeus has blinded Wealth so that he was unable to see to whom he was endowing wealth. Consequently it was the thieves, rogues and profligates who became wealthy at the expense of the worthy. Chremylus, a poor but worthy person, on visiting the Oracle at Delphi was told to follow and stay with the next person he should meet. This stranger turns out to be blind Wealth. On hearing of Wealth’s predicament, Chremylus takes him to the Sanctuary of Asclepius for a cure for blindness. The excerpts, which mockingly outline the visit to the Abaton, are reproduced in Box 1.1. The cure is successful and wealth is duly redistributed to the poor and the worthy.

CONCLUSION

Aristophanes, a wonderful poet, was also a great satirist: his play Wealth is immensely funny by any standards. However, we can’t leave the last word on the cult of Asclepius at Epidaurus to Aristophanes. Struckmann, a medical doctor himself, and writing in Kasas (1978, op. cit.), expresses a more rounded view. ‘The physicians of the Sanctuary of Asclepius were not in the least cheats or charlatans, they followed the traditional road of cultic therapy. The difference between rich and poor was apparent only in the value of the thanks-offerings.’ The stone tablets excavated at the site recount the cures performed at the Sanctuary. Pausanius, the ever-observant traveller, noted that: ‘In my day there are six left of the stone tablets standing in the enclosure, though there were more in antiquity’ (Pausanius, 1971, op. cit.). The stelai may have had a purpose as propaganda, or publicity, but more poignant and personal are the remains of the many votive offerings depicting limbs and body parts cured at the Sanctuary. They indicate a whole range of infirmities that were treated successfully by the then medical profession. These early physicians founded the world of healing we have inherited today; the man-god Asclepius and his protégé, Hippocrates, are the fathers of that great tradition based as it is upon observation and later scientific endeavour (Figure 1.9). The physicians of Epidaurus possessed the skill of questioning their patients, understood causation, and diagnosed through observation of the patient. They could even differentiate between seven forms of illness of the gall, four forms of jaundice, and twelve different bladder complaints’ and ‘In helping to effect a cure they prescribed special rules for the patient’s diata or diet’ (Struckmann, in Kasas, 1990, op. cit.). Furthermore the debt to this ancient tradition in medicine includes the use of the Hippocratic oath and also in the use of the staff and snake as symbols of the profession.

At the Sanctuary of Epidaurus supplicants came to restore balance between mind, body and spirit – a restoration to health or the maintenance of such a state of balance. The Sanctuary, set in a lovely hallowed landscape, was the physical expression of this attitude to balance, harmony and proportion. It was built over many generations by the finest architects of the time. What better symbol of this balance can one imagine? Crowning this architectural
Box 1.1.

Carion: Well then, we arrived at the temple, bringing with us a person who was then more wretched than any man alive, but now is supremely happy and blessed, and first of all we took him to the sea and gave him a bath.

Wife: Brrr, the cold! And at his age! Some happiness!

Carion: Then we entered the sacred precinct. We offered cakes and incense at the altar, ‘sops for Hephaestus’ flame’ as the poet says, and then we put Wealth to bed in the proper manner and prepared rough-and-ready mattresses for ourselves.

Wife: Were there any other patients there?

Carion: Yes there was Neocleides, the blind politician whom no sighted man can outdo in thieving; and there were a great many others with all kinds of diseases. Anyway the temple servant put out all the lamps and told us to go to sleep, warning us to remain silent if we heard any noise. So we all lay there quietly, but I couldn’t sleep. There was an old woman with a pot of wheat broth lying near her head, and I was very struck by this and had a consuming desire to creep up on the pot. So I looked up, and what did I see but the priest taking the cheesecakes and figs off the holy table; after which he went round all the altars seeing if anyone had left a cake there, and he consecrated all of them by putting them into his bag. Well, that assured me that what I intended to do was an act of piety, so I got up and made for the pot of broth.

A few lines later the play resumes:

Carion: Well, I was rather frightened after that and covered myself up, while the god went round looking very carefully at all the patients. Then a boy placed by his side a stone pestle and mortar and medicine box.

Wife: A stone one!

Carion: Not the medicine box, silly.

Wife: But, you lying scoundrel, how did you see all this? You’d covered yourself up!

Carion: I saw it through my cloak; this had no shortage of holes! Well, first of all he treated Neocleides. He prepared a plaster to rub on his eyes, three heads of Tenian garlic, then he pounded in some fig juice and sea onions, and finally soaked the lot with vinegar from Sphettus. Then he turned up Neocleides’ eyelids and rubbed the mixture into them, so as to give the maximum pain. He yelled and screamed, jumped up and ran off. Asclepius laughed and said, ‘That’s got you good and plastered; no more moving the previous question in the Assembly for you now!’

Wife: What a wise and public-spirited god!

Carion: Then he came to Wealth and sat at his side. He felt his head and wiped his eyelids with a clean linen cloth, while Panacea spread a red cloth all over his head and face. Then the god gave a clucking sound, and at once two enormous snakes came out of the inner shrine.

Wife: God save us!

Carion: They went under the red cloth and licked all round his eyelids, at least I think they did; and, mistress, before you could drink down ten cups of wine, Wealth was on his feet, and he could see. I clapped my hands for joy, and woke up master. At once the god disappeared, snakes and all, into the inner shrine. Well, you can imagine how the other patients congratulated Wealth. They were up all night until daybreak. And I praised Asclepius with all my heart – first, for so quickly restoring Wealth his sight; second, for making Neocleides’ blindness worse.

achievement is the great theatre of Polycleitos the Younger, built 1500 years ago. Its sweeping arms still enfold the remains of a once beautiful city designed and built to enhance health and well-being. Epidaurus, like any healing centre, is a very special place. What lessons can we learn from it for more general application in designing the therapeutic environment? This question will be addressed from time to time over the next chapters but, at the very least, Epidaurus sets a standard at which to aim and it is an inspiration for any involved in urban design.

Figure 1.9 Asclepius. (Source: Papadakis, 1976)
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THE GEOGRAPHY OF HEALTH

INTRODUCTION

This chapter presents statistical and other evidence for patterns of health and disease. It will discuss the measures used to determine the level of health and well-being, reviewing the limitations of the techniques used. The chapter explores the environmental, social and economic factors associated either with disease or health. An important section of the chapter discusses the sources of stress in the environment and their relationship to disease. Finally, the chapter concludes with a discussion of the implications of the findings for urban design.

SETTING THE SCENE

The World Health Organization (WHO) is the authority for health within the United Nations. ‘It is responsible for providing leadership on global health matters, shaping the health research agenda, setting norms and standards, articulating evidence-based policy options, providing technical support to countries and monitoring and assessing health trends’ (WHO, 2008). In the Introduction to this book, the WHO’s definition of health is quoted. This definition encompasses three dimensions of well-being: physical, mental and social. This definition informs both the content of, and the attitudes adopted in, this chapter. It will also be a theme running through the book for two reasons. Firstly, despite its generality, many studies on health refer to it: there is a consensus among scholars that this definition adequately represents the concept of health. The second reason is that this is a holistic definition recognizing that individuals’ health is not merely physical well-being, but encompasses a healthy mind and social well-being as well. This last point indicates that high levels of social cohesion – that is, the networks of friendship, neighbourhood and trust that people develop – contribute to their well-being. The term well-being has also been the subject of much research and several definitions are available in the literature according to the discipline within which it is developed. Relevant references are provided in the bibliography at the end of the book (see Galloway et al., 2006). However, for the purpose of this book well-being in relation to health is taken to mean mental well-being,
a state in which individuals are free from stress-related illnesses.

In addition to the definitions of health and well-being it is important to define the terms ‘disease’ and ‘illness’. Disease is the label attached by medical professionals to a series of identifiable symptoms, while illness is the personal experience of feeling unwell (Gatrell, 2002: 5). Because of the difficulty in defining health, data are usually collected on diseases such as the number of people affected by a particular condition like heart disease or cancer (Gatrell, ibid.). Common measures of (ill) health used in health-related studies are those which measure levels of mortality and morbidity in a population. Mortality rates are calculated as the number of deaths in a population or group divided by the number of people in that population or group. Morbidity rates refer to the rate of incidence of a disease. There are many indicators of morbidity. It would be impossible to consider all such indicators so this chapter will selectively include the most relevant examples in relation to the aims of the book. However, our interest goes beyond a simple description of mortality and morbidity patterns, and as far as possible we will move in the direction of studies that contribute to an explanation or understanding of probable causal mechanisms.

Studies on the geography of health have used a wide range of different methodological approaches. Gatrell (ibid.) identifies five schools of thought, each with its own philosophical perspective, methods and techniques used to measure health and well-being. These approaches, namely positivist, social interactionist, structuralist, structurationist and post-structuralist approaches, are briefly reviewed. In general terms, a positivist approach utilizes quantitative research methods to explain disease incidence in relation to a series of socio-economic variables. The aim is usually to assess whether there is a statistically significant relationship in geographic space between these variables and the disease under study. This approach has been highly criticized for neglecting the perspective and experience of the people affected by the disease. A response to these limitations comes from a social interactionist approach, which instead emphasizes the individual’s experience of the disease. A structuralist approach to the geography of health, in contrast, suggests that the cause of disease is not to be found in the behaviour of individuals but to be deeply embedded in the prevalent political and economic systems or structures. The structurationist approach explains the geography of health as an outcome of the interaction between ‘structure’ and ‘agency’. Finally, a post-structuralist approach highlights the context of power relations in the way in which knowledge and experience are constructed: according to this school of thought it is the distribution of power and the relationships which follow that explain the distribution of health or ill health. In this chapter, several studies are included illustrating a wide range of research approaches. The method adopted often reflects the researcher’s preferences or her aims and research questions.

GEOGRAPHIES OF HEALTH: FROM GLOBAL TO LOCAL

A good place to start a review of health outcomes is a comparison of mortality data at the world level. As an example, Figure 2.2 displays infant mortality – that is, babies who do not reach their first year of age. The map is a stark reminder of great worldwide differences in infant mortality. The ten countries with the highest infant mortality rates are all located in Africa, while the ten countries with the lowest
mortality rates are in the so-called ‘western industrialized’ countries. Figure 2.3, on life expectancy, reinforces the message. It appears that in the African countries where infant mortality is high, life expectancy is also low. These maps illustrate an important feature of health geography, that the poor die young [1]. Figure 2.4 shows a graph of life expectancy and gross domestic product (GDP) per capita. It clearly shows that life expectancy increases as GDP per capita increases; however, above a certain GDP level it seems that the
relationship is not as strong and other factors must be involved apart from personal income level, such as the distribution of wealth within a country (Shaw et al., 2002). The relationship between health, well-being and the fairer, more equal distribution of wealth in a community will be discussed more fully in Chapter 4, where a case study of Cuba will be used as an example.

In relation to causes of death there is a marked difference between poor and rich areas of the world, with infective diseases affecting the former and circulatory diseases widespread in the latter. For some scholars this difference is due to the so-called epidemiological transition (Shaw et al., ibid.). This is a disputed theory based on the notion that as countries become richer the main cause of death shifts from infectious diseases, typical of poor developing countries, to degenerative diseases such as heart disease, typical of western industrialized countries. Most statistical mapping of health outcomes seems to indicate that they are uneven at different scales. This is clearly apparent when analysing health outcomes across Europe.

‘In western Europe, the overall pattern for the population is that of rising life expectancy. At the same time, social inequities in health are widening, when measured in relative terms. This widening gap is caused by a relatively slower improvement in health among lower socio-economic groups than among higher socio-economic groups. In contrast, some of the CCEE [the countries of Central and Eastern Europe] and the CIS [Commonwealth of Independent States] have experienced a widening gap in social inequities in health, against a backdrop of static or declining life expectancy for the population as a whole. In these cases, widening inequities are brought about by lower socio-economic groups suffering a greater decline in health than that suffered by the population as a whole.’ (Whitehead and Dahlgren, 2006a: 11)

When analysing health outcomes, it is important to investigate the relationship between, for instance, health outcomes and living conditions over a number of different geographical scales. Shaw et al. (2002) review a number of factors that have detrimental
effects on health and well-being at a regional level in the UK: these include unemployment and social class. In their study of Oxford they point out that, although the mortality rate for the city as a whole is close to the national average, when mortality rates are analysed using the electoral ward as the unit of analysis, a striking disparity within Oxford occurs. The authors point out that local variation in health outcomes can exist while being indiscernible at a higher level of analysis such as the city, region, nation or continent.

EXPLAINING HEALTH OUTCOMES

Gatrell (2002) proposes a complex framework to explain health outcomes. For each of us, our state of health is the result of several factors operating at different levels, rather than as the result of a single determinant. These factors can be thought of as a hierarchy of levels ranging from those applying to the individual at one end of the scale to those factors associated with the wider community and the environment. Specifically, individuals are characterized by certain stable features of age, sex and hereditary determinants. We as individuals then adopt certain lifestyles that affect our health – for instance, smoking, a balanced diet or a strict exercise regime. Further up the hierarchy of factors, the community in which we live will exert some sort of pressure or support, including those deriving from our family or wider social networks. Furthermore, our health will be affected by the working and living conditions in the area where we live. These layers are contained in an overall frame given by the macroeconomic and broad-scale social conditions. These include the political system, which establishes the broad policy context, including health-related actions.

Figure 2.4 Life expectancy and gross domestic product (GDP) per capita. (Source: Shaw and Dorling, 2001)

Figure 2.5 Qualities of a healthy city. (Source: Barton and Tsourou, 2000).

It is apparent that an individual’s developing pattern of health is understood in terms of either a single factor such as lifestyle or a combination of factors such as health service provision and community environment. A consequence of this conceptual framework is the danger that health policies are developed in isolation from other social and environmental policy initiatives. With such a compartmental structure, urban design and spatial planning may, like other policy
initiatives, address superficial symptoms of the malaise. A holistic approach to health planning would consider the environment as all-encompassing, rather than simply another factor in the system, such as political or economic factors. It will be argued in later chapters that healthy outcomes will not result from a method that does not give due prominence to the natural environment in which humanity is an essential component. In a recent research development, Tzoulas et al. (2007: 167) formulate a conceptual framework of associations between urban green space, the ecosystem and human health. This structure overcomes the limitations apparent in the previous model by considering an overall model stressing the linkages between the ecosystem and human health, then analysing the contribution a green infrastructure can make to the health of both systems. This model will be dealt with in more depth in the ‘Green infrastructure’ section of this chapter.

As mentioned in relation to worldwide health inequalities, there is agreement that health outcomes are highly uneven. This means that ‘there are systematic differences in health status between different socio-economic groups. [But why should this be so?] Certainly, within any country differences in health can be observed across the population. Genetic and constitutional variations ensure that health of individuals varies, as indeed it does for any other physical characteristic. The prevalence of ill health also differs between different age groups, with older people [quite naturally] tending to be sicker than younger people, because of the natural ageing process. Biologically, women in older industrialized countries exhibit an advantage in survival over men at every stage of life. Chance also plays a role in everyone’s life, with luck deciding which individuals avoid a particular infectious disease or hazard and which succumb.’ (Whitehead and Dahlgren, 2006b: 2)

However, these differences in fortune become health inequalities when they are palpably unfair and socially produced: they begin to take on clear patterns. Because these health inequalities are patterned they do not arise due to chance: they are systematic. Most specifically, people who are economically and socially disadvantaged also suffer from ill health. These inequalities are socially produced because they are not determined by biological factors. Rather they are the product of that social process. There is broad agreement that these processes are unfair. There is agreement on the principle that all children, regardless of social group, race or religion should be given the same possibility of living a healthy life (Whitehead and Dahlgren, 2006b). Health inequality is a well-established corpus of research; however, more recently research work has advanced the hypothesis that culture is also a determinant of health and well-being. In particular, it is argued that the ‘materialism and individualism [associated with the affluent society] are detrimental to health and well-being through their impacts on psychological factors such as personal control and the need for social support’ (Eckersley, 2006: 252), though some have criticized this argument (Dressler, 2006). These and other psychological factors affecting health and well-being will be outlined in Chapter 3.

**ENVIRONMENTAL STRESSORS**

The places where we live, work and spend our leisure time potentially can nurture our health. However, they can also exercise great stress on us. Such stressors in our environment can make
us feel irritable, anxious, fearful or they can damage our health more directly, for example from the toxins in the air we breathe, in the food we eat or in the water we drink. For instance, Halpern (1995) examines the effects that environmental stressors in the built environment can have on people’s mental health. In his study environmental stressors are divided into ‘classical’ and ‘social’ stressors. ‘Classical environmental stressors’ include elements such as weather, air pollution, noise, water quality – that is, physical stressors – as opposed to ‘social environmental stressors’, which include crime, fear of crime, crowding and density: this last group of stressors are those caused directly by human beings.

CLASSICAL ENVIRONMENTAL STRESSORS

Several studies have been carried out on the effects of air pollution on human health. Air pollution is a real emergency. Newly industrialized countries including China, India and Russia are pursuing economic growth at a tremendous rate and are now ‘home to some of the most polluted cities on Earth’ (Anon., 2007: 5). ‘For example, at Linfen in Shanxi province – the heart of China’s coal industry – the industrial and automobile emissions put the health of 3 million people at risk. At Sukinda in the State of Orissa in India, 2.6 million people face the hazards of one of the world’s largest open-cast chromite mines. In Dzerzhinsk, Russia, 300 000 are exposed to toxic by-products from chemical weapons’ (New Scientist, ibid.). With the USA so reluctant to commit itself, at least at an international level, to the global efforts for the reduction of carbon emissions, then it is difficult to persuade developing nations to enthusiastically embrace international action on climate change. For it really needs a major shift in global economic thinking to put health and well-being at the top of the list of human goals. Despite this resistance to change, the negative effects of air pollution on health are well documented. For instance, Maheswarn et al. (2004) tested the hypothesis that stroke mortality and hospital admissions should be higher in areas with elevated levels of outdoor pollution because of the combined acute and chronic exposure effects of air pollution. Enumeration districts in Sheffield were used as the unit of analysis where stroke deaths and hospital admissions were examined between 1994 and 1998. Air pollution data for particulate matter (PM10), nitrogen oxides (NOx) and carbon monoxide (CO) were interpolated to census enumeration districts. The study also adjusted for age, sex, socio-economic deprivation and smoking habits. The analysis was for a population of 199 682, and based on 2979 deaths and 5122 hospital admissions. Stroke mortality was higher in the highest NOx, PM10 and CO quintile categories. Also, the increases in risk for admissions in hospital were higher in areas experiencing the highest levels of pollution. According to the authors of the research, if causality were assumed, 11 per cent of stroke deaths would be attributable to outdoor air pollution. Maheswaran et al. (2005) conducted a study examining the hypothesis that coronary heart disease mortality and emergency hospital admission rates are higher in areas with higher outdoor air pollution levels. The conclusions of this study were similar to earlier research pointing towards a link between coronary heart disease and high levels of outdoor NOx, a proxy for traffic-related pollution. Moreover, a study examining long-term exposure to fine particulates in the atmosphere found that ‘air pollution is associated with the
incidence of cardiovascular disease and death among postmenopausal women. Exposure differences within cities are associated with the risk of cardiovascular disease' (Miller et al., 2007: 447).

The connections between ill health and air pollution are undeniable. The relationship between traffic and effects such as asthma has been known for some time. Research has established beyond any reasonable doubt that there is a link between pollution and some forms of ill health. This is a further reason, if one were needed, to seriously reconsider the use of the private car, particularly one powered by the petrol engine. It may be possible to devise a targeting policy for interventions in areas of high pollution, specifically aimed at known sources of pollution. But, more generally, urban design should be aiming to reduce the need for travel by car in cities and promoting other less polluting forms of transport.

**SOCIAL ENVIRONMENTAL STRESSORS**

Social environmental stressors refer to the effects on people’s well-being caused by the presence or activities of other individuals (Halpern, 1995). Current thinking on sustainability in urban development, which promotes compact and high-density cities, goes against research findings on the adverse effects of urbanization on mental health. Sundquist et al. (2004: 184), for instance, explored the question of whether ‘a high level of urbanization is associated with increased incidence rates of psychosis and depression after adjustment for age, marital status, education and immigration status’. The study looked at the entire Swedish population aged 25–64 years for the period January 1997 to December 1999 in relation to first hospital admission for psychosis and depression. The findings are incontrovertible: incidence rates of psychosis and depression increase with increasing levels of urbanization. People living in high-density areas had 68–77 per cent more risk of developing psychosis and 12–20 per cent more risk of developing depression. These findings apply to both men and women. The findings could be dismissed if one were to believe that they only apply to Sweden. However, a study conducted in the UK investigated the rural/non-rural differences in the beginning and persistence of common mental disorder events. The study was conducted for a 12-month period: it studied 7659 adults aged 16–74 using a multilevel statistical modelling approach and the electoral wards as the unit of analysis. The study found that people living in rural areas had, to some extent, better mental health compared to people living in urban areas. The study found that ‘small but statistically significant differences in common mental disorders between urban and rural residents’ (Weich et al., 2006: 51) exist, thus calling for further investigation into the effects of urban and rural living on overall human well-being.

There seems to be some evidence to show that health and well-being are particularly affected by the level of urbanization. Generally, the higher the density or level of urbanization the greater the stress placed upon individuals within the community, with presumably the vulnerable being at the greatest risk of mental disorder. There are of course caveats that have to be considered when making such a claim. For example, there is the question of culture, age and family composition, employment regime and many other factors that impinge upon the health and well-being of the individuals that form a community. Some of
these factors will be considered in greater detail in the next chapter.

GREEN SPACES AND HEALTH

There is much commonsense wisdom that links a healthy lifestyle and the ‘green world’ of nature. But is there any evidence to support the claim that living near or being surrounded by green spaces such as parks, gardens and allotments improves the health and well-being of a population? Mass et al. (2006), in a study of the strength of the relationship between the amount of green space in people’s living environment and their perceived general health, found that the percentage of green space inside a one-kilometre and a three-kilometre radius had a significant relation to perceived general health. More importantly, the relation was present at all degrees of population density (referred to as urbanity in their study). It was found to be especially significant for lower socio-economic groups. In large cities, the health of certain groups, such as the elderly and youths, seems to benefit more from the presence of green areas in their immediate environment than other groups. Furthermore, Parr (2005) investigated the role of community garden work in assisting people with severe and enduring mental health problems. It was found that being involved with gardening work encompasses a whole range of dimensions with many beneficial effects upon the health of those participating. Gardening is a therapeutic, social, physical experience: it can operate to achieve social inclusion, stability and to gain work experience (Parr, 2005). Given the health benefits, improving accessibility to green spaces for ‘hard to reach’ groups – including the disabled, those affected by mental illnesses, those on low incomes, disaffected young people and ethnic minority groups – is not only fair but imperative for the general well-being of the community at large.

SPATIAL PLANNING, PUBLIC HEALTH AND CLIMATE CHANGE

This section introduces the notion that spatial planning and urban design can make a contribution to the development of healthy environments. In particular, it will attempt to trace the current state of the link between spatial planning, public health and climate change. The connection between planning and health goes back to the rise of the Industrial Revolution in England. Although economic activities have always produced some form of impact on nature and human beings, it was not until the Industrial Revolution that those impacts accelerated. As Benevolo (1971) put it:

‘[In] the space of a single generation, between 1760 and 1790, a degree of technical progress was achieved which made unlimited increase in industrial production possible. The development of these industries and their concentration in large factories drew many families from the agricultural districts of the south to the mining districts of the Midlands and North, from isolated country dwellings to the cramped districts that were built near the factories; so new towns were born, while old ones grew out of all proportion. The connection between towns and industry was soon very close. [Soon] the changes wrought in the towns and countryside by the Industrial Revolution emerged and began to be recognized as real problems.’

The reactions to the problems caused by the industrial and accompanying agricultural revolutions will be discussed in Chapters 6–8.
The experiments of social reformers such as Robert Owen, Titus Salt, the philanthropists who built the garden villages and Howard, combine active social change and guidelines for a planning system geared to health and well-being. The question this section addresses is the ways in which the current planning system and health systems are responding to the environmental and health emergencies becoming daily more apparent.

The American Public Health Association (Zabarenko, 2007) has strongly stated that climate change is a public health issue because the changes caused by climate change impact negatively on human health through ‘climate-related diseases, especially those transmitted by insects and those borne by water supplies. … Health hazards related to climate change include severe heat waves and droughts, which can affect the food and water supply; more severe storms; more ground level ozone, also known as smog, which is sensitive to temperature and can affect people with breathing problems such as asthma.’ The UK central government provides guidance to local authorities on planning policy. This guidance clarifies the link between planning policies and other policies that have a direct bearing on planning, such as public health. The guidance notes are being progressively replaced to, for example, coordinate planning policy across the country at all planning scales in the pursuit of sustainable development geared towards reducing the environmental impact of development. The agenda for planning in this country is varied and includes a mix of social and environmental measures. However, there have been calls to make spatial planning even more receptive to issues concerning public health and climate change. Recently, there have been suggestions for the convergence of planning and health planning on the grounds that the consideration of health aspects in planning and vice versa promotes health in a holistic fashion. As one commentator states:

‘While planning, health and environmental health may have gone their separate ways, there are an increasing number of policy drivers that begin to point to a more explicit role for public health in spatial planning. The important thing for the planning agenda is that individuals can only be healthy in healthy environments. Key issues include: housing, reducing the need to travel and the promotion of alternative methods; increasing levels of physical activity; improving social cohesion and social networks; tackling the problem of food deserts caused by out-of-town shopping and the decline of the high street.’ (Cookson, 2006: 26)

There seems to be a developing focus in planning on how climate change and health concerns are currently being tackled in Britain, which mirrors similar concerns in continental Europe, where countries like Germany lead the way in such thinking. Campbell (2006) notes that spatial planning in this country has been slow in addressing issues related to climate change, asking whether this is because this question is too difficult to be answered. Bulkeley (2006) outlines ‘how planning (potentially) has a role in minimizing both the causes and consequences of climate change’. However, she also points out that only lip service is paid to such issues and often there is a gulf between national policy documents and action on the ground. An innovative initiative giving hope for the future is the ‘Nottingham Declaration’, which has been signed by over 100 local authorities since the year 2000. These local authorities have committed themselves to addressing the causes and consequences of climate change. Bulkeley also notes that the attention of national government has focused on emission from the industrial sector, while the
more pressing issue of the domestic and transport sectors has been neglected. Bulkeley emphasizes the three key areas in the delivery of climate protection: energy supply, energy demand and addressing the direct impacts of climate change. It is well recognized that climate change will impact negatively on public health. Therefore, it would be reasonable to argue that planning for public health and for sustainable development, which repairs the damage done to the environment, should be considered as part of the same challenge. Indeed, advocating health policies that do not take into consideration climate change would be ineffective. It is argued here that promoting healthy and sustainable cities can be addressed within the existing planning framework. Indeed, there is no incompatibility between these twin aims: they are mutually supportive. Planning operates at different scales. Regional planning is the forum where sustainable development and health can be coordinated. This is the main strategic level for planning policy design. For example, PPS1 on sustainable development states that:

‘Regional planning bodies and local planning authorities should ensure that development plans contribute to global sustainability by addressing the causes and potential impacts of climate change – through policies which reduce energy use, reduce emissions (for example, by encouraging patterns of development which reduce the need to travel by private car, or reduce the impact of moving freight), promote the development of renewable energy resources, and take climate change impacts into account in the location and design of development.’ (PPS1, 2005: 10)

One specific suggestion for a healthy and sustainable city, which is to be developed in the second part of this book, is the widespread interweaving of nature within the urban structure. Current conventional wisdom tends to promote the idea of the compact city as the urban form that is most sustainable, particularly in terms of movements about the city. Many observers, however, recognize that the idea of the compact city is hard to sell in Britain, especially given the migration of middle-income families from urban to suburban locations in search of a better quality of life, which includes a private garden and the closer proximity of nature. However, those who advocate greener environments are often labelled ‘rural romanticists’, referring to the ‘utopian urban visions’ of those who built the very fine garden villages at the end of the nineteenth century and the start of the twentieth century. We intend to explain in Chapters 6 and 7 the idea of nature this movement of protest promoted and to advocate its rediscovery in an attempt to find culturally acceptable solutions to avoid environmental catastrophe, while at the same time promoting health and well-being. Recent ‘research and theory on restorative environments provide an alternative perspective [to rural romanticism as an explanation for the desire of urban residents for a closer contact with nature]. According to this perspective, [the desire for contact with the world of nature] is much deeper than … rural romanticism and may reflect our evolutionary heritage. [Moreover, city dwellers] often struggle to meet the demands of work, family and other obligations against a backdrop of an environment that itself may, because of its distance from the natural world, contribute to a chronic experience of stress’ (van den Berg et al., 2007: 82). This is a topic that will be developed further in Chapter 3. The next section looks at the experience of the European Healthy City Network and the lessons to be learnt for planning a healthy urban environment.
THE EUROPEAN HEALTHY CITIES NETWORK

The European Healthy Cities Network promoted by the World Health Organization aims at supporting ‘policies and action for health and sustainable development at the local level and across the European Region, with an emphasis on the determinants of health, people in poverty and the needs of vulnerable groups. ... Moreover its goal is to strengthen the standing of Healthy Cities in countries’ policies for health development, public health and urban regeneration; to play an active role in advocating health at the European and global levels through partnerships with other agencies concerned with urban issues and networks of local authorities’ (WHO Regional Office for Europe, 2008). The WHO Healthy Cities Project was established in 1986. The project has evolved in a number of phases. From 1987 to 1992 there were 35 project cities; from 1993 to 1997 38 cities were involved, 13 being new to the scheme; and from 1998 to 2002 there were 41 cities involved, 12 being new to the scheme. Phase IV of the project covers the period 2002–2008. The themes identified are: healthy urban planning, health impact assessment and healthy ageing. The emphasis in the former is on integrating health considerations in planning strategies and initiatives with emphasis on equity, well-being, sustainable development and community safety. Health impact assessment processes should be applied within cities to support intersectoral action for promoting health and reducing inequality. Healthy ageing aims at dealing with the needs of older people connected to healthcare and the quality of life (WHO Europe, 2003: 2–3). From 2003 to 2005 ‘there are 17 designated cities and 26 that have submitted their applications to become members of the WHO Healthy Cities network Phase IV. A total of 68 (18 “new blood”) cities have expressed interest or applied to become members’ (WHO Europe, 2004: 6).

Barton and Tsourou (2000: 30) suggest that the concept of a healthy city is ‘very broad, incorporating ideas from sociology, urban geography, ecology, politics, economics, philosophy and a host of other disciplines in addition to public health’. Some of the qualities of a healthy city are explored in Barton and Tsourou. Chapter 10 will return specifically to this concept of the healthy city with an examination of a case study in Copenhagen, which is part of the Healthy Cities Project. But first we will set the scene by outlining the concept of ‘green infrastructure’ and its benefits for healthy living.

GREEN INFRASTRUCTURE

This section develops the theme on how planning can support healthy living environments through the promotion of ‘green infrastructure’. Benedict and McMahon (2002:12) define ‘green infrastructure’ as ‘an interconnected network of green space that conserves natural ecosystem values and functions and provides associated benefits to human populations’. The concept evolved from two important precedents: (1) the linking of parks and other green spaces for the benefit of people; and (2) the linking of natural areas to benefit biodiversity and counter habitat fragmentation (ibid.: 13). Davies et al. (2006: 2) developed a planning guide aimed at providing ‘a method by which those interested and involved in pushing forward the development of green infrastructure planning on the ground might develop their own green infrastructure plans’. [2]. ‘Our focus here is on the main benefits that
the development of a green infrastructure can bring to healthy living and sustainable development. At a general level five broad sets of interests in green infrastructure can be identified (Davies et al., 2006: 2):

1. Sustainable resource management – particularly relating to the role of green infrastructure in the sustainable management of land and water resources, including production (e.g. energy and food crops), pollution control, climatic amelioration and increased porosity of land cover.

2. Biodiversity – particularly relating to the importance of connectivity of habitats at a variety of landscape scales.

3. Recreation – particularly relating to greenways and the use of non-car routes to address public health and quality-of-life issues.

4. Landscape – examining resources such as green spaces and corridors from aesthetic, experiential and functional points of view.

5. Regional development and promotion – particularly relating to sustainable communities issues relating to overall environmental quality and quality of life.

Though the starting point of the guide is Planning Policy Guidance 17 (PPG 17), the typology developed in the guide is much wider in scope.

As an example, Nottingham City Council is currently carrying out consultation on its Green Infrastructure Plan. Called ‘Breathing Space’, the Council wishes to develop a strategic framework for the management of Nottingham’s open and green spaces for the period 2007–2017. The main benefits that are recognized include: the sustaining of the economic life of the city; the development of a sense of place and pride of its people; the encouragement of physical and mental health; improvements in education and learning; reduction of crime where the spaces are well managed; and the promotion of biodiversity. This is a very complex plan with wide-ranging objectives. Chapter 13 will discuss this plan further and will explore links with the case study of the Meadows in Nottingham. As can be noted from the planning guide and the Nottingham example, there is no agreement on all the dimensions a green infrastructure should include, with some dimensions such as biodiversity and recreation more recurrent than others. Notably in Nottingham’s plan there is no mention of sustainable resource management. Indeed, research work carried out in Sweden showed that often the potential benefits that the development of a green infrastructure can bring to healthy human and ecosystem living fall short due to the fact that only some of the benefits are promoted in practice. ‘Following the arguments at the Rio Summit in 1992, the Swedish legislation has been modified to pay special attention to sustainability, including the importance of green space in and around urban areas. The revised legislation stipulates that urban planning should promote a good state of living environment, biodiversity, efficient use of energy and other resources’ (Sandström, 2002: 374). As part of the structure plan, local authorities are required to produce a green plan. Sandström (2002) analysed the green plans of seven Swedish cities and identified six main roles for green space. The first is its recreational role in everyday life, being particularly important for public health. The second main function is the maintenance of biodiversity – that is, the preservation of the diversity of species together with the ecosystems, which supports that diversity. The third function is as a city-structuring element. The fourth function of green space is its role in the culture and history of the city. The fifth function is the role it
plays in enhancing the environmental quality of the city by improving the local climate, air quality and noise reduction. This is another way in which green areas have a direct impact upon health and well-being. Finally, there is the role played by green infrastructure in establishing close links between the technical infrastructure and nature. From this analysis it is clear that a green infrastructure has the potential to impact upon a range of dimensions, including health, biodiversity and environmental quality. Sandström’s study shows that the green plans for Swedish cities selectively focused on some criteria. ‘Recreation was the criterion that received most attention, whereas maintenance of diversity and the other four criteria received less attention’ (Sandström, 2002: 378). There is thus a real danger that having identified a planning tool which could make a vital contribution to the development of healthy human environments and sustainable development, the sheer complexity of thinking about human health and ecosystem health holistically will result in actions that only focus on some of the aspects of the total problem.

In a conceptual framework linking green infrastructure ecosystem and human health, Tzoulas et al. (2007) explain the benefits of a model which considers human health and ecosystem health as two different faces of the same coin. The model (Figure 2.6) in its top half shows the interactions between green infrastructure, the ecosystem functions and services, and ecosystem health. In its bottom part the model refers to the dimensions of public health, namely socio-economic determinants of health, community health, physical health and psychological health. The two-way arrows show the linkages between the different parts of the model. The authors state that: ‘Multidisciplinary research should be integrated into transnational research policy if integration between human and ecosystem health is to be successfully achieved’ (Tzoulas et al., 2007: 174). This model seems to move in the direction of considering human and ecosystem health as a whole and thus moving beyond models that consider ecosystems and human health in isolation from each other. A green infrastructure can play (and consequently planners and urban designers) a fundamental role in the pursuit of a healthy living environment – both for humans and the ecosystem. As will be explained in Chapter 3, nature is paramount in achieving wholeness for individuals and more widely for communities, and such a model is thus a move in the direction of a holistic vision of healthy environments.

CONCLUSION

This chapter has investigated the geographies of health, focusing initially on the issue of health inequalities. Studies have shown that inequalities are responsible for poor health conditions. The chapter has emphasized the impacts of different stressors on health. Planning for a healthy environment has to consider these broader social inequalities to ensure that everyone benefits from any development. The chapter then moved on to focus on climate change and its impacts on health and an introduction to the response of the planning system. The case for a greener urban environment was made as a way to plan for a healthy environment, but such health planning should be based on recognition of the interrelated nature of the world in which we live. The recognition that an innovative transformation is necessary is made by Magnaghi (Franklin, 2007: 282) as follows:

‘To be fully realized sustainability must reconnect individuals with the local place, such that geographically, physically, socially,
economically and emotionally they form a vital and interdependent relationship. Another essential element to local self-sustainable development is meaningful participatory democracy, in which even the most marginalized are properly represented and have decision-making powers.'

In Magnaghi’s vision the building block for sustainable living is the village, connected in a network to other villages to form non-hierarchical ‘bioregions’. The project has been labelled as utopian. However, on the other hand, worldwide action plans towards sustainable development show that there is an urgent need for change if current trends are not to lead to catastrophic change. This theme will be developed in Chapter 11. If we keep thinking that radical change to our way of life is utopian we could arrive at a point where, unprepared, we are forced to adapt to climate change, which may well mean, in a worst-case scenario, living a troglodyte existence in subsistence communities. The vision promoted in this book is the design of a civilized environment, which is conducive to health, happiness and well-being.

NOTES

1 For more information on the maps, see [www.worldmapper.com](http://www.worldmapper.com). On the advice of John Pritchard of SASI, Figure 2.1 has been included to help comparisons in Figures 2.2 and 2.3. Figure 2.1 illustrates the comparative size of countries and continents using population rather than land area.

2 Davies et al. (2006) believe that the roots of the ‘green infrastructure’ concept can be found in other approaches to green space management and the interested reader can consult this source for further suggestions.
INTRODUCTION

This chapter continues the theme of health and well-being. Chapter 2 presented the statistical and research evidence for the geographical patterns of health and disease. This chapter examines evidence from psychology, within a holistic perspective, of place, time and sociological context. It develops the argument that a major cause of ‘disease’ is our alienation from nature. Neuroscience is the bedrock of the argument, which starts from an understanding of the crucial input from the child’s environment on how the brain develops. Nature and nurture in human development are emphasized. Ecopsychology is used to examine the relationship of humanity with nature. Ecotherapy features briefly, with regard to architectural design. The theme of the relationship between psychology and ecology introduces a short section on Gaia, which leads to a discussion of ecofeminism. Ecofeminism emphasizes female intelligence and values as a counter force to the masculine subjection and rape of the environment. Blocks to well-being and happiness are discussed, especially in the urban underclass and in the farming community, before reviewing the ingredients of happiness. The chapter closes by advocating that those engaged in city development implement in their projects, as their primary objective, designs which both respect nature, and foster individual and community well-being.

The WHO notion of health, as outlined in the Introduction, is taken as the criteria for what is therapeutic in this chapter. As a result of scientific analysis over two centuries, much is known about the minutiae of the human body, and its chemistry. Advances made in pharmacology in finding cures for previously deadly diseases, added to this considerable expertise, now result in a formidable and impressive medical science. However, because the proactive and holistic dimensions of health, as implied by the WHO definition, tend to be neglected, we have ended up with a health approach firmly seated in scientific reductionism: it is sometimes referred to as the ‘Western medical reductionist approach to health’. This may be truer of Britain than for some continental European countries. ‘Reductionism’, in terms of medical practice or healing, concentrates on treating the ill part of a person, bringing all available medical
knowledge and technology to bear on the treatment of that part, often successfully, within the limits set by the specialists in any specific area. This approach is presented as the only way forward by some medical practitioners, health commentators and by many who are responsible for the allocation of funds for health provision. Polly Toynbee, for example, is particularly scathing about the possible wasting of NHS funds on complementary medicine, which she terms ‘quackery’ (Toynbee, 2008).

Despite the many advances in medicine, it is a sick society, which needs to sustain itself through a steady consumption of tobacco, narcotics, hallucinogenic drugs and alcohol. Traditional healing conceptualizes health as being a state of equilibrium between mind, body and universe. This is closer to the spirit of the World Health Organization’s ideal. Having weighed the arguments of contemporary exponents of health and well-being alongside philosophical and historical debates on the subject, George Burns (2005) concluded: ‘It is not so much a question of either a reductionist or holistic approach as perhaps an acknowledgement of the value of reductionist medicine and the importance of a healthy relationship with our environment.’ Such an inclusive attitude would undoubtedly find favour in European countries such as Germany, where recovery periods in a spa town after illness are commonplace entitlements, for example. The objectives of the Foundation for Sound Medicine at Freiburg University include: ‘The furtherance of a new balance between medicine, the human being, and nature within patient care, teaching, research, and medical techniques’ (Viamedica, 2007). The Institute for Environmental and Hospital Hygiene at Freiburg investigates and identifies the causes of allergies in the components of materials such as those used in houses, in particular the levels of concentration of particular substances which cause toxicity. The Institute also incorporates the practice of complementary medicine (Figure 3.1–Figure 3.4).

The physician, pathologist and psychotherapist deal mainly with ‘disease’ and its cure. Novelists, dramatists and journalists can engage their public more readily with tales of flaws and fault-lines in human beings and deviant interaction. Likewise, most research focuses on aspects of sickness. Devastation, within a brief time-span, of particular places, such as Bhopal’s chemical explosion in India, the tsunami in South-East Asia, hurricanes in New Orleans, USA, and flooding of villages throughout parts of England during summer 2007, raises the possibility of there being an underlying, interconnected cause. These disasters arouse dismay. Collectively, we could address the underlying cause of such disasters, which appears to be our all-consuming destruction of the environment. A positive vision is conducive to changing. The question is: what would constitute a healthy or therapeutic environment?

NEUROSCIENCE

There is a shift in the zeitgeist towards recognizing links and interconnectedness within each discipline and across the sciences. Neuroscience exemplifies this concern with interrelatedness. Neuroscience examines the nature and function of each tiny section of the brain, how the neurons communicate with one another and, most important of all, how ‘the many aspects of bodily function and emotional behaviour are shaped by social interaction’ (Gerhardt, 2004). Sue Gerhardt, in Why Love Matters, makes the findings of neuroscience digestible for the non-scientist. She sees the individual as ‘an organism with many
interconnecting systems that provide feedback to each other and regulate each other’ (ibid.: 99). Feelings feed into this feedback system; they are the biological response of the organism to other people and situations. If feelings are suppressed, a source of information is lost. The individual would consequently have less information available to inform decision-making. Feelings are part of the self-regulating organism, the individual. If an individual were to suppress or deny experiencing feelings such as fear or sadness, for instance, the body’s muscular, autonomic and biochemical responses would already have been set in motion, but the individual would have erased a resource of information, which would have been available to inform how best to respond within the situation. Physical illness could be one outcome of severe or habitual suppression of emotion. Thanks to neuroscience, we now know that as a feeling is happening, physiological changes are taking place in the person’s nervous system, endocrine system and other systems, as well as thoughts arising in the mind. A therapeutic social environment is one where the value of feelings is acknowledged.

Societies and individuals are context bound, constricted by the limitations of their particular era. Freud is no exception; he belonged to an era of hierarchical thinking: nature was to be dominated and controlled by man; it was an age which dichotomized the person as being mind and body, mind being the superior partner, an age associated with the repression of sexuality. Freud, who articulated the notion of the unconscious, a concept which has since become accepted, saw it as a sort of cellar where repressed sexual feelings were securely locked. Freud neglected a spectrum of other feelings. Influenced by neuroscience, Gerhardt diverged from Freudian thinking, seeing an individual as ‘the product of interactions with others, shaped by the early regulation experienced with others and emotionally maintained by others as an adult’ (ibid.: 199).

**CONTEXT**

Context awareness – as already mentioned in Chapter 2 – is essential when helping individuals and groups, whether it is the psychotherapist with an individual client, a hospital about to discharge a patient needing palliative care, or the city planner designing a suburban extension for a community. Modelling planning of community provision on the prototype of how the brain and nervous system works is likely to
result in an effective scheme. Contextual awareness, influenced by this prototype, embraces seeing the individual as an organism formed by a network of systems, each with its own inherent functioning laws, the systems being in communication with one another, all the time responding to incoming stimuli from other individuals who are themselves influenced by their particular environment. Gesler’s ‘four environments’ methodology uses context awareness in analysing therapeutic landscapes such as Epidaurus (Gesler, 1993), the subject of Chapter 1. Contextual studies for a visual analysis are outlined in Moughtin and Mertens (2003).

To ensure that the societies of future generations are positive, cooperative people, parents need adequate financial, emotional and social input, including a safe environment in which to raise their children. Neuroscience has established that it is during the first three to four years of childhood that the functioning of different parts of the brain becomes established, conditioned by how one or both parents or principal care-giver relates to the infant, which in turn is affected by the environment in which the parent lives. This has political implications for the design of cities, as will be illustrated in later chapters, in case studies of Cuba, New Lanark, Port Sunlight, Copenhagen and Freiburg. Mostly, it is women who rear infants, sometimes unaided. A depressed mother will have difficulty in responding adequately to the needs of her baby or toddler. There will be a debilitating chain reaction in the baby or toddler and in the household generally. The feminist movement accept the findings that there is a high rate of depression in women. However, feminist sociologists argue that ‘women become depressed because they have reason to be so, that their position in society is one of disadvantage vis-à-vis that of men (Miles, 1988: 10). Having lived in social housing, on the minimum wage, doing a variety of low-paid jobs for a fixed period, Polly Toynbee documented the following. Over 70 per cent of the low paid are women, their work being officially and systematically devalued, because it is women’s work. Many companies, in the wake of the Equal Pay Act, ‘simply segregated their workers, so low-paid women worked in jobs where there were no men to compare their pay with’ (Toynbee, 2003: 233). Moreover, the men who were obliged to take on ‘women’s jobs’ in cleaning, catering and caring were accorded low female status. Chapter 2 quotes the work of Shaw et al. (2002) on the link between unemployment, low social status and depression. The earlier research of Brown and Harris (1978), into depression in women in East London, highlighted vulnerability factors towards depression as being relational: the lack of employment outside the home, lack of close relationships with either friend, relative or husband, being confined to the home with
children below the age of six and the loss of a mother below the age of eleven. Many of these vulnerability factors can be remedied by politicians, planners and urban designers by factoring in the requirements for a therapeutic environment.

In the redevelopment of existing urban areas and in the planning of new towns, pleasant community centres with crèches, children’s play areas, coffee bars, gymnasia libraries and shops could be given priority. These centres should be within safe walking distance, within each neighbourhood. Towns and villages with all or many of these facilities exist in Britain. Also, there are the brainchildren of nineteenth century philanthropists and industrialists: New Lanark in Scotland, Saltaire near Bradford, Port Sunlight in Cheshire, Bourneville near Birmingham, and New Earswick outside York. These settlements are prototypes for a therapeutic environment. Ongoing successful examples of sustainable and therapeutic urban developments are the Reiselfeld and Vaubin districts of Freiburg, Germany, the products of project groups within Freiburg City Council, the focus of Chapter 14.

Those in low-status work, on low pay, working several shifts in order to keep financially solvent are unlikely to meet the four fundamental human needs for a healthy person mentioned by Oliver James (2007: 16) in Affluenza: ‘Feeling secure; being part of a community; feeling competent; being autonomous and authentic.’ Affluenza documents how mass consumerism and selfish capitalism are damaging both planet and people. James warns: ‘Unless the socio-economic situation is addressed on a political level, taking antidepressant pills can hardly restore well-being. To deal with any one factor in the complex, seamless fabric of well-being, as if it were the sole component is failure-bound.’ We are now aware of the downside of global capitalism, of our contribution to global warming and climate change, and of the intrinsic fault-lines in what is promised by advertising. Some experts present pointers and stepping-stones towards redressing the balance. Deepak Chopra (1989), in Quantum Healing, emphasizes the oneness of mind and body in the aetiology of illness and in healing, a theme running through Gerhardt’s Why Love Matters (2004). The psychologist David Smail (1987: 161) advocates, in Taking Care, implicitly acknowledging the limitations of psychotherapy, that the culture of therapy be replaced with a culture of care; this would be done by our forcing open a ‘moral space’ around ourselves, into which we

Figure 3.3 University of Freiburg: Institut für Umweltmedizin und Krankenhaushygiene.
re-insert a ‘public dimension’. Much of what people take to be their private misery, he asserts, is generated within the social structure in which we are all located.

Ecological science presents a critique of existing society while suggesting directions for reconstructing human society in harmony with the natural environment. King (1989) and Roszak (2001) present ongoing developments in the ecology movement, a prism which embraces ecofeminism and ecopsychology. Ecological science, according to King, ‘concerns itself with the interrelationships among all forms of life – an integrative science in an age of fragmentation and specialization’. Social ecology challenges the dualistic belief that nature and culture are separate and opposed. Ecofeminism develops from this position, seeing misogyny as being at the root of that opposition. Ecofeminism’s ‘moral space’ passionately holds the belief that a healthy balanced ecosystem must maintain diversity: ‘The wiping out of a whole species corresponds to reducing human diversity into faceless workers or to the homogenization of taste and culture through mass consumer markets’ (King, 1989). This echoes Oliver James’s stance in Affluenza (2007). Just as the ecology movement seeks to give a voice to the bullied suppressed ‘other’, i.e. nature, whose non-verbal voice has been ignored, likewise ecofeminism represents the refusal of women in patriarchal society to remain silent, believing that the domination of sex, race, class and nature are mutually reinforcing. A therapeutic environment is one of equal opportunities, where nature is respected, where she does not have to erupt in the form of a drought or tsunami in order to be heard. This requires differentiating wants from needs, planning contextually. The Reiselfeld and Vaubin Project Groups, as detailed in the case studies in Chapter 14, are tuned in to the feminine. These case studies will demonstrate how, in practice, ecological thinking can be incorporated into urban design.

Effective decision-making in any field is dependent on precise communication. The best model for efficient communication is within us. It is the model of operations within the brain and central nervous system. Our brains and central nervous system are made up of ‘neurons’ which have tiny filaments, ‘dendrites’, growing at the ends of each cell. There are gaps, ‘synapses’, between the neurons. Across these gaps or synapses, the neurons talk to each other at lightning speed. Neurotransmitters, tiny chemicals, are the ‘runners’ that race to and from the brain, telling our every organ of our
emotions, desires, memories, dreams, intuitions. ‘Wherever a thought wants to go, these chemicals must go too and without them no thought can exist’ (Chopra, 1989: 45). This is a system of unity in diversity. This system, namely that of our individual selves, is dependent on other systems for survival and sustenance. The self is embedded in community, which in turn is embedded in the world. ‘To pollute the world for the benefit of the community would be short-sighted,’ writes De Bono (1979: 225) in The Happiness Purpose. This is precisely what we have been doing, in the name of progress! Anthropologists and psychologists over the past half-century have been doing the equivalent of the neurotransmitters, running messages to us from the cosmos warning and advising us. For example, Desmond Morris (1977: 211) stated: ‘We should tailor our intelligent opportunist advances to our basic behavioural requirements.’ Anthony Storr (1975: 164) wrote: ‘We are threatened as a species by our own destructiveness, and we shall never learn to control this unless we understand ourselves better.’ Sandra Bloom (2004) sees our short-sighted destructiveness as a form of dissociation and emotional numbing, a mindless spin-off of emotional illiteracy. She cautions: ‘The inability to manage emotions properly at national and international level results in self-destructive coping skills such as compulsive spending, greedy acquisition and violence.’ Becoming aware of how the greater ecosystem impinges on decisions about what we eat, how we dress, where to go on holiday and how to layout our homes requires sustained effort.

Changing the way we live is difficult but possible. Difficult because old neural networks automatically become activated when a particular feeling is aroused, which will manage the state of arousal in the old way. The quandary is that it is only by doing things differently that emotional processing can be changed. New forms of neural networking must be practised in order to lay down new pathways. This feat becomes possible for the individual with the help of a counsellor/psychotherapist. The conditions for this to happen require of the therapist an attitude of total acceptance, genuineness or congruence and empathic understanding, as spelt out by Carl Rogers (1951). Urban designers, teachers and those trying to influence change in society can apply the principles of the psychotherapeutic process to effect change, within their respective disciplines. Sue Gerhardt explains: ‘The therapist’s acceptance allows a neutral space to reflect on the feelings and consider how to respond afresh’ (Gerhardt, 2004: 203). Those trying to effect change – the planner, architect, urban designer are no exceptions – must first effect change in themselves, discarding worn out conceptual notions and blinkered conceptual frameworks. The basic resource of the urban designer as environmental therapist is listening: listening to her or himself, to others and to the scream of the environment. The planners of Vauban and Reiselfeld demonstrate this skill to a remarkable extent, engaging with the community in an intensive process of listening and participation.

Humanity is causing great damage to the global ecosystem which supports the 6.5 billion people on the planet. We need to seek new ways of thinking and being, so that humanity can live within the carrying capacity of the biosphere. This may involve actively seeking to establish a whole new range of subcortical signals. According to Lovelock’s ‘Gaia’ hypothesis (Lovelock, 2000: 144), the biosphere is a self-regulating ‘superorganism’, composed of all life, tightly coupled with the air, the oceans and the surface rocks, which maintains conditions ‘fit for life’ – though not necessarily human life – when an environment is changing,
on planet Earth. If humanity continues to behave recklessly, then Gaia may well deal with humanity in the same way as it would deal with any destructive parasite. Humanity may need the self-therapy of radically tuning in to nature, so as to lay down new cortical synapses to respond to the new range of subcortical signals. This approach is more likely to be successful than the defence mechanism of denial, characteristic of some leaders of powerful nations, who have opposed legislation to counteract continuing global poisoning by their own people. Such denial is a form of collective neurosis.

Stability is conducive to mental health. Children who have to move frequently with parents from one bed-and-breakfast, overcrowded temporary accommodation to the next – very often moving schools in the process, because there is not enough social housing – will have difficulty concentrating in school, difficulty in fathoming who they are and where exactly they belong. They are struggling at the base of the Maslow (1971) ‘hierarchy of needs’ pyramid (Figure 3.5). Young people living where gun crime is rife are also deprived of basic safety, at risk of being chronically aroused by fear and terror. This over-stimulation in the young can lay the foundations in the brain and nervous system for a disposition towards insecurity and anxiety in the adult, anxiety being defined as 'a disproportionate reaction to danger, or even a reaction to imaginary danger' (Horney, 1937: 42). Educational curricula which lack input for emotional development could fail society in a way that would lessen the likelihood of people of vision emerging, such as the founders of Port Sunlight or New Earswick. The Headmaster of Wellington College, Antony Seldon (Education Guardian, 29 May 2007), claims that we would be a better, more harmonious society if the young were taught how to sing, dance, paint, act, write poetry, play tennis, play the guitar. He complains that schools only focus on linguistic, logical-mathematical intelligence, neglecting the five other intelligences – personal, social, artistic, physical, spiritual/moral. He argues that if a broad education were provided, young people, instead of using cannabis, would get buzzes from normal, healthy living. Robert Owen, in the nineteenth century (New Lanark Conservation Trust, 2004), provided the sort of curriculum advocated by Seldon. The industrialist Owen believed that one furthered the well-being of society as a whole by respecting and promoting the rights of the human being. Dancing, singing, art and nature study featured prominently in the curriculum of the New Lanark village school. Nature study was also part of the core curriculum in Owen’s school. Robert MacFarlane, writing in The Guardian (4 June 2005), pinpointed ecological consequences of under-education. Quoting Barry Lopez, he reflects, ‘The more superficial a society’s knowledge of the real dimensions of the land it occupies becomes, the more vulnerable the land is to exploitation for short-term gain.’

Figure 3.5 Maslow’s hierarchy of needs pyramid.
Designers and developers for many generations have known how to incorporate safe playing spaces for children in the layout of new towns, as exemplified in Port Sunlight. These were often neglected in twentieth century British housing estates. The obesity phenomenon is partly a side-effect of children opting for sedentary electronic games instead of playing outside with their friends. Parents seem to forget that the majority of paedophile predators are not total strangers, but people known to their victims, often close relatives, so they cosset their offspring, believing they are protecting them, but deprive them of the enjoyment and social skills which can only be learnt from playing spontaneously with peers. Gardens for children are everywhere in Freiberg; one conceptualizes ‘kindergarten’ afresh. Cycle paths are as necessary for the young as they are for adults. Teenagers could gain from the camaraderie, exercise and independence of cycling to and from school, instead of being dependent on special buses or on parents taking them to school and leisure venues. They might choose the bicycle as being a preferable mode of transport to passive motoring. Belatedly, in Britain, money is being found for cycle routes. Copenhagen leads the way with its integrated plans for healthy outdoor activity.

**THE RURAL IDYLL AND SUICIDE**

A swing to a one-dimensional position of belief in a return to a wilderness setting being a cure-all will disappoint. Among farmers and farm workers there is a high incidence of suicide, according to reports by Exeter University (Booth et al., 2000). In Devon between 1981 and 1993, the 62 suicides among farmers were more than in any other county in England and Wales. Thirty per cent of the farmers in the Exeter study, who had visited their GP or mental health services, had presented with exclusively physical symptoms. The Exeter report recommended that GPs should consider depressive and suicidal intention in farmers presenting with physical problems. A similar high incidence of suicide amongst farmers and farm workers was found in Scotland by Stark et al. (2006). In areas where farming is less common, according to the Scottish report, farmers and farm workers were more likely to die by suicide. This report highlighted that there were lower rates of close confidants, smaller social networks and working alone as factors in the farmers who had killed themselves. This echoes the findings of Brown and Harris, mentioned earlier, on the link between lack of close confidants and depression in women. The DEFRA Report (2008), covering England and Wales in the years 1993–2004, states that suicide rates among farm workers is lower than for farmers. Could this be because of the injustice experienced by farmers whose produce, work and prospects are being undermined by the major global supermarkets who have enormous purchasing power and can render farming economically unviable? They can keep prices down in the supermarkets by paying the farmer below or close to the cost of production of the produce. Small suppliers are consequently unable to protect themselves against economic exploitation. David Bosshart, in Cheap (2007: 168), focusing on the shopper, observes that we no longer see any relationship between the costs of producing a product and its selling price. ‘The customer has forgotten that there was ever a link between the two.’ The effect of ‘cheap’ on farmer and farm worker is a downward spiral towards deprivation and loss of self-esteem. The Drugnet Ireland Report (2005) notes that farmers are ranked fourth in the UK among professions likely to kill themselves.
In Ireland, suicide rates doubled during the 1980s and 1990s, a time of transition from an agricultural rural economy to an urban serviced one. Ireland is examining the rural suicide phenomena. Nuala Brady, Project Officer of the Young Men and Positive Mental Health Project, cites six factors identified in the suicides of male farmers in the Drugnet Ireland Report (2005): social and geographical isolation; poverty and economic hardship; low status; changes in farming including increased paperwork due to the Common Agricultural Policy; family and relationship problems due to insular community and working at home; retirement and loss of social contacts. The definition of suicide adopted in Ireland, by REACH OUT (2005), is: ‘A conscious or deliberate act that ends one’s life when an individual is attempting to solve a problem that is perceived as unsolvable by any other means.’

Education through the mass media to promote emotional literacy and lateral thinking, together with preventative health projects, might prevent some suicides in the farming community. Consideration of the reality of the lives of farmers everywhere, including the complexity of their social and economic needs, and a revaluation of the role they play, is essential for their survival in what is now a predominantly urban and industrialized culture. Suicide in the farming community may be prevented if policies are adopted that treat the needs of urban and rural society as complementary, as is done in Cuba, the focus of Chapter 4.

THE URBAN UNDERCLASS

Employees of the multinational corporations, where domination from the top is powerful and access to the wielders of power inaccessible to the worker, are victims of an out-of-control market economy. They frequently work in high-rise buildings. Most multinational companies only offer short-term contracts, using the guise of constant ‘restructuring’ to legitimize getting rid of some staff rather than promoting them. Staff appraisals are used as ploys to increase employee workload. This engenders a climate of insecurity and stress. These are often ‘total institutions’, frequently providing a cafeteria and gymnasium on the premises, discouraging union membership and demanding total loyalty. The employee who becomes too company dependent, believing in the propaganda of such corporate cultures, risks losing interest in civic affairs. It is in the interests of a company manufacturing cluster bombs, for instance, to distract the workforce from thinking about the implications and consequences of their work. Once an employee becomes aware of playing a part indirectly in exploiting or oppressing others, then that employee is caught up in conflicting frames of meaning. A common way of coping when thus conflicted is to rivet one’s attention on immediate circumstances, rather than on a long view, according to the American social scientist, Richard Sennett (1999). ‘The person in this situation becomes a prisoner of the present, fixated on its dilemmas,’ he observes. Individuals caught up in this process become psychologically warped. The computer programmer in the skyscraper or the farmer on the ground is equally a victim of the exploitative, consumer-driven culture, not in control in any meaningful way. The wide-ranging phenomenon of ‘focal attention’ as a way of coping with cognitive dissonance is conducive to passively and imperceptibly allowing an assault on the ecosystem. The poor, whether farmers unable to see a future, single mothers depending on cheap food and clothing, or disenfranchised, powerless workers, are as great a challenge as
the affluent voracious consumer to the well-being of the planet.

ECOPSYCHOLOGY AND JUNG

Ecopsychology is concerned with the interface between psychology and ecology, attempting to discover how people can connect with the natural world in ways that are healthy both for people and for the planet (Scull, 1999). The goal of ecopsychology is to help people connect safely to each other, to the community and to the environment. In the epilogue to *The Voice of the Earth*, Roszak (2001), synthesizes ecopsychology as eight principles:

1. The core of the mind is the ecological unconscious.
2. The contents of the ecological unconscious represent, to some degree, at some level of mentality, the living record of cosmic evolution.
3. The goal of ecopsychology is to awaken the inherent sense of environmental reciprocity that lies within the ecological unconscious.
4. The crucial stage of development is the life of the child.
5. The ecological ego matures towards a sense of ethical responsibility with the planet that is as vividly experienced as our ethical responsibility to other people.
6. Ecopsychology re-evaluates certain ‘masculine’ traits which permeate the structures of political power, driving us to dominate nature as if it were an alien realm.
7. Whatever contributes to small-scale social forms and personal empowerment nourishes the ecological ego.
8. There is a synergistic interplay between planetary and personal well-being.

What is striking about these eight principles is that they are inclusive, embracing our interconnectedness as human beings and our dependency on the cosmos. By ‘synergy’, Roszak means the needs of the planet are the needs of the person: the rights of the person are the rights of the planet. In wealthy Western societies, well-being is equated with the ability to consume. There is an assumption that prosperity is tied to purchasing power. In contrast, as we will see in Chapter 4, Cuba, a comparatively poor country, provides health care for everyone as part of a programme for total social well-being (Scarpaci, 1999: 204).

Ecopsychology, which sees individuals and society as being responsible for damaging the ecosystem, is indebted to the writings and spirit of the founder of analytical psychology, Carl Jung (Read, 1977). Jung is concerned with wholeness, with interconnectedness; consequently, a Jungian approach is invaluable as a corrective to our disconnectedness from our past, our future and from the planet. Christopher Hauke (2000) relates Jungian concepts to our era. Jung observed that a one-sided, specialized development always and inevitably leads to a neurosis (Meier, 2001: 357). Jung’s ‘collective unconscious’ concept embraces the common denominators observable, throughout time, in the way human beings have the same life stages, human needs, ways of perceiving and responding to the world. The relationship of the personal to the timeless collective, in the collective unconscious, he describes as ‘archetypes’ (Meier, 2001). The archetypes are ways of naming those fundamental aspects of human development and behaviour which are present in the themes and imagery of fairytales, art, sagas and religions, throughout time and in every culture – for instance, the archetype of the wise old man or wise old woman. There are four main archetypes. The ‘shadow’ is an archetype
apposite to the theme of this chapter. The ‘shadow’ is the suppressed or unlived side of a person, having either negative or positive traits, the ‘shadow’ having been suppressed or unlived because of religious, cultural, family or individual reasons. The ‘shadow’ is an archetype which needs constant monitoring, at the individual and collective levels. The zealot, for instance, who is prepared to kill medical doctors while organizing protest demonstrations for the rights of the unborn child, is murderously acting out his shadow side. The shadow at political level is exemplified when a government of a wealthy nation, which professes concern for alleviation of poverty in Africa, makes aid-giving conditional on the poor countries of Africa importing grain and other basic material from wealthy nations, thereby preventing poverty-stricken African countries, which cannot realistically compete in a global economy, from ever becoming self-sufficient. The ‘shadow’ can subtly delude both individual and group. By tuning into their shadow, the neurotically driven consumer can change; the reticent masses can become vocal. The ‘self’, in Jungian psychology, is the core of one’s being, a centring force to do with wholeness. The designer, by observing his shadow, could discern whether a building he proposes is meeting environmental imperatives or is simply a monument to himself.

**ECOTHERAPY**

Ecotherapy aims to reconnect us to the systems upon which we depend for life and meaning. Ulrich et al. (1991) were involved in an experiment when patients were shown pleasant, natural scenes. Measuring alterations in indices such as heart rate, skin conductance, blood pressure and muscle tension revealed that exposure to nature scenes had positive physiological benefits, leading them to hypothesize a direct beneficial effect on the parasympathetic nervous system. Burns (2005: 415) quotes Ulrich’s discovery of 1984 that hospital patients with a natural landscape view – compared to those who looked out onto a brick wall – were discharged more quickly, used less major pain-killing medication and were rated more cooperative by the hospital staff. Frank Gehry’s Maggie’s hospice, Dundee, illustrated in the introductory chapter (Figures 0.1 and 0.2), is an example of creative design incorporating research findings ecotherapeutically.

**PLACE**

Places are more than the physical spaces occupied by buildings or designated locations. Just as significant people in our lives, especially during infancy and childhood, become internalized in the psyche, so too with places. They become part of our sense of identity, of who we are and where we belong. Eyles and Litva (1998: 260) quote the anthropologists Relph (1976), Tuan (1977), Duncan (1985) and Weil (1955) to support their findings that place becomes embedded in our feelings and memories as a result of ‘repeated encounters and complex associations’. Places are experienced in the psyche as centres of felt value, of experience and aspirations of people; place is experienced as being important for the identity of the individual with the group; place is perhaps the least recognized important human need. Urban design could be said to be the design of places within the public realm. Chapter 1 described how Epidaurus became a great place of healing. Its form was shaped by the most accomplished architects of the day. It was a place where inducing, analysing and
interpreting dreams was the main method of Asclepieian healing (Gesler, 2003: 31). The healing itself had ‘physical, mental, spiritual, emotional, and social components’ (ibid.: 41). Place features in dreams. The dream place is often the key to unlocking the meaning of the dream. There is reciprocity between our dreams and ourselves, as stated succinctly by Shakespeare in *The Tempest*: ‘We are such stuff as dreams are made on, and our little life is rounded with a sleep.’ Freud and Jung both recognized dreams as an important reservoir in psychodynamic healing. Both were well acquainted with how different cultures, at different times, interpreted dreams. When working with dream content, Jungians veer the conscious self towards learning from the unconscious content of dreams. Revisiting our dreams helps to reconnect us with and to the ground of our being, with our place in the world, to become grounded.

**WELL-BEING AND HAPPINESS**

The WHO definition of health is synonymous with the notion of well-being. Happiness is an aspect of well-being; it is inclusive of sometimes feeling sad, angry or other uncomfortable feelings. The pursuit of happiness and well-being as a concept is used for diametrically opposite aims by the advertising industry and by those promoting positive psychology. Advertising exploits our vulnerability to feeling inadequate in order to market commodities and luxury goods, persuading us that by having particular items we will be fulfilled and happy. An illusory promise cannot yield well-being. The neurotic response is to increase consumption in pursuit of finding the right panacea. The requirements for happiness, yielded by the research carried out by Helliwell (2002: 6), are: health, employment, being married, believing in God, feeling that people can be trusted, and living in a country where trust is high. The economist Richard Layard (2006) believes we are programmed to seek happiness. Life, liberty and the pursuit of happiness are among the inalienable rights of man, according to the American Declaration of Independence. However, the USA and Britain, two of the wealthiest countries, are currently among the least happy. The finding of Kahnemann et al. (1999) – that whereas the average well-being for a society increases as the average income increases up to the equivalent of approximately US $10,000 per year, additional gross national product (GNP) above that level adds little to the average happiness ratings of that society – is quoted by Felicia Huppert et al. (2005: 5), who points out that those countries with the least disparity between rich and poor, i.e. the Scandinavian countries, are the most contented. Satish Kumar, Editor of *Resurgence* (2007), warns: ‘When humans and natural resources are sacrificed to the economy, then the balance of ecology is destroyed.’

Lord Layard, in his book *Happiness* (2005: 16), recommends that we should monitor the development of happiness in our communities as closely as we monitor the development of income. Many of his recommendations echo those stated and implicit in this chapter. For Layard, happiness and care for others is a seamless garment. ‘To become happier we have to move to a positive sum game in which we care positively about the well-being of others.’ He pleads for psychiatry to be seen as a top branch of medicine. Happiness he conceptualizes as being part of ‘emotional intelligence’. Layard recommended in the Ashby Lecture at Cambridge University that every school should adopt scientifically evaluated approaches to the teaching of emotional intelligence. Schools should teach young people
‘about the main secrets of happiness for which we have empirical evidence,’ he insists. The Cambridge lecture marks a shift away from the twentieth century reactive approach to social dysfunction, from the focus on psychopathology, away from the emphasis on rationality in the curriculum content, towards a positive psychology.

**POSITIVE PSYCHOLOGY**

Seligman (2002), the exponent of positive psychology, identifies three facets of happiness: increasing positive emotion; engagement and absorption in whatever one does which is of interest to oneself; using one’s resources in something larger than oneself, giving life meaning and purpose. The research findings on happiness, together with the evidence that more equitable income distribution is highly correlated with the average level of well-being in society, lead Layard and Felicia Huppert to believe that as a result of disseminating these findings, political groups will be motivated to transcend short-term self-interest and produce policies that will improve well-being for whole societies.

Cognitive behaviour therapy aims to enable people to change from unhelpful, negative perceptions of situations towards conditioning themselves to choose more helpful ways of perceiving, concurrently altering how they feel at a visceral level. This process increases positive emotion. Getting into the habit of looking for helpful ways of seeing a situation sets in motion an upward spiral of positive behaviour and a holistic state of well-being. It is similar to the neuroscience idea of it being possible, with skilled help, to lay down and establish new neural pathways, to replace the triggering of neurotic responses. Seligman, elaborating on his second constituent of happiness, quotes Csikszentmihali’s concept of ‘flow’. ‘A person “in flow” feels as if time has stopped, and is completely focused on the task at hand.’ An artist wholly engaged in designing and producing a mosaic, a novelist bringing characters to life, in particular settings, a receptionist who succeeds in putting people at ease and making them feel welcome, all exemplify ‘flow’. Seligman reflects that someone who uses all three routes to happiness is leading the ‘full life’.

**THE FULL LIFE**

To lead the full life is, nonetheless, contextual. Climate change is well under way; too many rain forests have been destroyed and the carbon emissions from aircraft are increasing destruction. Leading the full life involves self-control. George Monbiot (2007) is emphatic that we have to stop flying, support the government in the taxation of airlines and use public transport instead of private cars in order to diminish the momentum of climate change for which we are responsible. It is paradoxically true that happiness is often found not by pursuing happiness per se; rather it is a state experienced, when one is engaged, with integrity, in simply living ‘the full life’. Just as the architect and planner have precedents for what is holistic practice in places such as Port Sunlight, Epidaurus and Maggie’s Dundee, likewise for the individual citizen, with role models such as Gandhi, Mandela and Francis of Assisi. Thirteenth century Italy was a time of warring cities and provinces. Francis’s decision to reorientate his life came while he was imprisoned as a young soldier. The renowned advocate of peace emerged from a war-torn context. Gandhi and Francis renounced possessions, while fully engaged in the flow of...
living the full life, while Mandela managed to live the full life in jail. The challenge they present to the hollowness of consumerism is obvious. These influential role models, from within their respective traditions, lived what is best in the yearnings of the collective unconscious of their particular zeitgeist. Inspiration and example on how to live holistically now can likewise come from a neighbour or family member.

CONCLUSION

This chapter is an overview of the relationship between human beings and their environment, taken at different levels: cosmic, ecological, economic, architectural, social and the inner environment of the psyche, the recipient and processor of these external influences. The limitations of linear, compartmentalized thinking in economic and physical planning was shown to be responsible for environmental pollution and also for unhealthy conditions which ignore the needs of the majority, especially women and children in cities, the poor in Africa and small farmers in Britain. Rethinking afresh, in a way which prioritizes inclusiveness and contextual awareness, was demonstrated as having worked, in the examples cited of therapeutic environments in Britain, Denmark and Germany. The Jungian concept of wholeness and interconnectedness was the leitmotif throughout the chapter. It was argued that an understanding of how neuroscience explains the development of the brain – the inputting and processing of external stimuli and foundation laying of neural communication systems – could be used as a model, par excellence, to improve listening and communication, by all involved in projects, welfare or design for others. This led to a recommendation that curricula in education include ecological awareness, participation in the arts, cycling and emotional literacy. Roszak’s notion of ecopsychology being an interplay between planetary and personal well-being led to a consideration of what constitutes well-being and happiness. Research evidence was used to show that altruism is part of contentment, most evident in egalitarian societies, which agree to share wealth, and to respect and share the earth’s resources.
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INTRODUCTION

The case study of Cuba completes the theoretical section of the book. The aim of this chapter is to make concrete some of the theoretical issues about health and well-being that have been introduced in the previous chapters. This section of the book started with a case study of Epidaurus, which highlighted the therapeutic properties of an ancient healing place. The Sanctuary of Asclepios at Epidaurus was a very special place. It was off the beaten track, remote and isolated, a place where supplicants could visit, leaving behind the stress of everyday life in the pursuit of healing. Twenty-first century Cuba is a complete contrast to ancient Epidaurus: it is very much a working environment, the home for just over eleven million people. The case study will concentrate on the capital, Havana, a beautiful, but noisy, decaying metropolis of two million people. Cuba has been living virtually under siege conditions for nearly half a century. Consequently its people are not amongst the wealthiest in the world. Health care in Cuba is holistic. It seems that Cuba, more than most other countries, lives according to the principles of ecopsychology outlined in Roszak (2001).

In Cuba, ‘An integrated approach to health care combines prevention with cure, and treats the individual as a bio-psycho-social being, living and working or studying in a given environment. This is, of course, a materialist approach in which the individual is viewed as a social being (worker) in harmony with the physical environment’ (Feinsilver, 1993: 29). Policies for education, rural development, urban agriculture and health are centred on the well-being of the individual while emphasizing care for the environment and the need for sustainable development. There are critics of some aspects of Cuban development. Nevertheless, using international measures of well-being Cuba, within the constraints of the limited budget of a Third World country, has achieved a high standard of health care.

GENERAL BACKGROUND TO HEALTH CARE IN HAVANA

Cuba is an island nation in the Caribbean Sea: it has a total land area of just over 110 000 square kilometres or nearly 43 000 square miles (Figure 4.1). The population of Cuba in 2001
was approximately 11.24 million people. Despite pursuing rural development policies aimed at retaining rural population and containing the drift of people to the cities, there is an increasing rate of urbanization: 75.5 per cent of the population live in cities, with approximately 2.5 million people living in Havana. As a result of the Spanish–American War at the end of the nineteenth century the Spanish withdrew from Cuba and the island state gained independence in 1902. American trade and influence dominated Cuba in the first half of the twentieth century. In 1959 revolutionaries, in effect led by Fidel Castro, ousted the Cuban leader, Batista (Gott, 2004: 165–72). Castro, in alliance with the Soviet Union, transformed Cuba into a declared Socialist Republic. Castro remained in power from 1959 until 2006, when because of illness he stepped down from office in favour of his brother. Relations with the USA and Russia have had major consequences for development in Cuba. Since 16 April 1961, when Castro declared Cuba to be a socialist state, relations with the USA have been less than cordial. Low points in that relationship with the USA were in the 1960s. First, there was an attempt to topple Castro by CIA-aided Cuban exiles in 1961. The invasion of Cuba at the Bay of Pigs was unsuccessful. It was quickly followed by the USA banning all US–Cuban trade, making travel, commercial and financial transactions by US citizens to Cuba illegal. For the next 30 years Castro pursued closer relations with the Soviet Union. Tension between the USA and Cuba peaked during the October 1962 Cuban missiles crisis. The crisis was finally resolved when Russia agreed to remove all its missiles from Cuba and in return the USA agreed to respect the sovereignty of Cuba and not to invade again (Kapacia, 2005: 120; Suchlicki, 2002: 147–8).
When the Soviet Union and the ‘Eastern Bloc’ broke up in 1991, Cuba’s economy was practically destroyed. Eighty per cent of Cuba’s trade was lost and living conditions deteriorated. A ‘Special Period in Peacetime’, a virtual state of emergency, was declared to deal with the extreme shortages of food, fuel and other goods. In response and hoping that it would lead to Castro’s removal, the USA tightened its trade embargo. It is against this economic background that Cuba’s development in health care should be assessed. In the words of Scarpaci (1999):

‘Cuba has an elaborate health care system. It supports medical science, health status and health services. Cuban health care is at the pinnacle of international standards. This is a remarkable accomplishment for a developing nation. Its search for universal high-quality care is even more remarkable in the midst of the dissolution of the USSR, the Council of Mutual Economic Assistance (CMEA) and the crisis of Third World debt.’

EDUCATION IN CUBA

The literacy rate in Cuba at 96.5 is high by any standards. This has not always been the case. The institution of compulsory education for all children was written into the Cuban constitution of 1940, long before the Castro revolution. However, until that revolution Cuban education was characterized by gross inequalities regarding access to resources and educational opportunities. These inequalities were particularly apparent between education in the cities and in the rural areas. In 1958 one million people were completely illiterate. In response to this challenge the Cuban government, in 1961, embarked on a national campaign to improve literacy (Kapacia, 2005, op. cit.: 119–20). Teams of students were dispatched to every home in the countryside where there was illiteracy or innumeracy, to teach those so deprived in the evenings. This team of 100,000 volunteer teachers became known as the ‘brigadistas alfabetizadores’ (‘literacy brigadistas’). The ‘teachers’, young students, were equipped with a lantern, pencil, jotter and a week’s training (a personal account from a former literacy brigadista).

Despite the economic upheavals of the 1990s, education expenditure continues to receive high priority. Education is free in the sense that it is state provided. Cuba has extensive tertiary education, with 47 universities having an enrolment of over 100,000 citizens. In addition ‘distance education’, or adult education, is offered in 15 centres, which provide afternoon and evening classes for workers, leading to a degree. According to a UNESCO report of 1998, third- and fourth-form students performed better in mathematics and language skills than their fellow students in other Latin American countries. This was no small achievement for a small country undergoing a severe and debilitating economic upheaval.

The main criticism of the educational system in Cuba is centred on the charge of political indoctrination. As early as primary school a ‘cumulative school file’ is kept for each student. This is similar to a continuous school report. The report, however, is not limited to academic achievements. Also, it is alleged, the report is to record community or revolutionary integration of the student and her or his family. Embedding the young people in the life of the nation is also achieved through a system of community work. Students are expected to do 30 days work per year on the land for a period of six years: this work is also seen as a form of agricultural education. Graduates are later required to engage in ‘community service’ for a period of three years. For those of us from
a 'liberal democratic tradition', priding ourselves, as we do, on a cherished diet of freedom, this overt process of socialization appears alien. But even from within the liberal democratic tradition it is difficult for the British to appreciate fully the need for young children to sing a country’s national anthem before starting school. Yet such symbolic gestures of national identity have great cultural meaning in some societies. In Cuba membership of a church or religion was forbidden for many years, as was teaching children about God. Is this any more or less objectionable than insisting that ‘creationism’ should be taught as science? The criticisms of Cuban education seem to be generated from within a narrow cultural framework, which underestimates a great achievement in difficult circumstances.

The purpose of this book is not to advocate any particular form of government. The purpose of this chapter, in particular, is to see if there is anything that can be learnt from Cuba that may be applicable in our own culture:

Figure 4.3 Trinidad.

a culture that is as different from Cuba as it is from the ancient world of Epidaurus. Cuban society is egalitarian in the sense that there is little apparent disparity in wealth between the poorest members of society and the richest. From the theoretical literature in Chapter 2 the egalitarian nature of Cuban society seems to be a solid foundation for general well-being (Layard, 2005: 52; Huppert, 2007; Mark, 2007). Secondly, there seems to be a higher authority, in this case the nation, to which the individual is responsible: in some ways the equivalent of belonging to a religious group. This bond is established early in the life of the child and reinforced throughout school and adulthood. As we have seen from the literature, being part of something greater than oneself is, in itself,
conducive to a sense of well-being. Thirdly, from early in school life children are introduced to the environment and the art of food production. Again, in the literature, we have seen the importance of being near to nature and that actually working on the land is a therapeutic activity (Milligan, 2004). Clearly, education in Cuba contributes to the general well-being of the population as a whole.

**RURAL DEVELOPMENT**

Unlike most countries which achieved political independence during the last century, in Cuba the plight of those living in the countryside was addressed immediately, so that small farmers could stay put instead of flocking to the capital for work, as happened in Bogota in Colombia or Lima in Peru, for instance. Cuba, like its giant ideological cousin China, pursued the combined objectives of rural development and rural population retention. Both countries followed the twin policies of retaining labour on the land, and decentralizing industrial production and services to promote regional equity. ‘Cuba, because of its initial resource and administrative advantages, was able to undertake a much more rapid transfer of economic opportunities and services to rural areas without reducing wages of the urban proletariat or services available in the cities. Cuba was able to create an economic climate favourable to population retention in rural areas without use of administrative controls on population distribution independent of economic incentives’ (Simmons, 1983) (Figures 4.2–4.6).

Before the Castro Revolution nearly half of the arable and grazing land was owned by 1 per cent of the population. Large estates accounted for three-quarters of farmland. Sugar production played a dominant role in the Cuban
economy throughout most of the twentieth century, right up until the mid-1980s. Most of the land holdings were bought during the 1920s, when world sugar prices were depressed and land was bought very cheaply. Castro’s first agrarian reform law, in 1959, aimed to limit the size of landholdings and to redistribute land in ‘vital minimum’ tracts to small farmers. Compensation was based upon tax assessment values, which in turn were based upon the deflated land values of the 1920s, the payment being made in 20-year government bonds (Suchlicki, 2002, op. cit.: 138–42). This turned out to be a good deal for the government and the people it represented, but caused much resentment amongst the former landowners. But as Gott (2004, op. cit.: 171) points out, ‘The land reform itself was moderate, only the rhetoric was revolutionary.’

After the revolution, sugar continued to play a dominant role in the Cuban economy. Agriculture was run on agro-industrial lines under the growing influence of the Soviet Union. Cuba was able to sell its sugar at inflated prices and in return was able to buy cheap petroleum and agrochemicals. The inevitable result was the loss of mixed-use land, supporting traditional types of farming, in order to feed the needs of one cash crop. The island lost the ability to feed itself. It became dependent on imports for as much as 57 per cent of all calories consumed. For example, Cuba imported ‘100 per cent of wheat, 50 per cent of rice, and up to 90 per cent of its beans’ (Cuba Organic Support Group, 2003). This experience in Cuba mirrored similar economic changes in developing countries dependent on commercial trade with countries in the rich north: a process which is still continuing.

The ‘Green Revolution’ in Cuba, or the ‘Era of Rectification’ as it is known there, started in the mid-1980s, predating the collapse of the Soviet bloc. It was, however, the economic chaos caused by the break in the Soviet economic lifeline to Cuba which stimulated the agrarian changes, already in their infancy. It is this change in outlook and environmental philosophy in Cuba that is so informative for those concerned with the health of both the individual and the planet. As part of the restructuring of agriculture, some state farms were turned into workers’ cooperatives and the dominance of monoculture gave way to sustainable organic farming with mixed crops for local consumption. To feed the hungry, Cuba had to produce twice as much food with less imported chemical input. This change of direction had to be achieved on once rich land impoverished by years of poor husbandry and reckless exploitation. The dependency on mechanization, artificial fertilizer and
insecticides had left the land in poor condition, sterilized by the chemical input and salinized by excessive irrigation. ‘Government incentives encouraged people in large urban centres to move back to work on the land … Organic methods such as integrated pest management, crop rotation, composting and soil conservation were implemented. Research institutes were set up to develop more sophisticated techniques such as worm composting, soil inoculants and biopesticides’ (ibid.).

There have been some notable successes in Cuban environmental conservation. For example, there has been a recovery of forest areas with a reforestation effort, which started in the 1970s. Since the early 1990s, over 100,000 hectares of forest have been replanted every year. There is also a major ecological initiative to bring this tree planting to the city: two million trees will be planted in the city over the next few years, which will include 200,000 fruit and nut trees. Ten per cent of the land in Cuba is officially protected land upon which building and development is forbidden. There are five national parks in Cuba, while four areas have been officially designated as UNESCO biosphere reserves (Cuban Wildlife Guide, 2008) (Figures 4.7 and 4.8).

### URBAN AGRICULTURE

In 2000 President Clinton signed the Trade Sanctions Reform and Export Enhancement Act, which permitted US firms to sell food and agricultural products to Cuba. Following the devastation caused by Hurricane Michelle on agricultural areas in Cuba, the country began to import food and agricultural goods from the USA. These purchases amounted to $4.3 million in 2001, $136.6 million in 2002 and $256.9 million (approximately £128 million) in 2003 (Alvarez, 2008, op. cit.). By 2003 Cuba had become an important food and agricultural export market for the USA. Despite this relaxation of trade in food and agricultural products, it did not fully compensate for largesse worth billions of dollars from the Soviet Union which was lost at the beginning of the 1990s. Cuba, it is estimated, at that time lost two-thirds of its food supply, most of it coming from the Soviet bloc. The 11.5 million people of Cuba were forced to pursue unconventional methods of food production (Kovaleski, 1999; Viljoen, 2005). This was particularly true for the capital Havana. Havana covers approximately 727 square kilometres, or nearly 0.7 per cent of the land area of Cuba. Its 2.2 million inhabitants make up 20 per cent of the Cuban population. Until the early 1990s, in Cuba, growing food was considered part of a peasant’s life. This lifestyle change from rural peasant to urban sophisticate was, as one
would expect, most apparent in Havana, the capital, and home to one-quarter of Cuba’s population. Despite this change of lifestyle severe food shortages required drastic measures to procure food.

‘By the end of 1992, food shortages had reached crisis proportions throughout Cuba, including the capital city Havana ... Like many large cities, Havana was a food consumer city, completely dependent upon food imports brought in from the countryside and from abroad. Havana had no food production sector or infrastructure, almost no land dedicated to the production of food. Worsening food shortages motivated Havaneros to spontaneously begin to plant food crops in yards, patios, balconies, rooftops and vacant land sites near their homes. ... Many began to raise small animals – chickens, rabbits, even pigs. ... By 1994 hundreds of Havana residents were involved in food production. The majority of these urban growers had little or no access to much needed agricultural inputs.’ (Pinderhughes, 2004)

It was only later that the Cuban government stepped in and supported this spontaneous movement, creating the Urban Agriculture Department in Havana. The new department secured land-use rights for all urban growers, set up a network of extension agents to advise on urban agriculture, set up seed houses, centres to harness microorganisms and to produce biofertilizers. Most countries believe that agriculture is an unsuitable occupation in urban areas. Certainly, it is carried on in many Third World cities but without official support and backing. Indeed, it is frowned upon as being ‘backward’ (Moughtin et al., 1992). In contrast, Cuba has developed an ‘extensive state-supported infrastructure to support urban food production and urban growers’ (Pinderhughes, 2004, op. cit.) (Figure 4.9). The three types of garden supported by the Cuban government are known as huertos (kitchen garden), organoponics (usually concrete constructions) and auto-consumos (gardens attached to institutions). The huerto is equivalent to our allotments or smallholdings: they may be individual, family or collective, ranging from a small postage stamp of a garden to two or more hectares. There are more than 19 000 individuals organized into 800 garden clubs throughout the capital. Auto-consumos are horticultural units attached to a college, hospital or factory. Their primary objective is to produce food for the lunches of students, staff, patients or workers in the institutions. Organoponicos originally were defunct hydroponic units which had been filled with composted sugar cane waste and used to grow vegetables and herbs organically. The success of this experiment led to the building of new ones, which were sited on any piece of wasteland, including defunct car parks. Organoponico has now become the general
name for any urban market garden with raised beds of soil (Cuba Organic Support Group, 2003). The raised bed is extremely efficient in vegetable production. ‘Yields from intensive farms have been found to be 1 kg of vegetables per square metre per month, while organoponicos yield about 2.5 kg of vegetables per month’ (Viljoen, 2005, op. cit.). The output from urban farming is impressive. According to Pinderhughes (2004, op. cit.), ‘In 1997, urban farms and gardens in Havanna provided 30 000 tons of vegetables, tubers and fruit, 3650 tons of meat, 7.5 million eggs, and 3.6 tons of medical plant materials … small-scale urban rice production is now producing as much rice as large-scale state owned farms in rural and peri-urban areas.’ Kovaleski (1999, op. cit.) notes that ‘Overall, the government estimates that 117 000 people work in urban agriculture and that the gardens account for about half the vegetables grown in Cuba.’ The urban gardens that started as a spontaneous response to severe food shortages have become an essential part of the Cuban economy, with some districts of Havana producing about one-third of their food, saving the need for imports using hard currency. The government has helped thousands of families and individuals set up home gardens, plant fruit trees and rear small animals. Cuba, in this field, is an exemplar for the rest of the world as it faces the consequences of climate change (see Viljoen (2005) for a thorough account of Cuba’s urban gardening and for ideas about adapting this system to Britain). The urban gardens of Cuba make a major contribution to the health of citizens by guaranteeing a large measure of food security, freeing people from a major cause of stress. The urban gardens also encourage a healthy active lifestyle and provide a diet of healthy food produced without chemical inputs harmful to human and environmental health.

**THE HEALTH CARE SYSTEM IN CUBA**

We have seen earlier in the chapter how education, rural development and urban agriculture in Cuba have direct implications for the general health and well-being of Cuban citizens. We now examine the health industry itself to see how it fits holistically into the other main Cuban policy areas. The following analysis uses Gesler’s four environments as informed by Scarpaci’s (1999) work in Cuba. They are: the natural environment, the built environment, the symbolic environment and the social environment (Gesler, 1993, op. cit.).

Economic necessity has seen the need to introduce nature into the Cuban urban environment. It has taken the form of intensive gardening being practised on every free (unused) piece of urban land. Furthermore, the law protects urban farmland from erosion by competing economic uses. This sends out signals that the well-being of the individual is of
paramount concern. This concern is expressed in other, more direct ways. On the wall of Calixto García hospital is the sign 'The health of one man is more valuable than all the land of the wealthiest man in the world' (Scarpaci, 1999, op. cit.). The protection of urban land for gardening is the evidence that this piece of medical propaganda is not simply fine words. The sentiment is put into effect by the way the land on which the city is built is used. Furthermore, the urban gardens bring people into direct contact with nature.

Conservation of the Cuban countryside is given great prominence. UN declarations about environmental protection, biodiversity and sustainable development are enacted as part of Cuban law. The protection and development of rural Cuba is founded on the aim to limit the size of the capital city, Havana. A key plank of planning in post-revolutionary Cuba has been an emphasis on rural as opposed to urban development. For example, both Havana and Lima in Peru had populations of about one million in the late 1950s. In just over 40 years Lima’s population grew to six million while Havana grew to just over two million: there is no slum development in Havana, on the scale of most developing countries. The Cuban goal of distributing services more evenly throughout the country has also resulted in a more evenly distributed population in pleasant smaller urban centres (Figures 4.2–4.6). The island so organized was better able to withstand the economic disaster of the 1990s: people were closer to a food supply and not so dependent upon expensive travel at a time of severe oil shortages. This policy promoted both the ecological health of the environment and the well-being of the people of Cuba. It may also prove to be the kind of population distribution best able to sustain health and well-being in the face of possible future economic crises brought about by climate change.

Health care facilities, doctors, surgeries, clinics and smaller hospitals are located evenly throughout Cuba, in accordance with the doctrine of decentralization. However, tertiary and specialist medical facilities are located in Havana, capitalizing on economies of scale and building upon many years of health investments predating the revolution. The wonderful street architecture of Havana makes the city an architectural gem and a fitting environment to be designated a World Heritage Site (Figures 4.10 and 4.12). Despite this magnificent architectural heritage there is evidence of neglect and urban decay (Figures 4.9 and 4.11). What fails to be done in the built environment can inform the viewer. In the case of Havana, areas of public spending such as health take priority over expenditure on the built environment.

According to Gesler (1993, op. cit.), reading the symbolism of the built environment uncovers the meaning attached to public

Figure 4.10 Baroque Cathedral, Cathedral de la Virgen Maria de la Concepcion Immaculada.
space. Land is not privately owned in Cuba – it is therefore not exchanged in the marketplace. The value attached to land is therefore not normally expressed in monetary terms. In a market economy, many of the garden plots would be converted to a more lucrative use. The most prestigious building, and one of the tallest, in Havana, formerly the Bank of Cuba, has been converted into a hospital. The whole tenor of the built environment speaks of health: investment has been directed to health infrastructure; the urban garden is a constant reminder of nature, a source of food and exercise; the bicycle and walking are ubiquitous methods of transport; and advertising of fast food does not deface the built environment.

Despite the priority given to, and the respect shown for, the health industry and its workers in the Cuban built environment, members of the health professions are easily accessible to all. Medical treatment is free to all Cubans. Cuba is a relatively egalitarian society. Certainly, Cuba has its urban poor, but there is no great disparity between rich and poor in society. Perhaps this apparent disdain of riches trickles down from Castro, the Father of the Nation, who, it is alleged, ‘genuinely dislikes money’ (Vulliamy, 2008). More simply, it may be the effect of a powerful political machine. Whatever the reason for the relatively egalitarian nature of present-day Cuban society, we have seen in Chapter 3 that happy healthy societies tend to be egalitarian, though they need not necessarily be organized with such centralized control, like the Soviet model.

**CONCLUSION**

Health is an area of public policy where Cuba has been immensely successful, exporting doctors and medical experience to other developing countries. Furthermore, Cuba has an active health tourism industry, offering products like the destruction of kidney stones, open-heart surgery, microsurgery to correct myopia, neural transplants to treat Parkinson’s disease, amongst others. The health statistics for Cuba are impressive (Feinsilver, 1993, op. cit.: 93). In 1990 life expectancy for Cuba was 75.2 years compared with 75.5 in North America and 66 in Latin America. In 2001, life expectancy had increased to 76.3, which compares favourably with European countries. In the early 1990s Cuba’s infant mortality rate was 11.1 per 1000 live births and was ranked third out of 191 countries (Scarpaci, 1999, op. cit.). Since then infant mortality rates have continued to fall, from 10.2 in 1992, to 7.9 in 1996, to 7.2 in 2001. These remarkable achievements have to be seen against a backdrop of a most severe economic downturn of almost catastrophic proportions. ‘Despite the economic difficulties of recent years, spending on public health has increased
steadily, which reflects the political will to maintain the successes achieved in this area. In 1994, health spending ... totalled 10611 million pesos, 17% higher than 1989’ (Pan American Health Organization, 2008). Health spending remains a priority: the Annual National Health Expenditure in 2001 was 6.7 per cent of gross domestic product (GDP). The country has nearly 60 physicians per 10,000 inhabitants, which is a total in excess of 60,000 physicians in all (ibid.). Evidence for the priority given to health is also apparent in other less overtly medical statistics. For example, literacy levels are high at 96.4 per cent, while 93 per cent of the population has access to drinking water services. The Cuban immunization system has eliminated three diseases (poliomyelitis, diphtheria and measles). The level of the immunization coverage for all vaccine-preventable diseases is almost 95 per cent. These statistics bear witness to a remarkable achievement for a developing world country at ‘economic war’ with its powerful neighbour for 40 years. Its achievements for those wishing to plan for health and well-being make an important case study, a powerful statement of what can be achieved with political will. Health care is holistic in Cuba; it encompasses physical planning, education and food production, in addition to a very fine health service available to all citizens free of charge.
PART 2

THE BRITISH TRADITION
INTRODUCTION

Part 1 explored the theories about the nature of the therapeutic environment – that is, those theories about the kind of environment which promotes health and well-being. The theory was applied to two case studies, ancient Epidaurus in Greece and twentieth century Havana, Cuba. Both of these case studies, while throwing light on the nature of the therapeutic environment, are culturally quite different from Britain as it is now, or as it is likely to be later in the twenty-first century. Part 2 of the book aims to relate the theory to Britain and its cultural traditions. Part 2 has five chapters. It begins with Chapter 5, a case study of Bath. Bath is a very British city, which has had a reputation for healing dating back to the Celts – long before the Roman occupation of the country. It remains a centre actively associated with therapy and has been operating as such for well over 1000 years – as long as Epidaurus at its apogee. Chapter 6 will examine the development of the ideas linking health and nature during the latter part of the eighteenth and the early part of the nineteenth centuries. It will concentrate on the work of the poets and their protest against the destruction of the environment, the plight of the poor and the barbarity of urban conditions. The chapter, which is entitled ‘The age of protest’, draws parallels with today, the awakening of concern for the environment and its effect on general health and well-being. Chapter 7 is a case study of New Lanark, developed by Robert Owen at the end of the eighteenth century. Many of Owen’s ideas have great resonance today: his concern for the well-being of his workforce and the care he took in the design and planning of the physical structures in which they lived are still informative. Chapter 8, ‘The city sanitized’, examines urban developments and landscape in the nineteenth and early twentieth centuries, carrying on the theme established in the chapters on the work of Owen and the ‘poets of protest’. An important section of the chapter deals with the sanitary reforms of Chadwick, still the foundation for health in twenty-first century Britain. Chapter 9, the final chapter of Part 2, is a case study of Port Sunlight on Merseyside. Port Sunlight, together with the other garden villages developed by philanthropic industrialists for their factory workers, are the models for so much of suburban Britain built in the twentieth century. In these developments they seem to have captured the imagination and aspirations of the typical British family. The garden suburb is very much in the mainstream of British culture, providing healthy surroundings in which to bring up a young family. Part 2 is the platform for the development of ideas about a sustainable, therapeutic environment for Britain in the next decades of this century, while facing the challenge of a changing ethnic mix, and a climate that in many ways will be less hospitable.
INTRODUCTION

The case study of Epidaurus demonstrates clearly how some places become well known, perhaps even famous, for healing. The reputation of each place grows, dies and is sometimes rekindled. Human beings seem to have a need for physical, mental and spiritual healing; we need to have a sense of well-being. At certain times, particular places, for some people, fulfil this need. These places gain a reputation, rightly or wrongly, for healing; they are perceived to serve this function successfully. This perception of a ‘healthy place’ is a cultural construct, not a verifiable scientific truth, except in the sense that the extent of that perception can be gauged. Bath, like so many of the spa towns throughout Europe, is one such centre with a reputation as a healing place. This reputation for healing stretches back 2000 years, with the famous periods being in the Celtic, Roman, Medieval and Georgian periods. Its reputation has recently revived with the opening of the new ‘Thermae Bath Spa’ and a number of hotels offering ‘spa breaks’. Bath is very much a centre for therapy of the twenty-first century. Bath is also a very fine city built in the period when architectural styles varied little. It is a unified piece of urban design, much loved and admired by tourist and native alike. It is a typically English city. For that reason, together with the contribution it has made in the field of urban design, Bath was chosen as the basis on which to build the study of the British contribution to planning for a therapeutic environment. The rest of the chapter will use Gesler’s (2003) four aspects of the environment to analyse the city of Bath as a place devoted to healing so that conclusions can be drawn with which to inform later chapters.

THE MYTH

Bath’s reputation as a centre of healing is rooted in the received idea, promulgated over many generations, that its mineral waters are an effective cure for a number of ailments and that contact with them promotes health and well-being. People are still willing to pay £50 per day for a spa session at ‘New Royal Bath’, proof that these notions have currency today. Bath’s reputation dates back to the Celts, perhaps as far back as the ninth century BC.
For the Celts this was a place connected to the underworld and with the goddess Sulis. Sulis, like Asclepius, was imbued with healing powers. The particular legend associated with a specific cure concerns Bladud, the son of a king of the West Country. Bladud, being a leper, was banned from the court. He then became a swineherd in voluntary exile. After being infected with his sores the pigs wallowed in the hot mud and were cured. Seeing the pigs cured, Bladud became the first to use the hot springs of Bath. Cured, Bladud returned home and became king. Myths like this are powerful symbols of beliefs common in a culture. As such they affect the way people relate to the mysterious environment surrounding them. These beliefs and perceptions are woven into the traditions of a place. From time to time, in that place, these traditions take on a greater or lesser significance. During the Middle Ages, for example, when therapy was closely related to religion and the miraculous, the Bladud legend and its traditions had great significance. By contrast, in the seventeenth century, Bath’s reputation declined when science began to question miraculous claims and only revived again during Georgian times. In the late 1970s the baths were closed because a young person developed fatal meningitis after visiting the baths. This probably represented Bath’s low point in terms of its reputation as a healing centre. Recently this reputation has undergone a revival with the opening of the fashionable ‘New Royal Bath’. Today, despite a universal, free and proven National Health Service, complementary medicine including a variety of therapies and holistic treatments are in vogue, a witness to the permanence and powerful attraction of places like Bath.
THE NATURAL ENVIRONMENT

Bath lies in a deep bowl: steep limestone cliffs at the southern end of the Cotswolds encircle it. Through this bowl flows a sluggish River Avon. This dramatic landscape setting was and still remains a key attraction for visitors. Early in Queen Victoria’s reign a fashionable and widely travelled London doctor wrote of Bath:

‘Of all the Christian cities, Rome excepted … Bath presents the most striking amphitheatrical spectacle which a traveller can behold … As we approached the city nearer and nearer, coming from the south, a sight burst suddenly upon me … hundreds of enchanted palaces appear, one placed higher than another, until the highest appear to touch the dark azure vault of heaven. … The twinkling of all the gas lights, profusely arranged in front of the many terraced edifices and crescents placed on different hills … presented to my mind a scene unequalled in any city.’ (Granville, 1841, republished in 1971)

Although we would not now write or speak of Bath in such flowery terms, nevertheless the city retains the magical image of a garden city sitting in its own natural amphitheatre.

Nature’s gift to Bath, the spa water, fell as rain about 10,000 years ago on the nearby Mendip Hills. It was driven down through permeable carboniferous limestone cave systems by the pressure of a high water table in the catchments. The water reaches depths of two to three kilometres where it is heated. It gushes forth to penetrate the overlying impermeable Lias clay through fissures to rise at three places in Bath. The greatest of these springs is King’s Spring, with a flow of 13 litres per second or just over one million litres per day. The temperature in the King’s Spring is 46°C (115°F). The other two springs are Hot Bath at 49°C and Cross Bath at 40°C (120 and 104°F respectively). These three sources of water, with calcium and sulphate ions amongst the 43 mineral traces, are the physical reason for Bath’s pre-eminence as a health resort (Cunliffe, 1995). But it is the built environment where this gift of nature has been architecturally expressed that accounts for the popularity of Bath for its visitors. Certainly, it is this urban form, so sensitively related to its fine landscape setting, that is of great interest to the student of urban design and city planning.

THE BUILT ENVIRONMENT

It seems clear that the Celts were drawn to Bath for purposes of ritual worship. The Celts had specifically designated sacred locations known by the Gallo-Britannic word nemeton. The word recurs throughout the Celtic world as, for
example, in *Aquae Armemetiae*, the sacred spring of Buxton (Figure 5.1). Such sacred locations were often associated with a grove. According to Cunliffe (1995, ibid.) there is archaeological evidence to support the idea that such a sacred Celtic grove existed at Bath. The sanctity of springs, as we saw demonstrated in Epidaurus, may result from a Mediterranean influence but it is certainly widespread throughout Europe. Usually the holy wells or springs were presided over by female deities: Celtic belief related earth and place to goddesses. As Cunliffe (1995, ibid.) points out:

‘The continuation of this belief pattern is shown by the large number of wells and springs in the west of Europe which continue to be associated with female Christian saints, and in this context it is not irrelevant to point out that the majority of French rivers names are feminine.’

A salutary lesson about the exploitation of nature and its effects is recounted in a story from pre-Arthurian times. It is called *The Rape of the Well-Maidens* (see Box 5.1).

Nothing immediately visible remains of Celtic Bath. Some of the magic of the architecture of the times can be gleaned from the enigmatic remains of Celtic settlements clinging to the wild coast of Dingle, County Kerry, Republic of Ireland. In particular, Galarus Priory, from early Christian times with its still intact, corbelled stone roof, is evocative of a time of much simplicity and also hardship (Figures 5.2 and 5.3). The painting of

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**Box 5.1. The Rape of the Well-Maidens**

‘The story begins long before the reign of King Arthur when the land was rich and fertile. At that time, so the story maintains, maidens stood guard over the sacred wells. The maidens offered travellers cups of healing waters, “some say that these were the very waters of inspiration”. All was well in this healthy bounteous land until the King decided to carry off one of the well-maidens, raping her. His men followed suit raping the other well-maidens. With these violations of nature itself the well-maidens withdrew their magic and healing for the world. The result was a parched land without wells, barren and devoid of enchantment. The moral of the story being that the King and his men, by seeking domination over others, had diminished the world’ (Gomes and Kanner, 1995)
Stonehenge by Constable captures the grandeur of possibly the greatest monument from that long period of time before the Roman occupation of Britain (Figure 5.4). We are on firmer ground with Cunliffe’s reconstruction, from the available evidence, of the area around pre-Roman Bath (Figure 5.5). The site was quite densely occupied:

‘Mesolithic hunters camped among the hot springs while Neolithic and Bronze Age structures cluttered the neighbouring hills. … A large Early Iron Age hilltop enclosure dominates Bathampton Hill, while on the opposite side of the river, on the hill of Little Solesbury, a more strongly defended site was built probably in the fifth century BC and occupied for several centuries.’ (Cunliffe, 1999, op. cit.: 12)

Bath at that time seems to have been a busy place. For many centuries before the invasion of Britain by the Romans in 43 AD, the hot springs of Bath dedicated to the goddess Sulis had served the spiritual and healing needs of many generations of Celts.

Bath during Roman times was an important strategic transport node. Important roads met at a crossing point of the Avon at Bath. The Fossway, which bisected the country from the Humber to Lyme Bay, met the road leading to London through Chichester and the south-west road which crossed Wessex to Poole Harbour (Figure 5.6). Bath during the Roman occupation of Britain was not a military, market or administrative centre of note. However, using their engineering skills to control the flow of water from the springs, the Romans were able to develop Bath as a great centre for the practice of healing. The health practice of the time was based upon Hippocratic medicine inherited from the Greek world, which was dependent upon water for purification. This product Bath could supply in great quantity;
furthermore, the water from the springs possessed a reputation, of great antiquity, for its power of healing. At the site of the springs, the Romans, over many centuries, developed a great complex of buildings. Combining the ancient Celtic goddess of place, Sulis, with their own deity, Minerva, they built a temple complex to the goddess Sulis Minerva (Figures 5.7 and 5.8). The city became a great health spa for the Roman army. Roman citizens from all parts of the then civilized world and also for the Romanized British: it was an important part of the successful Roman policy to subjugate, then pacify and civilize a conquered people.

After the retreat of the Romans from Britain, Bath declined as a place of importance. Its reputation as a healing centre revived somewhat under the guidance of the Benedictine monks who ran the ecclesiastical complex, which included the Abbey and springs. After the dissolution of the monasteries control of Bath passed to the mayor and city corporations in 1554 (Gadd, 1971, op. cit.: 15). Bath received little investment and by the time of Pepys's visit in 1668, Bath was essentially a small medieval city of 250 houses and a population of 1200 (ibid.). Most of what we see in Bath today was built during the eighteenth century: certainly, what is memorable about Bath is the Georgian architecture of the two Woods, father and son, together with the work of those architect developers who followed, such as Palmer, Adam and Baldwin (Figure 5.9). The changes brought about by the eighteenth century developers were not always welcome, being resisted by an active group of 'preservationists'. It was this faded city with a glorious past and a reputation for healing that the eighteenth century developers inherited. The Abbey, restored by Gilbert Scott in the mid-nineteenth century, is the main building that remains of medieval Bath (Figure 5.10).

Three men are associated with the revival of Bath's fame in the eighteenth century: they were Beau Nash (1674–1762), Ralph Allen (1693–1764) and John Wood the Elder (1704–1754) (Morris, 1972). Beau Nash was appointed Master of Ceremonies in 1704. It was Nash, a 'dandy' and gambler, who converted Bath from a place visited for reasons of health into a social and
entertainment centre, a playground for the wealthy. Allen became Postmaster for Bath in 1712 and revolutionized the postal system, becoming, in the process, the wealthiest man in the town. Allen owned Combe Down limestone quarries. It was his ‘Bathstone’ from which Bath was built. Being built from one material is probably the main reason why the city now presents a great unity of expression. John Wood the Elder, son of a local builder, returned to his native town in 1727, brought there by Allen to develop Bath as a showpiece for his stone (Mowl and Earnshaw, 1988). John Wood returned at a time when money was flowing into Bath, making it ripe for expansion. The collaboration of the two men laid the foundation for a building programme to accommodate 8000 visitors, the infrastructure necessary for the development of a fashionable spa. John Wood the Elder and John Wood the Younger were responsible for setting the architectural pattern for the city. The civic composition of Queen Square, The Circus and The Crescent is the centrepiece of the eighteenth century development (Figure 5.11). For the small medieval town lying in a provincial backwater John Wood, at the age of 21, proposed a master plan of great imagination. His inspiration was derived from a quaint and inaccurate understanding of history.

‘Wood’s interest in the ideas of pagan antiquity was an amazing and fanciful blend of several traditions: pre-Hellenic, Jewish and pre-Roman British or Celtic as well as Classical Greek and Roman. In his writings on architecture and ancient mythologies he set forth the idea, wholly unsubstantiated, that Bath was only the core of what was once a city the size of Babylon built by King Bladud ... around 480 BC.’ (Gesler, 1998, op. cit.: 25)

As Mowl and Earnshaw (1988, op. cit.) point out, ‘One side of Wood’s nature was as practical

Figure 5.8 The Roman Bath. (Source: Cunliffe, 1995).
as the mind of an architect–developer needed to be. The other side was a Romantic visionary.' For his architectural forms he turned to ancient Rome as interpreted by Palladio. His first plan for Bath included:

‘A grande Place of Assembly to be called the Royal Forum of Bath; another Place, no less magnificent, for the Exhibition of Sports, to be called the Grand Circus; and a third Place, with an equal State with either of the former, for the Practise of medicinal Excercises, to be called the Imperial Gymnasium of the City, from a Work of that Kind, taking rise at first in Bath, during the time of the Roman Emperors.’ (Gadd, 1971, op. cit.: 79)

Queen Square was the first part of the group completed. Wood treated three sides of the

Figure 5.9 Eighteenth century developments in Bath.

Figure 5.10 The Abbey, Bath.

Figure 5.11 Plan of Queen Square, The Circus and Crescent.
square, the north, south and east, each as one palatial composition. The north side is particularly monumental in Palladian style, having a symmetrical arrangement of seven houses with central pediment (Ison, 1948: 129) (Figure 5.12). John Wood completed the square in 1736, though additions and changes since, particularly to the west side, have done nothing to enhance the original composition. From Queen Square, Gay Street rises up the hill to The Crescent. Gibberd (1955: 273) suggests that the street is too long and the terraces are not articulated to fit the ground contours. For others, the walk against the contours adds greatly to the expectation and surprise of the arena formed by The Circus (Figures 5.13 and 5.14). Summerson (1958: 224) describes The Circus as being both simple and remarkable:

‘The Circus at Bath is a monumental conception based on the Colosseum inverted, simplified and enormously reduced in scale, and made to be the frontispiece of thirty-three standard town houses of moderate size. It has three orders, their entablatures richly carved, and its effect is quaintly beautiful – as if some simple minded community had taken over an antique monument and neatly adapted it as a residence.’

John Wood the Elder died in 1754, the year work began on The Circus (Figure 5.15). The
work was completed by his son, who went on to build Brook Street, which connects The Circus to the last great space in the group, The Crescent, built between 1767 and 1775 and designed by John Wood the Younger (Figures 5.16 and 5.17). The Crescent is set out from three centres, a long radius curve in the centre and two short radii at the ends. The terrace with its unbroken line, a sweeping curve of bold two-storey Ionic columns on a plain ground floor, encloses the space it reaches out to encircle. In this terrace the royal palace or the country mansion has been converted into a graceful, domestic terrace juxtaposed with a landscaped parkland.

Curves as they were used in both The Circus and The Crescent are as formal as straight lines. Later, however, during the last quarter of the eighteenth century, John Palmer built the sweeping curves of Landsdown Crescent and Somerset Place in Bath, which were highly informal and in complete contrast to both The Circus and The Crescent (Figure 5.18). In part, the development was designed to fit into the contours. The design consists of four segmental blocks of four-storey houses arranged alongside a landscaped depression. Landsdown Crescent is a symmetrical composition; the central block, on the highest point of the site, follows the contours and is linked by bridges to crescents on each side, which reverse the curve of the main block. The land falls steeply on each side of the main block, requiring the side crescents to step down the slope. Somerset Place, the last block in the composition, reverses the direction of the central crescent in the Landsdown group. Photography does little justice to the complexity of the sinuous curves of Palmer’s group, ‘In addition to the curves in the horizontal plain, the entire structure moves up a hill, down a valley and up a hill again’ (Bacon, 1975: 182).
The third main composition dating mainly from the eighteenth century, the new town of Bathwick, is on the opposite side of the Avon from the main town. The original plan for Bathwick was by Adam, who built the bridge across the river. The bridge was based on the Ponte Vecchio in Florence (Figures 5.19–5.21). It was commissioned by the owner of Bathwick Estate, Sir William Pulteney, and was built between 1769 and 1774. Though it has been much altered since it was built, the enclosed street remains. It is this street which makes the bridge unique in Britain. The bridge is not simply a river crossing but a visual junction connecting two parts of eighteenth century Bath. The final plan for Bathwick by Baldwin consists of a short street, Argyle Street, leading from the bridge to a diagonally placed square, Laura Place. The continuation of Argyle Street, Great Pulteney Street, which is 300 metres long, terminates in the mass of the former Sydney Hotel designed by Harcourt Masters but remodelled by Sir Reginald Blomfield. The development ends in the large hexagonal park that surrounds the former hotel, now a museum (Figures 5.22–5.24).

SYMBOLISM IN THE ENVIRONMENT

We know that the interests of John Wood the Elder were wide and eclectic. His design philosophy was idiosyncratic: its roots predated the Graeco-Roman classical world while its geographical compass stretched from Bath to Babylon. Fortunately his architectural model was more tightly controlled and structured. Wood’s architectural discipline was grounded in Palladio’s interpretation of the classical architecture of the ancient world (Palladio, 1965, Dover edition). The Palladian principles of architectural composition were universally applied in Bath during the eighteenth century. In some developments, such as Great Pulteney Street, some suggest that the application of those principles may not have been applied as successfully as in other developments. Generally, the classical ideals of architectural form were followed in Bath with great flair and success (Moughtin and Mertens, 2003).

John Wood, following Palladian ideals, was striving for order and harmony in his

Figure 5.17 The Crescent.
Figure 5.18 Layout of Landsdown Crescent and Somerset Place.
developments. For this purpose he relied upon symbols, the perfection of the circle and square for example. These symbols were thought to come from ‘God, the Great Creator’. Just as Plato conceived of the ‘The Greater Ordering One’ arranging the cosmos, using pre-existing eternal archetypes or ideas, so too the artist, according to this classical ideal, orders his work to conform to this timeless, God-given, system of proportion, which is ruled by a spatial dynamic symmetry. The modern translation of the Greek concept ‘symmetry’ would be ‘balance’. Vitruvius (Dover edition, 1960: 14) provides the key to understanding the use of this particular conception of the use of symmetry in architecture:

‘Symmetry is a proper agreement between the members of a work itself, and relation between the different parts and the whole scheme, in accordance with a certain part selected as standard. Thus in the human body there is a kind of symmetrical harmony between the forearm, foot, palm, finger and other small parts.’

Unity was thought to lie in ‘threes’. This is a much more ancient idea than the ‘Holy Trinity’ of Christian belief. As Plato explained, ‘But it is not possible to combine two things properly without a third to act as a bond to hold them together’ (Plato, 1969 edition). Humans being made in the image of God were composed of three parts, head, trunk and limbs. Furthermore, the body when stretched out could be bounded by the square and circle. The Vitruvian figure came to symbolize the significance of the human relationship with architecture and was a metaphor for this relationship of humanity, architecture and the cosmos or environment at large (Figure 5.25). Gesler (1998, op. cit.) illustrates how Wood the Elder created symbolic landscapes that were deeply concerned with the healthy relationship of humanity with its built environment and the cosmos. He suggests that:

‘Queen Square has a geometrical design that looks like an abstract Vitruvian figure. The
central area is a perfect square and inside this is a perfect circle. The King’s Circus was symbolically far more elaborate. It consists of two perfect concentric circles; the outer one’s dimensions almost exactly correspond to those of the north south dimensions of Queen Square and also the chalk wall at Stonehenge, some 30 miles [950 km] to the east south-east.’

The symbolism of the triad is found throughout the Palladian architecture of Bath. The Circus is composed of three identical parts and is approached by three streets. The façade is made up of three bands, each floor being quite distinctive through the use of the three main orders of Greek architecture: Doric on the ground floor, Ionic on the first floor and Corinthian on the second floor. Each order of architecture had its own proportional system: all elements of the order – column, capital, entablature – are dimensioned in relation to the diameter of the column at its base (Figure 5.26). The orders were related to the human figure; they were, in effect, personified. The strong, rather heavy Doric column represents the robust man. Wood used this order on the ground floor of The Circus to support the building. The Ionic column with its rather stiff capital or staid hairstyle represents the sensible matron: she was used on the first floor of The Circus. The slender, rather sophisticated Corinthian column was thought to be the feisty young maiden bedecked with a capital of flowing locks. This order was used on the second floor of The Circus to terminate this elegant composition.

John Wood the Elder was striving for order and harmony, or eurythmy, as it would be called in the world of ancient Greece. It was thought that this order and harmony mirrored the greater harmony of the cosmos and that the human world of perception was, or should aim to be, a microcosm or model of the universe. It was a part of the ‘great chain of being’. As Gesler (1998, op. cit.) puts it:

Figure 5.21 Adam’s bridge.

Figure 5.22 Laura Place.
‘According to these concepts, the maintenance of order in human nature was essential to physical and mental health. ... Drunkenness, illness, passion and madness represented disruption of order and harmony. The order and symmetry of the Georgian buildings in Bath can be thought of as attempts to counteract these disruptions.’

Figure 5.23 Great Pulteney Street.

Figure 5.24 The former Sydney Hotel.

There is another sense in which the Georgian buildings of Bath were coming to terms with health, nature and the environment. At about the time of the death of John Wood the Elder, attitudes to the natural world and humanity’s relation to it were changing. In the next chapter we will read how the eighteenth century poets put these ideas into words. In Bath we can see the beginnings of this revolution in attitudes to the natural world: it is made concrete by the way in which buildings were arranged in the landscape. The extent of this revolution in attitudes to nature in England is illustrated by the change in the way landscape is depicted in medieval art and landscapes of Constable (Figure 5.27). The natural world in medieval times was both fearful and sinful. According to Clark (1949):

‘St Anselm, writing at the beginning of the twelfth century, maintained that things were harmful in proportion to the number of senses which they delighted, and therefore rated it dangerous to sit in a garden where there are roses to satisfy the senses of sight and smell, and songs and stories to please the ear.’

An early reference to nature is in the Anglo-Saxon poem, Beowulf: terror of the natural world is the theme of Grendel’s Mere.

An Avalanche in the Alps (Tate Gallery London) (Figure 5.28) by Philip James de Loutherbourge (1740–1812) is a typical painting of the ‘sublime’; it is a magnificent image of the awe-inspiring ferocity of nature and its fearful power (Bazarov, 1981). It echoes the tradition of Beowulf with its mistrust of nature’s uncertainties but emphasizing the acceptance of the contradictions of the natural world, which both supports life while at the same time being its destroyer.

One avenue of escape from the terrors of nature was the walled garden, the mythical enchanted garden of Romance of the Rose,
a flowery meadow cut off from the world of fierce eruptions, cataclysmic events or fierce accidents; in this island of garden paradise love both divine and human could find fulfilment. Despite the growing awareness of the splendour and beauties of the natural world, until the Enlightenment the natural world remained highly disturbing. ‘The Mere’, which placed the mind in great danger, was a vast and fearful place. Escape from these dangers was in the safety of the enclosed garden, a secluded paradise. The word ‘paradise’ was borrowed from the Persian, meaning a ‘walled enclosure’. John Wood the Elder was steeped in tradition; he tamed nature, using the concept of the walled garden in his two major civic spaces, Queen Square and The Circus at Bath. In Queen Square and The Circus nature was controlled, civilized and ordered: it was kept in due proportion to, or in balance with, the cosmos. The composition was conceived as part of ‘the great chain of being’.

With the work of John Wood the Younger, there is a perceptible change of emphasis. The Crescent opens out to include the landscape: it is part of the landscape. Even more dramatic as a visual statement of this changing attitude to nature and the natural world is the development at Landsdown. Here the buildings follow the general lines of the contours in sinuous curves: the buildings and landscape are one. It is an architectural metaphor that puts humanity at the heart of nature. In Adam’s bridge across the Avon, the river is not the fearful ‘Mere’ of Beowulf. It is the location for a beautiful little street. Further along this axis the development terminates in a building set in a large town park, an acceptance of nature in the town.

**THE SOCIAL ENVIRONMENT**

Beau Nash developed Bath into a place where the pursuit of health was combined with recreation and gambling; it was the place to make or renew social contacts. In many ways this was the beginning of the tourist industry. Beau Nash brought some semblance of law and order to Bath. Seventeenth century Bath had the reputation for lawlessness, a place where street fighting and violence was common. Beau Nash improved the roads, kept them clean, stopped street fighting and banned the wearing of swords. He also introduced discipline, including strict dress codes, into the running of the Pump Room; in short he created in Bath a society of civilized manners.

Figure 5.25 The Vitruvian figure.
Bath became a place where the aristocracy mixed and socialized with the bourgeoisie. There was, to some extent, at least for the duration of ‘the season’, a social levelling. Even at that time of year social distinction was maintained by wealth. The more expensive King’s Bath was exclusive. The remaining baths, being cheaper, were accessible to greater numbers and were therefore overcrowded. At the bottom of the social scale was Leper’s Bath, where the poor received care. The Poor Law Act of 1572 permitted the treatment of the destitute at Bath and Buxton. Leper’s Bath achieved a reputation for its healing and received many patients sent by their parishes. As Bath developed its reputation for cures, many of the poor remained, adding to the growing legion of beggars for which Bath was known. An attempt was made in 1601 to control beggars with another Poor Law, which placed such people in a house of correction or workhouse. In 1714 this Elizabethan Poor Law expired and beggars began to increase again. Bath’s solution to the problem was to build a hospital for the poor. To this effect Bath General Hospital was founded in 1738, which in theory could receive, as patients, the poor from any parish in England. John Wood was commissioned to design the original

Figure 5.26 The five orders of architecture. (Source: Chitham, 1985).
hospital of 150 beds. The designs by Wood the Elder were given as a free gift along with his services in the building of the hospital. The city authorities granted the hospital free use of the Hot Bath and its pumps. An Act of Parliament to control gambling allocated, to the hospital, half the fines collected from offenders. The hospital designed by Wood, but extended later, developed a worldwide reputation for its treatment of and research into rheumatic disease (Gadd, 1971, op. cit.).

Bath was a town of contrasts in the nineteenth century. At one level it was a beautifully appointed spa. Its streets were lined with neatly detailed buildings in cream Bathstone, some being masterpieces of civic design by the architects, the Woods. The slums, built on the flood-plain of the River Avon, were in complete contrast. These were the equivalent of, but not on the same scale as, the informal areas around any modern city in Africa today. Certainly some efforts were made to alleviate the plight of the poor and destitute, for example the hospital built by John Wood. These efforts, as noble as they were, amounted to tokenism, in the face of a growing problem. The philosophical attitude, in the face of the mounting destitution, by those in authority is best summed up by Edwin Chadwick’s advice to the Royal Commission on The Poor Laws of 1832:

Figure 5.27 The Vale of Dedham by Constable. ©The National Gallery of Scotland.

Figure 5.28 An Avalanche in the Alps by Philip James de Loutherbourg. Tate, London 2008.
‘Make the pain of pauperism greater than the pain of poverty. Require all those who would elect the status of pauper to leave all their worldly goods and enter an unpleasant workhouse. Make “relief” cease to relieve and you would end the dependence on relief.’

(Hamlin, 1998)

It took the form of the seemingly inexhaustible supply of the hot mineral springs. Bath’s ‘setting contributed to this reputation. It was a ‘garden city’ in a spectacular landscape. Bath’s ‘Golden Age’, as a centre for healing, was in Georgian times, though the city is regaining some of its past reputation as a spa (Figures 5.29 and 5.30). Part of its attraction remains the springs and the landscape setting. Also of importance are the great architectural achievements of the eighteenth century, particularly the work of the Woods, father and son. The architecture of John Wood the Elder used symbols to relate the built environment to the greater unity of the cosmos. He employed, in his designs, the square, the circle and a system of proportion based on the human figure and the mathematics of ancient Greece as interpreted by Palladio. This

CONCLUSION

Bath was perceived by many to be a place of healing for 2000 years and more. This reputation was not confined to the wealthy but was inclusive of the poor, though they did not always have easy access to such care. Its reputation for health was indebted to nature.

Figure 5.29 Tourist attractions in Bath.

Figure 5.30 Tourist attraction in Bath.
symbolism was a metaphor for the unity, wholeness or health of a greater order. John Wood’s son and other architects of Bath, particularly Palmer, extended this abstract notion of order to the more tangible relationship of building and nature: buildings were juxtaposed with nature and were part of it. It was this relationship of buildings set in a fine landscape which so impressed many visitors to Bath in later times. The next chapter continues this theme of relating humankind, nature and wholeness or health. It does this by examining the work of the poets of the late eighteenth and early nineteenth centuries. They were responsible for promoting the philosophical foundation for the appreciation of humanity’s place in the natural world. They were also the voice of protest about the unnatural and unhealthy aspects of the great technological revolutions in agriculture and industry.
INTRODUCTION

The awakening to the effects of global warming and to the negative dimensions of globalization, throughout the last decades of the millennium, has parallels in the period spanning the 1760s to the 1830s, when North America, France, Germany and Britain focused their awareness on the injustices underpinning their respective social, economic and political systems. It was an age of exploitation. It was an age of protest. By re-examining the syndrome of discontent and protest of that period, we may better understand the fault-lines in our current approaches, so as to be more inclusive and holistic in planning an environment which fosters well-being. This was a period of revolution: the literary output of the time has been called the ‘Romantic Revolution’. The term ‘Romantic’, however, raises many questions about the precise demarcation, particularly for architects, between it and its antithesis, ‘Classical’. The often arbitrary nature of the distinction between these two approaches in design, painting and poetry often result in terms of abuse or, at best, a list of opposite traits: for example, Classical being associated with objective, rational, orderly, thoughtful; Romantic being associated with subjective, irrational, chaotic, emotional. Depending upon preference, poets or artists can be placed in either team. To avoid the subjectivity associated with using the term ‘Romantic’ and to emphasize the ‘down-to-earth’ and revolutionary nature of this movement, the period will be referred to as ‘the age of protest’; the poets, the intellectual leaders of this movement, will be referred to as ‘the poets of protest’. Excerpts from poems used in this chapter are taken from The Penguin Book of English Romantic Verse (Wright, 1968), unless otherwise stated.

The period being explored from a cultural and literary perspective in this chapter dates approximately from the publication of Lyrical Ballads by Wordsworth and Coleridge in 1798, until the death of Byron in 1824. It is generally agreed that, during this period of English poetry, there was in Western Europe a fundamental shift in consciousness in the way the natural world was seen and interpreted. This paradigm shift, or revolution, gave emphasis to emotion, intuition, democracy, individual liberty and women’s liberty, together with a love and respect for nature. Fundamental to the change in consciousness was the idea that health and well-being are intrinsically linked with nature, and that a strong bond between humankind and
nature is the foundation of a healthy society. Nature was seen to be ‘consoling or morally uplifting, a kind of spiritual healer’ (Wright, op.cit.: XV).

The revolution in literature mirrored the world of politics. America declared independence from Britain in 1776. The French revolt against aristocratic rule peaked on 14 July 1798, with the storming of the Bastille. This movement of rebellion rumbled in Germany, Austria and Britain, and of course in Ireland. The merchants had become more powerful. Progress in technology made possible the development of manufacturing. The buildings and their surroundings created for this industrial expansion were predominantly ugly, described by the engraver-artist poet, William Blake (1757–1827), as ‘the dark satanic mills’ (Bronowski, 1958). Subsistence farmers in Britain, evicted from their livelihoods because of the land enclosure laws which promoted the interests of the wealthy, migrated to the cities in search of work, to become the new poor, without rights, just like the mass migration to the big cities in Nairobi, Kenya, and in most Latin American countries over the past decades. During the age of protest, it was the balladeers, poets, artists, musicians and scholars who became the voice of the dispossessed and the outcast, highlighting social evils and their causes. Oliver Goldsmith (1728–1774), for instance, laments the depopulation of the countryside, voicing the resentment felt towards the voracious landlords, in the long ballad-type poem, ‘The Deserted Village’ (Kinsella, 2001).

RESISTENCE TO CHANGE: CRITIQUE OF VESTED INTERESTS

Resistance to altering one’s lifestyle, in the interest of community well-being, or as a contribution towards ecological sustainability, has precedent. Burke (1729–1797), in Reflections on the Revolution in France (Burke, 1790), advocated a return to the monopoly of aristocratic rule. A counter argument was put forward by Thomas Paine (1737–1809) in The Rights of Man (Paine, 1791). There is a considerable time lag between bringing matters in need of reform into the public domain and action being taken to address such matters. The reformer John Howard’s text State of the Prisons, published in 1777, for example, still waits to be implemented, some would argue. Percy Bysshe Shelley (1792–1822) was on the side of the oppressed, showering contempt on the ruling class:

‘Rulers who neither see, nor feel, nor know, But leech-like to their fainting country cling Till they drop, blind in blood, without a blow.’

(Shelley, 1942: 133)

So that the reader may gain a more objective perspective, Shelley (ibid.: 107) uses, in ‘Ozymandias’, a technique of distancing through time and place. The reader is invited to witness where ‘two vast and trunkless legs of stone/Stand in the desert’ beside which lays a half-sunken tablet, bearing the inscription:

‘My name is Ozymandias, king of kings
Look on my works, ye Mighty, and despair.’

The writers in the age of protest knew the themes, allegories and literary styles of the Bible. Their work is deeply moral. Their use of personification, as demonstrated by Ebenezer Elliott (1781–1849), in ‘Epigram’, has biblical overtones:

‘“Prepare to meet the King of Terrors,” cried
To prayerless Want, his plunderer, ferret-eyed:
“I am the King of Terrors,” Want replied.’
The self-professed atheist, Shelley, is as biblically steeped as his colleagues. This is evident in the way he uses allegory and personification in ‘The Mask of Anarchy. Written on the occasion of the Massacre at Manchester’, to name and shame the perpetrators of injustice:

‘I met Murder on the way –
He had a mask like Castlereagh’
(p. 235)

If a poem of such directness were published today, the poet would risk being prosecuted for libel, not only by ‘Murder’ but by those alluded to as ‘Fraud, Hypocrisy’ and ‘Destructions’ later in the poem.

**ENCLOSURE: THE AGRICULTURAL REVOLUTION**

The paradigm shift in the arts and poetry developed against a background of social and economic upheaval, a consequence of agricultural and industrial change on an unprecedented scale. This economic revolution occurred within a landscape of turbulent, traumatic and sometimes bloody uprising. Amongst this upheaval the poet and artist was pursuing a quest for individual liberty lived according to ideals untrammeled by older elitist rules and restrictions. Poetry, for example, was democratic in the sense that it spurned the elitist style of earlier poets and was written using diction of the common man: it gave voice to those marginalized by society, the rural poor, the beggar, women, children and the insane. The natural world in all its innocence became a prominent theme, while in art, landscape became subject matter not background.

John Clare (1793–1864) teases out the repercussions of the enclosure laws on wildlife and humans alike, in ‘Remembrances’. As a countryman, he knew of the symbiotic relationship between humans, flora and fauna, which depend for survival on how the land is farmed. Clare has an instinctive feel for ecology. He lists the creatures and place names directly affected by the enclosure movement in Northamptonshire, among which are the ‘mouldiwarps’, i.e. moles ‘sweeing to the wind’:

‘On the only aged willow that in the field remains,
And nature hides her face while they’re sweeing in their chains
And in a silent murmuring complains.’

Clare is geographically and historically aware. He uses irony in the reference to Buonaparte, associated with a revolution which was intended to bring freedom and fraternity, not tyranny in a different guise. The play on ‘levelled’ is evocative of the Levellers, a reformist group founded in 1645, whose egalitarian ideals, which included suffrage for all, so threatened Cromwell’s government that the founder members were either imprisoned in the Tower of London or managed to flee to the Netherlands. The ‘levelling’ in the wake of the enclosures was the antitheses of that envisaged by the Levellers.

‘Enclosure like a Buonaparte let not a thing remain,
It levelled every bush and tree and levelled every hill
And hung the moles for traitors.’

In Ireland, the traditional storyteller, the ‘Seanachai’, was the voice of the people and for the people, using verse or prose to empower them: analysing and naming what was amiss in their lives, expressing collective anger, suggesting ways of redress and enabling them to sustain hope. Brian Merriman (c. 1747–1805)
used the device of a debating platform, *The Midnight Court*, so that the oppressed people of County Clare could voice their grievances and to dramatize the ‘scale of Ireland’s disrepair’ in *Cuírt an Mhéan Oíche*, first translated by Frank O’Conner in 1945, as *The Midnight Court: A Rhythmical Bacchanalia* by Brian Merriman. The Prologue justifies why this special ‘court’ is essential:

‘The rape of the land with naught in its train
In place of crops, a weed-rank terrain
The land left empty and in decline
Wrecked by war, by death and rapine.

The people were explosive with resentment at the time:

The law is clouded, the scales awry
With all the pull that bribes can buy.’

Merriman uses the literary device of the ‘Speirbhean’, a female called ‘Aoibheal’, to symbolize Ireland. She explains the function of the Court:

‘To rip out bad laws by their core
To stand steadfast beside the poor and the weak
So the mighty will have to cherish the meek
The powerful desist from inflicting wrongs
And injustice enthroned where it belongs.’

Injustice included a denial of most human rights to the native Irish. Public gatherings of the peasantry aroused suspicion, the colonials fearing sedition. All were, therefore, to have their say at ‘The Midnight Court’:

‘The court is built on a civilized base –
The court of the weak with a female face.’

Merriman emphasizes the feminine. The deficiencies inherent in an over weighting of the ‘masculine’ in civic affairs were apparent to Merriman. The age of protest moved away from the dominance of the ‘masculine’, associated with the age of enlightenment’s reliance on a one-dimensional, purely cerebral, deductive reasoning approach, reflected in the arts, as rigidity in style and in restricted subject matter. The whole spectrum of human emotion had been excluded, imagination neglected, indeed the ‘feminine’ forgotten.

**THE POETS AND SCIENCE**

The poetry of the late eighteenth and early nineteenth centuries was, in part, a reaction to the mechanistic analysis of the natural world by classical physics. Descartes’ well-known saying – ‘cogito; ergo sum’ (‘I think; therefore I am’) – has had a far-reaching influence on thinking in the West. It has led to equating identity with mind rather than with the whole organism. In *Physics and Philosophy*, Heisenberg (1958) makes the point that modern science, at the outset, was characterized by a conscious modesty; it made statements about strictly limited relations that are only valid within the framework of those limitations. He tells us that this modesty was largely lost in the nineteenth century. Physical knowledge was considered to make assertions about nature as a whole. Science in the West followed the ‘reductionist’ tendency, considering nature not only independent of God, the great clockmaker of early science, but also of human beings. Science was able to make an objective understanding of nature its central tenet. It wasn’t until the end of the nineteenth century that the concept of the universe as a clockwork mechanism began to unwind. With the discovery of the electron and of radioactivity it became obvious that matter was more complex than supposed. Einstein confirmed that matter was
far from stable, for according to his formula $E = mc^2$ it could be converted into energy. Heisenberg and Schrödinger, in their weird world of quantum mechanics, abolished any remaining belief in the absolute distinction between matter and energy. A revolutionary discovery associated with quantum mechanics is that you cannot leave man or woman out of physics: there is no way of making observations independently of the observer (Heisenberg, 1958). Whatever stance one takes on the philosophy of science, it is undeniable that by the time of Wordsworth’s birth in the second half of the eighteenth century the great advances in science and technology had spawned the industrial and agricultural revolutions. These revolutions and the scientific endeavour responsible for them produced great technological benefits for humankind. They also had a downside: the family was destroyed as an economic unit and the individual was incorporated into an impersonal workforce, becoming a unit like electricity to be used for so many hours per day but only when required. This mechanistic and reductive view of the human condition in the natural world was challenged by the poets of the time.

Kroeber (1994: 7) argues that the poets opposed male rationality which reduces the social world to objects of exchange: attitudes that ‘fully triumphed in Western Civilization only in the nineteenth century, reaching their apogee perhaps in this century [twentieth century]’. Kroeber goes on to develop the thesis that this movement was ‘proto-ecological’, the forerunner of movements in ‘green thinking’ that inform the current debate on sustainable lifestyles and the planning of ecocities. The revolutionary ideas of the poets predate by over 200 years movements such as ecofeminism and give philosophical support to feminist critiques of the scientific endeavour by such writers as Evelyn Keller and Barbara McClintock, according to Kroeber. Crucial to this ‘proto-ecological’ stance adopted by the poets is a holistic approach to nature that we have come to associate with scientific ecology, which involves the concept of the ‘ecosystem’, a group of living organisms with symbiotic relationships with each other and to the non-living environment they occupy.

We also find the beginnings of psychology in embryonic form in the writings of Keats, Blake and Wordsworth; they speculate on how the psyche works. In a letter to his friend Bailey, Keats shares his thoughts: ‘I have never yet been able to perceive how anything can be known for truth by consecutive reasoning’ (Gittings, 1970). He states his own position: ‘I am certain of nothing but the holiness of the Heart’s affections and the truth of the Imagination.’ Blake and Wordsworth present in poetry what Freud was to state in scientific language: that whatever the infant and young child experiences has a lasting influence on the adult, affecting every aspect of inner private life, relationships and how one contributes to society (Freud, 1949).

Wordsworth devotes Books 1 and 2 of *The Prelude*, ‘Tintern Abbey’ and ‘Ode: Intimations of Immortality from Recollections of Early Childhood’ to this theme. His inner life was ‘fostered alike by beauty and by fear’ and by the rugged landscape of the Lake District. The fear was engendered by experiences such as rowing at dusk as a child in a stolen boat and being terrified.

‘When, from behind that craggy steep till then
The bound of the horizon, a huge cliff
As if with voluntary power instinct,
Upreared its head.’

He describes graphically how, in the wake of this experience of shapes, sound, atmosphere – and omitting to mention guilt – his brain:
'worked with a dim and undetermined sense
of unknown modes of being; in my thoughts
there was a darkness, call it solitude
or blank desertion.'

To the 'huge and mighty forms', which
obessed him by day and were the source of
nightmares, he ascribes a civilizing effect on 'the
passions that build up the human soul'; simply they
are 'enduring things', of nature. In the Immortality
Ode, Wordsworth philosophizes in terms
analogous to the Hindu idea of reincarnation:

'Our birth is but a sleep and a forgetting:
The soul that rises with us, our life's star
Hath had elsewhere its setting.'

He sees the natural state of humankind as
being essentially good, because that is how the
infant is: 'trailing clouds of glory do we come
from God, who is our home'. This resonates
with one side of Blake's concept of humanity in
‘The Divine Image’ from The Songs of Innocence
(Bronowski, 1958: 33):

‘For Mercy, Pity, Peace and Love
Is God, our father dear:
And Mercy Pity Peace and Love,
Is Man his child and care
For Mercy has a human heart
Pity, a human face:
And Love, the human form divine,
And Peace, the human dress.’

HUMANITY CORRUPTED:
THE SHADOW

As an addendum to Songs of Experience, Blake
put ‘A Divine Image’ (ibid.: 59), this time
describing the 'shadow' side of human nature:

‘Cruelty has a Human Heart
And Jealousy a Human Face

Terror, the Human Form Divine
And Secrecy, the Human Dress
The Human Dress, is forged Iron
The Human Form, a fiery Forge.
The Human Face, a Furnace seal’d
The Human Heart, its hungry Gorge.’

Blake's engraving illustrating ‘A Divine Image’
is equally stark and bleak. Wordsworth,
grappling with the evidence of human cruelty
in adults, tries to explain why his divine
infant becomes corrupted, using imagery of
a prison:

'Shades of the prison-house begin to close
Upon the growing Boy'

The prison imagery appears in Blake's
'London' as 'the mind-forg'd manacles'. Blake is
the perfect exponent of cause-and-effect and of
interdependence:

'Pity would be no more
If we did not make somebody poor'

In 'London', Blake creates both the
atmosphere and evokes the architecture and
design of the city, by his vivid presentation of the
plight of the exploited that inhabit the city. The
poem has to be experienced whole:

'I wander thro' each charter’d street
Near where the charter’d Thames does flow
And mark in every face I meet
Marks of weakness, marks of woe.
In every cry of every Man
In every Infant’s cry of fear,
In every voice, in every ban,
The mind-forg’d manacles I hear
How the Chimney-sweepers cry
Every blackning Church appals,
And the hapless Soldiers sigh
Runs in blood down Palace walls
But most thro’ midnight streets I hear
How the youthful Harlots curse
Blasts the new-born Infants tear
And blights with plagues the Marriage hearse.'

Blake condemns the clergy for their preoccupation with respectability, for siding with the establishment against the poor, for their warped interpretation of Christianity, in as much as they lack joie de vivre. The chimney sweepers in Blake’s time were children. Robert Owen, in his factory in New Lanark, would not allow the employment of children less than 10 years of age. He campaigned against child labour. Presently, serious journalists try to educate consumers to remember that the cheap clothes available in certain supermarkets are the result of exploited labour of women and children in India and Bangladesh. Bosshart (2007), for example, in *Cheap* questions the pursuit of unbridled consumer choice and greedy consumption, while Schwartz (2004) in *The Paradox of Choice* shows how too much choice can leave the consumer less content and more dissatisfied. Social responsibility is threaded throughout Blake’s writings. In ‘London’, Church and Crown are castigated for the exploitation of children and for the needless deaths of young men in the battlefield. Byron (1788–1824), however, though realistic on the carnage of the battlefield, does not wholly condemn war, perhaps reflecting his own privileged background:

‘War’s a brain-spattering, windpipe-spitting art,
Unless her cause by right be sanctified.’
(Wright, op.cit.: 231)

### THE VIOLENCE OF NATURE

In Austria and Germany, during this period, reaction against the constraints in permitted subject matter and rigidities of form in the arts found expression in the *Sturm und Drang* movement. Artists focused on violent sea storms. *An Avalanche in the Alps* (Tate Gallery, London) by Philip de Loutherbourge (1740–1812) is a magnificent image of the inspiring ferocity of nature and its fearful power (Figure 5.28). Goethe’s novel, *The Sorrows of Young Werter* (Lukács, 1947), explores the emotional turmoil and frustration of the protagonist Werter, whose life is adversely affected by the constraints of social class ideology, to the extent that he is driven to suicide. According to Lukács, Goethe supported the social aims of the French revolution, while rejecting the plebeian methods for their realization. The hitherto overlooked emotions of intense sadness, fear, violence and unpredictable mood swings feature especially in the music of *Sturm und Drang*; for instance, Gluck’s operas *Don Juan* and *Orpheus and Eurydice*, the Haydn symphonies composed in a minor key, such as No. 44 (The Funeral), No. 45 (The Farewell) and No 49 (La Passione). There is recognition of what would be described, post-Freud, as ‘the unconscious’ and its far-reaching influence, in Gluck’s *Orpheus and Eurydice*, whose subject matter is the underworld. Dream content and the supernatural are used by English poets such as Coleridge, in ‘Kubla Khan’ and ‘The Rime of the Ancient Mariner’, which could be seen as the counterpart of the Germanic *Sturm und Drang* movement.

The mariner-narrator in ‘The Rime of the Ancient Mariner’ (p. 155) describes a state where man lived in harmony with co-habitees of nature, and then wantonly killed one of a species – an albatross. A storm coincided with the mariner’s killing of the albatross, resulting in the deaths of his fellow mariners and with water shortage:

‘Water, water everywhere,
Nor any drop to drink’

It is only when the mariner accepts responsibility for killing the albatross, faces the consequences of his violation of nature and attempts to repair the damage that a measure of harmony is restored. The mariner experiences
great pain on confessing his sin against nature to the hermit:

‘Forthwith this frame of mine was wrenched
With a woeful agony,
Which forced me to begin my tale;
And then it left me free.’

This is similar to the moment of insight and accompanying catharsis in psychotherapy. Coleridge’s mariner takes on the task of disseminating what he has learnt from his act of vandalism. The poet painstakingly spells out the moral of the story in language familiar to his biblically educated contemporary readers:

‘He prayeth well, who loveth well
Both man and bird and beast.
For the dear God who loveth us,
He made and loveth all.’

Coleridge’s ‘Kubla Khan’ (Gardner, 1972), in its juxtaposition of mood and imagery, foreshadows twentieth century surrealism, and more graphically the architecture of The Eden Project (Figures 6.1–6.4). Kubla Khan’s ‘sunny pleasure-dome with caves of ice’, which he had built, somehow upsetting nature, in defiance of received wisdom, is conveyed in stark imagery:

‘Where Alph, the sacred river, ran
Through caverns measureless to man
Down to a sunless sea’

The negativity in Coleridge’s ‘Kubla Khan’ captures the floating anxiety engendered by contemporary global dimming, pollution of the seas and the destruction of the coral reef. The river meandered with difficulty in inhospitable terrain until it:

‘Reached the caverns measureless to man,
And sank in tumult to a lifeless ocean.’

Instead of being calmed and reassured by his invention of the ‘sunny pleasure-dome with caves of ice’ in this ecologically unstable and unsustainable setting, Kubla Khan experiences foreboding, hearing ‘ancestral voices prophesying war!’

Does the property developer, admiring his buildings on the flood-plain, ever listen to ‘ancestral voices’?

As we have seen, the poets of the age of protest reacted against the application of linear, reductive reasoning to literature. Yet Blake practised the meticulous observation of the scientist, throwing what he sees back at the establishment:

‘Is this a holy thing to see,
In a rich and fruitful land,
Babes reduced to misery,
Fed with cold and usurous hand?’

Blake is an urban poet, but not one dissociated from the land. The economy of language and juxtaposition of opposites in this
excerpt brings the needless poverty into relief.

Wordsworth, a native of Cumbria, is a poet of the countryside, extolling what he experiences as the intrinsic therapeutic power of each facet of life in the country. Whereas Blake is succinct, Wordsworth sometimes rambles. He was deeply inspired by the ideals of the French revolutionaries. His long poem ‘Tintern Abbey’ is dated 13 July 1798, the eve of the fall of the Bastille (Wordsworth and Coleridge, 1798). Wordsworth uses the time-span of five years from his previous visit to the monastic ruin, Tintern Abbey, as a device to expound how, ‘In lonely rooms, and mid the din of towns and cities’, the internalized ‘sensations’ from that experience, in his psyche, permeated his feelings, helping him to become a better person in the process. We might translate Wordsworth’s term ‘sensations’ as inspiration, experienced through the five senses. He attributes altruistic side-effects to these ‘sensations’:

‘as have no slight or trivial influence on that best portion of a good man’s life, his little, nameless, unremembered acts of kindness and of love.’

Absorption of the Tintern Abbey vista, he claims, has had spiritual repercussions: a deepening of his capacity for understanding and insight. He generalizes from his own experience to assuming it has a universal application:

‘While with an eye made quiet by the power Of harmony, and the deep power of joy We see into the life of things.’

Through his atunement with nature, his ability to empathize with others has been refined, so that he is ‘hearing oftentimes/the still, sad music of humanity’. By allowing nature to impinge on one’s being, Wordsworth asserts that one can feel connected with the whole cosmos, sensing:

‘A motion and a spirit, that impels All things, all objects of all thought And rolls through all things.’

Whereas in the ‘enlightenment’ period, writers and artists sought and presented their findings on the meaning of life by a largely cerebral process, retrieving material out of their minds. Wordsworth, in contrast, is grounded in body-mind attuned with nature:

‘Well pleased to recognize In nature and the language of the sense, The anchor of my purest thoughts, the nurse, The guide, the guardian of my heart, and soul Of all my moral being’

One could describe ‘Tintern Abbey’ as Wordsworth’s manifesto, stating his conviction that nature has deep and far-reaching benefits,
enabling humankind to be sustained in adversity:

‘For she can so inform
The mind that is within us, so impress
With quietness and beauty, and so feed
With lofty thoughts, that neither evil tongues,
Rash judgements, nor the sneers of selfish men,
Nor greetings where no kindness is, nor all
The dreary intercourse of daily life,
Shall e’er prevail against us, or disturb
Our cheerful faith, that all which we behold
Is full of blessings.’

His use of language, now, can seem over-effusive and sermonizing. In his day, it was the language in common usage.

**LANDSCAPE AS THERAPY**

Brian Merriman, in his *Prologue: The Midnight Court* as translated by Ciaran Carson

(Merriman, 2005), celebrates the therapeutic effects of the landscape around Lough Graney, in County Clare, communicating the sheer thrill of walking at dawn, ‘by a clear winding stream’ to the lake:

‘It would lighten the heart, be it listless with age,
Enfeebled by folly, or cardiac rage –
Your wherewithal racked by financial disease
To perceive through a gap in the wood full of trees
A squadron of ducks on a shimmering bay,
Escorting the swan on her elegant way.’

Merriman was no escapist dreamer. He lambastes the absentee landlords along with their ruthless representatives for the ‘rape of the land with naught in its train’, describing them as:

‘The jumped-up rich in plunder greedy
Flaying the sick, despoiling the needy.’
Those on the fringes of society were included by the poets of the age of protest. For example, Wordsworth’s elderly leech-gatherer, in *Resolution and Independence*, ‘not all alive nor dead/ nor all asleep’ eked out subsistence by looking for and collecting leeches on the moors, from ‘the waters of the pools where they abide’. Despite the poet’s being impressed by the dignity of this man and by finding ‘in that decrepit man so firm a mind’, he is distressed by his plight:

‘The old Man’s shape, and speech – all troubled me:
In my mind’s eye I seemed to see him pace
About the weary moors continually,
Wandering about alone and silently.’

Coleridge was as sensitive to the healing properties of nature as was Wordsworth. Addressing his sleeping infant in *Frost at Midnight* (p. 177), he wishes her a life in the open rugged countryside:

‘So shalt thou see and hear
The lovely shapes and sound intelligible
Of that eternal language, which thy God
Utters, who from eternity doth teach
Himself in all, and all things in himself.’

From believing in the sanctity of everything, egalitarianism is a logical position to hold. Blake becomes the voice of the harlot and of the chimney sweeper. Victor Hugo, who was pro Napoleon and pro revolution, challenges aristocratic France in his novel, *Les Miserables* (Hugo, 1862). Lamartine (1790–1869) emphasizes man’s unity with nature in ‘Le Lac’ (Lukács, 1947). Baudelaire (1821–1867), more than a century prior to the building of Gaudi’s cathedral, La Sagrada Familia in Barcelona, presents the perfection to be found in nature in architectural terms, thereby challenging how we normally think (*Figures 6.5–6.8*). His norm of perfection is architectural; he works backwards from this structure to nature. In this poem,

\begin{quote}
Nature’s a temple where the pilasters
Speak sometimes in their mystic languages;
Man reaches it through symbols dense as trees,
That watch him with a gaze familiar.
\end{quote}

He teases out his thesis in the next Stanza, coming to the conclusion that:

\begin{quote}
Sounds, fragrances and colours correspond.
\end{quote}

Wordsworth conflates God the architect with the human architect in ‘Inside King’s College, Cambridge’, reflecting on ‘this

*Figure 6.5* La Sagrada Familia, Barcelona: Gaudi.
immense and glorious work of fine intelligence!
He captures the serene atmosphere and sensuous appeal of:

‘These lofty pillars, spread that branching roof
Self-poised, and scoped into ten thousand cells,
Where light and shade repose.’

This description could likewise be of someone looking upwards, inside a wood (Figure 6.9).

Keats metaphorically held a funeral for the passing of the age of enlightenment, as represented by the demise of the god Saturn, ceding to the age of protest, as represented by the god Hyperion (Barnard, 1977). Saturn is a spent force in *Hyperion*, a pathetic figure:

‘Upon the sodden ground
His old right hand lay nerveless, listless, dead,
Unsceptred; and his realmless eyes were closed;
While his bowed head seemed listening to the Earth,
His ancient mother, for some comfort yet.’

Saturn, like all leaders, is bound by the inexorable laws of the cosmos, similar to the central Gaia concept (Lovelock, 2000, op. cit.). Keats sees and welcomes possibilities. In his ‘Ode to a Grecian Urn’, he addresses those depicted in each individual scene, painted on the urn, speculating on the potential emotional lives, movement and sensual experience inherent in each one:
‘Heard melodies are sweet, but those unheard
are sweeter.’

He celebrates the power of artistic form to communicate with the human spirit:

‘Thou, silent form, dost tease us out of thought
As doth eternity.’

Keats is philosophically minded. Alluding to the strait-jacketed approach of the age of enlightenment, he confides to his friend Bailey, in a letter: ‘I have never yet been able to perceive how anything can be known for truth by consecutive reasoning – and yet it must be.’ Having debated with friends and reflected on the part played by emotion, imagination, intuition in arriving at the essence or ‘truth’ in life, he resolves that conundrum, to his satisfaction. He writes to Bailey: ‘I am certain of nothing but of the holiness of the Heart’s affections and the truth of Imagination. What the imagination seizes as Beauty must be truth – whether it existed before or not’ (Gittings, op. cit.). This conviction Keats uses in the conclusion of the ‘Ode to a Grecian Urn’, the resolution of his debate with artistic object, the urn, which in essence is beautiful and timeless as a communicator:

‘Beauty is truth, truth beauty – that is all
ye know on earth, and all ye need to know.’

Figure 6.8 La Sagrada Familia, Barcelona: Gaudi, detail.

Figure 6.9 Lincoln Cathedral.
Keats, a poet who moved from studying medicine to full-time writing, figured out that the creative person must find some way of encompassing complexity, resolving tension and embracing paradox within his or her chosen art form. Shakespeare seemed to be the one who had found the key to working in this way, he noted in a letter to his brothers, George and Thomas Keats. He described this ability as ‘negative capability’. He describes this facet of intellectual equilibrium thus: ‘when man is capable of being in uncertainties, mysteries, doubts, without any irritable reaching after fact and reason’. Unlike the conformity of the masses to the whims of consumerism, in this era, the poets in the age of protest questioned the then status quo. Keats, Coleridge, Wordsworth, each in his own way tried to fathom how the psyche works. They were pre-psychologists. Keats, in his discourse on ‘soul making’, approaches a Jungian stance regarding individuation: ‘There may be intelligent or sparks of the divinity in millions – but they are not Souls till they acquire identities, till each one is personally itself.’

**Feminism**

Feminists were as much feared in the late eighteenth/early nineteenth century as were the suffragettes in the twentieth century. Thomas Moore, remembered for his sentimental Anglo-Irish lyrics, wrote a comic opera *M.P. or The Blue Stocking* (1811), in an attempt to stifle the female voice by ridiculing educated women. The most famous woman writer of this period was Mary Wollstonecraft (1992). She founded a school for girls and published a tract, *Thoughts on the Education of Daughters* in 1787, followed by *A Vindication of the Rights of Women* in 1792. Wollstonecraft was no man’s chattel. She married William Godwin. She died giving birth to their famous daughter, Mary, in 1797. This motherless child married Percy Bysshe Shelley. Mary Wollstonecraft Shelley published her novel, *Frankenstein*, in 1818. She describes the project of an inventor, the scientist Victor Frankenstein, who tried to re-animate a dead body. In this process he created a monster, which he then rejected, because his creation seemed so hideous. The novel *Frankenstein* (Shelley, 1999) is a parable about the use of scientific experimentation, just because it is technically possible, while excluding moral implications. *Frankenstein* has to do with the cold pursuit of logic to the exclusion of love. Victor Frankenstein failed to give love to his ‘creation’. Consequently, the ‘baby Frankenstein’ is unable to relate lovingly to others. His monster-baby states: ‘I am malicious because I am miserable.’ *Frankenstein* is a book about psychological deprivation, the resentment engendered by psychological deprivation, the social havoc which free floats from such a state of deprivation; it is a socio-psychological study of a sociopath villain. The twenty-first century corrective sequel to Mary Shelley’s *Frankenstein*, of 1818, is Sue Gerhardt’s *Why Love Matters* (2004).

**Conclusion**

The protest made by the poets of the late eighteenth and early nineteenth centuries was concerned with the neglected rights and needs of the individual, the insalubrious conditions of the urban workers and the forgotten therapeutic environment of the countryside. Their work reveals a deep understanding of the individual psyche and a passionate love of the natural world. The ‘poets of protest’ seem to have foreseen the threat of a mass society, enveloped in a new kind of environment where the individual was being regimented with a pressure to conform. The poets’ quest was for
liberty, a life to be lived according to ideals rather than sterile rules. Nature and the natural world was a constant theme of their verse: they believed that through the imagination, supported by nature, people could transcend their circumstances. Acceptance of nature and the 'natural' was the source from which humanity could seek answers to its questions. Nature was the great educator and also the great therapist. But life was not without its contradictions, there being times for celebration and optimism, times of great loss, for lamentation and regret. The poets of protest were intensely human but their humanity was rooted deeply in the natural world: their concern was for the health of nature, the health of society and the health of the individual, all being components of the same problematic. This attitude towards nature, health and well-being is deeply embedded in the culture and tribal memories of the British people. This love of and need for nature has too easily been dismissed as 'escapism' or 'romanticism'. On the contrary, a deep understanding of humankind's relationship with nature informs this philosophy of life. The next chapter illustrates a successful realization of a vision to provide dignified living conditions for workers in an idyllic natural setting. As 'proto-ecologists', the poets speak directly to our own century and to our concern regarding climate change and possible environmental disaster.
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NEW LANARK

INTRODUCTION

This chapter is a case study of New Lanark and the work of Robert Owen in building a community where the well-being of the workforce was considered to be as important as the maintenance of the machinery in the mill. The building of New Lanark spans the eighteenth and nineteenth centuries. Owen was developing his ideas at a time when the industrial and agricultural revolutions were having an immense effect on social conditions in Britain. He was operating when the dissenting voice of poetry was most loudly heard. Owen was very much part of this movement of dissent and protest at the conditions of the urban and rural poor. Owen built a community at New Lanark as an example or model illustrating the way he thought a healthy society could be organized. In effect he was working to the agenda of the poets and social reformers of the time. The chapter starts with a short account of Owen’s philosophy and his role in the development of the mill town; it will then use Gesler’s (1993) four aspects of the environment to analyse the contribution New Lanark makes to the development of ideas about the ways in which a healthy community can be developed. The concluding section of the chapter will draw together Owen’s ideas for the implementation of this ‘healthy society in the development of small self-sufficient “villages of cooperation” throughout the countryside.’

Robert Owen (1771–1858) was born in Newtown, Wales. His father was a saddler, ironmonger and the local postmaster. Owen was an avid reader and proved to be such a good student that at the precocious age of seven he was the assistant to the local schoolmaster. Owen soon concluded that all existing theologies were erroneous and were part of the problems humanity faced, rather than their solution. Owen’s philosophy was in line with the ‘Utilitarians’. For example, at the beginning of the fourth essay in New View of Society he wrote: ‘The end of government is to make the governed happy. That government is the best, which in practice produces the greatest happiness to the greatest number; including those who govern, and those who obey’ (Owen, 1817, republished 1991: 129). People like Jeremy Bentham, James Mill and Francis Place would have been in general agreement with such sentiments. They, too, would probably have accepted the proposition built onto this statement, that it was necessary to develop society and its institutions so that happiness could be fostered (Cole, 1953: 72).
Where Bentham, Mill and Place would have parted company with Owen was his optimistic belief that such social change could be achieved quickly. With 200 years of hindsight we, too, would be sceptical of such naive high hopes. But we also know that social change is possible. Clearly contemporary thinkers such as Layard (2005) would find much in Owen’s writing with which to agree. Today there would also be general agreement that education has a vital part to play in achieving societal change.

For Owen the central issue of moral life was the problem of free will versus necessity. Owen thought that most systems of government and education were backed by religions and based on the principle of free will, or on the assumption that since each individual was responsible for her or his actions she or he should be rewarded or punished for those actions. Owen concluded, however, that this principle was a leading cause of poverty and misery. For since individuals were the product of their environment their behaviour would improve only when their surroundings were altered. Attempts to reward or punish them without such changes would be fruitless (Owen, 1991, Introduction: xxiv). The argument about the relative importance of environment, nurture and nature has been the subject of lively academic debate over the 200 years since the time Owen was writing. While the cruder forms of environmental determinism have been questioned, neuroscience has once more highlighted the importance of the early social environment in the development of the individual and her or his eventual acceptance into the community (Gerhardt, 2004). For New Lanark, Owen, rather like Asclepios in Epidaurus, Castro in Cuba and Sulis Minerva in Bath, is the powerful, larger than life, father figure that dominates the scene and perhaps even distorts somewhat the message given about health and well-being in the community.

Owen started his working life as a shop assistant first in Stamford, Lincolnshire and later in London before moving to Manchester into the then booming cotton-spinning industry. Three years later he had his own spinning business and by 21 he was managing ‘one of the most up-to-date mills in the country, in charge, not only of the whole day-to-day finance, the purchasing of the raw material, … of everything, in fact, except for the marketing of the product (Cole, 1953). Owen, at about 29 became the part proprietor and sole manager of New Lanark Mills. For £60 000, to be paid over 20 years, Owen and his partners bought New Lanark Mills from David Dale, later to become his father-in-law.

THE BANKS OF THE CLYDE

Nature’s gift to New Lanark is the River Clyde. The fast-flowing river was the source of power that drove the mills. The site for mills on the banks of the Clyde was given the seal of approval by Arkwright when, for a short time, he was involved in the business enterprise at New Lanark. Before Owen became manager of the mills, and while Dale was the owner, New Lanark was already in the 1780s a model for its time. According to the New Lanark Conservation Trust the town illustrates ‘the most revolutionary element of the industrial revolution. The buildings and water-power system express the extension to the outermost limits of the application of building materials and techniques to the new industrial age’ (Historic Scotland, 2000: 38). This magnificent setting, in a wooded amphitheatre, through which a raging River Clyde flowed, was the ideal location for a cotton-manufacturing mill during the early
Figure 7.1
Layout of New Lanark.
years of the industrial revolution (Figures 7.1–7.3). The River Clyde was canalized, ran through the industrial complex and is an important feature of the townscape. New Lanark on the banks of the Clyde was, by any measure, a healthy location in which to live and raise a family, a quality it still retains.

**SOCIAL ENVIRONMENT**

The swelling number of factories spawned by the Industrial Revolution required a secure labour force. The labour force was expanding in the larger towns, attracting a steady influx of peasants displaced from the land and a stream of Irish immigrants; the labour force was increased further by the employment of women and children. For mills such as New Lanark, sited in the countryside, there was no ready-made labour market. Labour was imported from the larger cities and, in the case of New Lanark, from Glasgow. ‘On one occasion, indeed, it was recruited by press-gang methods, when a ship of emigrants from Skye was wrecked in the Clyde, and the survivors numbering, over 200 landed, were carted off to New Lanark Mills’ (Cole, 1953, op. cit.: 45). With a required labour force of about 2000, the founder of the mills, like other manufacturers in a similar situation, used the forced labour of children procured from the workhouses of large towns. When Owen arrived at New Lanark, there were some 500 pauper children apprenticed at the factory, some as young as eight (Owen, 1991, op. cit.).

This use of child labour to further the interests of rampant development has parallels today in the ‘sweat-shops of the Third World. As today, the eighteenth century had its share of those who objected to the abuse of children. Owen was one such person. He abandoned the policy of receiving apprentices from charities and instead encouraged the settlement of permanent families. For this purpose, he provided good-quality houses. In one of his earliest essays, Owen wrote ‘The practice of employing children in mills, of six, seven and eight years of age, was discontinued, and their parents advised to allow them to acquire health and education until they were ten years old’ (Owen, 1817, republished 1991, ‘Essay Second’: 55). As a footnote, Owen added:

'It may be remarked that this age is too early to keep them at constant employment in manufactories from six in the morning to seven in the evening ... Far better it would be for the children, their parents, and for society, that the first should not commence employment until they attain the age of twelve when their education might be finished.'

Owen, when he took control of New Lanark Mills, had plans for maintaining the health and
well-being of his most precious asset, the workforce. His plans were not only for the health and education of the children in his care, though that was an important feature of the plans, but for a thorough reform of the whole working of the factory and village. The first steps taken to build a community arose out of public health needs. He paid for street cleaning and established a general code of cleanliness for the village as a whole. This included an obligation on the tenants to keep clean the insides of the dwellings. The people of New Lanark took the first steps towards communal responsibility when it became competitive to be singled out for the cleanliness of the family home after a system of voluntary home inspections had been instituted. According to Owen, community life required two further conditions. The first of the necessary conditions was the building of places where the community could meet. Secondly, the community required training so that they could make the most use of the facilities. In the view of Owen, this implied a new and better education for the children and also for the older people.

Owen’s view of education was egalitarian. In his view every child should receive the best possible training to live the ‘good life’ that is, equipped in a way to live a productive life as an adult. Owen ‘would never have had any use for a segregated specialized education aimed at producing a cadre of priests, commissars, or as members of the governing class’ (Cole, 1953, op. cit.: 76). For Owen, the essence of education was ‘to impress on the young ideas and habits which shall contribute to the future happiness of the individual and the State’ (Owen, 1817, republished 1991, ‘Essay Fourth’, op. cit.: 152). The single necessary principle for achieving a good healthy society was the pursuit of happiness for all: ‘That principle is the happiness of self clearly understood and uniformly practised; which can only be attained by conduct...’ (ibid., ‘Essay First’: 22). This is very similar to the precepts and ideas being suggested by Huppert et al. (2005) in The Science of Well-Being.

By all accounts, Owen was successful in the running of his town and mill. The mill increased productivity, the workforce increased take-home pay, the children received, for the time, an excellent education, and a physician treated the people of New Lanark when they were sick. The Report by the Guardians of the Poor in Leeds, which visited New Lanark in 1819, was positive, almost glowing. It reported that:

‘Mr Owen’s establishment at Lanark is essentially a manufacturing establishment, conducted in a manner superior to any other the deputation ever witnessed, and dispensing more happiness than perhaps any other institution in the kingdom where poor persons are employed ... In the education of children the thing that is most remarkable is the general disturbance...’
spirit of kindness and affection, which is shown towards them ... In the adult inhabitants of New Lanark we saw much to commend. In general they appeared clean, healthy and sober ... In this well-regulated colony, where almost everything is made, wanted by either the manufactory or its inhabitants.’ (Quoted in Morton, 1962)

**THE BUILT ENVIRONMENT**

New Lanark, for its time, was an exemplar of a community organized so that it was a sound investment, economically successful and at the same time a healthy place for its inhabitants. ‘Sound investment’ did not mean exorbitant profit. Investors in New Lanark could expect to get a flat rate of return. Higher rates of return on investments inevitably lead to the ‘dark satanic mills’ of William Blake and to the slum developments spawned around every manufacturing town in Britain. Using a piece of modern jargon, ‘there is no such thing as a free lunch’, excess profit on development, less euphemistically called ‘greed’, is paid for in environmental and human degradation. Profits in New Lanark were ploughed back into the social and built environment, ensuring the health and well-being of the community which serviced the mills.

The original mills were built while Dale was the owner. According to Historic Scotland (2000) in their *Nomination of New Lanark for Inclusion in the World Heritage List*, the most dramatic change in the site ‘was the arrival of the four cotton-spinning mills and housing for people in what had been barren and useless land’. These mills were built on the Arkwright model. Arkwright was, briefly, a founding partner at New Lanark, where no doubt his ideas were influential. Arkwright was responsible for designing a workable factory system that produced cotton yarn for which, at the time, there was an insatiable demand. These mills were extended and remodelled by Owen to make them more efficient and in some cases he rebuilt them after destruction by fire, but essentially they date from Dale’s time as owner.

The last major change in the built environment has been the recent programme of reconstruction, which has put most of the building in the village back into use as hotel, shops, museum and homes. An important feature of the reconstruction is the careful restoration of Mill number 1 (Figure 7.4) between 1993 and 1995. It has been converted into a fine hotel for tourists. Mill number 1, like the other mills on the site, has had a chequered history. It was built in 1785, burnt down and rebuilt in 1789. The top two floors were demolished in 1945 but the mill was returned to its full height in the 1990s. The reconstruction is based partly upon the design of Mill number 2,
which retains its original façade facing the river and dating from 1788. Figure 7.5 shows a view of The School and Mill number 4 from the river.

The housing in New Lanark dates mostly from the late eighteenth century, predating the arrival of Owen at the mill. It is the most extensive multistoried industrial housing in Britain. The steep slopes to which the long tenement blocks cling dictate its form, which, of necessity, follows the contours (Figure 7.6). It is very reminiscent of the Gorbals in Glasgow, a common urban form in nineteenth century Scottish cities. For rural Scotland in the late eighteenth century it was unique. Typical of this housing is Braxfield Row, circa 1785–95: it is the first row of housing on entering the village. Below it and parallel is Long Row, circa 1792. Lower down the steep slope is Double Row, circa late eighteenth/early nineteenth century: it is built into the hillside so that the bottom two floors are single sided.

Owen’s contribution to the housing stock in New Lanark was to enlarge the properties, improve the sanitation and to build additional terrace blocks (Morton, 1962: 25). New Buildings (Figures 7.7 and 7.8) was one such improvement by Owen. He extended the block and provided upper floor halls for Sunday schools and Gaelic services. ‘It was given a pediment, the first in the village, an oculus and advanced end bays, similar to those used at Mill 3, possibly as part of Owen’s classicizing of the village (Historic Scotland, 2000, op. cit.: 49).

In terms of the built environment Owen’s main contribution in New Lanark was the accommodation he built as community facilities, particularly those structures used for educational purposes. Owen’s predecessor and father-in-law had provided schooling for the factory children: some graduated through eight classes. The factory schooling at New Lanark in Dale’s time compared favourably with the charity schools but was conducted in unused mill accommodation. The first purpose-built mill schools in Britain are the New Lanark Institution for the Formation of Character (1809–16) and The School (1817) built by Owen at New Lanark (Figures 7.5 and 7.9).

The early partnerships formed by Owen to own and run the mill with him were unwilling to support Owen in his ideas for the education of the workforce. It was thought by his partners that it was an unnecessary expense imposed on a manufacturing industry. It was not until Owen reformed the partnership in 1814 that he was able to proceed with his plans for the building of special educational premises. Among his partners of 1814 were: Jeremy Bentham, leader...
of the Utilitarians and the acknowledged chief of the radical philosophers; Joseph Foster, a leading Quaker philanthropist and promoter of universal peace; Michael Gibbs, who later became Lord Mayor of London; and finally William Allen, an implacable opponent of the slave trade. The new partners were committed to Owen’s ideas about education and saw great potential for its development in New Lanark (Cole, 1953, op. cit.: 66).

After the formation of the new company, The Institute and The School were completed and put into immediate use. Both buildings are long hipped structures, simple in outline with a central pediment. Internally both buildings contain suites of large, well-lit rooms capable of many varied teaching activities. The architectural treatment is a solid industrial classic style with windows arranged symmetrically about the central pediment. It was the New Institute for the Formation of Character, more than any other building, on which Owen built his reputation as a reformer. It was designed to give food for the mind and body of all age groups from the youngest infant to the adults of the village. The New Institute was probably the earliest of its kind anywhere, and certainly in Britain. It was the first physical expression of Owen’s ideas about the environment, individual development, community health and well-being. The curriculum in The School and The Institute emphasized the expressive arts, dancing, singing and poetry. The building also performed other communal functions – for example, acting as a venue for public lectures, communal dining and religious services.

The village store in New Lanark is regarded as the seedbed of the cooperative movement. The store, founded by Owen in the early nineteenth century, is still a shop today. The store pioneered a fair trading system, bringing benefits to the community and to those who used it. For example, the profits from the store paid the teachers’ salaries. It was quite different in its basic concept, in its purpose and in its management from the normal factory shop of the time. Such shops were run without the benefits of the workers in mind, exploitation was both their ethos and modus operandi. Owen is the father of the cooperative movement, which is still a force for fair trade today. This store in New Lanark is this movement’s small beginning.

New Lanark’s built environment illustrates the way in which wealth can be created without
the wanton degradation of its producers or the environment. New Lanark sits in a great landscape. The landscape has been modified to meet the requirements of a manufacturing industry using architecture of simple grandeur. The Scottish tenement tradition is displayed in the tall terraced blocks of housing and in the solid treatment of the mills themselves. In contrast are the smaller masses of the school, institute, managers’ houses and workshops. The theme of all the buildings in the complex remains the same: a civilized and civilizing classical architecture of human scale, good proportions, with solid, dependable masonry having simple details. It is the architecture of Scottish vernacular ‘writ large’, a monumental unity: the physical expression of Owen’s paternalistic model for a ‘new moral world where the health, happiness and well-being of the community is as important as profit.

THE SYMBOLIC ENVIRONMENT

Owen had a vision of the healthy, cooperative community. New Lanark was his experiment, his model, to show how such a community could become a reality and what it might look like. Owen actually built his utopia in microcosm. Utopia is not really the correct description of New Lanark. It is not a community which is ‘ideally perfect but impracticable’, as the dictionary would define ‘utopia’. New Lanark was built, it was profitable and, furthermore, it still exists. New Lanark, however, did need ‘philanthropy’, or ‘a benevolent loving of humankind’, to make it work. In the next paragraphs, the physical structures of New Lanark will be examined to discover the way in which this ‘love of humankind’, in particular the way in which the care for the health and well-being of a community in its environmental setting, manifested itself symbolically in the structure of the village.

A deep understanding and love of nature is implicit in Eastern art forms, particularly in Chinese painting and the Japanese garden. However, it was in Britain during the eighteenth century that the theory of ‘the picturesque’ and the ‘sublime’ landscape was defined. This movement in the pictorial arts was paralleled in the poetry of the time (see Chapter 6). Scotland with its ancient geological structure, rugged topography and wild scenery was a ready-made focus for the appreciation of the picturesque and sublime in nature. Thunderous waterfalls, sheer cliff faces and dark gorges were the components of the sublime (Figure 5.28). The Falls of Clyde close to New Lanark fall into this category of ‘the sublime landscape’. ‘It is on the Bonnington Estate, immediately upstream of New Lanark, that we find the earliest known building in Scotland specifically sited for the

Figure 7.7 New Buildings.
enjoyment of wild nature. Built in 1708, the Bonnington view-house created an explicit visual dialogue between the ordered beauty of the park on the one hand, and the wild grandeur of the gorge on the other’ (Historic Scotland, 2000, op. cit.: 35). New Lanark’s built form captures this grandeur of nature while at the same time harnessing its power for the purpose of industry. Its simple but rugged architecture made from local stone complements the environment. The village is very much a part of nature: it is built from the underlying geological structure on which it sits and out of which it grows. Nature is introduced into the heart of the village where the Clyde is canalized and harnessed to power the village. Furthermore, this magnificent scenery is at the disposal of the New Lanark community: it is not simply the reserve of a wealthy landowner or the privileged tourist.

The central space in the village is its green. Behind the tenements are kitchen gardens, which were a valuable food source for the community. As we saw earlier, New Lanark was self-sufficient in most of its daily needs. It was in effect a sustainable settlement. The village had its own fresh water supply, a local cheap and healthy food supply, an abattoir, a fair trade shop, foundries and workshops for maintaining the mills, accommodation for educational and social activities. The whole well-kept village exuded care for the environment and for those whose labour was essential for the running of a profitable manufacturing industry.

The guiding figure in the development of New Lanark as a self-sustaining community was Owen. It was his drive, imagination and benevolence, together with the philanthropic support of his co-owners, that made the experiment at New Lanark successful. This benevolent paternalism that sustained the village is clearly manifested in its layout. Around the focal point of the village, the green, are located the detached villas occupied at various times by Dale, Owen and the later managers (Figure 7.10). Facing this space is the ‘Counting House’, which Owen built onto an earlier row of houses in 1810–16. It was the wages office with a commanding view of most of the village (Figure 7.11). This bow-end to the terrace proclaims itself the nerve centre of the whole operation.

The form and construction of the village reflects the rugged landscape in which it sits and from which it has been carved. It is a complete self-sufficient and self-sustaining community with accommodation for all its daily needs. It is watched over by the strict but benevolent eye of a proud domineering father. The architecture of New Lanark is not that of the mean and ugly slums which became commonplace in the urban Britain of the Industrial Revolution: it is the architecture of an educational prophet concerned to teach its dependants to be happy and healthy.
The New Institution for the formation of Character, New Lanark, Lanarkshire - drawing partly reconstructed.
Owen thought of New Lanark as an experiment, a preparation for achieving his much larger vision for improving the conditions of humankind. Owen's experiment at New Lanark was a great success. His success in New Lanark led him to believe that his ideas could be spread worldwide in a decade, ‘All the means requisite to effect this change over Europe and America in five years from its commencement, and over the world in less than ten, are now in the control of society; and they will be thus applied as soon as measures shall be adopted to make society so far rational as to understand their own permanent interest’ (Morton, 1962, op. cit.: 177). His large-scale plan, like many such ‘grand designs’, was doomed to failure. The ideas for villages of industry were developed over a number of years and were presented in a number of reports. For students of planning, architecture and urban design, Owen's Report to the County of Lanark is a seminal work. For example, his suggestion for a settlement pattern of self-sufficient villages, distributed on good agricultural land, is the beginnings of the idea of regional planning.

Owen in 1820 reported to the County of Lanark ‘of a plan for relieving Public Distress and removing Discontent, by giving permanent, productive Employment to the Poor and Working Classes, under Arrangements which will essentially improve their Character, and ameliorate their condition, diminish the Expenses of Production and Consumption, and create Markets co-extensive with Production (Owen, 1991, op. cit.: 250). The Report began with a statement of the problem as he saw it, namely a lack of employment at a wage which would support a working man and his family. Owen's solution was based on his experience in New Lanark: it was the creation of villages of industry, or communities of cooperation. Owen's plan did not envisage a segregation of agriculture from industry. His plan was for villages of 300–2000 people to be settled on the best agricultural land with supporting agricultural estates from 600 to 1800 acres. Agriculture and industry were to be interrelated and of mutual support and benefit. Owen's villages were to be 'self-educating, self-employing, self-supporting and self-governing': in the language of today, they were to be sustainable. Each settlement was to have accommodation for public buildings, public kitchens, schools, committee rooms, library, dormitories, homes, visitor's rooms and infirmary. Gardens and recreational areas were to be located beyond the residential areas. Further out still were to be located the buildings for manufacturing purposes, slaughterhouse and stables. The whole settlement was to be encircled by farmland. Within this

![Figure 7.10 The 'green' and the manager's house.](image)
multifunctional settlement there is the germ of the idea of zoning, but one based on common sense and small in scale. It is unlike the large areas of single use, such as large faceless industrial or commercial zones that developed in the twentieth century city.

Owen’s plan laid great stress upon the need for, and the value of, communal effort, in contrast to the individualism advocated by many political economists. It is this individualism that bedevils much of modern thinking and militates against the pursuit of health and well-being in the community. In Owen’s words, ‘if there is one closet doctrine, more contrary to truth than another, it is the notion that individual interest, as that term is now understood, is a more advantageous principle on which to found a social system, for the benefit of all, or any, than the principle of union and mutual cooperation’ (Cole, 1953, op. cit.: 137). Those writing today about well-being, such as Huppert et al. (2005) and Layard (2005), are the direct heirs of this particular philosophy.

CONCLUSION

The legacy Owen has left is immense: it spans many fields of endeavour. It includes education, town planning, economics, social and political philosophy, labour relations and the cooperative movement. Owen was not simply a theorist: he was a practical, down-to-earth businessman, who was extremely good at his business. In this age of environmental damage and climate change Owen speaks directly to us as no other figure in British history. He can tell us how to make twenty-first century Britain a tolerable, civilized place in which to live in accord with the neighbours and with the environment on which we are so dependent. If, as a nation, we had listened more closely to Owen over the last 200 years we might not have been left with the difficulty of clearing up the environmental mess left by greedy all-consuming development.

Specifically, Owen’s suggestions for education and early learning in an atmosphere of love and play are in tune with the findings of neuroscience and the development of the mind of the child (Gerhardt, 2004). The government’s launching of a national play strategy seems to be a step in the right direction and in tune with Owen’s philosophy (The Guardian, 3 April 2008). The notion that it is the whole village that educates and is responsible for the child is also worth revisiting, but perhaps not quite in the Spartan-like dormitories of Owen. In this policy area the Danes seem to be leading the way; there is much we can learn from their experience. Like the great fairy-storyteller, Hans Christian Andersen, ‘Denmark is fond of children. There are well-equipped playgrounds for little ones and giant skateboard runs for their seniors.'
The quality of childcare, and the support given to working parents, is generous. Those in the public sector, for instance, have the right to stay at home on the first two days of their child's illness (The Guardian, 1 April 2008). Owen was sceptical about the contribution organized religion could make to the welfare of humankind. In many ways he was an early advocate of secularism. Nevertheless, his basic thesis that a happy, healthy community is one where the concern for the welfare of others comes first corresponds with the philosophy, if not always the outward behaviour, of many of the world's great religions. It is also in accord with much that is being advocated by those studying the causes of well-being (Huppert et al., 2005, op. cit.). Owen's suggestion for the development, throughout the regions of the country, of small self-contained, cooperative communities, set within their own supporting landscape, is one that seems well worth considering in the light of the current need to build many more new sustainable communities throughout Britain.
INTRODUCTION

Chapter 6 discussed the leading intellectual role played by poets in opposing the degradation of the human spirit and the environment by rampant urbanization resulting from the twin revolutions in agriculture and industry. The case study of New Lanark in Chapter 7 recounted the efforts of Robert Owen to build an alternative healthy response to the remorseless process of squalid urban growth. This chapter will build on the work of these two chapters by examining the ways in which other reformers attempted to civilize and make healthy the vast swaths of degraded development that sprang up around major towns and cities in Britain. The chapter starts with a brief outline of the extent of the growth of cities in nineteenth century Britain and the health hazards faced by their citizens. The chapter continues with the analysis of population growth by Malthus and a discussion of attitudes to poverty, pauperism and the workhouse. At the heart of the chapter are the sanitary reforms of Chadwick, the Public Health Legislation and their effects on the health of urban Britain in terms of life expectancy. In contrast to these centralized initiatives, a short case study of Saltaire outlines a purely local, holistic initiative in caring for the well-being of the working family: it contrasts with the national effort that concentrated initially on sanitation, water and cleansing the city. Chapter 9 starts with a discussion of the emerging ideas on landscape and the integration of nature with urban development. It concludes with Port Sunlight, and the Quaker developments spanning the end of the nineteenth century and the early twentieth century in places like Bournville and New Earswick, together with the garden city and garden suburb movements of the twentieth century.

URBAN DEVELOPMENT IN BRITAIN

Charles Dickens has set the scene for our emotional response to urban Britain in the nineteenth century. The Dickensian account of squalor and grinding poverty in *Hard Times* is very much a part of, and reinforces, tribal memory in this country. The history of British towns and cities in the early nineteenth century
is, in general, the story of ill health and high mortality rates, but more particularly it is about typhus and consumption (Flinn, in Chadwick, 1842). It was a time of rapid change. Many people were on the move from country to town. The urban migrants came from rural Ireland, the Scottish highlands and the dispossessed from the enclosed landscapes of England. People were attracted by the work to be had in towns or more simply the immigrants were those expelled from the land by landowners keen to improve agricultural productivity. Despite the economic results of the war with France, periodic epidemics and a series of poor harvests, the urban population grew at a remarkable rate. The population in England and Wales in 1801 was nine million. By the mid-century it was 18 million, half of which was in urban centres. Town population doubled within two or three decades. For example, Liverpool grew from 88,000 in 1801 to 165,000 by 1831, while Manchester grew from 90,000 to 187,000 and Leeds from 53,000 to 123,000 in the same time period (Smith et al., 2001).

As Sheard and Power (2000) point out, while ‘health and life expectancy decreased with increasing urban size during the nineteenth century’ it was not ‘urban size per se which is important, but conditions within the urban area’. The speed of urban development was not accompanied by an equivalent revolution in the planning and management of towns and cities. Urban bureaucracy and its polity remained largely in its bucolic state, an anachronism from rural Britain in the eighteenth century. It was not able to contend with the new demands of growing cities. Urban housing was constructed to meet market demand without considerations of overcrowding, sanitary services, clean water supply or refuse disposal. A deteriorating environment accompanied rapid city growth. As we have seen, population health is closely correlated to city size. However, conditions within cities were also important in determining the health and well-being of the urban population. Of particular importance, in this respect, was density. The spread of back-to-back housing, which was an eighteenth century innovation, became a regular practice rather than an exception. In the last chapter we saw the use of back-to-back housing in New Lanark: this was on a small scale and in a rural context. New Lanark never became a slum. Throughout urban Britain in the early nineteenth century back-to-back dwellings were the common form of housing development for the working people of the country. For example, ‘In 1840 between 7000 and 8000 of Nottingham’s 11,000 houses were reported to be back-to-back’ (quoted in Flinn’s introduction to Chadwick, 1842).

There are a number of accounts of urban housing conditions in The Report on Sanitary Conditions of the Labouring Populations of Great Britain prepared by Chadwick in 1842. Chadwick quotes, for example, Dr Duncan on conditions in Liverpool (see Box 8.1). Chadwick quotes another medical officer, Mr Handley, as follows:

‘When the small-pox was prevalent in this district, I attended a man, woman and five children, all lying ill with the confluent species of that disorder, in one bed-room, and having only two beds amongst them. The walls of the cottage were black, the sheets were black, and the patients themselves were blacker still; two of the children were absolutely sticking together. It was indeed a gloomy scene.’

Reports of this tenor induced Chadwick to state amongst his conclusions:

‘That the various forms of epidemic, endemic, and other disease caused or aggravated, or propagated chiefly amongst the labouring
classes by atmospheric impurities produced by decomposing animal and vegetable substances, by damp and filth, and close and overcrowded dwellings prevail amongst the population in every part of the kingdom.’

Chadwick goes on to conclude that these diseases are always found in conjunction with the degraded physical circumstances his surveyors had documented. The last occupied courtyard house with communal toilet in Britain was demolished in Belfast circa 1970 (Figure 8.1).

Death rates in urban Britain in the early nineteenth century were much higher than those in the rural areas of the country. Even in towns there were considerable differences between localities. For example, the death rate in the suburb of Broughton, Manchester, was 15.8 per 1000 in 1840, while nearer to the town centre at Ardwick the rate was 28.6, and in the central district itself the rate was 35.2. Despite these death rates, in some parts of urban Britain the population of the country kept rising, putting further pressure on the towns and cities. An ever-growing section of the population were moving to the environmentally less favourable areas of the towns and cities (Flinn, introduction to Chadwick, 1965).

**Box 8.1.**

‘The cottages are built more with a view to the percentage of the landlord than to the accommodation of the poor ... The houses generally consist of three apartments, viz., the day-room, into which the street door opens, and two bedrooms, one above the other. There is likewise beneath the day-room a cellar, let off either by the landlord or the tenant of the house, to a more improvindent class of labourers; which cellar, in almost all cases, is small and damp, and often crowded with inhabitants to excess. These cellars are, in my opinion, the source of many diseases, particularly catarrh, rheumatic affections, and tedious cases of typhus mitior, which, owing to the overcrowded state of the apartment, occasionally pass into typhus gravior.’ (Chadwick, 1842)

**MALTHUS, POPULATION GROWTH AND POVERTY**

Thomas Malthus first published *An Essay on Population* in 1793. In that essay he analysed the cause of fluctuations in the size of human population. In particular he examined the relationship of population and its food supply. The work of Malthus has often been denigrated and misunderstood. Deserving special notice is his

**Figure 8.1** The last occupied courtyard house in the UK, Cromac, Belfast, c. 1970.
method of thinking holistically in terms of population and its supporting environment. His observations led him to the conclusion that human populations increased geometrically, whereas agricultural production, at best, can only increase arithmetically. The effect of this disproportionate growth of population and its food base, according to Malthus (1793), would inevitably lead to too many mouths to be fed by too little food (Appleman, 2008). This was his calculation:

‘Taking the population of the world at any number, a thousand million for instance, the human species would increase in the ratio of 1, 2, 4, 8, 16, 32, 64, 128, 256, 512, etc., and subsistence as 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, etc. In two centuries and a quarter the population would be to the means of subsistence as 512 to 10, in three centuries as 4096 to 13, and in two thousand years the difference would almost be incalculable.’

The first half of the formula, the geometric power of population increase, is true of any plant or animal species, an argument used by Darwin as a key to the theory of natural selection and evolution. The second half of the equation, being a conjecture not a field observation, has had a chequered history and at times and in some locations has not always been an accurate reflection of the agricultural endeavour. Nevertheless, it is only now that we can see how the limits to agricultural production in relation to the burgeoning world population may prove catastrophic. David and Marcia Pimental (Appleman, 2004) point out, for example, that the USA uses 17 per cent of its consumption of fossil fuel on food production; such a massive investment of energy far outstrips the energy obtained from food. They also point out that: ‘Worldwide, more than 10 million ha [hectares] of agricultural land are abandoned annually because of serious soil degradation. During the last 40 years, about 30 per cent of total world arable land has been abandoned because it was no longer productive.’ There is general agreement that, worldwide, there are growing shortages of food, water and land for agriculture, while GM technology seems a long way off (Borger, 2008; Randerson, 2008).

Furthermore, greater numbers of people in fast developing countries such as India and China are demanding a greater share of world resources. These pressures on a finite or possibly shrinking resource base give added urgency to the recognition of the importance of the basic thesis of Malthus.

In the second edition of the essay on population, Malthus lifts some of the gloom associated with his thesis, softening some of the harshest conclusions of his first essay. He suggests that the biological ‘juggernaut’ could be held in check through moral restraint, returning responsibility to the individual within the population (see Box 8.2).

According to Malthus, natural population growth forced the poorer people to subsist on the smallest quantity of food that will support life, a fact of life for many in the less developed world today. In many ways, we in the developed world have exported our poverty. Malthus did not appeal to the medical fraternity for intellectual support for his claims. It seemed to him that disease disproportionately affected the weak in society, the strong being able to resist the ravages of epidemic and contagion. He did not worry whether disease was caused by miasms or contagia, or whether the effects of hunger could be distinguished from those of dwelling in crowded houses surrounded by filth, or whether poverty directly generated disease or simply added to the number of victims. He simply assumed that people lived as well
as conditions allowed. Surely people would not pack like sardines into small dwellings or remain filthy if they had alternatives, any more than they would starve if they had food (Hamlin, 1998). Unlike some of his followers and others in the business of reform, Malthus did not blame the poor for their plight. He was recording a truth as he saw it. For him, the might of nature was the ultimate control mechanism. In the 1830s and 1840s the predictions of Malthus appeared to be coming true. Population was not being kept in check by famine according to classical Malthusian thinking but by nature’s fierce retribution, disease. ‘The population of this country was beginning to exceed its capacity – or willingness – to house itself healthily’ (Chadwick, 1842, introduction by Flinn).

In the early nineteenth century population was rising in Britain while death rates also continued to rise, matched by increasing birth rates, the rate of population growth reaching a maximum in the 1820s. It all seemed to fit with the grim theory of Malthus where societies tend to move towards a balance determined by environmental conditions, so that new individuals replaced those ‘put under the sod’. Between these two events the poor could expect little solace. Considerations of poverty are often associated with notions about morality. This was true of the nineteenth century. The debate revolved around the question: is the miserable existence of the poor created by society and the environment, or is their misery the result of fecklessness? Those who believed the cause of poverty was fecklessness could then analyse this tendency to fecklessness in terms of an inability to stay sober, to save for a rainy day, to manage a household budget, or it could be put down to plain ignorance. This was the nature of the debate in the nineteenth century, but as an argument it has its parallels in the 1990s, when members of Parliament were exhorting the poor, particularly single mothers, to learn how to live on less.

Blaming the poor for their poverty has a long history in Britain. This seems to have been the general attitude of many in the business of

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**Box 8.2.**

‘To those who still think that any check on population whatever would be worse than the evils which it would relieve … And if we adopt this opinion we shall be compelled to acknowledge, that the poverty and the misery which prevailed amongst the lower classes of society are absolutely irremediable … and it seems evident that no improved form of government, no plans of emigration, no benevolent institutions, and no degree or direction of national industry, can prevent the continued action of a great check on population in some form or other; it follows that we must submit to it as an inevitable law of nature; and the only enquiry that remains is, how it might take place with the least prejudice to the virtue and happiness of human society. … All the immediate checks to population, which have been observed to prevail in the same and different countries, seem to be resolvable into moral restraint, vice or misery; and if our choice be confined to these three, we cannot long hesitate in our decision respecting which it would be most eligible to encourage.’ (Appleman, 2004)
improving urban conditions in nineteenth century Britain. There was an attempt to draw a distinction between the deserving and undeserving poor: the undeserving poor being those willing to rely on poor relief or to be declared paupers and so consigned to the workhouse. The Elizabethan Poor Law of 1607 made it possible for those in distress to gain relief from the parish in which they were born and lived. The relief from poverty was usually medical care and small supplements to wages. It was a small-scale rural operation not suitable for the growing towns and cities. Reform of the Poor Law was necessary but its focus was the rising cost. Reform meant disciplining the undeserving poor – that is, the lazy and the improvident who were breeding too fast. Edwin Chadwick, whose sanitary reforms were to change the urban environment in the second half of the nineteenth century, reported in 1832 to the Royal Commission on the Poor Laws. His suggestion was quite simple but brutal. Chadwick suggested that the new system should make the pain of pauperism greater than the pain of poverty, or make relief cease to relieve. In this way it would be possible to end dependence on relief. It is this seductive argument, ‘to get people off benefit’, that is still used today in some quarters of the political establishment. Conditions in the workhouse did deter people from declaring themselves paupers. The death rate of adults and children in the workhouses were higher than in the urban areas of the country: people preferring to starve than enter such a fearful place. It was a short step from advocating brutal workhouse conditions to the elimination of redundant population through infanticide, an idea current in the 1830s, itself an extension of the practice at that time of ‘not prosecuting infanticide aggressively’ (Hamlin, 1998).

Chadwick was the dominant figure in the field of public health in nineteenth century Britain. The House of Commons did not always welcome his recommendations, particularly his suggestion for the centralization of the Poor Law and his recommendation that children should not be employed in factories unless they had a certificate to say that they were receiving three hours education a day. This was the same Chadwick whose suggestions for dealing with pauperism, by today’s standards, seem somewhat less than humane. His crowning glory as a reformer was his report to the Poor Law Commissioners in 1842, which led to the developments in systems of sanitation, drainage and water supply (Chadwick, 1842). These sanitary reforms over the next half-century turned fetid urban slums into civilized places fit for human habitation. Like most health reformers of the time, Chadwick believed that most deadly diseases were caused by filth (Hamlin, 1998; Cockayne, 2007). Chadwick’s solution was to wash all the filth away down self-flushing, egg-shaped sewers. Liquid waste could then be transported, mainly by gravity, to the countryside to be used as fertilizer.

Sanitary reform was faltering at first. It wasn’t until the cholera epidemic of 1847 in which 10 000 Londoners died that Parliament was finally persuaded to act on Chadwick’s recommendations, passing the necessary health legislation in 1848. Radical and rapid sanitary action became widespread throughout the country in the second half of the nineteenth century. This action was part of a much larger endeavour, a massive expansion of the country’s infrastructure. The infrastructure development, consisting of a network of roads, tramways, hospitals, sewers and waterworks, was primarily
a public sector initiative. ‘From the 1850s, local authorities carried out over 90 per cent of all government investment. By the early 1900s, this was nearly as large as the capital expenditure of the whole of manufacturing industry.’ Within this infrastructure, development expenditure on public health was a capital-intensive activity. ‘The average figure for capital investment in water was £1.5 million per annum in the 1880s …’ and the ‘… estimate of public health effort averaging two-fifths of total local authority capital expenditure on services’ (Sheard and Power, 2000). By any standards, this was a monumental effort, owing a lot to the dedication of Chadwick. By the end of the nineteenth century, urban Britain was more or less sanitized. The sewage system that Chadwick bequeathed to the nation served Britain right through the twentieth century.

Chadwick was single-minded, almost one-dimensional, in his attitudes to public health reform: he was successful because of his dedication to the ‘sanitary idea of health’. He also had the ability both to marshal evidence and to argue his case convincingly in political terms. This was a time when revolution was in ‘the air’: unrest was rife, as was so ably voiced by the ‘poets of protest’. It is not difficult to imagine that, at this time, Chadwick’s ability to link sanitation to political stability was important to Home Secretaries, even when they were not pleased to hear what he had to say about the cost of the necessary actions (Hamlin, 1998). Overall, health did improve in late nineteenth century Britain. Population nearly doubled from 1841 to 1901 – from about 20 million people to 38 million. In the same period in England, death rates per 1000 people fell from 22 to 17, though infant mortality remained persistently high until the first decades of the twentieth century. How much of the improvements in the general health of the British population, including the end to the epidemics that bedevilled the early decades of the century, are due to sanitary reforms is difficult to determine. Other factors such as improvements in medical practice, including vaccination, were no doubt important. Chadwick and the sanitary engineers who followed him, with their work below ground and out of sight, laid the foundation for general well-being in the twentieth century.

**THE MEDICAL PROFESSION AND REFORM**

The public health infrastructure of the late nineteenth century was an outstanding achievement, a ‘technological fix’ of quite extraordinary dimensions. Chadwick, despite his protestations, was not and could never have been the sole author of this sanitary movement. The climate of public opinion had to be receptive to the idea. ‘Sanitation was in the air’: the moment was ripe. This receptive climate was in no small measure due to the small but growing medical profession. For example, at the end of the eighteenth and the beginning of the nineteenth century there were some remarkable achievements in military medicine. The conquest of a disease such as scurvy and a reduction in the number of serving soldiers and sailors dying through infectious fevers was the result of the work of military doctors, extending military discipline to the fields of personal hygiene and diet. This kind of common sense began to filter through to civil medical practice. There was a rise during the late eighteenth and early nineteenth centuries, not only in the numbers of medical practitioners, but also in their improved professional skills (Flinn, introduction to Chadwick, 1842). It was this group of medical
practitioners, trained mainly in Edinburgh, who acted as the nation's conscience in matters of public health, keeping the issue before those with greater influence.

Amongst the medical profession's concerns was the relationship between sickness and hunger, which was the result of low wages in relation to the cost of living. Also of concern were the causes of exhaustion, mental depression and anxiety, which were thought to be the result of repetitive factory work, insecurity and impoverished living conditions. While drainage and clean water were an obvious need of all, so too was a decent home, a living wage and good food. However, they were low on the political agenda. Chadwick's concern in his great report of 1842 was quite specifically with 'working men'. The medical profession had wider concerns: they were with women giving birth and the exhausted child in the factory (Hamlin, 1998). This more holistic and preventative attitude to public health was kept alive by the nascent medical profession: it is close in spirit to the thinking on health and well-being today.

Public health is a political issue: it is about 'who gets what health treatment where and when'. It is part of the political competition for goods and services. In Marx's terms, it is part of the class struggle. The ideas of Thomas Paine (1737–1809) were a feature of any discussion of a political nature: they influenced poetry of the time as well as public health reforms. Paine's writings supported both the French and American revolutions and were an attack upon the British establishment. He was persona non grata in his own country and was advised by William Blake to leave the country before his book *The Rights of Man* appeared in print in 1791. He was put on trial by the British government, in his absence, for seditious libel. His answer to the charges was: 'If, to expose the fraud and imposition of monarchy ..., to promote universal peace, civilization, and commerce, and to break the chains of political superstition, and raise degraded man to his proper rank; if these be things libellous ... let the name of libeller be engraved on my tomb.' (Paine, 2008)

Those in the Paine camp were in no position to win an argument with the British establishment, for whom even the politically anodyne sanitary reforms were unpalatable. With the outbreak of cholera in London, Chadwick's drains were the only politically acceptable proposition. If politics is indeed the 'art of the possible' then Chadwick was adroit enough to seize the opportunity.

**TITUS SALT AND SALTAIRE**

In the turbulent years of the early nineteenth century, when popular revolt was not far from the surface, a number of reformers responded to the pressures urging a rapprochement between capital and labour. They were seeking a new accommodation with radical movements such as 'chartism', so that business could still run effectively. Saltaire, built by Titus Salt (1803–1876) between 1850 and 1875, was the largest of several settlements developed by industrialists. The building of these industrial villages owed much to Owen and New Lanark. They make an interesting contrast to, and complement the countrywide sanitary reforms of, Chadwick. In 1849, James Silk Buckingham brought together his ideas on social reform in his work *National Evils and Practical Remedies*. His solution to solving the social evils of the day was a model town designed in some architectural detail. The town named Victoria was never built:
it was planned in great detail for 10,000 houses arranged in concentric squares surrounded by the rural beauties of nature (Figure 8.2). Other influences on Salt included John Gubbs Richardson, who built Bessbrook near Newry in Northern Ireland (Camblin, 1951). The small village was built to house the employees of a linen factory and was characterized by generous landscaping consisting of allotments, two public gardens and land for sports activity. The village had its own school, shops, dispensary and community centre (Figure 8.3).

Salt's motives for building Saltaire were probably mixed. His decision to move out of Bradford sprang in part from the needs of his industry. His new town was four miles from

Figure 8.2 Victoria.
Bradford on the River Aire between the Leeds–Liverpool canal and main railway line from Scotland to the Midlands. The site was excellent for the location of a manufacturing town; the factory being sited between the canal and the railway line made the handling of goods cheap, while the general location gave direct connection, both with the sources of raw materials and market outlets for finished articles (Moughtin, 2003). Clearly the new site for the factory was a good reason for the location of the new town but the squalid conditions of Bradford, which mirrored urban conditions in the rest of the country, were an incentive for Salt to start afresh on a new site. Like the rest of urban Britain, Bradford grew rapidly. In 1831 the population of the parliamentary borough of Bradford was 43,527. In 1841 it was 66,713 and in 1851 it was 103,771. This was a 40 per cent increase of population in just 20 years. It was inevitable that this phenomenal rise in population would

**Box 8.3.**

‘Immediately after the stones had been thrown the principal portion of the women and children, as if by concert, withdrew, and a ferocious attack was made upon the specials by hundreds of men armed with bludgeons, pokers and other missiles. The specials fought bravely but were overpowered by the overwhelming number of their assailants whose ranks were constantly receiving accessions, and whose object was to bar all means of retreat. After a severe conflict the specials were able to rescue themselves from their position, and when a little room had been gained heads were broken pretty freely on both sides …’ (Reynolds, 1983: 142)
Figure 8.4 Plan of Saltaire.
cause social problems. These problems of poverty, insecurity, disease and consequently insurrection were precisely the concerns with which Chadwick was attempting to deal at a national level.

While the 1832 Reform Act widened the franchise to include voting rights for some in the middle classes, it did nothing to address the political rights of the working class. In response, William Lovett drafted the ‘People’s Charter’ in 1838: it was at the centre of the campaign by radicals for a thorough review of the political system, in order to redress some of its inequities. The Charter’s six main demands were:

1. Votes for all men.
2. Equal electoral districts.
3. Abolition of the requirements that Members of Parliament be property owners.
4. Payment for MPs.
5. Annual general elections.
6. The secret ballot.

The Chartists placed a petition before parliament in 1839, 1842 and 1848, their charter being rejected on each occasion. 1848 was a year of great civil unrest and revolution in many European countries, Britain being no exception. Bradford was one of the centres in Britain where this unrest turned to violence. It was reported in the *Bradford Observer* that, in May 1848, 20 000 Chartists marched through the town in military formation. Countermeasures were taken by the authorities, which included the billeting of troops in the town. Local newspapers of the period reported a number of violent clashes between the Chartists, police and troops (see Box 8.3).

During this violent period in Bradford, Titus Salt was the town mayor. During his time as mayor Salt tried unsuccessfully to get the pollution from the factory chimneys cleaned up with a device called the Rodda Smoke Burner;
which probably left him disillusioned. With so much to do in Bradford, even this improvement was beyond his power to achieve. It is not difficult to imagine the magnitude of the task Salt faced if he had tried to establish a profitable and humane business in the violent and degraded environment of Bradford. In these circumstances, the site on the River Aire four miles from Bradford must have seemed ideally suited to his purpose. Saltaire was designed to play its part in the ‘conciliation of the working classes’. Reynolds (1983) describes the objective of Saltaire as trying ‘to marry the social experience of the eighteenth century village to the economic structure and technology of the nineteenth century’.

The houses built by Salt’s architects Mawson and Mawson were vastly superior to most workers’ houses built in the first half of the nineteenth century. They were supplied with gas and water direct to the home from the factory. Each house had its own lavatory in the back yard and was designed as a two-sided terrace, where each home had cross-ventilation or through-draft, conforming to the best sanitary practice of the time. In order to determine the type and quantity of housing required for the town, Salt commissioned a sort of social survey among his workers. From this he was able to estimate the various housing needs for different family sizes. This was probably the first time that it had occurred to anyone that a workman with 10 children needed more rooms than a workman with one child (Dewhurst, 1960). The variety in house type gave the architects the opportunity to articulate the long street elevations. Large houses were placed at the end of terraces or at places where the long terraces stepped down the contours. In this way, the frontages were articulated with pavilions of larger houses breaking the roofline. Though the gridiron plan was similar to that used for much of nineteenth century working-class housing, in Saltaire it was sensitively designed, so it did not plumb the depths of monotony associated with nineteenth century housing development. Saltaire never degenerated into a slum. This may be due, in part, to the small scale of the development, but more probably because of the thought given to the design of the buildings and their detailing. The development was designed with care by human beings for fellow members of the human race.

The main street, Victoria Road, is the spine of the town and a fine piece of civic design. Along Victoria Road are arranged the public buildings. Entrance to Saltaire is through a small square enclosed on one side by the hospital and on the other three sides by the almshouses for the retired workers. The road passes down one side of the square, leaving the remaining space for use as a communal garden, attached to the almshouses. From the entrance square, the road narrows between two groups of terraced houses before opening out into another small square, enclosed by the

Figure 8.6 The Institute, Saltaire.
school and the Institute (Figures 8.4–8.9). From here, the route to the factory narrows again between terraces, before crossing the railway line to the works and the chapel. Here, made physically manifest, are the Protestant values of Salt: the key to a good life being work and prayer (Figure 8.8). Beyond the factory and across the canal and river is the public park and allotments (Moughtin and Mertens, 2003: 158–9).

Walking down Victoria Road is a delightful aesthetic experience. The spaces are architecturally modulated; buildings are arranged on either side of the route, in mutually reflecting projections or axially composed frontages. The whole street is an exercise in ‘inflection’ – that is, the echo of feature with feature across the space, the ‘minuet of street architecture’ as Trystan Edwards (1926) once described such a street scene. The environment of Saltaire speaks of the care and thought that has been given to the well-being of the people who were to live there, work in its factory, then retire and die there. Such care for well-being implies much more than the provision of basic services which, though important, is little more than a token gesture. A visit to Saltaire with its decorative architecture in honey-coloured stone still uplifts the spirit. But it was an act of paternal benevolence that created Saltaire. This
paternalism, while providing public baths for the community, did not permit the building of a public house, an acknowledgement of the saying 'he who pays the piper calls the tune'. Those who follow Paine are more inclined to believe that well-being in all its various manifestations is a basic human right, not a hand down from the great or the good. For 'drinkers' the opening, in 2007, of a bar called 'Don’t Tell Titus' was a timely blow for freedom, choice and the rights of man and woman.

CONCLUSION

This chapter has discussed the environmental conditions in the rapidly growing towns and cities in nineteenth century Britain. The conditions under which the urban working class lived, particularly in the early decades of the century, were the cause of epidemics and were thought to be responsible for the general poor state of health of the urban population. In mid-century there was great civil unrest in the country, with activists such as the Chartists demanding political change. Unlike other European countries, Britain did not quite descend into revolution. Political reform was slow, but most of the demands of the Chartists were indeed met by the end of the century, the main exception being the demand for annual elections. The other major response to the public unrest was the sanitary reforms of Chadwick, a truly monumental development of urban infrastructure that served the country for most of the twentieth century. A number of philanthropic industrialists, such as Titus Salt, by their example demonstrated the way in which capitalism could be profitable, without destroying the environment or the health and well-being of the workforce. We will see in the next chapter how the ideas of people like Salt were developed by the industrialists of the late nineteenth and early twentieth centuries, and furthermore how those ideas influenced the

Figure 8.9 Housing, Saltaire.
building of suburban Britain. The nascent medical profession began to find its voice in the early decades of the nineteenth century, widening the debate on ill health and disease, arguing that the root cause of disease was poverty, which itself was spawned by the prevailing social and economic system. However, the great urban achievement of the nineteenth century, the sanitary reforms of Chadwick, was double-edged. Together with later public health acts, the foundations were laid for the development of a healthy urban environment. There was an improvement in the health of the nation as measured by indicators such as life expectancy and infant mortality. By the beginning of the twentieth century, these indicators were showing marked improvement. The reforms of Chadwick, however, by centralizing infrastructure developments under state control, to some extent weakened local independence. With too much power at the centre the citizen’s control over his or her destiny is weakened. Control over one’s own life is a fundamental right and a requirement of the healthy individual.
INTRODUCTION

This chapter explores the ways in which those ideas we have developed in Britain about the ‘good life’ – well-being and living close to nature – are expressed architecturally. The chapter continues the theme established in the earlier chapters of Part 2, developing the idea that the British sense of identity, health and well-being is intimately connected to, and is best expressed in, ‘landscape’: this imperative leads naturally to the building of the ‘leafy suburb’, a long-lasting, persistent theme of urban development in Britain. England, ‘this green and pleasant land’, has as collective self-concept the notion of itself as being the healthy countryside, the environment of nature, as opposed to the ugliness of the city: the ‘satanic mills’ of Blake, associated, in the British psyche, with overcrowding, squalor and disease. This chapter will examine the work of environmental designers in landscape, architecture and town planning in accommodating nature; in particular, it will examine the development of the concept of the ‘picturesque’ as applied to the landscape, the cottage and the garden suburb, paying particular attention to Port Sunlight. The chapter will conclude with a comparison of the persistent or spontaneous suburbs of the twentieth century (Mellor, 1955), where the upwardly mobile working and lower middle classes found freedom of self-expression, with the council estates, the tower block and the new town, marking out the state’s response to housing shortage and the urban slum.

THE ‘PICTURESQUE’

According to Hussey (1967), ‘The picturesque view of nature was the new, the only way of deriving aesthetic pleasure from landscape … the picturesque became the nineteenth century’s mode of vision.’ The picturesque vision was a break with the past, a new way of seeing the natural world; it was indeed a paradigm shift. It was a movement away from the very formal layouts of towns and landscape like the plan for Karlsruhe (Figure 9.1). Central to this new sensibility was
nature as expressed in the landscape painting of Turner or Constable (see Figure 5.27), or by the poetry of Keats and Wordsworth. The new sensibility, as we have seen, stressed the importance of the individual and one’s infinite capacity and need to engage with the natural world. One strand in the development of this new sensibility and the appreciation of nature was the Grand Tour (Hibbert, 1974). It was on this journey that the British tourist was brought into contact with ‘poetry, painting, gardening, or the science of landscape’, which according to Horace Walpole, ‘will forever, by men of taste, be deemed Three Sisters, or the Three New Graces who dress and adorn nature’. The tourist travelled through the wonderfully scenic landscape of the Alps to Italy, where one was able to see at first hand the work of Claude or Salvatore Rosa. The first grand tourists of the earlier part of the eighteenth century were the sons of the aristocracy or the gentry sent to the continent, particularly to France or Italy, to finish their education. From the end of the

eighteenth century the ‘elite’ grand tourist would ‘rub shoulders’ with other types of tourists drawn from the middle classes. This growing tourist industry spawned a whole new literature, both tourist guides and accounts of travels, such as Percy and Mary Shelley’s *History of a Six Weeks Tour*. Such popularizing of travels in Europe widened the appeal of the new attitudes to nature, supporting a growing interest in architecture and garden design in late eighteenth and early nineteenth century Britain (Roe, 2005).

The foundation of the appreciation of nature and the therapeutic quality of landscape became embedded in British attitudes by widespread travel throughout Europe, augmented by a flourishing home-grown tourism to places like the Lake District and the Scottish Highlands. Travel in this country was facilitated by the building of public and private roads and by the publication of travel guides such as *A Guide to the Lakes in Cumberland, Westmoreland and Lancashire*, published in 1784 by Thomas West. West extols the virtues of the British landscape, saying that: ‘The genius of Britain rivals that of ancient Greece and modern Rome.’ The growing attraction of the areas such as the Lake District inspired works by William Gilpin, Uvedale Price, William Wordsworth, Constable and Turner. This aesthetic endeavour, in turn, fed into the ideas about how the environment should be structured. The growing democratizing of ‘recreational’ travel led to works outings or the ‘Wakes Weeks’ in Lancashire and the cheap travel that made some of the benefits of the ‘Grand Tour’ open to an ever widening public.

**THE LANDSCAPE MOVEMENT**

Hussey, in his introduction to Stroud’s (1957) account of the life and work of Capability
Brown, describes Brown as ‘the most celebrated English landscape architect of the eighteenth century’. Despite Brown’s denigrators of the late eighteenth century, particularly Payne Knight and his doggerel *The Landscape: A Didactic Poem* (1794), his work is still regarded by many as the highpoint of the English Landscape movement. Moreover, the estates he remodelled are thought to be the essence of the English landscape. The taming of nature by Brown and those who followed gave a whole new dimension to life. As Taylor (1973) points out: ‘It is impossible to exaggerate the enlargement of human personality made possible by this taming of nature.’ The manicured parks were humanized by carefully sited temples, grottos, belvedere and tower. Follies became three-dimensional sculpture, the designer having accepted the notion of the viewer walking freely in all directions, so that pictures unfolded as the observer moved through nature. This freedom of movement in and through nature had its reference point in the writings of the poets and symbolized the recently won, if restricted, freedoms achieved during the English revolution of 1688. It was a freedom for the few but a pointer towards the demand for more fundamental human rights for all, a trigger for the revolutions of America and France (Paine, 1984 edition).

It was, however, Kent, Brown’s immediate predecessor, for whom he worked for a while, who is generally recognized as the originator of landscape gardening in this country. This position as founder of the Landscape movement is based on Hugh Walpole’s claim that ‘Kent first leaped the fence and saw all nature as a garden’. From the time of Kent the whole of an estate to its boundary became the garden; indeed, the whole of England to its shoreline became ‘the garden’. England ‘the garden’ was partly an attitude to the aesthetics of the ‘picturesque’. It also represented a fundamental change in attitudes to land and property. The agricultural revolution, mainly an eighteenth century movement, had a profound effect on the environment. There was a tendency amongst landowners to cultivate every acre they possessed. In the process they created the rural landscape of today: it was this tendency of the aristocracy to farm, to use and to ‘own’ the land, which created the English countryside.

As Hussey (1967) points out: ‘The whole Kingdom was gardened … The woods, the downs, the fields that we take for granted, are now seen to have been but parts of a vast created landscape, natural enough to our eyes, but in reality managed as much for picturesque appearance as for economic returns.’ This is still true despite the fundamental changes in agricultural practices since Hussey was writing. Despite the loss of many hedgerows to industrial farming, the landscape of Britain retains, in large areas, that manicured appearance of the ‘landscaped kingdom’ left as inheritance by Brown and those who followed him. This exaltation of nature and liberty inspired the Victorian creators of the public parks that adorn many of Britain’s cities. For example, Joseph Paxton, head gardener to the

*Figure 9.2* Birkenhead Park.
The Duke of Devonshire, was employed at Birkenhead Park, Merseyside, to transfer to the municipality the qualities of landscape, its pleasures and recreative powers which hitherto had been the privilege of the few (Figures 9.2 and 9.3).

Notions about the form of the ‘ideal home’ in Britain today originate from the end of the eighteenth century. This model home incorporated notions of individual freedom and the therapeutic value of nature and the garden, which is best expressed by informal, organic architecture, the spontaneous architecture of the vernacular. Vernacular – a term originally used to describe a local or native language as distinct from the classical language of the church — was, in the nineteenth century, absorbed into the language of architecture. It was to this vernacular architecture, constructed from local materials by local craftsmen, that landowners intent on developing their estates on the edge of London turned for inspiration. The model for such development was the village rather than the town, ‘in order to establish the right relationship between the new suburb and the existing landscape’ (Taylor, 1973). This idyll of the picturesque country cottage, for those who could afford it, does not sit comfortably with the reality of the miserable conditions of the actual cottages occupied by the rural poor. Nor does this idyll correspond with the destination of the rural dispossessed, those urban terraced cottages in courts and fetid rows, built without regard for the health and welfare of the occupants.

In New Lanark and Saltaire the enlightened mill owner designed and built small towns for their workers. The Georgian model village is a further strand in the making of later nineteenth century developments and their successors, the twentieth century urban suburbs. In the main, the early Georgian model village was an assembly of local vernacular cottages designed and constructed by the local mason. Examples of this type of development include Westport in Ireland, the town formally
designed by James Wyatt (Figures 9.4 and 9.5) (Moughtin and Mertens, 2003: 182). Milton Abbas in Dorset is probably the first major example of picturesque village planning, though in many ways it transcends the purely visual requirements of that style. Indeed, in appearance Milton Abbas looks ‘modern’ and ‘up to date’ (Figures 9.6–9.8). Milton Abbas was part of the tradition of building cottages outside the landscaped parks of the wealthy landowners. The Earl of Dorchester in 1774 removed the existing town from outside his mansion. He moved the entire settlement half a mile down the valley. Here Sir William Chambers and Capability Brown resettled the townspeople in a single long street with church, pub, shop and almshouses. The houses appear to be detached villas with white plastered walls and thatched roofs. Behind each villa, which is in effect a ‘pair of semis’, is a long vegetable garden, in front is a broad band of neatly kept communal lawn. The development is a long sinuous curving street perfectly related to the sheltering hills that define the cleft in which the town sits. This is the geometry of the landscapist, the long flowing curve of nature that owes little to Euclid.

Taylor (1973) describes Nash as the ‘father of the suburb’ – that is, a purely residential area often sited on the edge of the city limit. This is particularly true of his work at Regents Park. Blaise Hamlet, north-west of Bristol, was designed in 1811 (Figures 9.9–9.11): in its subtle and informal arrangement of cottages it has many of the characteristics of the later well-designed suburb. The function and location of Blaise Hamlet, however, were quite different from the suburb: it is the garden village in miniature. The village was intended as a retirement hamlet for the old retainers of a Quaker banker, J. S. Harford. It was built at the edge of his baronial Blaise Castle. The hamlet has only eight small dwellings but Nash
has given the illusion that it is a much larger community, by placing each cottage around a central green moulded into little hills and dells: the cottages themselves are of tremendous variety, an imaginative use of a limited number of materials in compositions of delightful simplicity. The architecture has been much denigrated, given such labels as ‘joke oak’, ‘bun loaf’ and ‘Tudor teahouse’. Despite being the object of such verbal abuse, like Constable’s *Haywain* (1821), it still has a treasured place in the British mentality. The main difference between Blaise Hamlet and its later, cheap imitators is its authenticity, its sound construction with crafted panels of flint, weather boarding and intricate clusters of modelled brick chimneys. It is a small-scale environment, where no two buildings are the same: it depends for its effect on the intricacy of a very human scale where the care for the design of the details of the environment speaks of the care for the community for whom it was built. While Blaise Hamlet fits picturesquely into its surroundings it goes further. Each home has a veranda and doors that lead directly onto the garden, windows arranged to give views of the moulded landscape and gardens that merge with it. These were not great houses occupied by voyeurs of the scene. Each family was part of nature in the best traditions of the poets extolling the virtues of the natural world: Nash put into architectural terms those ideas the poets were writing about so eloquently.

The changed attitude towards nature and the landscape affected house design, but in quite profound ways, that went far beyond notions of the picturesque. The tendency towards more informal, asymmetrical house plans, together with the adoption of Gothic detailing, has led to the label picturesque for this style of building. This, in turn, has emphasized the importance of the aesthetic decisions made by architects in what became known as the ‘battle of the styles’. Such a simplified viewpoint overlooks the new demand from the growing numbers of the middle class for homes closely related to nature. The middle classes were demanding that their families, like those of the wealthy, should be intimately connected with the

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**Figure 9.8** Milton Abbas.

**Figure 9.9** Blaise Hamlet (composite photo).
landscape. The means to make this connection were: the bay window projecting the room into the garden; the veranda or balcony with their bringing of the garden into the home; together with features such as cloisters, pergolas and French windows; and above all else the ubiquitous conservatory. The external walls of the house were moulded to create opportunities for strategically placed windows facing interesting views of the surrounding garden or landscape. This, then, was the basis of the picturesque, model home, a concept embedded in the British psyche: it symbolizes family well-being.

**BIRTH OF THE SUBURB**

Although Nash is thought to be the inspiration of speculative suburban housing, it was probably Norman Shaw who, at Bedford Park, created the first garden suburb. Bedford Park was the model for the later industrial villages built by the philanthropic industrialists of the late nineteenth and early twentieth centuries. Shaw’s villas, detached or semi-detached, were designed specifically for the new bourgeoisie. They were built for families wishing to live within 30 minutes of the centre of London. Every home in Bedford Park is an individual three-dimensional sculptural form inserted, snugly, into a well-established garden, where existing trees were treasured and protected. Bedford Park, designed by Shaw for his patron Jonathon Carr, has none of the rigid geometry of previous urban housing in such places as Saltaire: it is a free-flowing landscape where families can develop their own individuality and where the architecture permits the illusion that each family uniquely owns the surroundings. Bedford Park is no ‘fish-bowl’ development where one picture window faces another at hailing distance.

The zeal for paving, streetlights and sewers of the nineteenth century health reformers such as Chadwick, whose work was discussed in the last chapter, was essential to cleanse the city in order to eliminate the crippling effects of epidemics. However, the Victorian penchant for health considerations, in their narrow physical sense, to dominate public debate, resulted in vast areas of urban Britain being covered in monotonous row upon row of bye-law housing. In the sanitized city, minimum standards became the norm. Uniform blocks of housing faced each other at standard distances in serried ranks of identical housing units. While Shaw’s development at Bedford Park is in great contrast to the inhuman bye-law streets of Victorian cities, his homes were for the wealthy few, not for the mass of the working people of the country.
RUSKIN AND MORRIS

Two thinkers of the nineteenth century were instrumental in developing and propagating the idea that nature is the springboard of architecture and town planning. Ruskin, in a lecture of 1853, suggests that the modest vernacular cottage possesses deep moral and spiritual significance. ‘The very soul of the cottage – the essence and meaning of it – are in its roof; it is that, mainly, wherein consists its shelter ... It is in its thick impenetrable coverlid of close thatch that its whole heart and hospitality are concentrated.’ For Ruskin, the invitation to take shelter ‘beneath my roof’ had great significance. Ruskin thought that after the roof, in importance, came the bay window as a visual expression of a generous welcome (quoted in Watkin, 1982: 142).

Ruskin, like the ‘poets of protest’, could be described as a proto-ecologist in so far as he extolled the value of using nature as the model for architectural detail and structure, but more importantly in his statements showing an understanding of the relationship between human beings and nature. Ruskin’s green credentials are fully established in The Lamp of Memory, where he advocates ‘The idea of self-denial for the sake of prosperity, of practising present economy for the sake of debtors yet unborn, of planting forests that our descendants may live under their shade, or of raising cities for future nations to inhabit.’ He goes on to make the point that:

‘God has lent us the earth for our life; it is a great entail. It belongs as much to those who are to come after us, ... as to us; and we have no right, by anything we do or neglect, to involve them in unnecessary penalties, or deprive them of benefits which was our power to bequeath.’ (Ruskin, undated second edition of 1855: 190–1)

An important legacy of Ruskin is his notion that only happy healthy workpeople can produce beautiful things. Realizing that society cannot be changed simply by advocating a way of building or a way of painting, Ruskin, following on from Owen, made plans for social change, prompted, according to Farmer (1996), ‘by his involvement for the first time with working men in his attempts to inspire the craftsmanship of the museum’. This is, of course, the Oxford Museum, a fine example of Gothic Revival, with which Ruskin was involved from the early 1850s. Ruskin was one of the great theoretical writers on art and architecture, but it was Morris in particular – and the Arts and Crafts
movement more generally – that moved the ideas of Ruskin onto a more practical plane, applicable to the world of building and to the making of everyday items of furniture. The Arts and Crafts house, with its dominating, hospitable roof, its close relation to nature, its honest craft conditions of building, became the dominant form of house building in Britain, Europe and North America. The pale imitations of the Arts and Crafts house still dominate large areas of suburban Britain in the twenty-first century. Morris, like so many of the avant-garde thinkers of the nineteenth century, was deeply concerned with politics and the healthy society (Morris, 2003, edited by David Leopold). Like Ruskin, Morris was in the mould of Owen, the builder of New Lanark: he was also a great influence on the philanthropists who built the garden villages such as Port Sunlight and the later garden cities and garden suburbs.

**PORT SUNLIGHT**

**Foundation and origins**

‘The truest and most enlightened form of enlightened self interest requires that we pay the fullest regard to the interest and welfare of those around us, whose well-being we must bind up with our own and with whom we must share our prosperity.’ (Port Sunlight Village Trust, undated)

This is a quote from a speech in 1900 by William Hesketh Lever, later to become Lord Leverhulme: it sums up his enlightened ideas about the people who worked for him. Lord Leverhulme has left no direct references indicating the sources for his ideas for the garden village he built from 1888 on the banks of the Mersey opposite Liverpool. Lever was in the tradition of philanthropic industrialists such as Owen and Salt and was probably aware of their developments at New Lanark and Saltaire. As a well-travelled, well-connected man he probably knew of less well known but similar industrial developments, such as Richard Arkwright’s village at Cromford in Derbyshire and, two miles from his own site, also at Bromborough Pool, is ‘Bromborough Pool Village’, built to house Price’s Patent Candle Company in 1853 (Figures 9.12 and 9.13). Port Sunlight was at the apex of this long tradition which attempted to provide decent housing for the working class. A further tradition incorporated into Lever’s Port Sunlight is the rural model cottage developed by the
improving country landowners, discussed earlier in the chapter. The final thread in Port Sunlight’s rich pedigree is the picturesque visual tradition derived from the eighteenth century landscape tradition and the poets writing about the value of nature: a tradition that was transformed into the Victorian garden suburb, particularly Bedford Park by Shaw. Lever is also quoted as saying that ‘The cottage is the unit of the nation’ (ibid.), which places him as following in the footsteps of Ruskin, Morris and the Arts and Crafts movement.

**Natural environment**

Lever moved his factory from a constricted site at Warrington to a new location at Bromborough Pool on land which was cheap but prone to flooding. The new village, Port Sunlight at Bromborough Pool, was inaugurated in 1888. The site had room for expansion and it had good connections by road, sea and rail. The site was traversed by tidal inlets which formed the structure of the plan devised by Lever and his architect Owen (Figure 9.14). The tidal inlets were filled in and cut off from Bromborough Pool by a dam in 1901–2. A competition for a revised plan was won by Prestwich, a student at the Liverpool School of Architecture. The plan was in the Beaux Arts tradition (Figure 9.15). Fortunately, the rigid formality of the plan is not apparent to the visitor: it has been softened by the exigencies encountered in building, the delicate scale of the architecture, fine landscaping and the original tidal inlets, one of which remains as ‘the Dell’, a natural sunken garden, and the others can be traced in their influence on the position of the earlier street blocks (Figures 9.16 and 9.17).
An abiding impression of Port Sunlight today is the sheer amount of well-maintained open space. It takes the form of: lovely communal parks, such as the Dell, a natural garden in which people stroll and children play; formal tree-lined boulevards, such as the Diamond, that leads to the Lady Lever Art Gallery; a playful fountain, popular with the family; the mundane but useful private back gardens; recreation areas including a well-used bowling green; and finally, the carefully and communally maintained front lawns used by resident to commune with resident (Figures 9.18–9.20). This natural non-crowded environment is due entirely to the ideas of Lever and distinguishes Port Sunlight from earlier nineteenth century industrial towns. As Lever maintained, the ‘building of ten or twelve houses to the acre is the maximum that ought to be allowed … every house should have space available in the rear for vegetable garden. Open spaces for recreation should be laid out at frequent and convenient centres … a home requires a greensward and garden in front of it’ (Hubbard and Shipbottom, 2005).

**Social environment**

The tenancy of cottages in Port Sunlight was confined to company employees and pensioners. This was not the standard community of the city: Port Sunlight was a total institution. In accordance with Lever’s theory of profit sharing, no realistic return on the cost of outlay of the village was intended. Port Sunlight was an exercise in profit sharing. However, the profits were not shared directly with the workers but instead were invested in the social environment of the village. Lever hoped ‘to build houses in which our workpeople will be able to live and be comfortable’ (ibid.). In the 1980s the cottages
Figure 9.17 Port Sunlight: the Dell.

Figure 9.18 Port Sunlight: boulevard.
were made available for tenants to purchase and are no longer restricted to company employees. The cottages are, however, protected by restrictive covenant, in addition to listed building and conservation area legislation. Port Sunlight Village Trust was established in 1999: it now manages the communal buildings, the few remaining unsold homes and the impressive landscaping regime. While the social structure of the village is changing, the physical appearance remains very much as Lever planned.

There are few, if any, self-contained communities such as Port Sunlight that are richer in social and educational institutions, or indeed in public buildings to house those institutions. Lever introduced many schemes for the welfare, education and entertainment of his workers, many of which still exist; and some have developed a momentum of their own. Gladstone Hall, designed by William Owen in 1891, was the first assembly and recreation hall. Over the years, it has been converted into the Gladstone Theatre. In addition, the village had its shops, school, church, Hulme Hall for special conventions, a Temperance Hotel now the Bridge Inn and the Lady Lever Art Gallery (Figures 9.21–9.24). Port Sunlight was and still is a really well-endowed community, some of its social infrastructure being paid for from the share in the profits of the industry that accrued to the workforce from Lever’s policy of ‘profit sharing’. Lever’s care for the health and well-being of his workers did pay dividends. In addition to an economically successful industry and a wonderfully equipped village, the state of health of the community was much better than in other parts of the country (Tables 9.1–9.3). For example, in 1909, the average death rate in Port Sunlight was 9.0 compared to 20 for Liverpool, while the infant mortality was 70 per 1000 in the first year of life compared to 140 for Liverpool. The birth rate in Port Sunlight too
was much higher than in the rest of the country. This really was a happy, healthy community in which to raise a family: just as Lever planned.

### The built environment

There seems to be general agreement amongst architectural critics that Port Sunlight was never a pioneer in terms of architecture. Tarn (1964–65), for example, described the architecture as ‘pretentious’. The dismissal of Port Sunlight in this way seems a little ungenerous: Lever promoted a commonsense solution to the housing needs of the working family. His views also represent populist attitudes to the home and its appearance. Lever stated:

‘Flats and such devices for crowding a maximum amount of humanity on a minimum amount of space are destructive of a healthy life ... I am positive, from all the statistics available, that the most healthy conditions of the human race are obtained where the home unit exists in a self-contained house, with living rooms on the ground floor and the bedrooms on the first floor immediately over.’ (Hubbard, op. cit.)

The housing was of two types. The first was the ‘kitchen cottage’, with a kitchen scullery and three bedrooms. The second type was the ‘parlour cottage’, which had a parlour and a fourth bedroom. WCs were in outbuildings and the bathrooms were mostly on the ground floor (Pevsner and Hubbard, 1971). There were notable exceptions to the less than enthusiastic architectural reception of Port Sunlight's buildings. Theo Crosby (1978) described it as: ‘The first and only good

**Figure 9.21** Port Sunlight: Lyceum.

**Figure 9.22** Port Sunlight: Leverhulme memorial.
housing estate in England … Port Sunlight is a place we can learn from.’ It was, however, a foreigner Muthesius, in Das English Hause (1904–5), whose enthusiasm for Port Sunlight gave it a seal of approval on the international scene (see Muthesius, 1994).

Lever employed a number of architects on the building of Port Sunlight: Pevsner and Hubbard (op. cit.) list about 15 firms as being the main contributors. Cottages are usually in groups of between two and ten, with no two blocks being identical. The cottages were arranged in super blocks with the inner private courtyards being used for vegetable gardens. The diversity of architectural treatment gives the occupants a sense of individuality, a quality in their homes that many families in Britain appear to seek. However, the diversity of architectural treatment is within the vernacular so that the village is a unity despite the apparent diversity. All buildings are designed to a common human scale; they employ a range of sympathetic materials and are beautifully detailed: They are decorative, which may be a reason why their appearance did not appeal to the modernists of the twentieth century. Furthermore, the buildings are arranged within a fine landscape which dominates the composition (Figures 9.25–9.27). Port Sunlight is a lovely built environment: it is indeed a work of art. Of art, Lever said, ‘it has always appealed to me as a stimulating influence … and it has always appealed to me because of this fact, that only the best and truest in art survives’ (Port Sunlight Village Trust, op. cit.). The village has survived the test of time; it still gives pleasure to its community and to those who visit. There is much we can learn from Port Sunlight when designing the healthy, therapeutic environment.

**Symbolic environment**

The environment of Port Sunlight is the physical record of the benevolent care Lever expended on behalf of his workpeople. Lever, in a letter to the architect Thomas Mawson in 1918, wrote: ‘It seemed to me that the life of the people, in all planning, must be the first consideration’ (ibid.). The care for the well-being of the community is expressed in the landscape in which the people of Port Sunlight live and breathe its fresh air. They live in carefully designed, appropriate homes, embellished with fine decorative detailing. The community’s daily physical, artistic and spiritual needs are met with public buildings of great quality for education, health, pleasure and religious purposes. For the workpeople at Lever’s factory, it was not all work and drudgery. For the active there was: the open-air pool, the recreation grounds and the vegetable gardens; for the less active, the bowling green; for the artistic, the art gallery and theatre; while for the drinkers, belatedly and after

![Figure 9.23 Port Sunlight: Hulme Hall.](image_url)
negotiation, there was the pub. Finally, if illness did strike the individual, a cottage hospital was provided. The whole village is a symbol of the care given to the health and well-being of the community: an exemplar of the therapeutic environment.

Table 9.1 Average death rate per 1000

<table>
<thead>
<tr>
<th>Region</th>
<th>Death Rate per 1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denbighshire</td>
<td>19.0</td>
</tr>
<tr>
<td>Caernarfonshire</td>
<td>18.0</td>
</tr>
<tr>
<td>Middlesex</td>
<td>11.0</td>
</tr>
<tr>
<td>76 great towns (over 50,000 inhabitants)</td>
<td>16.2</td>
</tr>
<tr>
<td>142 small towns (20,000 to 50,000 inhabitants)</td>
<td>14.7</td>
</tr>
<tr>
<td>Rest of England and Wales (country)</td>
<td>15.0</td>
</tr>
<tr>
<td>All England and Wales</td>
<td>16.0</td>
</tr>
<tr>
<td>Liverpool</td>
<td>20.0</td>
</tr>
<tr>
<td>Port Sunlight</td>
<td>9.0</td>
</tr>
</tbody>
</table>

Source: George, A.R. (1909) *Labour and Housing in Port Sunlight*, Alston Rivers Ltd., quoted in *Port Sunlight Fact Sheets*, Port Sunlight Village Trust. info@portsunlightvillage.com

Table 9.2 Infantile mortality per 1000: deaths of first year of life

<table>
<thead>
<tr>
<th>Region</th>
<th>Mortality Rate per 1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caernarfonshire</td>
<td>160</td>
</tr>
<tr>
<td>Denbighshire</td>
<td>158</td>
</tr>
<tr>
<td>Oxfordshire</td>
<td>65</td>
</tr>
<tr>
<td>76 great towns (over 50,000 inhabitants)</td>
<td>125</td>
</tr>
<tr>
<td>Rest of England and Wales (excluding small towns)</td>
<td>97</td>
</tr>
<tr>
<td>All England and Wales</td>
<td>119</td>
</tr>
<tr>
<td>Liverpool</td>
<td>140</td>
</tr>
<tr>
<td>Dewsbury</td>
<td>179</td>
</tr>
<tr>
<td>Port Sunlight</td>
<td>70</td>
</tr>
</tbody>
</table>

Source: George, A.R. (1909) *Labour and Housing in Port Sunlight*, Alston Rivers Ltd., quoted in *Port Sunlight Fact Sheets*, Port Sunlight Village Trust. info@portsunlightvillage.com

Table 9.3 Average birth rate per 1000

<table>
<thead>
<tr>
<th>Region</th>
<th>Birth Rate per 1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monmouthshire</td>
<td>35.5</td>
</tr>
<tr>
<td>Durham</td>
<td>34.8</td>
</tr>
<tr>
<td>Sussex</td>
<td>21.3</td>
</tr>
<tr>
<td>76 great towns (over 50,000 inhabitants)</td>
<td>28.3</td>
</tr>
<tr>
<td>142 small towns (20,000 to 50,000 inhabitants)</td>
<td>26.9</td>
</tr>
<tr>
<td>Rest of England and Wales (country)</td>
<td>26.9</td>
</tr>
<tr>
<td>All England and Wales</td>
<td>27.5</td>
</tr>
<tr>
<td>Liverpool</td>
<td>33.7</td>
</tr>
<tr>
<td>Port Sunlight</td>
<td>42.0</td>
</tr>
</tbody>
</table>

Source: George, A.R. (1909) *Labour and Housing in Port Sunlight*, Alston Rivers Ltd., quoted in *Port Sunlight Fact Sheets*, Port Sunlight Village Trust. info@portsunlightvillage.com
Port Sunlight was the foundation for the garden city and the garden suburb, inspiring the suburban developments from the 1930s and the post-Second World War new towns. Bournville was an early follower of the Port Sunlight model: it was founded near Birmingham in 1879 but not begun until 1894. George Cadbury built Bournville in connection with his chocolate factory. The village was conceived as economically independent of the factory, attracting residents from outside Bournville; consequently, its community was made up of a wider social spectrum than Port Sunlight (Figures 9.28 and 9.29). Raymond Unwin, the architect, was pivotal in the development of both the garden city and the garden suburb. Unwin was another architect in the tradition of Ruskin and Morris. For him the English village was a symbol of the natural response to basic
human needs: it was, for him, a social group with the ability to grow into a more complex structure, the main unit of this social structure being the family and its home (Jackson, 1985). The ideas of Unwin and his partner Parker, being centred on social amelioration, found a sympathetic hearing from influential Quaker families.

It was the Rowntrees, a Quaker family, who commissioned Parker and Unwin to design and build New Earswick near York, the third of the industrial villages of the late nineteenth and early twentieth centuries. The development was an experiment in providing decent housing, sound education and recreation in a healthy environment. The Rowntrees wanted to remove New Earswick from the tradition of philanthropic paternalism and so divorce it from the idea of charity. The concept was to build at a price that working people could afford. Nevertheless, rents were still beyond the reach of the lowest paid residents. It was not until after the First World War that New Earswick expanded rapidly with housing at higher densities using government subsidies. Perhaps a lesson to be learned from these early experiments in building healthy environments is that payment of a decent living wage might negate the need for charity or subsidy. It may have been Lever who understood the need and desirability of this policy: 'It is by the paying of the highest possible rate of wages to the employee-worker for the fewest number of hours that an adequate demand for this increased volume of products can be found' (Port Sunlight Village Trust, op. cit.).

The successful development at New Earswick by Parker and Unwin led naturally to their commission to develop Letchworth Garden City. Howard’s idea for a garden city first appeared in 1898 as a book, *Tomorrow, A Peaceful Path to Real Reform*; it was reprinted as *Garden Cities of Tomorrow* in 1902. Howard’s diagram of the three magnets that appeared in that book illustrate the good and bad features of both town and country (Figure 9.30). In town-country he tried to combine the best of both worlds. In his analysis of the problem, Howard said: ‘Each city may be regarded as a magnet, each person as a needle, and, so viewed, it is at once seen that nothing short of

![Figure 9.30 Howard’s ‘three magnets’. (Source: Howard, 1965).](image)
Figure 9.31
Letchworth: the superblock.
the discovery of a method for constructing magnets of yet greater power than our cities possess can be effective for redistributing the population in a spontaneous and healthy manner’ (Howard, 1965: 45). Howard’s healthy magnet for living was the garden city, combining the good features of town and country, where ‘all the fresh delights of the country – field, hedgerow, woodland, not prim parks and gardens merely – would be within a very few minutes walk or ride’ (ibid.: 142). Howard was very much within the social tradition of the poets who emphasized both the needs of the individual and of the community but viewed within the context of nature’s setting. Parker and Unwin interpreted Howard’s enigmatic diagrams sensitively, relating the development to a difficult site. Throughout the plan landscape was the dominant consideration. Groups of cottages, following the model of Port Sunlight, were arranged in superblocks with internal courts used as vegetable gardens. The fronts of the cottages were arranged around green spaces (Figure 9.31). Parker and Unwin’s cottages tended to be simpler in design and less decorative than those in Port Sunlight, becoming the model for the more utilitarian local authority public housing later on.

In 1906, a trust was established to develop Hampstead garden suburb, which was designed by Unwin: it was a model for later similar developments. A leading figure in the development of Hampstead garden suburb was Mrs (later Dame) Henrietta Barnet. She felt that the ideal community should comprise all classes and all generations of people: this mixed class development was the crux of the concept for the proposed suburb. The community was also to be served by public transport with the building of the tube station at Golders Green. The suburb was founded as a reaction to overcrowding, poverty and ill health in places like Whitechapel. The model for the
development was the middle-class Victorian suburb, but adapted for a mix of classes. The idea was to build cottages with their own gardens to be let at a moderate rent and to be located within a twopenny fare of central London. The suburb was to have its own community facilities including schools, library, public hall, church, chapel and shops. The protection of nature featured strongly in the aims for the suburb, which was to be organized so that ‘every tree may be kept, hedgerows duly considered, and the foreground of the distant view preserved, if not as open fields yet as a gardened district and the buildings kept in harmony with the surrounds’ (quoted in Jackson, op. cit.: 85). Hampstead garden suburb today presents a civilized face to the world, a pleasant place to be: it is a well-planned and carefully designed environment for family and community life (Figures 9.32 and 9.33).

**CONCLUSION**

The main development in twentieth century Britain has been the suburb. This despite the bad press suburban development has received from the architectural and planning professions. Suburban development is the natural or organic way in which a city grows. From time to time, in the past, new settlements have been spawned mainly to colonize unoccupied territory or to subdue and control a subject race. In Britain the development professions, particularly in the second half of the twentieth century, have been promoting policies which attempt to limit ‘urban sprawl’ or ‘ribbon development’ in favour of new towns or designated areas for growth. Despite the weight of political and professional orthodoxy, most of the British population live in unplanned suburbs. Many are not of the quality of Hampstead garden suburb or Port Sunlight. Despite the shortcomings of some suburbs, people seem to like them. While many architect-designed multistorey flats have been demolished and while some local authority housing estates leave a lot to be desired as living areas, the leafy suburb of ‘jerry-built’ semis continue to house most of the nation in ‘well enough’ contentment. The twin problems for the twenty-first century are the development of healthy, low-density, civilized suburbs and the improvement of existing suburbs so that they provide a healthy environment built around the individual home in its own small garden, yet meeting the onerous criteria for sustainable development. This is the agenda for the next chapters in Part 3 of this book.
PART 3

DESIGN FOR THE THERAPEUTIC ENVIRONMENT
PART 3: INTRODUCTION

INTRODUCTION

Part 2 of this book started with a case study of Bath, a very English city, and one concerned with the promotion of health. Chapter 6 examined the protest against poverty and urban squalor in the industrial cities of Britain – this protest led to violence here and in other European cities; the chapter documented the literature, which while equating well-being with individual freedom and a rapprochement with the natural world, articulated the protest of the age. Chapters 7 and 8 examined some approaches to reform which addressed the problems of disease and poverty. The reformers included enlightened mill owners intent on creating healthy conditions for their workforce, an essential component of the business. In effect, such benevolent entrepreneurs were nurturing the human workforce just as any enlightened farmer would have treated his ass: it was a sound business strategy. The other main strand of reform was the construction, in the second half of the nineteenth century, of a national system of water supply and sewage disposal. Such sanitary reform was the bedrock support for a healthy urban society: it is the necessary prerequisite ensuring generalized well-being amongst the community, but of itself not sufficient to achieve it.

The design of the therapeutic environment is the theme of Part 3 of this book. By design of the therapeutic environment is meant the process of city building that promotes the health and well-being of the human population. The next chapters explore the notions of the healthy city within the changing cultural context of this country. The earlier chapters in Parts 1 and 2 established the close connection between the health and well-being of individuals, the community to which they belong and the environment in which they live. The environment that sustains human and, indeed, all life forms on earth is under considerable pressure: some would describe it as already sick and diseased, in desperate need of expensive regeneration (Brown, 2007). For this reason Part 3 begins with an analysis, in Chapter 10, of these environmental pressures, the changes they might occasion, most worryingly in climate, and their impact upon urban design. Chapter 11 discusses the organic relationship between city and its bioregion: it develops the idea introduced earlier that the health and well-being of a population is partly dependent upon the community’s intimate and immediate connection to a healthy and natural environment. This chapter presents the case that the bioregion is the geographical area most suitable for the planning and management of the natural environment, together with the human activities it supports. The remaining three chapters of Part 3 deal directly with the planning of the healthy city and its main elements. The problem for city development is often seen as the need for accommodating a growing population, which some estimate as 10 million: others point to a higher figure, swollen by immigration. Current thinking places great emphasis on new greenfield development such as the proposed ‘eco-towns’. Clearly this is a major consideration, whatever the population forecast. Nevertheless, 60 million people live in existing accommodation, largely unsuitable for conditions of healthy living in the twenty-first century. Part 3 will emphasize this larger problem, putting forward the argument that it is the city in its region as a whole that requires refiguring as a therapeutic environment. The following chapters address this specific issue, informed by case studies in Copenhagen, Freiburg and Nottingham.
INTRODUCTION

This chapter outlines the environmental constraints for an urban design programme that delivers a sustainable settlement pattern in twenty-first century Britain: a settlement pattern which mitigates the worst effects of climate change whilst promoting health and well-being. The chapter begins where the Stern Report ends: it analyses the effects climate change will have on the planning and design of cities in Britain. In particular, it will examine the implication for cities of global migration, expensive energy and the growing demand for basic resources such as food and water. The chapter will conclude with a case study of Hockerton, near Nottingham, where a small group of families are experimenting with an imaginative way of meeting the challenging times ahead.

CLIMATE CHANGE: THE STERN REVIEW

There is general agreement that climate change is occurring. There is also wide agreement that humankind has contributed to climate change over the last century. Further, it is commonly agreed that unless some urgent actions are taken to decrease humankind’s ecological footprint, our contribution to climate change will continue unabated over the next century (IPCC, 2001). While there is this general agreement there are different opinions about the severity of climate change and the effects it may have on different regions of the globe. At one end of the scale of opinion are those who maintain that with an adequate international response in the reduction of greenhouse gases, the average increases in climate temperatures will peak at about 2°C. This change in climate will cause sea-level rises, problems of food production, draught and flooding. Taken together with an expected increase in the number of extreme climatic events, it remains a scenario with which humanity can deal. Even with this most favourable of outcomes, sections of humanity living in fragile environments and those living at the poverty level in more favoured environments would suffer considerable stress. In 2003, affluent Europe suffered a heat wave
that killed 200,000 people: such events will be more common in the future. The most favourable scenario for the future, just outlined, does not augur well for the health and well-being of the Earth’s human population: it will necessitate a considerable effort in mitigating the worst effects of climate change. At the other extreme of this continuum of opinions on the state of future global climate are the pessimists. This group emphasize factors such as the destruction of the world’s ecosystems that regulate climate, which act as a positive feedback on Earth’s rising temperatures. They note: the rapid melting of the ice caps and with this a loss in the ability of the Earth to reflect sunlight back out of the atmosphere; the melting of the northern tundra and the possible release of methane, a more powerful greenhouse gas than carbon dioxide; the warming of the oceans with similar effect to the melting of the tundra; and the destruction of the tropical rainforests with their ability to store carbon. Hansen, at the Nasa Goddard Institute for Space Studies, is suggesting that CO₂ in the atmosphere must be cut to levels well below those proposed even by the EU if catastrophe is to be avoided: this is a most daunting prospect (Hansen, 2008; Pilkington, 2008). If this litany of horrors is not enough to curdle the blood, then add to it the imminent peaking of oil supplies and the inevitable rise in the cost of energy: this completes a picture of the doomsday scenario.

Lovelock, in *At War with the Earth* (2005) and *The Revenge of Gaia* (2006a), states his belief that already we have inflicted so much damage on the planet’s natural systems that even if we stop using fossil fuels now we will leave a much impoverished legacy for future generations. He goes so far as to suggest that it is too late for thoughts of sustainable development. In its place, what we need ‘is a well-planned sustainable retreat,’ he says. Leading this retreat and coming to terms with Gaia requires taking ‘the high-tech road’, ‘embracing science and engineering, not rejecting them’. According to Lovelock (2005, op. cit.), we desperately need the skills and invention of technologists to lessen our impact on the Earth.

It is probably fair to assert that British governments over the past 20 years have taken a lead in supporting research into the science of climate change and in commissioning sound policy documents outlining ways of reducing Britain’s contribution to climate change. The list of such highly professional and thoughtful documents is immense – see, for example, Roaf *et al.* (2005). Despite this work, actions on the ground in Britain have not been as unambiguously ‘green’ as many in the environmental lobbies think desirable. Certainly we have not been as effective in this matter as some of our European partners, such as Germany, nor indeed as some Scandinavian countries. Notwithstanding these shortcomings, Prime Minister Brown, as the then Chancellor of the Exchequer, in 2006 commissioned the Stern Review into the economics of climate change, laying the platform in this country for a rational discussion on the best ways in which Britain can come to terms with and face up to the challenges posed by humanity’s greatest crisis. The Stern Review, though it may be considered to be overly optimistic, nevertheless offers a sound basis for healthy debate. In summary, the main conclusions of the Stern Review (2006) are:

1. There is still time to avoid the worst impacts of climate change, if we take strong action now.
2. Climate change could have serious impacts on growth and development.
3. The costs of stabilizing the climate are significant but manageable; delay would be dangerous and much more costly.
4. Action on climate change is required across all countries, and it need not cap the
aspirations for growth of rich and poor countries.

5. A range of options exists to cut emissions – strong, deliberate policy action is required to motivate their take-up.

6. Climate change demands an international response, based on a shared understanding of long-term goals and agreement on a framework for action.

According to Stern, with the right effort, it is possible to stabilize greenhouse gases at acceptable levels – that is, at something about 80 per cent of current levels. According to Stern’s report, this major effort will cost about 1 per cent of global gross domestic product (GDP), if we had started at the time of the report. However, the costs and risks of inaction are great indeed. The basis for Stern’s conservative calculations, however, has been thrown into doubt. Hansen, one of the world’s leading climate scientists, has suggested that the current climate target in Europe of 550 parts per million (ppm) of CO₂ should be slashed to 350 ppm (Hansen, op. cit.). Such a target means that we have less time in which to deal with CO₂ emissions than Stern suggests and the economic costs may be greater. Stern himself has warned that climate mitigation costs have risen to about 2 per cent of global GDP since his report was written (Stern, 2008).

THE ALTERNATIVE VIEW TO STERN

Those in the ‘green movements’ question the very basis of Stern’s argument, which defines the problem and its solution as one of changing to a non-carbon energy source with which to drive the global economy – that is, a policy of ‘business as usual’ but with a cleaner power source. The counter argument to Stern, seen as ‘the establishment’, defines the problem as one of adapting to a diminishing global resource base, which must serve a growing world population until at least the mid-twenty-first century. Climate change according to this line of thought is only one very serious symptom of a whole range of interconnected environmental challenges for humanity. This basket of environmental problems poses a threat to the very future of human occupation of the planet. Amongst these other challenges are: food and water supplies; the destruction of global environmental support systems such as the destruction of the rainforests and the pollution of the oceans; the growth of monoculture and with it the destruction of the habitat of our fellow creatures which, in turn, affects the whole food cycle. Simply replacing fossil fuels with a more benign source of power, while maintaining a greedy and profligate attitude to the Earth’s resources, delays the day of reckoning for those able to afford the best climate mitigation efforts and for those able to plunder dwindling resources. Such a strategy, so this line of reasoning suggests, would condemn the poor and powerless, particularly in developing countries, to an early extinction. We have already witnessed food riots in a number of developing countries. Even in Britain, food prices are rising rapidly, while in the USA world shortages of rice have encouraged the hoarding of that precious commodity (Adam, 2008; Borger, 2008; Sheeran, 2008).

Heinberg (2004) defines the situation humankind faces as an ecological problem as opposed to an economic or engineering problem: ‘While fossil fuel depletion is a real and immediate crisis, it is also symptomatic of a universal ecological dilemma, which consists of three interrelated factors: (1) population pressure; (2) resource depletion and (3) habitat destruction.’ The human population, like other species, has met this problem from time to time
throughout our tenure of the planet. Diamond (2005) documents some of the failures of once great cultures. Some of those failures are associated with the overuse and ultimate degradation of their environmental support system. However, the world’s population of 6.5 billion people is a testament to human ingenuity. Unlike other species, the human population has great ability to increase the supply of available resources. We do this by colonizing former unoccupied or underused territory, so that now the human population occupies almost the entire surface of the globe. From time to time humans have invented whole new technologies to exploit existing resources more intensively. Finally, we have discovered new and underused resources to temporarily extend the carrying capacity of our supporting environment. An expansion of resources, though this is by no means assured, may be part of the answer to current challenges. Expansion of resources without at the same time addressing the demand for those resources could simply store the problems for a not too distant future. Reduction of resource demand is not new to humanity. Human groups have reduced resource demand in the past by population control through sexual taboos, the veneration of chastity, infanticide, long periods of breast-feeding, birth control and abortion. Some traditional cultures limit resource use through ethical systems that value sharing and parsimony or by decrying ostentatious displays of wealth.

Failure to control and limit the use of resources inevitably leads to the reduction of population through war, famine or disease. According to Heinberg (2004, op. cit.): ‘Nature cannot tolerate the unlimited proliferation of any species, supply-side strategies are always temporary, and sometimes counter-productive, eventually resulting in spectacular population crashes in species that have momentarily benefited from them.’ Since energy use facilitates the extraction of and refinement of other resources, then simply developing an alternative to oil will mean greater competition for the Earth’s shrinking resource base to serve an expanding population. If the human population is to escape from the apparent inevitability of Malthusian predictions, then the only effective long-term strategy is one which reduces humanity’s environmental footprint by an overall reduction in the use of resources. In terms of energy, Heinberg (ibid.) suggests a ‘powerdown programme’ – that is, a planned reduction in the use of power, not simply a conversion to other possible sources of power.

The world’s population is expected to rise from its present 6.5 billion to about 9 billion by the mid-twenty-first century. The United Nations has produced long-range population estimates for the next 300 years. At medium and low fertility rates, the global population, according to UN forecasts, should fall to between 4 and 6 billion by 2150. No doubt the population will fall further if nothing is done about climate change. This tentative forecast is central to how we think about protecting our environment and with it the health and well-being of its changing population. The key problem then centres on what we do in the next 50 years to solve over-consumption and over-population at the end of what has been a period of rapid economic expansion facilitated by cheap power.

**FUTURE CLIMATE**

Climate change models indicate that mean global temperatures will rise by 2–5°C by 2030 or more optimistically by 2060. Without action to cut greenhouse gas emissions, by 2100 temperatures are likely to rise between 3 and 10°C. This assumes that concentrations of
greenhouse gas emissions would, without global action, be treble pre-industrial levels (Stern, 2006). The UK Climate Impacts Programme (UKCIP, 2008) has applied the work on this international modelling of future climate to this country. UKCIP02 has produced a series of estimates of climate change in the UK for the next 100 years.

The models for the UK climate, which incorporate work carried out at the Hadley Centre, are for four alternative future climates based on four scenarios. The four scenarios are: low emissions; medium low emissions; medium high emissions; and high emissions. Whilst there is no scientific consensus on the effect of climate change on the flow of the Gulf Stream, the UKCIP studies are based on the view that the Gulf Stream will continue to exert an important moderating influence on the UK climate. It is estimated, however, that its strength might weaken, perhaps by as much as 25 per cent towards the end of the twenty-first century. But if the flow of the Gulf Stream were to be interrupted, as some scientists predict, then the changes to the UK climate would be serious. However, for the moment, the most likely future UK climate until 2100 will probably be within the ranges of climate outlined in UKCIP02 (www.ukcip.org.uk/scenarios).

Britain, with its temperate climate, will be affected to a lesser extent than countries with more continental climates such as the USA, Australia and continental Europe. This is particularly true for the first half of the twenty-first century. Many of the changes in climate that are expected in the next 50 years are already inevitable. They are determined by greenhouse emissions that have occurred over the past 200 years. Therefore, because of this inertia in the climate system, there is little that can be done about climate in the next few decades. The volume of greenhouse gases emitted from now on will influence the climate in the second half of the twenty-first century. As Stern (2006, op. cit.) warns, the longer the delay in dealing with the problem, the greater the danger from climate change and the more expensive it will be to put it right.

By 2040, average annual temperatures for the UK are expected to rise by 0.5–1.0°C, depending on the region. Average summer temperatures are expected to rise by 0.5–2.0°C. These average figures for the UK hide significant regional disparities: for example, there is expected to be greater warming in the south and east of the country than in the north and west. Summers generally will get hotter and drier while winters will get milder and wetter. The number of very hot summer days similar to those in 2003 is expected to increase and the number of cold winter spells similar to those of 1947 is expected to decrease. Throughout the half-century the thermal growing season is expected to lengthen but soil moisture levels in the summer and autumn are expected to decrease. Any advantage for crop growing will therefore depend in many areas on the availability of water for irrigation. This is the general climate that we have to plan for and for which we have to design buildings over the next 30–40 years. These are also the climatic conditions that form the basis for any discussion of the development of an environment that sustains the health and well-being of the future population of the UK. Clearly, regional climate predictions for the second half of the twenty-first century are less certain than those to mid-century. However, using their four scenarios, UKCIP (2008, op. cit.) expect that, by 2100, annual average temperatures for the UK will have increased by between 1 and 5°C. Summer temperatures would rise by 1 and 6°C depending on region in the UK and on the emissions scenario. So the summer would continue to get hotter and drier with up to 50 per cent less precipitation.
We in Britain may be more fortunate than people in other parts of the world, many of whom will experience greater climatic perturbations. Some areas of the globe will no longer be capable of supporting a human population while other areas will become extremely uncomfortable. ‘Lovelock reckons that the British Isles will be among the few island oases in a world, including much of mainland Europe, being given over to desert, scrub and oceans devoid of life’ (Jeffries, 2007, op. cit.). Jeffries goes on to quote Lovelock as saying, ‘Everybody in Europe will be wanting to come here’ and ‘We’ll be a bloody lifeboat for Europe. It will be their right to come here too ... because we’re all members of the European Community.’ The mass movement of population as a result of climate change is a strong possibility: Lovelock, in quite a forthright way, has drawn attention to an issue that is rarely aired in public debate.

**PEAK OIL**

The eclipse of the global economy and its free market philosophy is forecast from time to time. Sometimes the forecast is made with apparent relish, accompanied by not a little wishful thinking. While recognizing the surprising resilience of the market system, a threat of a Middle East war or a minor incident such as a striking workforce affecting the flow of Nigerian oil can throw markets into a state of anxiety, with a consequent rise in oil prices. The impending peak in oil extraction and the inevitable end of cheap energy, together with the volatility of the Middle East, could well lead to a major downturn in the global market, a world recession or a perturbation in world trade. The current ‘credit crunch’ and global recession are early warnings of such possibilities. It would seem wise for any national government to consider using national assets – that is, its accumulated wealth – to invest in alternative energy sources while it is still able to do so: a policy that sits well with the necessity to deal immediately with reducing the production of greenhouse gases, to hold climate change in check. In circumstances like this, it would also be prudent to ensure the adequate supply and delivery of food, water and the other necessities of life.

Heinberg (2004, op. cit.) suggests four main strategies for dealing with the problem of peak oil and the ending of cheap energy. He labels them: ‘Last one standing – the path of competition for remaining resources; power down – the path of cooperation, conservation and sharing; waiting for a magic elixir – wishful thinking, false hopes and denial; and building lifeboats – the path of community solidarity and preservation.’ The first strategy condemns peoples of the world to a period of war, economic crises and environmental catastrophe, where the wealthy and powerful commandeer the resources of others using military force. The second strategy, the one advocated by Heinberg (ibid.), is ‘powerdown’, the title of his book. He asserts that: ‘The only realistic alternative to resource competition is a strategy that will require tremendous effort and sacrifice in order to reduce per-capita resource usage in wealthy countries, develop alternative energy sources, distribute resources more equitably and humanely but reduce the size of the human population over time.’ This is a strategy that many environmentalists would advocate. It is one that Britain and many other countries advocate in part, at least at meetings of the United Nations. So far, there is little evidence of a reduction in per-capita resource use amongst the wealthy nations nor, despite the efforts to ‘make poverty history’, a redistribution of resources more equitably. There is a danger if we don’t follow a strategy like ‘powerdown’, then the job will be done for
us by Gaia, through war, famine, drought, disease and disaster (Lovelock, 2006a, op. cit.).

Heinberg's third generic strategy is 'waiting for a magic elixir'. This is, in part, the laissez-faire strategy whereby the market will fix it for us. All we need to do is provide the right market conditions so that technology will solve the problem. Stern (2006, op. cit.) uses this argument to some extent when he describes the environmental crisis as a massive market failure. The argument for this strategy asserts that with the reduction of oil supplies and the rising cost of petroleum products, other means of generating the power humanity needs will be developed. Assuming a limitless safe and cheap carbon-neutral energy source were to be developed, the counter argument suggests that, without a frugal self-limiting culture, then the human response would be a continuing harvesting of other resources to sustain further population growth. With the very evident stress humanity is placing on the planet and its resources, it is clear that humanity must seriously reduce its ecological footprint on the planet by reducing population and, more particularly, its resource need; as Lovelock puts it, it is necessary for humanity to perform a sustainable retreat.

Heinberg's final generic strategy, 'building lifeboats', assumes that our civilization is past redemption and cannot be salvaged as it currently operates. It is further assumed that the current environmental problems and growing competition for cheap power supplies are simply symptoms of the early stage of societal disintegration. If this is the case, it might be appropriate for some communities to attempt to save or preserve what is best in our cultural heritage using, perhaps as a model, the work of the religious orders in the Dark Ages after the fall of Rome. Heinberg (2004, op. cit.) and Diamond (2005, op. cit.) paint a bleak picture of the challenging times that may lie ahead of humanity. Even the respected scientist, Lovelock, tells us 'that we have every reason to be scared stiff' at what might lie ahead of humanity (Jeffries, 2007, op. cit.). Stern (2006, op. cit.) by comparison is comforting, rather like a snug warm blanket on an icy morning, yet Stern himself paints a bleak picture.

Clearly, it is the role of the UK government to press for international cooperation in the reduction of greenhouse gases. We have a good record in addressing this issue and must be considered one of the world leaders in this field, particularly with our unstinting support for Kyoto. Despite Britain's leadership in seeking, with some limited success, a global and cooperative response to climate change, Britain, as the Stern Review emphasizes, is still seeking a relatively painless solution to the problem which doesn't recognize the fundamental axiom that economic growth, as it is currently defined, and long-term sustainable lifestyles are incompatible. Furthermore, if the USA continues to follow a Bush agenda, then it seems clear that the world will descend into a destructive competition for the control of oil and other scarce resources. With the election of Obama there seems great hope for a radical change in environmental policies in the USA. For example, the sudden interest of the USA and Europe in biofuels at first sight may appear to be a useful and 'green' way to increase energy supplies. Biofuels, however, consume many hectares of agricultural land, denying food for the Third World poor and diverting the product of the soil to feed the insatiable greed for energy in North America and Europe. Beddington (2008), in his first public lecture as the British government's chief scientific adviser, said that the rush to biofuels is threatening world food production. Furthermore, he pointed out that the prospect of food shortages over the next 20 years is so acute that politicians, scientists and farmers must begin to tackle the problem
immediately. He could have added architects and planners to that list of professions that need to take note of this urgent problem when designing our cities. It may be appropriate for the UK to set an example by reducing our environmental footprint and planning for a real ‘powering down’ and greening of our economy. But in case such an effort proves futile in changing attitudes in the wider world, it may be useful to have a plan B. Plan B would follow Heinberg’s fourth strategy, developing Britain as a lifeboat for its people. It would be wise for each family group and community in the country to follow similar strategies so the ‘HMS Britannia’ becomes a series of nesting lifeboats, life rafts and lifebelts. From all accounts, we are probably in for some rough weather ahead: now may be the time to adopt the ‘precautionary principle’ and to ‘batten down the hatches’. Since Britain is expected to be one of the few places that will retain a reasonable climate, at least for the first half of this century, the ‘lifeboat’ strategy seems a reasonable proposition. It also gives the rest of the world’s main polluters time to wake up to the dangers of climate change and mend their ways. Failing that change in the behaviour of others, it provides an opportunity for Britain to adapt to a far worse climate towards the end of the century, always providing we retain control of our borders and so prevent overpopulation due to an influx of dispossessed migrants, ‘climate change refugees’.

Finding and developing the right mix of energy sources quickly is vital for the survival of this country as a healthy place for people to live and prosper. It is therefore the key to ensuring the health and well-being of Britain’s population. The British government produced its White Paper on Energy (Department of Trade and Industry, 2007): it was a basis for public consultation until late 2007. The underlying assumption in both the Energy White Paper and the Stern Review is that economic growth will be possible while tackling climate change. This is a position that is challenged by many in the green movements, no matter which view they may take on the desirability of nuclear power. They would argue that climate is just one severe symptom of a much deeper environmental malaise, a malaise caused by humanity’s greed, manifested in the pursuit of economic growth: the result of which is that the world’s resources are overstretched to breaking point. Milmo and Milner (2007), for example, report that: ‘Soaring global demand for copper is a growing threat to the British railway network leading to a surge in trackside metal theft. Rail customers are victims of an economic crime that is being driven by the insatiable demand for industrial material in China and India.’ It appears that China has overtaken the USA as the biggest
polluter long before this event is predicted to happen. This should be a warning to the world, alerting us to the great and immediate dangers of unsustainable global economic growth.

The White Paper on Energy (DTI, 2007) noted that ‘energy demand worldwide [is set] to increase, particularly in the United States and in emerging economies, such as China and India. On the basis of present policies global energy demand will be more than 50 per cent higher in 2030 than today, with energy-related greenhouse gas emissions around 55 per cent higher.’ According to the White Paper, ‘it is likely that the UK will need around 30–35 GW of new electricity generation capacity over the next two decades and around two-thirds of this capacity by 2020.’ This is because many of our coal and most of our existing nuclear power stations are set to close. The extra energy demand, if satisfied, will fuel economic growth. This economic growth will increase the stress on a seriously depleted and degraded environment: it will not restore a healthy balance to the Earth’s ecosystem.

At the centre of the debate about future energy mix is energy security and the possibility of the ‘lights going out’ over Britain. A city without light or power to carry on essential services is a frightening prospect. The exhaustion of gas fields in the North Sea, together with the closure of ageing nuclear and coal-fired power stations, leaves Britain vulnerable to foreign suppliers, ‘Also with the UK increasingly reliant on imported energy, we need to manage the risks arising from fossil fuel resources in fewer and further afield places, some of them in less stable places’ (DTI, 2007). Clearly the British government of 2008 believes that a new batch of nuclear power stations is an important part of the answer to this problem. A further reason given for developing this new generation of nuclear stations is the ‘greenness’ of the proposal: green in the sense, so it is argued, that nuclear energy produces less greenhouse gases than other comparable power stations fuelled in other ways. For example, it is stated in the White Paper that our carbon emissions would have been 5–12 per cent higher without nuclear power. However, in terms of greenhouse gas emissions nuclear power is not entirely carbon neutral. Uranium has to be mined, processed, enriched and manufactured into fuel rods. The spent fuel rods have to be reprocessed or placed in some repository. All this uses energy derived from fossil fuels. Furthermore, nuclear power raises security, safety and health issues.

Despite a credible case against the development of a new group of nuclear power stations, it is difficult to dismiss the strictures of the environmental campaigner Lovelock (2005, op. cit.), who writes: ‘I find it extraordinary that the one safe and proven energy source that has minimal global consequences – nuclear power – is so readily dismissed. It is now as reliable
as any human engineering can be and, according to a recent Swiss report, it has the best safety record of all large-scale energy sources. France has shown that it can become a major national source of energy, yet governments are still fearful of grasping this one lifeline we can use immediately.' The nuclear option may not be a viable long-term solution to the energy needs of the planet, when others begin to demand their share of the industry; nevertheless, it seems clear that the UK lifeboat needs nuclear power in the short term simply to stay afloat.

There is, however, a large ‘but’ to this guarded affirmation of the idea that nuclear power may be part of this country’s generation of electricity for the national grid. The limit to development in Britain, as elsewhere, is not just one of power: we are limited in what we can do by all those major environmental life support systems on the planet that are under threat. The current proposal to develop a nuclear option for power generation should be part of an agreed ‘power down’ strategy or in Lovelock’s words ‘sustainable retreat’. The easy option promoting economic expansion as envisaged in the White Paper on Energy is short-sighted (DTI, 2007, op. cit.). The major components for long-term power generation are the totally benign technologies of sun, wind and wave. Nuclear energy in the short term will be needed for essential services and therefore should be limited to its present 18–20 per cent of the total energy mix.

In ‘lifeboat Britain’, the long-term future would be shaped within a national system of local energy networks. Simpson’s paper ‘Solar Socialism’ (2006) sets out a radical alternative to the present national grid system of power distribution that is potentially more efficient and certainly more democratic. Simpson says: ‘The change is in a shift from assumptions that energy systems are about big power generation that must struggle to keep up with insatiable consumer demand, to a recognition that the future will be shaped within a national system of local energy networks: a system where every part of our existence – our homes, our roads, our workplaces, schools and hospitals – is a generator of sustainable energy rather than just a consumer of it.’ Unfortunately, until we can reach this ideal state we may need nuclear power: indeed, it may be needed to make this transition. Whatever the energy system that eventually transpires, it is part of the very structure of our daily lives and as such it should be made visible, acceptable and accessible in town and country, not hidden behind a highly guarded security fence. This is probably the most intractable problem with nuclear power: the infrastructure associated with the industry is so vulnerable to attack, a further reason to limit this method of power generation to emergency cover, a reserve, to be phased out as the century develops.
A CASE STUDY IN HOCKERTON

A case study of development in Hockerton, near Nottingham, concludes this chapter on the environmental crisis: it shows how a healthy, elegant lifestyle is possible without destroying the environment. The Hockerton Housing Project (HHP) is a small development consisting of five family homes outside the village of Hockerton and about two miles north-east of Southwell in Nottinghamshire (HHP, undated, 2) (Figure 10.1). This is the intelligent design response to the dangers of climate change by a few families in consultation with their architects Professor Brenda and Doctor Robert Vale. It is, in microcosm, a solution to the design problem faced by the larger community. The Hockerton Housing Project is one innovative model for sustainable living: it is ‘the UK’s first earth-sheltered, self-sufficient, ecological housing development’ (HHP, 2001). The project families live a holistic way of life, in harmony with the environment, in which all ecological impacts have been considered and accounted for.

Natural environment

The site is large for suburban development at one house per 1.5 hectares; however, it includes provision for crop cultivation and the rearing of animals (Figures 10.2–10.5). The development has its own water catchment for drinking and other uses, together with its own waste disposal using a reed-bed system. The five homes face...
south in a terrace having a conservatory along this façade. The main living areas of the dwellings have been covered with earth excavated from the site. The roof has been grassed over and slopes smoothly into the neighbouring field, so reducing, considerably, the ecological footprint of the development. The site has been designed on permaculture principles (Mollinson, 1996). (For a case study in permaculture, see Moughtin et al., 2003: 102–5.) Over 5000 trees have been planted, including oak, hazel, cherry and willow, which creates a haven for wild creatures and enhances local ecological habitats where all plants are arranged to assist the health of other plants. Organic farming is practised on the site, producing healthy food for the community. A small lake has been formed for recreational purposes, fish breeding with a section that filters waste through reed-beds.

**Social environment**

This is a small tightly knit community. Some of the families participated in the design, its building and now in the management of the project. Many of the ideas for the project came from the members of the families, particularly Nick Martin, who had already built an environmentally friendly home in the locality. From the project’s inception, the ‘project families’ were involved in securing finance for a project, which at the time, was most unusual. The community organization developed as a result of discussions with the Industrial Common Ownership Movement; two cooperative companies were established, one to manage the homes and the other to manage Hockerton Housing Project Trading Limited and any other commercial venture. Part of this project has been the aim to create ‘sustainable employment’ for community members. The group now run, for example, workshops on sustainable development and training for sustainable community building. The families meet regularly to allocate work to be done.
in maintaining the estate, all members contributing time for essential jobs in the gardens and on the estate generally, or conducting tours and maintaining the wind turbine. In addition to the care for the estate, some members specialize, for example, as business development manager, chief beekeeper or electric car coordinator. The estate seems, to the observer, to be well organized, the result of expending great care, love and affection. It is a happy place to visit.

**Built environment**

Hockerton was designed as a zero-energy development, reducing life cycle energy to a minimum. The houses are earth covered, superinsulated and rely on passive solar heating without space heating. There was a careful choice of building materials so that the structure was made primarily from benign, organic and recycled materials. The materials were also chosen for their high thermal mass, absorbing heat from the sun, then releasing it when the air temperature drops (HHP Trading, Fact sheets 2 and 9, undated). The building services are autonomous – that is, self-sufficient – within the site. This is mainly due to the very low energy requirements of the development, which is only about 10 per cent of the average UK home, so that the relatively small renewable energy systems produce enough energy for the community. The homes are arranged as a terrace aligned along a south-east to north-west axis to maximize the amount of sunlight penetrating to the back of each home that sits snugly under its earth blanket (Figures 10.6–10.8). The south-facing elevation is a continuous double-glazed conservatory. It is separated from the rear of the house by triple-glazed, argon-sealed Swedish windows. The shallow angle of the roof of the inner house makes great use of the low winter sun. In this way, the design provides good internal daylighting conditions while maximizing passive solar gain. The trees to the south of the lake, being deciduous, permit light to penetrate during autumn and winter. Each home is six metres deep with a 19-metre south-facing conservatory running the full width of the house. Four houses are 122 square metres (167 with conservatory) and the middle one is larger, being 140 square metres (195 with conservatory). Rooms not dependent on natural lighting, such as utility rooms or bathrooms, are located towards the rear of the house. The construction cost of the buildings was £450 per square metre in 1997, which compared favourably with more traditional housebuilding costs at the time. The savings on energy running costs put the community at a great advantage over those in more conventional homes who are beginning to see their energy and water bills rise.

**Symbolic environment**

The Hockerton Housing Project has been an exercise in community building in addition to being a fine example of autonomous housing. Perhaps these two processes are essential.
components of the same endeavour: caring for the health of the environment is indeed caring for the well-being of one’s neighbour; it is an exercise in communal living in its truest sense. In Hockerton, the whole environment symbolizes this community effort. The development is owned by the community, not simply in the sense that they bought it, but more significantly because they designed, built and now maintain the estate. That is ‘ownership’ with a much deeper meaning. The neighbours live close together; they share the same services, the pond, the land, the community hall and office, and finally they share the same sustainable trading industry. There is an obvious care for the fellow creatures with which the community share the estate. Biodiversity is being maintained and the small-scale ecosystems that support it are lovingly tended. Hockerton has been designed for healthy living in the twenty-first century without destroying its supporting environment. It is an exemplar of a sustainable and a healthy, therapeutic environment.

CONCLUSION

The following chapters will build on the ideas presented in this chapter, which have been illustrated by the project in Hockerton: they will incorporate in the urban design brief the notion that visible decentralized energy structures will give form to the city in its region. The chapters will demonstrate, in terms of urban design, that there is no tension or dichotomy between nature and culture, rural or urban, or the city and its region. It is argued in this book that humanity is essentially part of nature and that human settlements are as natural as the beehive, the bird’s nest or the termite’s mound. The following chapters will explore the form of human settlement to best express this relationship. Furthermore, it is argued that a healthy lifestyle for humankind depends on an understanding of, and closeness to, nature and the natural world of which it is a constituent part. To maintain this position is not to reject science and its wonderful advances, but to accept that scientific endeavour is itself part of nature. Coming to terms with our human limitations and our habitat would, in the words of Lovelock (2005), ‘require us to embrace science and engineering, not reject them; we need their skills and inventions to lessen our impact on the Earth.’ The community at Hockerton has achieved this goal with great elegance: there is much that can be learned from their experience.
INTRODUCTION

This chapter outlines a proposal for a landscape that will sustain a healthy population in Britain during the next decades of rapid and dramatic climate change. It draws upon theoretical ideas and best practice in both Europe and the English-speaking world. The chapter starts by discussing the relationship between humanity and nature, developing the notion that there need be no dichotomy between city culture and nature. It then explores thoroughly the concept of bioregion. Moreover, it is argued that the healthy city is the ‘natural city’; furthermore, a city and its citizens show signs of ‘disease’ when its culture becomes parasitical. It then introduces an experience in local self-sustainable development in Italy. The chapter discusses the efficacy of the ecoregion as a means of maintaining a delicate balance between the human population and its supporting environment or the ecosystem of which it is part. The chapter concludes discussing the potential structure of governance to implement the bioregion vision.

Mumford (1938, 1944 and 1946, for example) was an early theoretical writer calling for a reintegration of culture with nature. Mumford proposed ecoregionalism as a means of reintegrating the city into its regional hinterland: he criticized the bureaucratic state as incapable of resolving the cultural and ecological crisis. Mumford suggested that the mechanistic city was both parasitical and imperialistic, devouring the product of its region and beyond. The mechanistic city according to Mumford was incapable of sustaining itself even in terms of population, city growth being maintained by attracting migrants from afar. Mumford and other writers since have pointed to the folly of ‘denaturing’ humankind and have asserted the importance of taking back or reinhabiting this earthly home of ours.

There are strategies that humanity can adopt which will reduce the impact we have on the environment so that the crisis never reaches proportions that will cause an evacuation of the planet or the equally frightful idea of the mechanization and therefore destruction of the physiology that makes us human. Even a human retreat from large areas of the planet that may become inhospitable or the creation of large enclosed artificial environments for human occupation are possibilities, which should and
can be avoided. A more attractive strategy to follow, first hinted at by Mumford in 1919, is the development of an ecoregional settlement structure: an idea later embodied in the concept of the bioregion and the non-parasitical highly self-sufficient city. Self-sufficient settlements in such a bioregion would rely upon reduced resources imported from beyond their boundaries and would export reduced amounts of waste beyond their immediate territories.

**BIOREGIONS AND THE BIOREGIONAL BOUNDARY**

The ideas of bioregions have their roots in the ‘biome’ ecological concept of Clements and Shelford in the 1930s, which refers to a special natural habitat such as desert or rainforest characterized by a specific climate (Merchant, 1992). In addition, according to Atkinson (1992: 330) the bioregionalism concept stems from two American traditions, the ‘conservationist literature and attitudes of Thoreau, Emerson, Muir and Leopold’ and the regionalism of Munford and Odum.

Atkinson (1992: 328) states that: ‘The notion of bioregionalism originates from the ecocentric wing of the environmental movement.’ The ecocentric movement considers conservation of natural resources and decentralized socio-economic systems as the two main tools to achieve sustainable development. Dodge (1981) adds to these two elements the concept of ‘spirit’. The interaction of these three elements shapes bioregionalism as ‘a decentralized, self-determined mode of social organization; a culture predicted upon biological integrities [sic] and acting in respectful accord’ (Dodge, 1981: 10).

Self-reliant communities are considered to be the stewards for natural systems since their closeness to them can make it easier to take action more quickly in situations of environmental damage. Self-reliant communities are encouraged because the contemporary economic system cannot be supported by the natural systems; thus, the first step to living sustainably is to produce locally and to understand the carrying capacity of each region (Kumar, 1993). To achieve this vision a decentralized, locally based economy that makes use of the resources of each bioregion is promoted (ibid.).

The idea of ‘spirit’ that permeates bioregionalism is due to the fact that, according to the bioregionalist, the human mind and natural systems are interconnected. This means a deep respect for all form of life, since they represent enrichment for humans. This element emphasizes that bioregionalism does not only have regard for ecosystems and natural systems, ‘It is concerned with creating a society that will maintain its environment as a congenial and pleasant place to live in now and in the future’ (Atkinson, 1992: 329).

The definition of bioregions as natural systems is still not precisely stated. Berg (1993: 19) defined bioregions as ‘geographic areas having common characteristics of soil, watersheds, climate, and native plants and animals that exist within the whole planetary biosphere as unique and intrinsic contributive parts.’ Dodge (1981) considers several ways to delineate bioregions, suggesting that they should be considered together. These are: biotic shift, watershed, land form, cultural/phenomenological elements, spirit presence, and elevation. Some of these, such as watershed, land form and elevation, are grounded on straightforward methods. But others, for instance the biotic shift ‘in plant/animal composition from one place to another’, presents uncertainty about the significant percentages to assert that there is a passage from one to another bioregion. Several
criticisms have challenged bioregionalism as a body of knowledge. Those encompassing method and technique are the most relevant. Aberley (1993) points out that much of the bioregional work has local pertinence and an effort must be made to define techniques that can potentially define a bioregional method.

Thus, how can we answer questions such as: What is a bioregion? How is its boundary defined? There is no universally accepted answer to these questions. Mumford, for example, says of the region that ‘it is a complex of geographic, economic and cultural elements. Not found as a finished product in nature, not solely the creation of the human will and fantasy, the region, like its corresponding artefact, the city, is a collective work of art.’ Mumford sees the region as organic without specific clearly demarked boundaries: ‘The region may be defined in and delimited in thought; but this is largely a practical convenience. In conceiving of a region, then, it is necessary to take an area large enough to embrace a sufficient range of interests, and small enough to keep those interests in focus and to make them subject to direct collective concern’ (Mumford, 1938: 303, 314, 315 and 367). Here Mumford seems to be echoing the commonsense view that Aristotle had of city size.

More recent writers are divided on the nature of the bioregion. One school of thought sees natural regions as a series of nesting physical bioregions while others see them as a series of overlapping functional regions. There seems to be widespread agreement that the region is an organic phenomenon. ‘It is never possible to tell a place that it is a region; either it is a region inherently, by its own internal logic, or it is not a region at all. As a result, regionalism stands in stark contrast to the command – and control – structures we have placed on the landscape, structures like state and county boundaries by which we attempt to tell places what they are and what they are part of’ (McGinnis, 1999: xvi, see also 71–75).

Some have likened the patterning of bioregional boundaries to a mosaic, others to the scaly flexible skin of the snake. Such analogies are grossly oversimplified. Complexity theory has identified a universal geometry of emerging forms in the natural world. These emerging forms are patterns within patterns ‘…families of similar-looking structures, such as all cumulus clouds, all maple leaves, or all mountains’ (Barnsley, 1993:4). If you examine the surface of a sand dune you will find smaller sand dunes on its surface: the surface of these small sand dunes is made up of still smaller dunes. ‘These basic elements of form are called fractals by those who study geometric shapes in nature’ (Mandelbrot, 1982). Brunkhorst (2000) cites, as an example of fractals, the beauty of the fern frond, where the elements of the frond are smaller and smaller groups of frond-shaped forms (see Figure 11.1). Spirals are a universal feature found in nature, from patterns of the nebulae, hurricanes, to the whirlpools in turbulent water. According to McGinnis (1999:xvii):

‘These forms play back and forth in one another, that what happens at a larger scale is related to what happens at a much smaller scale, but not in a Newtonian way. Rather, they influence one another through that process complexity theorists call “emergence”, where new forms suddenly begin to emerge, often at several different scales at once, the way crystals emerge in a supersaturated solution.’

Following on from this line of analysis, Brunkhorst (2000) outlines the following ecological regional framework, suggesting the ‘ecodomain’ as the largest unit; it is in effect the biosphere. The second largest unit is the ‘ecoregion’, which is at the scale of the continent or subcontinent. The third unit on
this scale is the ‘bioregion’ or the large regional landscape. The ‘landscape’ or subregional landscape ecosystem and finally the ‘patch’ or ecosystem component complete the scale (see Figure 11.2). This system of nesting ecological units, whilst a neatly organized scale, nevertheless is only a partial and simplified view of a complex set of relationships. Complex overlapping and fluid boundaries represent the actual state of ever-changing ecosystems as opposed to rigid human-constructed boundaries. Such boundaries when set in stone or fossilized may become an impediment to a true understanding of the relationship between humanity and its use or abuse of resources. It is argued here that bioregional planning, to be truly effective for sustainable development or a sustainable retreat, must be based on boundaries that reflect the transient realities and characteristics of ecosystems. It would appear that a starting point for a bioregional approach to planning would be the mapping of critical issues of sustainability such as water, flooding, energy, waste treatment or those factors considered to be the most limiting systems to further development, such as precious agricultural land or vital areas of wilderness, which are to be protected at all costs. Using GIS it is now a routine procedure to map these crucial systems separately and analyse areas of conflict and potential synergies.

**Figure 11.1** Fern: order and structure in nature.

**Figure 11.2** Hierarchical framework for ecological units.

**URBAN METABOLISM, THE BIOREGION AND THE CITY**

The world’s cities occupy about 2 per cent of global land surface but they use 75 per cent of the world’s resources, releasing about the same...
proportion of wastes (Giradet, 1992). More than 50 per cent of the world’s population will soon be living in cities, contributing to a massive consumption of global resources. The modern city is an ‘open system’ – that is, cities are not self-contained, but are maintained by exchanges of materials, energy and information with areas beyond their periphery. The concept of ‘metabolism’ can be used to form an understanding of this process. As applied to people or other animals, metabolism refers to the processes that are used to produce food and energy for the conduct of daily living. ‘Urban metabolism refers to the material and energy inputs needed to meet the living and non-living components of urban systems … When we have used these inputs, we have what is commonly referred to as waste’ (Keen, in Brikeland, 2002:58). In ecosystems found in nature, such as the rainforest, waste from one process becomes a resource input for another process. For example, animal droppings and rotting vegetation serve as nutrients for plant life. There is no waste and the whole process of the ecosystem is circular. In contrast the wasteful process associated with city metabolism is linear. The city consumes goods, energy and food at high rates then pollutes the environment heavily with organic wastes, noxious fumes and inorganic wastes (see Figure 11.3). It has been suggested that this linear urban metabolism should be converted to a form resembling the circular metabolism of nature by design and management (see Figure 11.4) (Giradet, 1992; Roelofs, 1996). City circular metabolism approximates to nature’s systems where waste products are integrated into the wider ecosystem as new inputs of material and energy; consequently, the output of waste is minimized.

It has been suggested that a ‘compact’ or ‘dense’ city can be adapted and managed to achieve a circular metabolism, where consumption is reduced by implementing efficiencies and where reuse of resources is maximized (Rogers and Gumuchdjian, 1997; Rogers and Power, 2000). Increasing urban densities is not universally accepted as necessarily the only or best strategy for reducing the city’s ecological footprint. However, increasing urban density is often associated with savings in the energy used in transport by increasing the viability of public transport. Because distances between facilities are reduced in dense cities, walking and cycling are promoted, which saves energy expended on transport while fostering a healthy lifestyle.

Bamford in Birkeland (2002) has demonstrated a relationship between petrol consumption and city density. Generally, the higher the city density, the lower the citizen’s per-capita use of petrol. This, however, is not a universal truth. For example, Brussels is more than twice as dense as Copenhagen, yet it consumes more petrol than the Danish capital (ibid). There are also savings in land with an increase in city density. But there is also a downside to increasing urban densities.

Figure 11.3 The city: linear metabolism.

Figure 11.4 The city: circular metabolism.
For example, as population densities increase in urban areas, home food production declines and with it the ability to recycle organic waste.

‘The contribution that lower densities can make to the productive capacity or output, efficiency and flexibility of the household economy is substantial. Lower densities can also increase the scope and quality of domestic and neighbourhood recreational or social pursuits, and better meet changing household preferences and life circumstances … Whether space is wisely allocated in our cities depends on among other things, what that space is, or can be, used for and what values are fostered by such use.’ (ibid)

The importance of the household economy in urban development should not be undervalued as a study of any city in the developing world would show – see, for example, Shalaby’s study of ‘Income generation by women in Egypt’ (Moughtin et al., 1992). Viljoen (2005) makes a good case for urban agriculture: his work in Havana, Cuba and particularly the concept he has developed for ‘continuous productive urban landscapes’ is particularly important in general but also as a means of supporting urban systems of circular metabolism (see also Moughtin and Shirley, 2005; Roaf et al., 2005). There are numerous studies that show the therapeutic value of gardening and the health value of green areas in the city (Burns, 2005), which gives added weight to the need in the city for space for intense urban market gardening, the traditional garden allotment and the vegetable plot attached to each suburban home.

Density alone is a crude instrument on which to base a theory of sustainable development. When the health and well-being of the city population is taken into consideration, then advocating the compact city or the ‘densification’ of existing settlements as a panacea for present environmental ills may turn out to be counter-productive or an oversimplified reaction to a complex problem. Recent implementation of such policies in the UK has given the green light to a voracious development industry, resulting in the crude overdevelopment of many inner city sites (Figure 11.5). It may be more realistic to apply to each case the principle of circular metabolism, attempting to reduce each urban footprint in the most appropriate way. Applying the principle of circular metabolism to the city in its regional settings and attempting to balance the ecological footprint at these scales may stand a greater chance of success, leading to a more balanced view of the relationship between humanity and nature or town and country (see Figure 11.6).
It has been argued that the bioregion is the proper setting for managing environmental resources for sustainable human settlement (Brunkhorst, 2000). As we saw, Mumford was an early advocate of a bioregional approach to settlement planning; he was equally critical of the suburb and the giant metropolis. He thought that suburban sprawl, as he described the suburb, desecrated the landscape and spawned stunted communities without an economic or cultural base. Such suburbs, to Mumford, were simply sleeping quarters. The metropolis, on the other hand, is in Mumford's analysis a place where excessive capital investment in transportation systems and other services only increased congestion, forcing up the cost of land, which in turn generated more intensive use and further congestion. For Mumford (1938) neither metropolitan congestion nor low-density suburban fragments could substitute for community building in a regional structure. Mumford's frame of reference, to some extent, echoed the earlier pronouncements of Ebenezer Howard (1965), particularly his concept of the garden city, and Patrick Geddes (1949), with his interest in regional planning.

**BIOREGIONAL PLANNING**

Despite different approaches to bioregional planning, in general terms it begins from a different premise from that of conventional planning models. Conventional planning is basically a process for choosing between developments according to the best or most economic use of land. It accommodates growth in the sense of transforming nature, though the process may attempt some conservation if the price is acceptable or if it is politically expedient. The Stern Report (2006) makes it quite clear that it is the economics of sustainable development that are of paramount concern. The problem of climate change is an economic one. At what point is it economic to intervene to correct the market? Stern points out that it will be more expensive to deal with the consequences of climate change the longer effective action is delayed. In contrast to economic planning, bioregional planning starts from 'the assumption that humans are biological entities and therefore need systems for living that are designed to meet their cultural, economic and physical needs, but in ways that foster symbiotic relationships with complex ecological systems in the bioregion. Human cultures have co-evolved with nature, a relationship which has been integral to both human survival and biological evolution. Thus, humans are dependent on the integrity of the food chain (e.g. without the bacteria in our stomachs we might be unable to live). Therefore, lifestyles, cultures, industry and even systems of governance are rooted in, and should conform with, the natural conditions of the region’ (Birkeland and Walker, in Birkeland, 2002:236). The basic difference in philosophy and emphasis between conventional and bioregional planning is illustrated in Figure 11.7. In conventional planning the environment is a subset which can be traded off against other factors to achieve a so-called balance; in contrast, bioregional planning asserts the pre-eminence of nature: the constraints of the

![Figure 11.6 The bioregion: circular metabolism.](image-url)
natural environment determines other activities.

THE PRIMACY OF NATURE AND THE LANDSCAPE

Rural areas of the bioregion cannot be considered in isolation from the rural and urban settlement pattern as a whole. If one takes a narrow homocentric stance, the *raison d'être* of the rural hinterland is to service the urban settlements: a ‘deeper green’ perspective would emphasize sustaining the biosphere of which human beings and their settlements are but a part. From this perspective it is the health and well-being of the biosphere that is paramount and without that healthy environment the human population cannot thrive. Following on from a homocentric stance, urban settlement is normally considered the positive or primary element in the regional landscape. Often they are given the greatest planning attention. In most mapping conventions the urban areas are shown in black, the positive element, set against the surrounding countryside, which is largely white. The city of Hamburg has taken a different and greener attitude to its surrounding countryside. It has embedded a landscape strategy into the planning of its urban infrastructure; landscape corridors stretch from all directions deep into the heart of the city. This attitude is symbolized by the mapping of the city where the built-up areas are shown in white and the landscape areas are shown in grey (see Figure 11.8). Figures 11.9 and 11.10 try to make this point a little more dramatically by using black for the built up areas and white for the landscape (Figure 11.9) then reversing this colour coding in Figure 11.10. The importance of the regional setting for the city has been undervalued in this country: most attention has been given to urban areas, where the wealth and votes are to be found. It may be time to end this dichotomized thinking and see the bioregion as one, where town and country are indivisible or where human culture and its artefacts are as natural as the landscape in which they are located. This is the unified, healthy and well-rounded way of seeing the problems of human settlement.

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**Figure 11.7** Sustainable development: the orthodox model and the holistic model.
The function of the bioregion and its landscape is to maintain environmental services including waste management, water, energy and food supplies for regional populations, together with the maintenance of biodiversity. For too long monoculture has dominated the rural landscape: its role has been to support global food markets, seeking justification in the presentation to the population of a spurious choice of food products (Schwartz, 2004). We are fast developing a farming system where subsidies go to the wealthy landowners while those less fortunate lead a stressful life, finding it hard to get a reasonable price for their produce from supermarkets intent on keeping prices down no matter what the means or the effect. Clearly, the shortest supply lines, serving local markets with good-quality, fresh produce would seem to be both in the people’s best interests, certainly in terms of health, and also be a more sustainable system in the long term. An assumption of urban landscaping is that the city is not, apart from a few token allotments, the place where food is grown. The city is not the location for trees and bushes bearing fruit, where ground cover is edible, or where vegetables are used as decoration (Moughtin and Shirley, 2005). This is most unfortunate, particularly when there have been a number of
studies showing the therapeutic benefits for those engaged in gardening. Mollison (1996), in his book *Permaculture*, suggested that we:

‘Replace energy hungry parkland lawns (requiring frequent mowing, fertilizing, and weed control with health damaging pesticides) with edible and decorative understorey species such as blueberry, comfrey, lavender, strawberries and so on, depending of course on climate. Nut trees could replace barren hedges. In the industrial zones, greenbelts and undeveloped city land, urban woodlots could be created. These could include native trees to attract birds and productive insects, as well as orchards.’

Viljoen (2005), in *Continuous Productive Urban Landscapes*, also advocates the development of urban agriculture, citing the intensive urban gardening practised in Havana, Cuba.

**THE EXPERIENCE OF THE ITALIAN TERRITORIALIST SCHOOL**

This section presents research conducted by the Italian Territorialist School in the area of planning for sustainable development. This school is a multidisciplinary group that puts

1 ‘Translator’s note: faced with the impossibility of satisfactorily translating the Italian word *territorio*, we have introduced the neologism ‘territory’ (and ‘territorial’, etc.). Used not only in the strictly military or geographical sense, *territorio* usually means the local (administrative) area and is a handy term in Italian for various concepts (land, ground, local administrative area, region, humanized landscape, environment, etc.). It takes on a specific meaning, however, in its use by the Italian Territorialist School: the complex local material, cultural, historical and relational world people live in’ (Magnaghi, 2005: 22).

The main argument of the Italian Territorialist School is that the global economy ‘with its reliance on ever larger megalopolises is destructive not only of the environment but also of that sense of identity which comes from belonging to and interacting with a local place (a “territory”) and a local community. To be fully realized, sustainability must reconnect individuals with the local place, such that geographically, physically, socially, economically and emotionally they form a vital and interdependent relationship. Another essential
element to this local self-sustainable development is meaningful participatory democracy, in which even the most marginalized are properly represented and have decision-making powers’ (Franklin, 2007: 282–3). In order to build this vision the key building block is the village; this could be found both in a rural or urban context. In an urban context the city is the city of villages, and the villages are networked in non-hierarchical ‘bioregions’.

These ideas have been experimented in several projects. One of these is the Territorial Coordination Plan (TCP) for the province of Prato. The province of Prato (Figure 11.11) is located in the region of Tuscany in Italy. The Plan developed under the direction of Alberto Magnaghi, founder of the Territorialist School, is an experiment in ‘local sustainable development’. There are several components to the Plan. Firstly, the plan distinguishes between the structural and the strategic aspects. The structural aspects refer to the essential resources in the province, called structural invariants in the ‘statute of places’, which defines the place and its identify. The strategic aspects develop the scenarios for the future local self-development of the province. This Plan is a threefold tool for developing participation and democracy, strategic planning and as a future proposal for the territory. The information framework is an inventory that includes structural and statutory aspects. The Heritage Atlas is created with the aim of identifying the resources to be used in the development scenarios. A central idea developed in the Plan is that ‘the focus had first to be shifted from a functional interpretation (highlighting the internal relations in the east–west metropolitan area) to an interpretation establishing the special features of settlements of the whole province’ (Magnaghi, 2005: 16). Such a move away from a functional interpretation of the territory is a first step in the pursuit of a concrete utopia (on this concept,
see Magnaghi, 2005: 116), which is the creation of future utopian scenarios — *utopian* because it contrasts with current development models based on functional economic relationships in the territory but *concrete* because it is established on local identities through democratic decision-making of local societies and in the case of the Prato province also of local institutions.

**STRUCTURE OF GOVERNANCE**

Healthy governance is predicated on democratic decision-making and where great emphasis is placed on citizen participation. Indeed, definitions of sustainable development are built on a premise that recognizes the virtue of grass roots community activity in the development process. ‘Think globally, act locally’ is a catchphrase often used in any debate on sustainable development. Citizen participation in development and the political structures that sustain it are clearly essential requirements of local and regional government. It is often argued that the lowest level or tier of government should be the local community occupying a clearly defined district or quarter of the city.

People see the city partly in terms of named and clearly identifiable districts or quarters. This is the local tier of governance, the parish council. The district, quarter or neighbourhood may no longer be essential for some social relationships, but it is an essential construct that locates people to their environment. As Lynch (1981: 247–248) points out, the neighbourhood is ‘a space which is commonly defined and given a name, and within which people find it relatively easy to band together when things get dangerous.’ It is part of the home territory, a place of safety, therefore of vital importance for health and well-being. A basic consideration in city design is the question of political control. Since citizen control is a key concept in the pursuit of sustainable development, the question arises as to the precise areas of management, which might properly be placed under community control. Parish councils may be able to channel local interests, making vocal those views and lobbying for their acceptance. But the power of communities to say ‘no’ to all developments would lead to total stagnation, not necessarily sustainable development, which may be in the interests of the larger community. City government has been the main actor in the field of urban infrastructure developments since the earliest civilizations. To some extent the power of local government has been overshadowed by the growing might of the State. The patchwork of local authorities structured along lines that separate the core city from its suburban hinterland has further weakened the authority of local government to plan, in a comprehensive way, for the well-being of the regional city as a whole; it is a major disservice to sustainable development. The ability to develop a sustainable infrastructure, including the transport network, is the proper concern of the regional city authority. Since Patrick Geddes first coined the term city region, the concept has become part of the planner’s language, used frequently by many authors (Geddes, 1949). Howard’s earlier idea of the garden city was in effect a proposal for a city region (Figure 11.12). It comprised clusters of settlements linked to each other by a strategic transport network. The basic idea was the development of a functional arrangement of settlements with clearly defined physical identity but with social and economic interdependence (Howard, 1965).

A debate on regional government often returns to the question of the correct size for a city region. There is no one correct size for a city region is the short answer to this
question. The size of the city region to some extent is irrelevant. More important than crude size is the population’s sense of belonging to the place and to a particular polity, so that meaning is derived from citizenship. The city region would be one way in which a balance between the town and country could be managed effectively. It is important that rural areas are managed not only as places where people live and work, but also as places that provide the urban population with food, water and areas for leisure. In addition, the rural areas surrounding cities provide environmental services in the form of pollution control and are important in maintaining biodiversity, which contributes to the well-being of the UK’s ecological system. It is only when the often conflicting requirements of town and country are governed by the one all-embracing polity that prominence can be given to the environment, the main support for a healthy population in tune with the rest of its ecosystem.

**THE REGIONAL PROVINCE**

Regionalism has many meanings (Glasson, 1978). It is used in this book to mean an intermediate level of government and administration between the city region and the state. The prime reason for this additional government structure is to make planning more effective by devolving power and decision-making closer to the people. Being larger in population terms than the city region, such provinces provide a stronger counterbalance to central authority. For a fuller account of regional planning and its development in the UK, see Moughtin and Shirley (2005), Chapter 4. A key to effective regional management of environmental resources lies in legitimizing actions and decisions through the election of
the governing body, a process that takes control over day-to-day living closer to individuals. As we have seen, such control or management of one’s own destiny is a factor in maintaining general well-being. Non-elected bodies and quangos such as regional economic councils or regional advisory commissions are no real substitute for an elected regional government. It was not therefore totally unwelcome news to hear that bodies such as the East Midlands Regional Assembly might be dissolved, despite the good work in which they have been involved. However, there is a proviso. Fully elected regional governments should replace such bodies as soon as possible. This is particularly true for England. However, with the rejection, by referendum, of such a regional government for the north-east of England, the idea of elected regional government and its advantages will have to be sold to a sceptical electorate.

Like the city region, it is difficult to determine an optimum size for a regional province. Cultural identity is more significant than size in determining boundaries. With the establishment of successful elected assemblies in nation states of Scotland, Wales and Northern Ireland, all up and running and showing every sign of independence from London, it may be the appropriate time to revisit and repackage the idea of elected regional assemblies for England. Almost by common agreement, the region is seen as a flexible concept and its size and boundaries vary according to its purpose. Any regional system of government will have its anomalies. For good governance, fixed boundaries are necessary, and for continuity they should have a degree of permanence. The boundaries and areas associated with the regional government offices, currently the outreach of central government, seem as reasonable as any other option for the structuring of regional governance in England. Within these regional provinces, ideally there should be a further set of subsidiary administrations based on 30 or 40 city regions based on the ideas of Senior (1965). Such city regions would be well suited to structure and manage a sustainable public transport system serving commuter movements, while reinforcing the idea of a place of belonging, the ‘hometown’ and its community.

The bioregional structure of governance would comprise the state, province, city region and neighbourhood or district. In the UK there is the added complication and tension between the regional administrations for the other nations that comprise the country. Scotland has already declared itself a government, seeking additional powers. Certainly there is no way such regional administrations could be equated with a province of England. Until these relationships between nations are resolved in some rational way the position can only remain, to say the least, anomalous. Without the land cover of Wales and Scotland, England alone would find it a greater challenge to sustain its burgeoning population. Some form of regional government structure of semi-independent nation states may be one eventual possibility.

**CONCLUSION**

The sustainable or biocity is one that is in balance with its region, in synergy with its natural environment, an active part of the larger ecosystem of which it is a vital component. The regional landscape in which the city is located cannot remain the ‘Cinderella’ of political decision-making, the space to be gobbled up for speculative urban developments: neither can it remain the province of those vested interests that wish to protect it at all costs. It requires rational planning in the interests of the region
and of the nation, where land is allocated for much needed urban development in locations and on land that does not destroy the food-producing potential of the region or vital environmental services. The ‘green belt’ has served the purpose of rural protection well for the past 60 years, but it is a crude instrument that often preserves the interests of those fortunate enough to have adjacent urban properties. In times of great pressure, as the next decades are likely to be, the notion of the green belt should be replaced by other methods of rural protection, possibly similar to those used with great success and popular approval in the national parks. However, the danger of relaxing the green belt restrictions around our cities could be the wholesale rape of the countryside; those restrictions therefore have to be replaced with planning instruments, which if anything are more rigorous. It is not argued here that the city in its bioregion is or ever should be entirely independent of the national or global economy. The city is a place of exchange of both goods and ideas. That role does not conflict with the goal to achieve a sustainable future by establishing a healthy ecological balance between the city and its supporting hinterland – that is, a system of city regions nesting within bioregions having their existence validated by popular mandate. To make it absolutely clear, this chapter has not been advocating a return to some glorious and probably mythical past where the town was merely an appendage of the countryside, simply serving the main function of marketplace: the biocity outlined here is a vital component of a set of overlapping regional ecosystems, located in a State, which puts as its primary aim to develop in harmony with nature.
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The city has many functions: it may be a great centre for trade, commerce, industry or learning. Central to all of these functions is the city as the place where the family locates its home. The family, whatever the precise meaning of that concept for a given culture, is the reproductive unit that ensures a future for the city: it is also the main concern for the community’s health and well-being. As such, the family and its home is the prime concern in any discussion of sustainable development. Despite these very clear and simple truths, other considerations in the planning and development of cities often seem to take precedence over home building in government priorities. For example, the planning system in this country has been reformed to ease restraints on large-scale developments such as airport runways and to reduce perceived delays to the activities of the business world that may have been caused by planning. On the other hand, requirements on house builders to improve the energy efficiency of newly built homes are slow to be introduced against stiff opposition from vested interests in the building industry. This book strongly supports the notion that the family home is the primary concern of the city building process and it is the health and well-being of the family that is the focus of sustainable development.

The home, like the family, can take many different forms. To some extent both family structure and dwelling type are products of specific cultures in particular locations for some period of time. Family structure and the dwelling it occupies change with the process of acculturation – that is, with the grafting onto the parent culture of ideas that are often introduced from, or have originated beyond, the homeland of the culture. The traditional home in Britain, over the past century and longer, has been the small, detached house or cottage, the ubiquitous ‘semi’ or the terraced house, each home having its own attached garden. Social structures such as the family often change more quickly than the physical structures they occupy. The family types in this country today are vastly different from their Victorian predecessors. Nevertheless, judging from house sales in the real estate market and from the house types the building industry continue to build and sell, the home with attached garden is still a popular choice of
dwelling for many families from both the older indigenous groups and from amongst the more recent arrivals to Britain. As we have seen in earlier theoretical chapters, there is strong evidence that links health and well-being with an active and productive life spent in close proximity to nature and the natural world. A healthy city structure, it would seem, is one that introduces nature into existing areas of the city while fostering the development of new family homes each with their own garden arranged as close as possible to larger areas of natural landscape.

In the past, locating a home or settlement has been determined by many factors, some of which have been critical for some cultures at particular times and places. Many basic geographical texts enumerate the factors that, have in the past, governed human settlement patterns. In summary, they have included; proximity to fresh water, good productive land, an important transportation junction, or within a good defensive site and within reach of important locations. To some extent, modern technology and the ease with which services are delivered together with the almost universal ownership of the car in Western societies has seen the loosening of many constraints in the location of the home. In theory, if not in practice, the whole landscape is available for home building. The inevitable growth in the cost of petrol is likely, in the medium term, to stimulate the demand for public transport and a decline in the use of the petrol-driven private car. The problem for the city planner is to devise urban forms that accommodate this new reality, where public transport is the main means by which people move about the city and a dominant factor in the location of the home. This chapter will explore the ways in which linear urban structures can facilitate mass movement of people by public transport, while fulfilling the requirements of sustainable development and delivering a healthy environment. The chapter will end with a case study of Copenhagen, a city that for many years followed a master plan based on linear bands of development taking the shape of a hand (Figure 12.1).

It is sometimes useful to examine settlement structures from the past: such studies may throw some light on current problems. A linear settlement form is the one most often associated with the efficient mass movement of people by public transport. Linear settlements have a long history: they are common in medieval England, being a form associated with non-planned or spontaneous towns and villages. Chipping Campden is a lovely example of such a small town built along one main street (Figures 12.2 and 12.3). An important reason for considering a linear form of development in the twenty-first century is the efficient way in which homes can be arranged along the line of a public transport service maximizing the potential

Figure 12.1 The five-finger plan.
which he outlined a concept for a linear town. His proposal was for a planned town taking the form of ribbons of development arranged on either side of a wide tree-lined central avenue carrying the main road and rail traffic. Along this artery also ran the main public services such as water and sewerage. These ribbons were planned to run from town to town as a national network. They were to open up the countryside and to encourage agriculture along its length, so raising rural living standards: it was a plan for rural as well as urban development.

In 1894 the Compania Madrilana de Urbanizacion (CMU) was formed to promote the building of La Cuidad Lineal designed by Soria y Mata two years previously in 1892. The CMU was also formed to construct and run the associated tramway and the public services provision. The trams were at first dependent on animal power: later they were converted first to steam and later electrified. The suburb was designed to provide cheap housing for the middle classes. The house plots varied in size but the overall density worked out at about 3.2 houses to the acre (Figure 12.4). Only one section of the project of about 3.2 miles was completed to the north-east of Madrid. By 1927 it had approximately 2500 dwellings with a population of over 12,000 people. Sixty-nine per cent of the population were from the lower income groups while the remaining

**LA CUIDAD LINEAL, MADRID**

In 1882 Don Arturo y Mata published, in the periodical *El Progreso*, a series of articles in which he outlined a concept for a linear town.
were drawn from the professional classes and skilled workers (Figure 12.5) (Boileau, 1959).

Water supplies introduced into the area made possible irrigation and also the liberal planting of trees. The result was a green shady suburb in a hot dusty city. Some provision was made for community facilities such as a bullring, amusement park and theatre. For shopping, residents relied on nearby villages. Compared with Port Sunlight and other British garden suburbs of the time, La Cuidad Lineal was not as well endowed in terms of community facilities but it did lead the way in planning for mass public transport.

This was a successful commercial investment where the company founded by Soria y Mata supplied to the community water and electricity and provided the sewerage system in addition to selling and developing the land. The company
also operated the successful tramway until 1952, when it was taken over by the Municipality of Madrid. With the dominance of the motorcar as the main means of movement in the city and the decline of the popularity of the tramway, Soria’s unique town has been submerged in greater Madrid. However, as a concept, it still has lessons to teach in terms of the design for mass forms of transport and for ways in which the countryside can be opened up. Revitalized, the working landscape becomes a healthy environment both for urban and rural populations.

RUSSIA, MILIUTIN AND ‘DE-URBANISM’

The Russian planner Miliutin made a significant contribution to the development of the idea of the linear city. Miliutin, in his writings and in his inter-war plan for Stalingrad, used the linear concept as a flexible extensible form for the city and its region. Miliutin’s idea was that any future populated areas should be associated with a major road; dwellings were to be located in the countryside within easy reach of urban facilities dispersed in a ribbon about 300 metres wide and arranged on either side of the road. Each community facility was planned to occur at different frequencies depending on the population required to support the service (Figures 12.6 and 12.7). There were two competing groups of architects in post-revolution Russia early in the twentieth century. Both groups were trying to see how architecture could best serve the proletariat. The ‘urbanists’ were advocating high-density, high-rise development, a network of vast communal housing with collective services. In contrast the other group, the ‘de-urbanists’, who eventually lost the political battle, suggested communities comprising homes dispersed throughout the countryside. The aim of the ‘de-urbanist’ was to end the distinction between town and country. The view of the ‘de-urbanist’ was holistic: they saw the city in its total environment.

‘We must stop designing piecemeal and start to plan whole complexes, to organize the distribution of production and the territorial distribution of industry over entire economic regions of the Soviet Union.’ (Kopp, 1970)
THE LINEAR PLAN IN BRITAIN

After the destruction caused by the Second World War, the Modern Architectural Research Group (MARS) produced a master plan for London that was based on an analysis of movement in a great but congested metropolis. An aim of the plan was to increase the importance of public transport: ‘With an excellently organized public transport system, the number of people going to and from town in private cars will be few, being confined to certain professions. Other private cars would serve mainly for pleasure’ (Korn and Samuely, 1942). The resulting MARS plan for London was based on a series of linear forms arranged to serve the transport network (Figure 12.8). The group also advocated bus-only highways uninterrupted by crossings with services tightly scheduled. In Britain in the 1940s there was, in effect, the idea of an integrated public transport system. The plan envisaged green wedges extending from the periphery of London to the city centre. These green wedges were to provide sites for recreation, health and education, an idea that resurfaced in this country 50 years later with the publication of Towards an Urban Renaissance (Urban Task Force, 1999). In practice, however, it was the city planning ideas of Howard as

Figure 12.8 The MARS plan for London.
interpreted by Abercrombie that finally won political backing and were accepted as the basis for the development of London and its region in the second half of the twentieth century, the basic concept being a central city contained by a green belt, beyond which growth was to be channelled into a series of discrete new towns.

Arthur Ling, who had worked on the MARS plan for London, was able at the new town of Runcorn in Cheshire to implement some of the features of the linear city concept. Ling was the first planner since Soria y Mata to base the structure of a small town on an effective arrangement for public transport. The plan was to extend an existing town of about 30,000 people to 100,000 and to extend the existing strong industrial base by attracting additional employment outlets. The population was arranged in a dispersed linear form: ‘A linear arrangement of new residential communities, on either side of a spinal public transport route, has been evolved so that the majority of people will be within five minutes walking distance, or 500 yards, of a route which is especially reserved for buses’ (Ling, 1967). It was not possible to use a pure linear form for the town because of the constraints of existing development. Ling turned the linear structure back on itself to form a figure-of-eight with the town centre at the focal position in the centre of the composition (Figure 12.9). Barton et al. (2003: 20, 21) discusses the characteristics, advantages and disadvantages of the neighbourhood in linear townships, illustrating his analysis with the structure plan of Peterborough (Figure 12.10). According to Barton, in addition to the linear structure reinforcing the viability and quality of public transport, it also encourages walking and

**Figure 12.9** Runcorn: structure plan.

**Figure 12.10** Linear neighbourhoods: Peterborough.
(Source: Barton et al., 2003)
cycling, and gives access to open space, water and wildlife, all important for the health and well-being of the people living in such places.

The first plan for Milton Keynes proposed a linear structure for the city (Figure 12.11). For those concerned with sustainable development, the present city, built around the requirements of the private car, is far less interesting than the first plan, which was designed for the efficient running of a public transport system. In the case of Milton Keynes it was to be a monorail. The proposed population of 250,000 was to be arranged in communities of 5000–7000 people centred on a monorail station, which was to be a seven-minute walking distance from most homes. The overall density of the city was to be 50 persons to the acre, built in the form of low-rise development up to three stories in height, but with higher blocks near the stations (Houghton-Evans, 1975). The city was to comprise townships or communities connected by two interlinked circuits of public transport joining home, work and the central city. The townships were also served by an independent road system giving Radburn-type access to the housing. The monorail system, however, was found to cost more than the infrastructure required for 100 per cent car usage. This became a key factor in the rejection of an interesting and innovative plan. According to Houghton-Evans (ibid.), ‘the cost per passenger mile [for the monorail] would be much less than travel by car, and a modest rate charge would allow the system to be paid for, operated and replaced after 60 years for much less than the alternative high capacity road system.’

In retrospect, it is now possible to say that taking account of the true environmental costs would have, without doubt, tipped the advantages further in the direction of the monorail: it would have prevented the short-sighted decision in favour of a city development that may prove most unsuitable in the future.

**THE LINEAR CITY AND ITS THEORY**

The concept of the linear city was developed by March (1974) into an idea for an urban structure following transport and infrastructure corridors, stretching across regional and national boundaries without end in sight. Central places would be located Miliutin-like at strategic points along the corridor. In March’s theoretical structure every part of the city would be close to the countryside, though it would be possible to drive through the countryside without seeing a town (Figure 12.12). The theory does not take into account the equally natural development of central places, which act as magnets attracting development to specific locations (Christaller, 1966). This attraction of the central place.

Figure 12.11 Monorail city: first plan for Milton Keynes.
distorts the pure form of linear development, creating real estate of great value. The place so formed itself becomes a starting point for new branches of linear development.

March advocated a change in perception. He said, ‘Think line not blob.’ The theory relied for its intellectual rigour upon the geometry of Fresnel’s square (Figure 12.13). In Fresnel’s square each successive ‘annular ring’ diminishes in width from the middle but is exactly the same area as the central square, or March’s ‘blob’. If the rings are regarded as possible ways of arranging buildings or areas of urban development, then each possesses different problems of internal arrangement, services, heating, lighting and the way the development relates to external spaces. The greatest difference is between the central space, the ‘blob’, and the outer ring, the ‘line’. Interpreting Fresnel’s square all depends on the scale that is adopted. For example, the diagram can be used to contrast the form of a home on its garden as opposed to a courtyard house with a central patio. At the other extreme the ‘blob’ could represent a town following the ideas of Howard and the ‘line’ a ring of development arranged in the manner of Miliutin. While both ‘blob’ and ‘line’ have the same ground area, the ‘blob’ would require space for internal circulation, light and open space, so increasing the density on the remaining space. Furthermore, the ‘blob’ has far less frontage facing onto adjacent space than the ‘line’, or in the case of a settlement less frontage onto the natural landscape. This latter quality of the linear form of development is important for the delivery of a healthy environment for most of the population. Linear urban development, if used flexibly for development of limited extent and located in areas of natural landscape, seems to have great potential in delivering an environment that is both sustainable and has great benefits for the health and well-being of those who make it the location of their home.
An argument running through this book maintains that the therapeutic environment is one where city development is modelled on nature. In other words, it is argued that the health and well-being of individuals and communities is dependent on a full acceptance that humanity, in all its manifest cultural expressions, is deeply embedded in nature and the natural world. These are expressions of worthy sentiment, which could simply mean greening the city with landscape features. The importance of landscape in the city is not in any doubt, but it is not sufficient for a healthy sustainable environment, nor is it what is meant by the idea of using nature as a model for city development. Humanity is a vital and intelligent component of nature and the natural world. The recognition and acceptance of that role with the great challenges and opportunities it presents is the foundation both for a healthy and sustainable society. Following this line of reasoning leads to the view that towns and cities are features of the natural world, falling into the same category as those other great structures of nature, the homes of the ant and the bee. To define or see nature and culture, countryside and town as opposites is to miss the great unity of nature. Asserting the idea that nature is the model for city building is one thing, making such an idea a practical proposition or operational is quite another. Many designers in the past have made nature the inspiration of their work, for example in the flowery excesses of the Rococo or, more notably, in the work of the designers of Art Nouveau movements of Britain and Europe. In architectural terms the designs of Gaudi are outstanding examples of buildings based on structural forms found in the world of nature (Figures 6.5–6.8). While buildings such as those of Art Nouveau and the many other examples of structures with claims to have conceptual origins in nature are an inspiration for designers, few, if any, give clues about the process of nature from which those forms derive. It is an understanding of the form-giving processes of nature that holds out the prospect of developing city structures that are deeply embedded in the natural world.

Chaos is the theory of nature. ‘Pattern born amid chaos: that is biology’s basic beauty and its basic mystery. Life sucks order out from a sea of disorder.’ Gleick (1998: 299) goes on to quote Schrodinger, the quantum pioneer, as saying that a living organism ‘has the astonishing gift of concentrating a “stream of order” on itself and thus escaping the decay into chaos’. Chaos then is the universal theory of nature: it begins where classical science stops. Quoting Gleick again (1998: 3): ‘For as long as the world has had physicists enquiring into the laws of nature, it has suffered a special ignorance about disorder in the atmosphere, in the turbulent sea, in the fluctuations of wildlife populations, in the oscillations in the heart and brain. The irregular side of nature, the discontinuous and erratic side – these have been puzzles to science, or worse, monstrosities.’ Chaos theory looks at the whole and concentrates on the everyday things we can feel, hear and smell, the unpredictability of weather, the formation of clouds or the way in which particular trees grow. It seeks an answer to the question: how does order appear from chaos? In a world governed by entropy and slipping towards greater disorder, that ‘black silent night’, suddenly there is order, which appears, for the moment, to defy the Second Law of Thermodynamics.

Gleick, already quoted many times, gives a readable and easily accessible account of the development of the rich ideas that were formative in the development of chaos theory. For architects and designers, Mandelbrot is one of the most interesting of the early thinkers in this field. Mandelbrot (see particularly The Fractal Geometry of Nature, 1982) is
a mathematician with a strong visual intelligence: as a geometer he has the kind of mind that converts problems into pictures. Mandelbrot in his work demonstrates the limitations of Euclidian geometry, a cornerstone of classical science. His analysis of forms found in nature is accompanied by the most spectacular imagery (Figure 12.14). His analysis of the measurement of national geographic boundary's shows clearly that the scale used in measurement is critical to the result. He used the Koch curve to illustrate this point (Figure 12.15). The demonstration begins with the construction of a triangle with sides of 1 unit. At the middle of each side a new triangle of one-third the size is drawn on each face. This process can proceed ad infinitum. The figure can be placed within a circle but ever quite reaches its circumference. Eventually the perimeter of the Koch curve is infinitely long but within a finite circle. By analogy the length of the coastline of an island such as Britain varies depending on the scale of the measuring instrument. As the size of the scale used to measure the coast decreases, so one discovers bays within bays within bays. These are the fractals of nature.

Fractal is the word invented by Mandelbrot to best describe this universal feature of the natural world: it is a way of seeing infinity. Mandelbrot (1982: 1) describes his work as follows:

‘Why is geometry often described as “cold” and “dry”? One reason lies in its inability to describe the shape of a cloud, a mountain, a coastline, or a tree … More generally, I claim that many patterns of Nature are so irregular and fragmented, that, compared to Euclid … Nature exhibits not simply a higher degree but an altogether different level of complexity. The number of distinct scales of length of natural patterns is for all practical purposes infinite … The existence of these patterns challenges us to study those forms that Euclid leaves aside as being formless … Responding to this challenge, I conceived and developed a new geometry of nature and implemented its use in a number of diverse fields. It describes many of the irregular and fragmented patterns around us, and leads

Figure 12.14 The Koch curve.

Figure 12.15 The Triadic Kochlake (© Mandelbrot, 1982).
to full-fledged theories, by identifying a family of shapes I call fractals ... also the shapes described here tend to be scaling, implying that the degree of their irregularity and/or fragmentation is identical at all scales.'

The fractal is a most useful analogical tool for the city designer aiming to build in harmony with the processes of nature. The analogy of the fractal for the city designer is made immediately apparent with Gleick’s description below of the systems for blood vessels and lungs in the human body. The parallels are immediate, with the designer’s interest in the economy of movement, complex circulation systems and the premium on space, particularly in important locations in human settlements.

‘Blood vessels, from aorta to capillaries, form another kind of continuum. They branch and divide and branch again until they become so narrow that blood cells are forced to slide through single file. The nature of the branching is fractal ... As a matter of physiological necessity, blood vessels must perform a bit of dimensional magic. Just as the Koch curve, for example, squeezes a line of infinite length into a small area, the circulatory system must squeeze a huge surface area into a limited volume. In terms of the body’s resources, blood is expensive and space is at a premium. The fractal structure nature has devised works so efficiently that, in most tissue, no cell is ever more than three or four cells away from a blood vessel. Yet the vessels and blood take up little space, no more than about 5 per cent of the body ... The lungs, too, need to pack the greatest possible surface into the smallest space. An animal’s ability to absorb oxygen is roughly proportional to the surface area of its lungs. Typical human lungs pack in a surface bigger than a tennis court.’ (Gleick, 1998: 108)

Mandelbrot has strong views on architecture. He is not an admirer of the early twentieth century architecture of the modern movement: ‘A Mies van der Rohe building is a scale bound throwback to Euclid, while a high period Beaux Arts building is rich in fractal aspects’ (Mandelbrot, 1982: 24). He believes that buildings composed of simple shapes are basically inhuman because they fail to resonate with the natural world. Indeed, he goes further, suggesting that such shapes are not in tune with our systems of perception, which, being fractal in essence, are at their best when receiving fractal messages. In contrast to the severity of form of much of the work of the modern movement, the buildings of the Beaux Arts are composed of parts and shapes that announce and reflect the main form. The aedicule (the small house), which appeared at times as windows and doors mimicking the shape of the main pediment, was common to such compositions (Figure 12.16). One may or may not agree with Mandelbrot’s views on architectural design, but it would seem that with our quest to come to terms with nature, the overlapping complexity of the fractal may be aesthetically as well as functionally suited to organizing the city as the healthy home of humankind.

‘Why do we change our minds about what is beautiful?’ This question de Botton asks himself, or rather the answer he develops, may be useful for urban designers to contemplate as they attempt to design a healthy or therapeutic environment for the future (de Botton, 2006: 154). For help in discussing this question, de Botton turned to the German art historian, Wilhelm Worringer (1907), who had suggested that, during the span of history, there were two types of art, ‘abstract’ and ‘realistic’, either type being in favour from time to time and from place to place. According to de Botton, ‘The most compelling aspect of Worringer’s theory – a point as readily applicable to architecture as painting – was why a society might transfer its
loyalty from one aesthetic to another. The determinant lay, he believed, in the values which the society in question was lacking, for it would love in art whatever it did not possess.’ Incidentally, an idea like this is as applicable to city planning or urban design as it is to art and architecture. This analysis might go some way towards explaining the architecture of the modern movement at the beginning of the twentieth century and also its demise in popularity. At a time of war and social conflict there may have been the subliminal need for the geometrical purity, the simplicity of form, the separation and expression of function, which in their highest architectural expression brought a sense of tranquillity and order. Unfortunately, the mass execution of the ideal after the Second World War did not live up to expectations and the housing, in particular, was perhaps built at a time of changing zeitgeist. Today, we face quite a different problem. Humanity appears to be recklessly destroying the natural world. It may be this lacuna in our psyche that we have to fill with our art, in which case it is the right time to return to natural or realistic notions of art, in an attempt to structure the happy, healthy and beautiful city.

CASE STUDY: COPENHAGEN, DENMARK

Introduction

Copenhagen was chosen as a case study because it is one of the cities that was participating in the WHO European Healthy Cities Network from its inception in 1987; it was also one of the first cities to prepare a health plan (Barton and Tsourou, 2000; Beatley, 2000). In addition, Denmark is one of those ‘happy healthy’ countries referred to in Chapter 2, which is wealthy but where the wealth is evenly distributed. In recent research by Veenhoven (2007), Denmark was one of three countries rated the happiest in a sample of 90 countries.

Regional planning

Denmark is a relatively small but affluent country with a population of 5.5 million people. Greater Copenhagen, which is the country’s capital, and its region has a population of 1.7 million and the city itself has a population of about 0.5 million. Copenhagen has a long history of regional planning; it is known for its ‘five-finger plan’ (Figure 12.1). The plan dates back to 1947 (Copenhagen, Regional Planning Office, 1948–9).
While planners in Britain were aiming to limit urban spread, the Danes aimed to control and direct it along fingers of development. Stevenson (1953–4) said of the Danes: ‘the urbs is not an evil to restrict but a benefit to spread ... the city is not malignant but a healthy growth which may still be allowed almost to double its size by controlled suburban development.’ The idea of the plan for Copenhagen was that the public should have free access to public transport, community facilities and places of work, while still being able to enjoy and live close to nature. The plan was designed so that all citizens could enjoy healthy pursuits in the surrounding forests, lakes, rivers and fjords, while still benefiting from being close to the city centre. The beauty and simplicity of the ‘five-finger plan’ is the ease in movement of goods and people along five main road and rail transportation routes. Furthermore, it is a plan that has been effective for 60 years: it still dominates and gives form to Copenhagen's urban structure. Although regional planning as such is no longer a prominent planning activity in Denmark, nevertheless the ‘five-finger plan’ is ‘still very much in the minds of the politician, planner and people of Copenhagen’ (personal comment from Mr Juul, a health planner in Copenhagen). Copenhagen of the future will have to accommodate about 10,000 people per year until the mid-2020s. This will involve the building of 3500 homes with supporting community infrastructure per annum, a large undertaking that will probably involve the thickening and extension of Copenhagen’s fingers of development (Copenhagen, Capacity, 2005).

**City planning**

Latest plans emphasize the ‘blueness’ of Copenhagen in addition to ‘greening’ the city. Priority is given to improving the city for its existing citizens, making a very fine city healthy for all. Health planning in Copenhagen is holistic and includes the design of its environment. Making Copenhagen’s waterways accessible to the community is a major achievement in promoting health and well-being in the city. Three open-air swimming pools have been created in Copenhagen's waterways. The Harbour Bath designed by the Bjark Ingels Group ApS is probably the most impressive. It, along with the other baths, is the culmination of many years’ work which has transformed Copenhagen’s harbour from an industrial waterway to a place for play, exercise and sport. In 2000, the water in the inner harbour was declared safe enough for swimming. The design of the Bath was the outcome of an architectural competition: the winning design extended the adjacent riverside park onto the Harbour Bath so that park, bath and waterway are one co-extensive community facility.

Copenhagen has a long tradition of cycling – together with walking, cycling is considered a healthy and green alternative to other means of transport. Since the early 1980s Copenhagen has established an extensive network of cycle tracks, with later infrastructure employing tracking on both sides of city streets (City of Copenhagen, 2007a). This cycle track is an appropriate model for the proposed network of pedestrian routes for the city. The first phase of one element of this dedicated pedestrian infrastructure, ‘The Green Pulse of the City’ (City of Copenhagen, 2007b, Byens Gronne Puls) was due to begin in 2008. The ‘Green Pulse’ is an outdoor fitness route for the able-bodied, but with access and facilities for those with disabilities. At regular intervals along the route, pavilions are planned containing gym equipment to increase the pulse rate. Like all sporting infrastructure in Copenhagen, the emphasis is on fun. Exercise, sport and healthy activities are designed to be pleasurable experiences – this is the major goal of all planning for healthy
activities. To this end, the ‘Green Pulse’ route has playground equipment for all ages from the very young to the more mature citizen.

Copenhagen has embarked on a coordinated urban design strategy for the city. Copenhagen Urban Space Action Plan (CUSP) aims to develop a metropolis with a strong urban identity. The city has a strong tradition of developing pedestrian urban spaces (Gehl, 1996; Gehl and Gemzoe, 2000). One of the first pedestrian precincts of the twentieth century, the two-kilometre-long street nicknamed Stroget, opened in the inner city in 1963 (Bondam, Technik- og Miljøforvaltningen, 2006). Other pedestrian streets and squares have been added since, so that much of the city centre is car free (Figures 12.17–12.20). The vision for the urban design strategy is of a city of unique urban spaces that enhance the identity of the city and improve the quality of life and the well-being of its citizens. The plan has identified four basic types of urban space in need of strengthening: shopping streets – the aim is to make them pedestrian and more attractive places to visit; major connecting streets – the aim is make these links between shopping streets, recreational areas, schools, sports facilities and housing areas, secure pedestrian friendly streets; urban squares – there are many potentially lovely squares that could be designed to offer better opportunities for play, exercise and socializing. The fourth type of space identified is the promenade. The aim is to create an extensive network of pedestrian streets, primarily in the city centre and along the waterfront (Figures 12.21–12.22).

The ecological renewal of Vesterboro

The renewal of Vesterboro, Copenhagen is of particular interest for those involved in sustainable development and the creation of a healthy environment (City of Copenhagen, 2006c, d). Vesterboro is a renewal area of an experimental nature: ecological solutions are being implemented for problems associated with energy, waste and water. It is also an area putting into effect policies for greening the city. Vesterboro is an older residential area of Copenhagen, close to the central station (Figure 12.23). It has a population of 6500 and 90 per cent of its buildings are pre-1900. The street blocks have five- and six-storey flats around the perimeter, with open space (Figure 12.24), dwellings, workshops and small enterprises in the courtyards. The aim of the action plan was the ecological reduction of resource consumption – that is, moving the district towards a more circular metabolism. It was recognized from the start of the project that ecological improvements would not be achieved merely by the installation of technical infrastructure. Therefore, the active commitment of the community through participation in the planning process was
pursued as a priority. Local urban renewal shops were adopted as forums for discussion. The organizational structure in Vesterboro was completed by the institution of the Urban Renewal Centre, which offers training in such subjects as gardening and craft skills. The pilot projects included: the restoration of Dannerbrogsgarde 18 with the installation of passive and active solar heating, water-saving measures and rainwater recycling; the opening up of a typical courtyard to include garden spaces and an ecologically balanced greenhouse;
and finally the area was comprehensively ‘greened’ with trees, shrubs and vertical green walls (Figures 12.25–12.27). The early results of the project indicate a reduction of 14 per cent in CO₂ emissions, 11 per cent savings in electricity, 20 per cent savings in heating, while water consumption was reduced by 50 per cent. These figures cover only the first three blocks of an experimental project, but they do give some indication of the potential for such projects if extended citywide.

**Copenhagen: a national perspective**

Developing Copenhagen as a healthy sustainable city is part of a wider national endeavour. Denmark is pursuing policies for reducing and reusing waste, economies in water usage and in expanding the alternative energy industry. Denmark has been using wind turbines for power generation since the aftermath of the
First World War and the country has had a National Energy Plan since 1976. Since 1990, Denmark has been following a goal of sustainable development in the energy sector. From that time Denmark’s gross energy consumption has remained constant despite a growing economy (Figure 12.28). In addition, renewable energy consumption has increased while that from oil, coal and coke has decreased, resulting in a reduction of CO₂ emissions (Denmark, 2008). The whole country is

Figure 12.24 Copenhagen: Vesterboro.

Figure 12.25 Copenhagen: Vesterboro.

Figure 12.26 Copenhagen: Vesterboro.

Figure 12.27 Copenhagen: Vesterboro.
following effective policies to reduce its carbon footprint, creating a stable platform for developments in Copenhagen.

CONCLUSION

Copenhagen is a classical form of linear urban growth. Since 1947 growth has been channelled from the centre along five main transport routes. Between these fingers of development are areas of natural landscape. This is a form of development where all citizens have easy access to nature. Moreover, it is the form of development where farm produce is close to its market, a key feature necessary for a city with a circular metabolism. Furthermore, the inner areas of the city are being greened, improving environmental quality but also supporting urban agriculture, a feature of the economy of Havana in Cuba, an exemplar of a sustainable healthy urban lifestyle (Figure 12.29). Copenhagen is a city region where boundaries between urban and rural are blurred: the scaling of those boundaries are as complex as the geometrical forms Mandelbrot used to describe the natural world he analysed. A feature of greater Copenhagen are the many co-housing, ecological family groups that have much in common with the group at Hockerton but have greater support as part of a wider network. Copenhagen has been a city associated with social experiments such as the fun-loving ‘hippy commune’ of the 1970s at Christianshavn (Figures 12.30 and 12.31). The city now leads the way in other social experiments of a more controlled nature with wider application. Such experiments promote health and well-being through activity, sport, closeness to nature but, even in official policy statements, there is still great stress placed on the fun of keeping fit: good health is a quality to be enjoyed (Figure 12.32). Chapter 3 emphasized the importance of the early days of childhood for the development of the adult. Mortimore (2008) wrote ‘the Danes know how to do childhood’. He goes on to point out that Denmark is the
homeland of Hans Christian Andersen and that ‘Denmark is fond of children. There are well-equipped playgrounds for little ones and giant skateboard runs for their seniors. The quality of childcare, and support given to working parents is generous … The UNICEF survey of the quality of childhood in 21 of the most developed countries placed Denmark in third place [the UK was 21st].’ Planning for children and play at all ages is an important key to well-being and the therapeutic environment: Copenhagen sets the standard in this aspect of urban design (Figure 12.33).
INTRODUCTION

This chapter examines the nature of the healthy city quarter, one that fosters the well-being of the community. For some time the city quarter or district has been seen as the main component of urban design (Gosling and Maitland, 1984). The development of such city quarters on ‘greenfield’ sites presents an exciting challenge for designers. However, of greater significance is the restructuring of existing city quarters to make them suitable for twenty-first century conditions. Most of the UK’s population live in existing housing stock, much of it at least 60 years old. Many of these districts and neighbourhoods of older housing will become increasingly unfit for purpose as we move towards mid-century. The residents of the existing cities who live in these ageing areas make up the majority of the electorate. They cannot be ignored for long. This issue will have to be addressed, otherwise the shiny new eco-towns, in reality a city quarter by another name, may cause anger and resentment amongst those not receiving such preferential treatment. Now is the time to consider this daunting task of city refurbishment, in tandem with building the much-needed new city quarters. The UK needs eco-cities, not small isolated eco-towns. Part of this endeavour of transforming urban Britain is the building of new eco-suburbs, the new city quarters of the future. This chapter starts with theoretical notions about the quarter and its parts: it analyses both the main components of the quarter and the relationship of the healthy quarter to its bioregion. There are many projects in the UK that address the problem of building for the twenty-first century – they have been well documented elsewhere; therefore, only a few will be mentioned in this chapter. For a thorough introduction to this work in the UK, see Barton et al. (2003). The UK case study examined in this chapter will be the Meadows, Nottingham, a neighbourhood that was redeveloped in the 1960s. The current plans for the Meadows aim to tackle the problems of a deprived inner city area, building on an ambitious community project to make the district the first carbon-neutral neighbourhood in the UK, a healthy sustainable environment for
the decades ahead. It leads into the case study of Freiburg (Chapter 14), which sets out the necessary framework for a successful conclusion to a project such as the Meadows.

THE QUARTER

The size of the quarter or district is a subject for dispute. The definition of the city district by Lynch captures the fluid nature of the concept: ‘Districts are the medium-to-large sections of the city, conceived of as having a two-dimensional extent, which the observer mentally enters “inside of”, and which are recognizable as having some common character’ (Lynch, 1981). The physical size of the city quarter varies with the size of the parent city and its population size is related to its function within that city. The quarter is home to something of the order of 20 000–100 000 people. This is an imprecise concept, as are descriptions of human groupings. The city district or quarter, however imprecise its boundaries, is a named area of the city. In Nottingham, for example, there are the districts of Lenton, the Meadows, Forest Fields, the Lace Market, together with many other such places. The seamier side of community life, the gang wars associated with inner city territories, is evidence of the importance of such places in the minds of people. These city quarters are places to which people relate as residents or outsiders. Even to the non-resident these areas are major structuring elements by which the city is understood. Such places are the basis of perceptual structuring, which renders the city intelligible to its citizens.

THE NEIGHBOURHOOD

Neighbourhood and quarter are often used interchangeably. Neighbourhood, like quarter, is capable of a number of interpretations, taking on a number of forms and sizes. We derive the word quarter from the Roman planned city: it was divided into four quarters by its two main streets, the cardo and decumanus. In the UK we have derived our idea of neighbourhood largely from the planned new towns built in the post-Second World War period. Harlow is a classical example of neighbourhood planning. It has a series of districts each housing approximately 20 000 people. The district is subdivided into neighbourhoods of about 5000 people. For the smaller settlement the neighbourhood is the town quarter while for the larger metropolitan areas the neighbourhood may be much bigger. The neighbourhood, like the city quarter, is a fluid concept.

THE HOME AND THE HOME PATCH

At a smaller scale than the neighbourhood is the ‘home patch’. Existing cities at the scale of the street are comprised of a myriad of overlapping places, significant to groups of close neighbours. Traditionally in the UK the home patch is associated with the mutually supportive community in the ‘working-class street’ of the North of England or in the homes clustered round the village green. The co-housing clusters of Scandinavian countries fall clearly into this definition of home patch. In addition to these obvious examples of the home patch, cities have groups of families living in close proximity where the neighbours collaborate for mutual benefit and where they take ownership of the immediate environment as an extension of home. Arranged around the home patch are the family homes: this is the main unit from which the city is built. The home has many forms, which are adapted to the specific cultural needs of the occupying family. In ecological terms the
main function of the home is to nurture the family and to sustain a healthy city population for the future. The home is the main planning unit of sustainable development and the therapeutic environment.

COMMUNITY

Neighbourhood and community are two closely related concepts used to describe and analyse some aspects of the form and function of the city. Furthermore, the concepts have at times been used synonymously in the planning of settlements. This interchangeable use of neighbourhood and community can cause confusion (Barton et al., 2003: 8; Moughtin and Shirley, 2005: 159–73). The quarter, neighbourhood, home patch and home refer to places. Community is about people: citizen groups, neighbours and families. Community is not necessarily associated with a specific location. Communities are formed around a shared interest, such as work, education, theatre or art. Some of these community networks are international in extent. Academia and business, for example, have associations that cross international boundaries. Many groups or communities, however, do have association with a local place. The locality is the focus for social activities, such as school, where parents meet on the ‘school run’, allotment or bowling clubs, and the pub. While the physical elements of what makes up ‘place’ can be planned and delivered by the development industry, it is not possible, or even desirable, to engineer community. Clearly, from the experience of Port Sunlight, it is possible to create a physical environment that supports and stimulates the development of a vibrant community of overlapping interest groups. Such community development we have seen as important to health and well-being, a prerequisite to the development of a therapeutic environment.

COMMUNITY FACILITIES: CATCHMENT POPULATIONS

A flourishing, healthy community develops a complex lattice of social networks. The provision of community facilities serving such a healthy society would naturally reflect its complexity: there would, of necessity, be a duplication of services with overlapping catchment areas. In this way individual choices would not be confined to local facilities. However, in new development there is no other rational or economic way of providing community facilities other than for a supporting population in a given area. The assumption is that a residential population of a certain size located within walking or cycling distance can support a school, post office or health centre. Figure 13.1 is a list of supporting populations for a number of community facilities. A newly developed settlement such as one of the proposed eco-towns planned in this way would have a meagre diet of community facilities giving little choice to residents. This was the kind of criticism levelled at the early postwar new towns in Britain, one of the causes of ‘the new town blues’. Such developments would

| 2500 to 4000 Primary School |
| 2500 to 3000 Doctor |
| 2000 to 5000 Corner Shop |
| 5000 to 7000 Public House |
| 5000 to 10000 Group of Shops |
| 5000 to 10000 Post Office |

Figure 13.1 Supporting populations for community facilities.
compare unfavourably, from a social point of view, with a new edge-of-city suburb connected by public transport to the city centre and other suburban centres. The well-connected suburb is more likely to develop into a lattice of overlapping communities than a pristine new town surrounded by a green belt.

**CITY FRACTALS**

The city components – quarter, neighbourhood, home patch and home – have the quality of the fractal as defined by Mandelbrot (1982). They nest one within the other, overlap and only come into sharp focus when examined at the appropriate scale. The city components have that dynamic quality of the fractal, changing with viewer and viewpoint: that ‘will-of-the-wisp’ characteristic of eddies in a stream. Each fractal shares the same functions and activities with other fractals in the same set. For example, the healthy city fractal consumes and creates energy, uses and harvests water, provides and consumes food, creates and reuses waste. In summary, each city fractal is, as far as possible, autonomous and circular in its metabolism.

Although occupying a relatively large site and unrepresentative of most urban residential areas, the Hockerton project nevertheless exemplifies the ecological approach to development where this small community, in terms of function, is the city in microcosm. The eco-industrial park in Kalundborg, Denmark is another case where the term fractal could be used to describe the ecological outcome in the planning of this part of the city. In Kalundborg eco-park industries and businesses locate together in order to trade in waste (Roelofs, 1996; Moughtin and Shirley, 2005). The partners in the park include a large coal-fired power plant, a refinery, a wall-board factory, and a biotech firm making insulin and industrial enzymes in partnership with the city of Kalundborg. Figure 13.2 illustrates the flow of wastes and material amongst the related industrial, commercial and community outlets. By taking this ecosystemic view of industry, its ecological footprint can be reduced considerably while improving the profitability of the complex. Industrial ecosystems, which result in a continuous cyclic flow of materials and energy, largely eliminate the direct environmental impact of industry (Tibbs, in Birkeland 2002). The eco-industrial park combined with policies for mixed land uses assists in the development of balanced, environmentally healthy autonomous quarters. Port Sunlight and other similar foundations of the late nineteenth and early twentieth centuries in the UK point the way to an elegant solution for the design of a neighbourhood environment that sustains a healthy community lifestyle.

**THE CITY QUARTER IN CHALLENGING TIMES**

A discussion about the planning and design of the quarter, neighbourhood and home patch – these rather fluid concepts – has to be set
within the context of the probable conditions that can be expected over the next 30–40 years. As we saw in Chapter 10, population in the UK is likely to grow dramatically. This population increase is occurring against a background of growing demand for affordable homes and a serious housing shortage in some parts of the country. There is some dispute about the precise nature and extent of population increase, particularly that caused by immigration. The population in Britain, as we have seen, could reach 70 million before mid-century. Much will depend on how quickly and how badly climate change affects central and south Europe. A population projection, for Britain, of an additional 5 or 6 million is at the lower end of the current forecasts for the next 20–30 years. If the more pessimistic views of climate change prove to be an accurate representation of this process, then current population forecasts will be a great underestimation with population rising faster than expected for the first half of the century and continuing to rise after mid-century. This rising demand for new properties in new sustainable developments, however, has to be seen against a background of unfit for purpose, existing urban structures.

The government of the UK plans to build 3 million new homes by 2020. About one-third of these will be in eco-towns, some on brownfield sites. The 3 million new homes also include refurbished housing stock. This is a massive undertaking. But will it meet the needs of a dynamic and growing population? Will it address the problems of the existing, unfit for purpose, housing stock? If the population is set to increase by 6–7 million people, a modest estimate in the view of many, then it will mean the building of another city, larger than Birmingham. The government intends to build at the rate of 240,000 homes per annum from 2020 – that is, building two cities the size of Nottingham every year in the third decade of
this century. This is not simply a massive task—it is monumental in scale. Building ten eco-towns is not the answer to this problem. The eco-town idea is a diversion, distracting attention from a serious problem (Hunt, 2008).

As we have seen, there is some dispute about the population projections for the UK over the next few decades. The need to accommodate 10 million extra people in the country over the next 30 or 40 years, however, is not an unreasonable assumption. This is the equivalent of building 40 cities the size of Nottingham. How would it be possible, on such a vast scale, to avoid the ugliness of some of our new town developments or their equivalents in France? Breaking the development down into 100 city quarters each of about 100,000 people would still lead to the creation of large characterless and desolate urban developments. This is a formidable task for a small country, even though it has a strong group of professional architects, urban designers and planners to give direction to the programme. Meeting the challenge successfully requires the political acceptance of the immensity of the task and an understanding of the nature and scale of the problem by the political leadership in the UK. There is a sense in which the ‘final’ population of the UK will never be known: the goalposts will always be shifting. It appears that population projections are constantly being revised upwards as new figures for immigrants are incorporated into the calculations.

The development of a rational form of urban expansion in the UK over the decades ahead, which acknowledges both the scale of the problem and the uncertainties, would be greatly facilitated by the abandoning of a number of irrelevant and largely aesthetic notions inherited from the past. Irrelevant intellectual constraints are a luxury in times of crisis. These irrelevant notions include the concepts: that a town or city can or should be finite in extent; that the town or city should have a precise boundary making a clear visual distinction between what is urban and what is rural; that the suburb, sometimes called ‘urban sprawl’, is an evil to be avoided; that the green belt encircling cities is the best way to preserve the countryside and contain urban growth; that urban growth should be directed beyond the green belt into discrete new or expanded towns; and that cities should be high density and compact so that the pressure on rural landscape by ‘sprawl’ is reduced. This intellectual baggage compounds the challenge facing the UK, which is to accommodate up to 10 million additional people in healthy communities before the mid-twenty-first century (Donald, 2006; Hall, 2006).

**POPULATION DISTRIBUTION**

Finding space for the equivalent of 40 new cities, each the size of Nottingham, without destroying valuable agricultural land, encroaching on wilderness or alienating local communities presents great difficulties. Distributing the extra population more evenly throughout the country in healthy small-scale garden suburbs, if sensitively implemented, may be acceptable to the electorate. In this way the pain would be more evenly and fairly distributed, but so too would be the undoubted gain. The additional population brings with it great possibilities for wealth creation through the additional work involved in development and the necessary extra service provision; it also brings with it the justification of, for example, larger and better equipped hospitals, together with a stronger local tax base. Each municipality would be required to bid for development if it wished to be considered a partner in this national
endeavour. Such a procedure would avoid the need to force through unpopular large-scale developments. It would, however, mean decentralizing greater power to municipalities. A city such as Nottingham would be expected, initially, to make a bid for additional accommodation to house 40,000 people – that is, about one-sixth of its current population. When the development is distributed in this way the task does not appear as daunting: building one suburb of 5,000 people every five years is not beyond the ability of a city the size of Nottingham. Given responsibilities like this, municipalities may once again take the entrepreneurial initiatives for which they were noted in the nineteenth century. Not all places would bid and not all bids would be successful. Any bid would have to show, for example, how the development would improve the lives of its resident community and the town’s ecosystem in terms of agricultural production, biodiversity, waste disposal, energy production, service and community provision.

MODEL GARDEN SUBURB

The spatial limits for this model community or neighbourhood should be determined by a reasonable walking distance of about 800–1,000 metres from the centre to the boundary of the neighbourhood. The land within a grid of 1,600 metres square (Figure 13.3) will accommodate a community of 10,000 at a gross density of 50 persons per hectare: this is allowing about 56 hectares of land for community purposes. At about 100 persons per hectare the same piece of land will accommodate a community of 16,000 people, allowing 95 hectares of land for community purposes. At a much higher density of 150 persons per hectare the site will accommodate 20,000 people with 115 hectares of community land.

By arranging a number of communities, or garden suburbs, in a linear series a city district of between 40,000 and 64,000 could be housed along a four-mile stretch of public transport. The densities for this development would be either 50 or 100 persons to the hectare – that is, either predominantly two- and three-storey housing or four-storey development. Each community in the model is a fractal of the city as a whole and therefore, to some extent, autonomous or self-sufficient. Running through the middle of the development is the public transport route, along which route in the model the community facilities are arranged. Along the periphery of the development is open

![Figure 13.3](image)

Model for small local communities at different gross densities.
countryside, which is within 800 metres walk or half a mile of the most distant home (Figure 13.4). This is purely a diagrammatic illustration of one possibility. In the case of Nottingham, for example, 40 000 people could be housed in garden suburbs along a four-mile extension of the existing tram system. The additions to the city would be incremental, built when needed to the specifications of the local community, planned by local designers and built by the local building industry. It would be development for and by Nottingham as opposed to a town foisted on a region to the anger of many in the local community. To avoid the monotony of a single design over such a large extent, different local design groups could be used to design and supervise each garden suburb, say of 5000 people. Furthermore, the work of developers too could be limited to the construction of small blocks of development, support being given to local builders with a commitment to the city.

CASE STUDY

There are a number of examples in Britain of innovative approaches to the design of sustainable city components that promote health and well-being. Examples would include: St Augustin’s project, King’s Lynn, Norfolk, which promotes the urban garden as a feature of a healthy living programme (Barton et al., 2003); the small Springhill Cohousing Community of 35 homes on two acres of land in Stroud, Gloucestershire – this is a community who are following a lifestyle similar to the smaller one in Hockerton (Springhill Cohousing Community, 2007); the well-known zero-carbon community at Helios Road, Wallington, Surrey (Peabody Trust, 2006); and the car-free urban street block in Edinburgh (Figure 13.5).

These and other equally interesting British projects are well documented, so this chapter will concentrate on a project in Nottingham still in the early stages of development, with little to show on the ground. It is, however, a project that could point the way for a national suburban renaissance or the restructuring of vast swathes of our urban fabric that is in need of attention.

The Ozone project, the Meadows, Nottingham

The Ozone project is located to the south of Nottingham city centre: it includes the Meadows and the Embankment (Figure 13.6). Before the Industrial Revolution, the area was a ‘water-meadow’ owned by the Duke of Newcastle. In the nineteenth century, it
developed into a working-class housing area with some industry. The magnificent but underused and poorly maintained Embankment was given to the city by Sir Jesse Boot for use as a public park. This is a 36.5-hectare park with a mile-long river frontage: it includes the rundown Grade II Memorial Gardens (Figures 13.7–13.9). In the 1970s part of the Meadows was redeveloped in Nottingham’s slum clearance programme. The result is a typical neighbourhood of the 1970s, with dreary and dangerous underpasses connecting large areas of housing, arranged around culs-de-sac. The neighbourhood has few connections with the surrounding city: it is ringed by the River Trent to the south and by major roads to the east, north and west; in some instances these major roads are reinforced as barriers with additional service roads and heavy planting. The area appears to be totally isolated. The 1970s development is a maze of dead-end streets, a place in which the stranger can easily lose her or his way. The maisonettes and flats in the area are unpopular dwellings for local people, added to which the gang culture associated with the Meadows makes it unattractive for new residents: it is not a favoured address (Figures 13.10 and 13.11).

About 9000 people live in the Meadows in 4000 families. The neighbourhood has an unfortunate reputation for drugs, crime and antisocial behaviour: it is in the worst 2 per cent of areas, nationally, for places affected by crime. The area suffers high unemployment, being one of the 5 per cent most deprived wards in the UK. Unemployment in the Meadows is 8 per cent, twice the city average, with 38 per cent of residents between the ages of 16 and 74 having

Figure 13.5 Edinburgh: car-free residential street block.
The general health of the people of the Meadows is of great concern. The neighbourhood has the highest rate of chronic heart disease in Nottingham. Nearly 20 per cent of the population have a limiting long-term illness, while increasing numbers of children in the Meadows are classified as obese.

Nearly one-third of people living in the older properties to the south-east of the built-up area suffer fuel poverty (Figure 13.12). This health report for the Meadows makes depressing reading: it is a place in great need of restructuring if it is to face up, with confidence, to climate change, energy insecurity and the possibility of spiralling food costs.

**Ozone vision**

The vision of the Ozone project is to enable the Meadows and its community to realize its full potential. The aim is to turn a place in distress into a vibrant, healthy community. It is a holistic vision while emphasizing four main themes for action: energy, community, opportunity and lifestyle. At the heart of the project is the issue of climate change; it examines ways in which energy can be generated and saved so that residents spend less on fuel. The long-term aim is to create the world’s first zero-carbon community. The project is community centred: it is the community and its ideas that are paramount in decision-making. The project aims
to benefit the community in terms of the opportunity it provides for employment, training and the use of improved facilities. Finally, the Ozone project aims to improve the lifestyles of local people; the vision is of a healthy, active, green community.

**Components of the Ozone project**

The Ozone project was one of 23 projects in a nationwide competition for lottery funding. Unfortunately, it was unsuccessful in that bid. The Meadows community sponsors and other stakeholders are now seeking to achieve their goals by other means. Despite the setback, this is still an active community project. The eight components of the Ozone project are:

1. The Hawksley Tower.
2. The sports pavilion and pitches.
3. The exemplar terrace.
4. The flood defence scheme.
5. The wind turbine.
7. Greening the Meadows.
8. Victoria Embankment Park development.

Large-scale, costly developments such as the 60-metre-high Hawksley Tower with its range of community facilities and generating 60–70 per cent of its own power may never be completed in its current form, though the wind turbine has just received planning permission. Other parts of the project, such as the flood defence, are a necessary precaution for which, no doubt, funding will materialize. The Embankment Park is owned by the city council and is their responsibility. Though the council has many budget commitments, some improvements to the Embankment may be possible; the sports pavilion, however, may need special funding. Perhaps the most exciting prospect is the work being done on the Meadows Ozone community-owned ‘Energy Service Company’ (ESCO). The community ESCO is currently seeking a long-term energy sector partner to turn itself into a zero-carbon energy zone: ‘To deliver this, people in the Meadows will enter into long-term contracts with themselves (via the ESCO) and it is the ESCO that would have a long-term contract with an energy company. We would use the security of that long-term contract to explore new ways of raising the thermal efficiency of housing and generating renewable energy at household or community level’ (draft of part of a letter to be sent to energy sector companies; source: Alan Simpson MP). Such simple devices would be more feasible if the UK government makes regulations requiring designated energy suppliers to introduce a renewable energy tariff for producers of renewable energy. Other countries have already introduced such a system of

*Figure 13.8 The Embankment: The River Park.*
favourable tariffs for renewable energy production. Germany, discussed in Chapter 14, is well ahead of the UK in this aspect of energy production. A financial agreement such as the one proposed in the Meadows would enable the community to achieve many of its energy goals.

The neighbourhood regeneration team in the city of Nottingham’s Planning Department (NCC, 2008) is currently preparing a long-term plan for the Meadows. However, planning for the

Meadows has to be seen in the context of other problems in the city. The Meadows is one of eight deprived areas in Nottingham. They are all amongst the most deprived areas in the UK. The regeneration team have a solid platform for planning the Meadows: they already have an existing and active community organization, the ‘Ozone Committee’, with whom to work. This group already has a raised awareness of the need for action to regenerate the Meadows: they know the difficulty of that task but they have a vision for the area. Furthermore, they have expressed that vision in the Millennium Bid. The city council was deeply involved in the Ozone project as a partner in the bid. It is therefore not surprising that the regeneration team is already building on the participation process that started with the Millennium Bid. This process of public participation is being continued with further meetings exploring the possibilities for future action. The proposed second line of the Nottingham Tram Network (the NET) is planned to run through the heart of the Meadows. When this is built, then the Meadows will be linked to the city centre and other parts of the city. It will become a prime location and
city-owned land will increase in value. This is a potential lifeline to the community.

**CONCLUSION**

This chapter has examined the form of the healthy city quarter. It has addressed the important issue of the distinction between the physical concept of neighbourhood and the social concept of community, the first being physical and associated with space, the second being about people and the ways in which they relate. The urban designer manipulates space; overlapping communities develop in spaces often much larger than the planned neighbourhood. Communities convert the designer’s space into place, giving it meaning. The chapter then outlined the extent of the challenge facing the city-building professions. The scale of the new development required to house an expanding population is immense. This is in addition to the necessary restructuring of existing UK suburbs for healthy living in the coming century. A model for a garden suburb of 5000–10 000 people is suggested as the main unit of city expansion. It is suggested that units of this size, arranged along public transport routes, out of city centres may break down the enormity of the scale of development, particularly if such development were to be distributed evenly throughout the UK. Small discrete physical units of low-density development in close proximity to natural landscape may develop into places where families can be at home and lead a healthy lifestyle. The last part of the chapter was devoted to a case study of the Meadows, Nottingham. It is at the start of the process of restructuring and renewal that many city neighbourhoods will face, so that they can develop into therapeutic environments, fit for healthy family life in a changing climate. The next chapter is a case study of Freiburg, Germany. It is a city facing up to climate change and the energy crisis in an elegant and civilized manner, an inspiration to those seeking to design the healthy therapeutic environment.
INTRODUCTION

Germany has been chosen for this final case study because it is so far in advance of the UK in the reduction of its ecological footprint and therefore in its efforts to protect the environment that sustains health and well-being. It also has a health service and standard of living that is the envy of the world. While we in the UK produce a mere 2 per cent of energy from renewable sources, Germany produces 16 per cent. While we contemplate the building of a handful of eco-towns and eco-villages, some by 2016, Germany, starting from its existing urban structures, is developing eco-cities throughout the country. Freiburg has been chosen as a case study because it is an average kind of German city, about the size of Nottingham. It has been innovative in its approach to energy production, but it is no longer the leader in this endeavour: for that purpose Munich would have been chosen for the case study. Freiburg has also been chosen because it has developed two outstanding examples of new city quarters in Vauban and Rieselfeld: they are thoroughly modern garden cities fit for twenty-first century living.

FINANCIAL STRUCTURES FOR HEALTHY SUSTAINABLE DEVELOPMENT

The key to German success in this field of renewable energy production is a policy that empowers people and local authorities to solve energy problems for themselves. This citizen empowerment is the result of the German government’s decision to require energy companies to pay citizens four times the market price for solar energy that they produce themselves: it is a price that is guaranteed for 20 years. It is similar for gas: two years ago, the German government changed its rules on gas production, permitting locally produced biogas being fed into the gas network. However, it is only non-food crops, grown between food-crop seasons, which can be used for this energy source.

Municipal authorities are encouraged to join the – almost – national crusade to reduce the country’s carbon footprint. For example, Munich has made all its municipal roofs available and free for the generation of solar energy. Imagine the effects on Nottingham’s ecological
footprint if its city council were to follow a similar policy. To make it a practical proposition, the UK government must take action on special tariffs for solar power generation. Repeat this Nottingham story throughout the UK, then, like Germany, Britain would not need to build expensive French, and possibly hazardous, nuclear power stations. The long-term sustainable future seems to be locked into a localized power supply rather than a wasteful national grid (Simpson, 2006). This is the most economical way to supply energy. The empowerment of citizens is the one certain way to achieve this goal. Empowering citizens is also a good way of improving the health and vitality of those citizens in a modern city. No longer would people be subjugated to the state machine or kept forever as dependent and wayward children of the energy companies: citizens would be energy producers as well as energy users.

**FREIBURG: HISTORY AND LOCATION**

Freiburg is one of Germany’s many ‘eco-cities’: it is home to ‘Solar Region Freiburg’, which is a blueprint for sustainable regional development; it is a natural bioregion. The use and installation of solar power is everyday practice in Freiburg. The region boasts a strong and growing solar economy: ‘Three per cent of all people in paid employment in the Freiburg region (approximately 9400) work in the wider environmental sector’ (Freiburg im Breisgau, 2006a). This solar network has developed over the last 25 years, making Freiburg a leading player in the German solar industry. Freiburg, in the extreme south-western corner of the Federal Republic of Germany, is strategically located at a junction of the ancient trade routes between the Mediterranean and North Seas and the Rivers Rhine and Danube. Consequently, the city has been influenced by many different cultures since its foundation in the eleventh century. The current ‘sun culture’ of Freiburg, though dynamic and forward looking, has its roots deep in the environment. Even in the great plane of the Rhine Valley, ‘people remain surprisingly rooted in the soil – a phenomenon that is not just confined to the heights of the Black Forest’ (Freiburg im Breisgau, 2006b).

At the intellectual heart of Freiburg, a city of about 200,000 people on the western edge of the Black Forest, is the ancient Albert-Ludwigs-University. Since 1457 Freiburg has been a university city. Albert-Ludwigs-University, with 24,000
students, is one of five universities in this city with a long academic tradition. The intellectual elite is powerful in the city. It was the driving force in the rejection of nuclear power in the 1960s: it was also instrumental in the development of Freiburg as the ‘solar city’ (from a meeting with Mr Dressel of Solar Region Freiburg, 14 September 2007). Despite 80 per cent of the city being destroyed by bombing during the Second World War, Freiburg still has an attractive historic city centre. Most of the destruction occurred in one air raid in November 1944, when 9000 flats were made uninhabitable (one-third of the housing stock) and 2000 people killed. The only building left standing in the city was the magnificent cathedral (Figures 14.1–14.3). The rebuilding of central Freiburg was not typical of the postwar period in Germany nor, indeed, of the rest of war-torn Europe. In other cities, the response was functional and in an uncompromising ‘international style of architecture’. Freiburg, in contrast, chose to use the ground plan of the old city as the model for its rebuilding programme. The plan, however, was not to build a ‘museum piece’; only those buildings capable and worthy of renovation were rebuilt in their old form (Figures 14.4–14.6). The gaps between such buildings were filled in with ‘modern architecture’ of the time but whose
character and scale reflected the architectural traditions of the city (Figures 14.7 and 14.8). The result is a city centre with a strong visual image: its pedestrianized streets and squares are a pleasure to explore (Daseking, Director of Planning, 13 September 2007, Planning in Freiburg, a lecture given to visiting planners from Louven).

Freiburg is not simply the solar city of Germany, it is also known as the country’s environmental capital. The ecological profile of Freiburg is founded in the deep-seated environmental awareness of its citizens, an environmental policy with a long-term perspective for sustainable development, and a network of institutions for environmental protection (Freiburg im Breisgau, 2006b). The city seems grounded in a politically active intelligentsia. The ‘Greens’ have made Freiburg a political stronghold. With a 25 per cent share of the popular vote, the green movement in Freiburg is probably the strongest in any German city. In 2002, Dr Dieter Salomon was elected Oberbürgermeister. He is the only member of Bündnis 90/Die Grünen (The Green Party) who holds this office in an important German city.

In Freiburg, there is much to protect both for the citizens facing a future of climate change and as an attractive place for its many visitors – that is, as part of the city’s lucrative tourist industry. Freiburg’s 5200 hectares of municipally owned woods is one of the largest urban forests in the Republic of Germany. The forest is managed according to strict statutory sustainability criteria. In addition, more than 50 per cent of its city territory is secured, through sanctuaries, for the protection of species and habitats. Other land is protected for recreation purposes (Freiburg im Breisgau, 2006b). Building height restrictions in the mountains maintain the daily evening flow of fresh air that clears the city of pollution. ‘Nothing is permitted in this neck of land that might disrupt nature’s ventilation system for the city’ (Daseking, Director of Planning, 13 September 2007). The city has an unusual system of open channels (bächle) that run throughout the historic centre (see Figures 14.6 and 14.7). The fresh water flowing through these channels was once used to fight fires or to ‘water the animals’, but never to carry effluent. The channels are still constantly flowing, carrying clear water diverted from the Dreisam. Their function now, apart from delighting and intriguing the tourist, is to provide the natural cooling air associated with moving water on hot summer days, a sensitive reuse of a once more functional feature of Freiburg’s city life.

Figure 14.3 Freiburg Cathedral, Great Tower under maintenance.
Figure 14.4 Historisches Kauhause, Historic Merchants Hall, Cathedral Square.

Figure 14.5 Alte Wache, House of Badenesian Wine, Cathedral Square.
Figure 14.6 The New Town Hall, 1896–1901.

Figure 14.7 Shopping street, Old Town.
TRANSPORT AND ENERGY

Freiburg’s policy aims at a reduction of traffic through an integrated system of urban planning and transport planning so that car traffic is replaced by local public transport, the bicycle and walking (Krettschmer, 1995). It aims also to make essential car traffic that cannot be transformed into other modes of transport, compatible with the city, its environment, pedestrians and cyclists. For this purpose, Freiburg is using extensive traffic-calming measures and the pedestrianization of large tracts of the city centre. Local public transport run by a regional transport association has an almost 3000-km-long network of light rail transport, buses and urban railways. There is a cost-effective monthly ticket of just over 40 euros for travel through the entire region. The use of this efficient, comfortable and clean public transport system is financially very attractive for the user. Compared with Nottingham, a city of comparable size, which has one excellent tram route, Freiburg has four, connected by bus routes to all parts of the region. In Freiburg there is a dedicated network of about 500 km of cycle routes with 9000 bicycle-parking places, including a bicycle-
parking garage for 1000 bikes. In Freiburg the cyclist is king. More than 25 per cent of Freiburg’s travel distance is by bicycle. Nottingham, the home of Raleigh bikes, cannot compete with Freiburg in this healthy form of travel.

The concept for local energy supply in Freiburg focuses on three main points: the saving of energy, the development of renewable energies, and efficiency in the generation of energy. CO₂ emissions in Freiburg are caused mainly by energy supply and traffic. The municipal council aims to lower emissions by 25 per cent by 2010. The city has already achieved a 5 per cent reduction against a background of rising population. By 2010, renewable energies are planned to account for 10 per cent of the generated electricity in Freiburg. As far back as 1992, Freiburg Municipal Council adopted a resolution that would only permit the construction of ‘low-energy buildings’ on municipal land and that all new buildings must comply with ‘low-energy specifications’ (City of Freiburg, 1995; Freiburg im Breisgau, 2006a). The low-energy house standard in Freiburg is more rigorous than national standards: it stipulates that new houses must be designed so that they use one-third less energy than required by German law.

Freiburg is a well-known leader in the field of renewable energy technology. Solar technology alone has generated nearly 1000 jobs in about 80 companies. Other sources of renewable energies are being developed in the city, including biomass, water power, wind power and geothermic power. About 15 medium and large district heating plants with co-generation technology already generate electricity and heat, meeting 50 per cent of the city’s demands in an eco-friendly and economic manner. Freiburg has been an inspiration to other German cities. As a result, solar panels may soon adorn the roofs of the medieval town of Marburg. A coalition of Social Democrats and Greens on Marburg City Council have passed a new law forcing owners of all new or renovated buildings within its jurisdiction to include solar panels. Those failing to comply with the new directive face fines of 1000 euros. Marburg seems to be going further than most German cities by including older houses in the legislation. Marburg may be the new trendsetter not only in Germany, but elsewhere in Europe, even the UK (Smee, 2008).

FUNDING FOR RENEWABLE ENERGIES

Funding renewable energies is critical for their adoption. The new solar panels in Marburg could cost homeowners 5000 euros. Because of the law that guarantees the payment by local power firms of an above-market rate for renewable energy fed into the national grid, homeowners installing solar panels recoup their financial outlay within 15 years. In addition to this national initiative, the regional power supply company in Freiburg, Badenova, runs a subsidy programme supporting customers who want to install photovoltaic panels. The scheme is financed from electricity sold under the brand name ‘Regiostrom’. The small surcharge on Regiostrom, as compared to the standard tariff, is invested exclusively into further Regiostrom power stations, photovoltaic installations, biomas and small hydropower. Ten per cent of Badenova’s customers have voluntarily opted for electricity from regional and renewable energy sources. This cross-subsidy has improved the competitiveness of solar energy and has brought about a continuous increase of environmentally friendly electricity generation (Freiburg im Breisgau, 2006a, op. cit.).
FREIBURG: SOLAR INNOVATIONS

The Heliotrop Solar House by Rolf Disch was illustrated in the introduction to this book (Figures 0.3 and 0.4). This is an iconic building, an innovative design that sets standards for future solar developments. Freiburg is home to many other innovations in solar technology. These other projects may not all be as visually arresting as the Heliotrop House but they illustrate the wide range of uses for this technology. In Freiburg, one can sample the full range on the ‘solar menu’. Solar energy has been used in shops, hotels, schools, churches, the roofs of garages and a football stadium, in addition to the small traditional domestic house (Figures 14.9 and 14.10). The technology can be used successfully and economically on new buildings and with the appropriate financial support mechanisms it can make a significant contribution to the energy needs of the existing building stock. Freiburg is the city in Germany that receives the most sunlight. It is therefore fitting that Freiburg is the symbolic leader in this technology. There is space here for only four examples of the use of solar technology. They have been chosen for their symbolic value for the solar industry in Freiburg.
Solar-Fabrik (the Solar Factory)

The solar industry in Freiburg has a wide support network, which includes the universities and research institutes. Within this network, Solar-Fabrik on the Haid Industrial Estate is of great significance. It is a fine piece of architecture in its own right (Figures 14.11–14.13). This is Europe’s first zero-emissions factory for solar panels. It is also one of Europe’s leading solar technology companies, producing components for the industry to the latest technology standards. Fittingly, the building that houses the company caters for its entire energy needs, from renewable energy for production and for the supporting offices. The solar power system of the building has a total surface area of 575 square metres, with an output of 56.5 kWp. Solar cells have been integrated into the insulation glazing of the façade so that the maximum area of the building can be exposed to the sun for the generation of power. The façade modules are aligned to provide shade when the sun is high during the summer, preventing the building from overheating. The slightly slanting glass façade makes full use of the low-lying sun for passive solar heating during the winter. Fresh air in the summer is precooled in channels below ground, while in the winter it is preheated. A combined heat and power station (CHP), fuelled by vegetable oil, supplements the energy for this
Figure 14.11 Solar-Fabrik.

Figure 14.12 Solar-Fabrik.
zero-emissions factory: it is operated by Badenova, the regional power company (Solar-Fabrik, 2007).

The Church of St Peter and Paul

In 2001, the Catholic Church of St Peter and Paul became the first church in the archdiocese of Freiburg to install photovoltaic cells on the roof. The church was consecrated in 1968 and has a vast trapezoidal roof that, from a distance, resembles a great pyramid. One of its roof surfaces faces due south, making it ideal for a photovoltaic installation (Figures 14.14–4.16). The system has a total peak rating of 24.1 kW; theoretically it could cater for approximately 58 per cent of the power needs of the parish – that is, the kindergarden, presbytery and church. The power is fed into the public grid, saving the environment 10 tonnes of CO2 emissions every year. Part of the income from the sale of the electricity is used to finance four community kitchens in the church’s partner parish of San Arcángel in Peru. The building is visually enhanced by the addition of solar panels to its roof. More importantly, it shows great care for the environment and also for the well-being of the larger community, with whom we share the protective roof of the biosphere (Freiburg im Breisgau, 2005).

Solar Tower and the Mobile

Freiburg’s railway station is the hub of long-distance and local public transport: it is the place where all tram routes converge. It is also the place where the 19-storey Solar Tower and the Mobile are located. The railway station, designed by Harter and Kanzler, was built between 1999 and 2002. The 60-metre-high Solar Tower has a prodigious photovoltaic array on its south side: there are 246 modules covering an area of 327 square metres with a peak rating of 34.4 kW. The solar panels are not in the standard blue but in dark anthracite. In 2001 a second tower of 13 storeys was built, fitted with solar panels covering 209 square metres having a peak rating of 21 kW. The towers make a strong visual statement about the focus and importance of public transport; they are landmarks that can be seen from many parts of the city (Figure 14.17). The Mobile, built in 1999, is sited at this strategic transport hub. The Mobile is a small delicately designed circular building. The Mobile, in addition to 1000 supervised bike-parking places, has a repair unit, bike-hire facilities, cycle shop and café, ‘the velo-bistro’. Solar collectors producing heat are integrated into the balcony railings and a photovoltaic unit with a rating of 2.2 kW is mounted on the roof. The electricity
produced is fed directly into the railway’s electricity grid (ibid.; Freiburg im Breisgau, 2006a, op. cit.).

**The mayor’s office and administrative building**

Commitment to sustainable development and a healthy environment is demonstrated right at the centre of political power in Freiburg. Since 2004, the historical administrative building at the heart of the Old Town has been fitted with its own power station. There has been no hesitation about installing the most up-to-date solar engineering on a very precious listed building, an architectural monument from the past (Figure 14.6). The solar power station has been fitted to the roofs of the 11 south-facing dormer windows. The 165 solar modules with 140 square metres surface generate 14,500 kWh of electricity each year. This is the average annual consumption of electricity of four families (Figure 14.18). Badenova, the regional electricity company, funded the scheme (ibid.). The Ozone group in the Meadows, Nottingham is trying to emulate an arrangement of this kind with a power supply company.

**VAUBAN AND RIESELFELD**

The two ecologically trendsetting neighbourhoods of Vauban and Rieselfeld in Freiburg were implemented using standard procedures in Germany: from this point of view they are nothing special. A Bebaungsplan (B-plan) is prepared for inner city areas, subject to developmental pressure for change or where it is thought that there is a need for such a change. The B-plan, once prepared and adopted, is legally binding. It is prepared by the local authority themselves, by consultants, or in partnership with private developers. Preparing the B-plan takes about two years to complete. It sets out the use for land and buildings, and designates areas for infrastructure; it may also specify plot sizes, density of dwellings, building lines, building heights and roof forms. In addition, it allocates land for community purposes, public and private open space, and specifies ecological requirements. It can be a most thorough document that prescribes the proposed development in some detail.

Once approved, the B-plan permits little room for interpretation. Planning approval then becomes an administrative procedure, checking against the B-plan and the technical building regulations. The B-plan will have specified certain measurable conditions such as the site coverage, the maximum building height, the location of the building on the site and its footprint. The B-plan can lead to developments just as monotonous as the worst speculative
housing in Britain (see Stille’s account of the German planning system, 2007). Vauban and Rieselfeld, in contrast, extend the boundaries in the delivery of sustainable development, respecting the local ecology: they are therapeutic environments supporting the well-being of their human and non-human communities. Using the standard administrative procedures can result in urban dross. In contrast, Freiburg has been able to deliver two fine examples of twenty-first century urban developments. What were the special factors operating in Freiburg that made this development possible?

Vauban

After the reunification of Germany and the withdrawal of allied forces, the former French barrack site, Vauban, became redundant and derelict. A new district has been built on this site using some of the former barrack buildings interspersed with new housing developments. Vauban is situated south of Freiburg’s city centre. It is three kilometres from the central railway station, taking about 10 minutes by tram (Figures 14.19 and 14.20). The Vauban district is designed to be environmentally, family and child friendly, with practically no cars on its internal roads (Figures 14.21–14.24). The overall target was to develop a community of about 5000 people and to create 600 jobs on 38 hectares of land – that is, at a gross density of 140 persons per hectare or about 60 persons per acre. In the building of Vauban, Freiburg had one great advantage: it owned the land bought from the Federal authority for 20 000 000 euros.

Public awareness and participation in the planning and development process was
Figure 14.17 Solar Tower.

Figure 14.18 Solar panels in the mayor’s office.
Vauban was designed to be, as far as possible, car free. One of the key components to make this idea work is the solar garage at the edge of the district (Figure 14.25). State building regulations specify that each residential unit has to be provided with a car-parking space. This condition is achieved by the solar garage, which also has on its roof 800 square metres of solar panels with a peak rating of 90 kW. Cars can enter the housing areas only for delivery and pick-up, so that Vauban is car free. Residents have two options. The first option is ‘car-free living’ (outofreiess Wohnen). A car-free household has to make a one-off payment of about 1000 euros to the ‘car-free living’ association, in which case their prescribed parking space of eight square metres is used to provide playgrounds, gardens and sports fields. The second option is ‘living without a car space’ (stellplatzfreies Wohnen). In this case the family owning a car has to purchase a car space at a cost of about 5000 euros. Since the area is well served by bus and tram links, Vauban aims to be 75 per cent car free: it is one of the biggest projects of car-free living in Germany.

Vauban has set new standards in terms of energy use. Between 1995 and 2000, the ‘energy standard’ in Germany for a new home, on average, was about 100 kWh/m²a and the ‘energy standard’ for older houses was 200 kWh/m²a. By comparison Vauban set the much higher standard for new housing at 65 kWh/m²a. In addition, nearly 100 homes have been built as ‘passive houses’ to a standard of 15 kWh/m²a. Such passive houses do not need conventional heating systems: this is the Hockerton model on a larger scale. A number of experimental homes are called ‘plus energy houses’ – that is, houses which produce more energy than they use. This should be the model for all new buildings in the UK. A large number of buildings in Vauban are equipped with solar thermal or photovoltaic installations, many being used on older properties dating from the days when Vauban was a French barracks (Figure 14.26). Most of these solar systems were subsidized by Badenova. A wood-chip CHP power station run by Badenova provides power and heating in the district. As a result of the energy measures, it is estimated that Vauban produces 60 per cent less CO₂ than a conventional new estate (Figure 14.27).
The achievements of Vauban in energy use and supply are extraordinary. However, this is only one aspect of Vauban’s effort to heal the environment. Other major ecological achievements include the successful efforts to save every tree on the site, the greening of roofs and façades, together with the provision of children’s play areas at every street corner as part of the extensive system of public green spaces. The floor plane of Vauban is designed to be porous, allowing rainwater to soak away: in Vauban the rainwater is permitted to form natural pools within green areas. Even the metro runs on a green strip, which reduces noise as well as reducing excess loading on the drains and the possibility of flooding. Because of the extensive greening of the district, Vauban is a garden suburb in a very modern sense: it is a civilized place in which children can grow and develop.
The community of Vauban, through the medium of their official but independent organization Forum Vauban, are responsible for the many innovations in planning and design: they are driving the innovative agenda that makes this district such an attractive and healthy place for family life. Forum Vauban held many workshops that resulted in actions that delivered the goal of an ecologically sound district. The design of the neighbourhood centre was the result of one such workshop. In the case of the neighbourhood centre, ‘planning for real’ techniques were used with great success (Figures 14.28 and 14.29). ‘Planning for real’ was the technique used in the early stages in the planning of Raleigh Street in Nottingham in the mid-1970s, an interesting parallel (Moughtin and Simpson, 1978). Vauban is a credit to ‘people power’ in the terms of
Gibson (1978), the originator of ‘planning for real’.

**Rieselfeld**

Together with Quartier Vauban, Rieselfeld is Freiburg’s response to the large demand for housing, dating from the late 1980s and early 1990s. The new district of Rieselfeld is in the west of Freiburg (Figures 14.19 and 14.30). It will accommodate 4200 residential units for

**Figure 14.25** Solar garage.

**Figure 14.26** Older houses with solar panels.

**Figure 14.27** Schlierberg Solar Estate, bordering Vauban: area of mixed use with ‘surplus energy homes’.

**Figure 14.28** Vauban: neighbourhood centre.
about 10,000–12,000 people on 70 hectares of land at gross densities between 140 and 170 persons per hectare. Unlike Vauban, where the land had to be bought, Rieselfeld is being developed on part of a sewage farm owned by the city. There are subsidies for the building of schools, fire stations and also from the Federal State of Baden-Württemberg as part of the Building – Priority – Programme. Apart from these small-scale subsidies, Rieselfeld is self-financing through the sale of city land for building. This means that the project has to be a marketing success. For this purpose, Rieselfeld has to be a popular place where people want to live. An essential condition for marketing is the division of the street blocks into small lots parcellled out to investors and developers. In this way, there is a great variety of building types, their internal arrangements and architectural treatment. The district has many advantages: for example, it is close to the Haid industrial area, though a large number of jobs in the service sector will be created locally. Rieselfeld borders an attractive nature reserve to its west. Finally, the tramline was extended to Rieselfeld before the project was under way, connecting the district to the city centre and other locations in the city (Freiburg im Breisgau, 2007).

The urban plan for Rieselfeld was the result of an ideas competition. The prize-winning design is now being developed by a project team that is part of the city administration. Many of the planning goals are similar to those of Vauban. Rieselfeld does not have the stock of existing buildings that give so much character to Vauban. It also appears to be higher density and more urban than its twin development. Vauban, with its existing trees, has had longer for the landscape to mature. Rieselfeld may look quite different, even in five years’ time. The majority of buildings in Rieselfeld are apartment houses and multi-dwelling units in blocks up to five storeys in height. However, there is the same strong orientation towards ecology, the family and children. The plan also gives priority to public transport, foot and bicycle traffic, but the ‘no-car families’ of Vauban do not appear to dominate the district (Figures 14.31–14.34).

Although, in 2007, there were only about 8000 inhabitants in Rieselfeld, there were already a number of community facilities in place, including a vast array of children’s day-care centres and children’s gardens. There are also primary and secondary schools, sports clubs, gymnasia and an ecumenical church (Figure 14.35). At the heart of the district is the community centre, which includes the ‘Mediothek’, a media centre for children and teenagers (Figure 14.36). The community centre, naturally, has a photovoltaic installation on its roof. The 130 panels have a peak rating of

Figure 14.29 Vauban: neighbourhood centre.
18.84 kW providing 17 000 kWh of solar current per year (Freiburg im Breisgau, 2006a, op. cit.).

**CONCLUSION**

Freiburg is a leader in ecological planning and sustainable development. It is Europe’s Solar City and unashamedly sells itself as such. Freiburg, some time ago, recognized that the sun, as an energy source, has a long and spectacular future. Oil may run out this century but the sun will still be shining when humankind is a distant memory. Each year the Earth reaps 795 trillion kilowatt hours of energy from the sun over its entire surface. This is many times the amount of primary energy required by the human population each year. In mathematical terms, the sun can cover our energy needs; furthermore, it causes no problems of pollution. The problem for some areas is that most of this energy from the sun occurs in the summer months: even in sunny Freiburg, 80 per cent of
Figure 14.31 Rieselfeld and the car.

Figure 14.32 Rieselfeld and the car.
Figure 14.33 Rieselfeld pedestrian street.

Figure 14.34 Rieselfeld: children’s play area.
this irradiation occurs in the summer. In most places, other than tropical and Mediterranean countries, solar energy requires supplementation with other forms of energy. As we saw, Freiburg is exploring CHP power units fuelled from a sustainable source and of course wind power readily available in the heights overlooking the city (Figures 14.37 and 14.38).

The people of Freiburg were angered by the proposal to build a nuclear power plant in Emmeningen, a rural district close to the city. This environmental threat in their ‘back yard’, together with the knowledge of the fatal environmental damage inflicted by the burning of fossil fuel and the even more frightening prospect of fossil fuel running out, prompted Freiburg to engage in its present creative response to the pressing problem of finding new energy sources. In seeking a healthy sustainable future, Freiburg is fortunate: it has a sunny climate and a wonderful healthy regional landscape with refreshing winds from the mountains. Freiburg is also fortunate to be located in a country where the government is in

Figure 14.35 Rieselfeld: ecumenical church.

Figure 14.36 Rieselfeld: the ‘Mediothek’. 
Figure 14.37 The heights above Freiburg.

Figure 14.38 The heights above Freiburg: wind power.
tune with the age in which we live and is therefore supportive of environmental initiatives. Freiburg’s many universities and research institutes provide the intellectual rigour for the city’s initiatives in ecological living, while the mayor and his political colleagues give thoughtful and enthusiastic political leadership to the whole endeavour to find a sustainable and civilized lifestyle for the difficult times ahead.

Freiburg has also been fortunate in having a planning and development secretariat that is able to take full advantage of these favourable conditions. Quartier Vauban and Rieselfeld are the result of this community endeavour. The planners and designers of Vauban and Rieselfeld were able and willing to work closely with citizen groups who were themselves aware of climate change and its ramifications. Such participatory planning has set a high standard for the rest of Europe, including the UK. Certainly the planners of Vauban and Rieselfeld were working on land owned by the city. As such, they were able to lay down design conditions in the lease that were mandatory for developers. It is rather like the process used by the John Woods, father and son, in their fine development in eighteenth century Bath.

Nothing can detract from the great success of both Vauban and Rieselfeld or the work of their planners: other cities in Germany with similar opportunities have not been so bold or imaginative. Vauban and Rieselfield are examples of healthy and therapeutic environments fit for family life and the rearing of children in times of climate change.
The practical examples and review of literature throughout this book support the notion that a healthy environment and a healthy community are vital for the health, well-being and happiness of the individual. Neuroscience emphasizes the importance of the very early years of childhood for the development of well-adjusted individuals with a predisposition towards health and well-being. The young child requires a close and stable relationship with the family, whatever its composition, the community and the natural environment. Furthermore, it was found that a continuing close association with the natural environment enhances the health and well-being of individuals. It is also clear that a physically active lifestyle that such an environment promotes is conducive to health and well-being. It would seem that cities supporting such a lifestyle should be structured so that every home is close to open countryside – that is, within comfortable walking distance of it.

There is evidence that communities having the least disparity in wealth seem to have the healthiest populations – that is, those communities where the difference in wealth between the very rich and the poorest members of society is least, on the whole, tend to be the ones where measures of health and well-being for the population in general are the highest. This is most apparent in those communities where all basic needs are met and where individuals live in reasonable comfort. In this respect the affluent yet egalitarian societies of Scandinavian countries are often quoted as the model to follow. Access to life’s basic needs, such as food, water, energy and employment, are important for a stress-free and healthy life. Fundamental to all these basic needs is the security of an affordable home. In the British context this means a home set within its own garden. In Copenhagen and Freiburg great care is given to the needs of children in design of the relationship of the home to the local neighbourhood. These cities also give priority to walking, cycling and public transport – that is, to the healthy and energetic means of movement within the city. Planning for the private car is given less emphasis. Freiburg, in particular, demonstrates how the private home can supply much of, and in some cases all of, its energy needs.

The global climate is set to change dramatically over the next 40 years. In that time average global temperatures will probably rise by 2°C. This is likely to occur even if the most
effective measures to reduce greenhouse gases are taken immediately. If these measures are not taken quickly, then global temperatures may rise by as much as 6°C towards the end of this century. The changes to climate we are probably going to experience over the next half-century are already built into the system. These climatic changes will affect the health and well-being of the British population in a number of ways, unless measures are taken to mitigate those effects. Diseases such as malaria, which are endemic in tropical and subtropical regions, may move northwards to countries like Britain. The heat wave of 2003 in Europe, which resulted in the deaths of many people, could be repeated as summer temperatures rise in the future. It would seem that both new development and existing properties will need to be designed or adapted for the challenging times ahead. The serious flooding in the UK in 2007 was a timely warning of worse conditions to come. A strong planning system is needed to ensure that future development is sited in areas not prone to flooding and that development is not located in areas likely to cause flooding in existing properties within the same natural drainage area. It is important that design standards for all new buildings are set so that they are super-insulated and are energy self-sufficient. Anything less is myopic.

There is much speculation about the future population of the UK. Some predict a growth of 5 million people, others an extra 10 million, over the next 25–30 years. Few commentators have considered the possible side-effects of climate change on the future growth and size of the UK population. As southern and central Europe becomes drier and more arid – that is, less hospitable for human occupation – there is the prospect of migration northwards. Britain at mid-century, with its relatively milder climate, may prove to be an attractive place for migrants fleeing climate change, or as Hilary Benn calls such migrants, ‘environmental refugees’. If Lovelock’s vision of the future holds true then Britain could become, in his words, ‘Europe’s lifeboat’. With so much uncertainty about future population projections and predictions, it was concluded that it would be wise to plan for a UK population of 70 million, with the distinct possibility that without effective immigration controls even for our fellow Europeans this figure may increase.

Planning for a sustainable Britain with a 70 million plus population is a daunting task for future architects and planners. The Optimum Population Trust (OPT), a campaign group for a lower population in the UK, has suggested that Britain is sustainable at about 20–30 million people. Certainly, Britain during the Second World War, with a population of about 40 million, was barely self-sufficient. At that time too, the country had a regime of strict food rationing, a command economy, a strong tradition of urban vegetable gardening and few private cars. If Lovelock’s agenda for a sustainable Britain were accepted then one-third of its landmass would be allocated for urban development, a second third for intensive agriculture and the final third for wilderness. While this is a good starting point for discussion on a sustainable Britain, we have concluded that, in essence, there is no dichotomy between urban and rural landscape, no real distinction between nature and culture. Furthermore, such a dichotomy only serves to confuse the issue. Humanity is part of nature and its settlements are an expression of nature. The problem is how to support a human population of 70 million people without destroying its life-support system, the natural environment, with its very necessary and wonderful biodiversity. Fortunately, Cuba has demonstrated that a large city of about 2 million people, in difficult times, can be self-sufficient in fruit and vegetables.
It follows that the twenty-first century city should be designed at densities that give its citizens the choice of this healthy lifestyle.

The recommendations for designing a sustainable settlement pattern for this country are derived from the analysis of the problem. They are put forward merely as a point of departure in a discussion, not as a ‘final solution’. The idea of degrees of self sufficiency, here called ‘circular metabolism’, is applied to each level or scale of settlement – that is, from nation, bioregion, the city and its hinterland, quarter or garden suburb, street block to the home. Each such ‘fractal’, using Madelbrot’s term, contains all the main functions found in the larger community but appropriate to its scale. The home is the city in microcosm, a place, for example, where energy and food would be both consumed and produced, water would be used, recycled and harvested.

Climate change and resource depletion will make the world a less hospitable place for humanity. Nevertheless it is still possible, in the UK, to chart a path whereby our cities become healthy and exciting places in which to live, work and play: places where technology has been harnessed in the service of nature. Solutions to the problems we face are known. Innovative ideas are being implemented in, for example, the fields of local energy production, intensive urban agriculture, in the development of techniques for greening urban areas and generally making the city more environmentally friendly. City extensions can take the form of garden suburbs of human scale, threaded like beads on a string of public transport routes, interwoven with productive agricultural landscapes. With careful planning, 8–10 million additional people can be accommodated in Britain while retaining large areas of wild and working landscape. These areas of natural landscape, too, are places where people live and engage in productive work, as well as being essential both for feeding the country and maintaining a viable habitat for wildlife.

However, a major problem facing Britain in the years ahead is improving existing housing stock so that it is ‘fit for purpose’ in the twenty-first century. This is a problem that can be solved, in part, with effective government support, by the people themselves. Stern (2000) suggested that climate change is the result of market failure. It may therefore be appropriate to regulate some aspects of the energy market, following the example of Germany with its special tariffs for the production of small-scale renewable energy production. Such a market correction would greatly facilitate projects like the Meadows in Nottingham, where people are trying to help themselves. There seems to be a growing political consensus in the UK that climate change is a great threat to our way of life. There is also a growing awareness of this issue amongst the general public. Both a party political consensus and popular support for policies that may prove painful are essential for the changes necessary to confront this challenge. Such changes will include decentralizing power to the regions and municipalities, together with the task of reinventing a planning system that has the power and popular authority to engage in building a sustainable, healthy and therapeutic environment.
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