Figure 2.23 The Orangery, Wollaton Hall, Nottingham

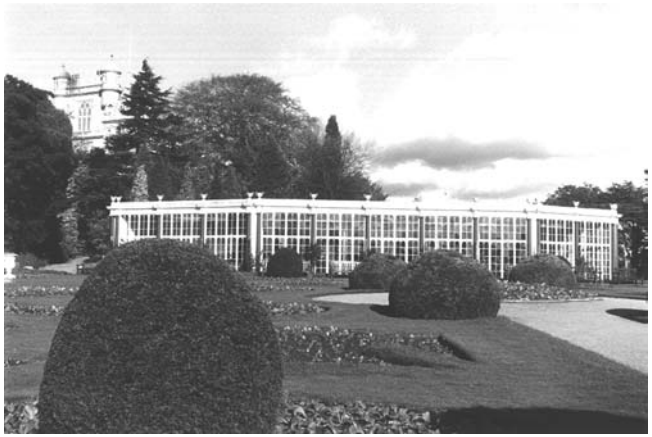

Figure 2.24 The Orangery, Wollaton Hall, Nottingham

building to provide not only light but also passive solar heating.

Passive solar energy can provide up to 20 per cent of the annual space heating required for a well-insulated building, but it does have implications for the orientation of the building. For effective solar gain, window openings should be in walls with an orientation within 30 degrees east or west of south with a southern orientation being the optimum position. There are, however, problems with large south-facing windows in domestic buildings in this country where we place great emphasis on privacy: it is usual, particularly in residential areas, for frontages to face frontages. An arrangement where the front of one house overlooks a neighbour's backyard is generally unacceptable in 'Middle England'. A north–south orientation for the long axis of terrace housing is more suited to British conditions. With this orientation it is possible for the front of one house to face the front of the house opposite while both living rooms receive sunshine, one side in the afternoon and the other side in the morning. Large south-facing windows designed to generate solar heating, if overlooked, will be unacceptable to the occupant in this country and will be draped in net curtains to re-establish privacy, so defeating the original purpose. In buildings not dominated by the cultural need for privacy, such as schools, universities and offices, it may be possible to give greater priority to an orientation which maximizes the use of passive solar heating.

The conservatory – a common feature of many Victorian and Edwardian villas (Figures 2.23 and 2.24) – is becoming increasingly popular with home owners. It is a reasonably low cost and culturally acceptable method of passive solar heating in the home. It also forms a useful buffer between the external climate in winter and the interior of the building. The conservatory is most appropriately placed on the south, east or west walls. If not properly designed, the conservatory – even when well sited – can be a source of heat loss in the winter and cause overheating in the summer: adequate ventilation is essential, and the wall on which it is placed should be well insulated and fitted with double-glazed windows. Buildings

designed specifically for use with a conservatory or sunspace offer great scope to create comfortable spaces, and energy saving. The conservatory also facilitates food production, its traditional role in the past. In addition, the sunspace or conservatory offers an opportunity for innovative design. The glass atrium and the street arcade are both features which, like the conservatory, modify the internal climate. They also enhance natural lighting within a building complex while being exciting visual additions to the urban realm (Figures 2.25–2.28).

It may appear from the previous paragraphs that the application of the principles of sustainable development will result in an urban form comprising a blanket of four-storey blocks arranged in serried ranks of parallel rows in order to maximize solar gain and energy efficiency. Energy efficiency in built form is, however, only one (albeit important) aspect of sustainable development. Other factors such as food production, landscape protection, maintaining biodiversity and energy-efficient movement of goods and people are also important considerations in the planning and design of the sustainable city. Each new addition to the city is designed for a specific site. The existing patterns of development condition the ways in which the principles of sustainability are applied. Additions to the city will be located along particular street lines and about specific neighbouring properties. It is this context, which sets the parameters for new development and to which the discipline of energy conservation must be applied. Even on greenfield sites, which in a sustainable city would be avoided if possible, the urban designer is not presented with a *carte blanche*. The urban designer cannot ignore contours, special

Figure 2.25 Leadenhall Market, London

Figure 2.26 Leadenhall Market, London