



Figure 1.2 Trastevere, Rome, Italy

A sound structure has been neglected. The results are visible; a system of regular inspections and conservation planning could prevent this sad state of affairs

and environmental effects—botanical, biological, chemical and entomological. Human causes nowadays probably produce the greatest damage. Structural actions resulting from gravity are dealt with in Part I, Chapters 2–5, and the other causes in Part II, Chapters 7–11.

Only a small fraction of the objects and structures created in the past survives the ravages of time. That which does remain is our cultural patrimony. Cultural property deteriorates, and is ultimately destroyed through attack by natural and human agents acting upon the various weaknesses inherent in the component materials of the object or structure. One aspect of this phenomenon was succinctly described as early as 25 B.C. by the Roman architect and historian Vitruvius, when considering the relative risks of building materials:

'I wish that walls of wattlework had not been invented. For, however advantageous they are in speed of erection and for increase of space, to that extent they are a public misfortune, because they are like torches ready for kindling.

Therefore, it seems better to be at great expense by the cost of burnt brick than to be in danger by the inconvenience of the wattlework walls: for these also make cracks in the plaster covering owing to the arrangement of the uprights and the crosspieces. For when the plaster is applied, they take up the moisture and swell, then when they dry they contract, and so they are rendered thin, and break the solidity of the plaster.'

Consequently, when analysing the causes of deterioration and loss in an historic building, the following questions must be posed:

- (1) What are the weaknesses and strengths inherent in the structural design and the component materials of the object?
- (2) What are the possible natural agents of deterioration that could affect the component materials? How rapid is their action?
- (3) What are the possible human agents of deterioration that could affect the component

materials or structure? How much of their effect can be reduced at source.

Natural agents of deterioration and loss

Nature's most destructive forces are categorized as natural disasters, and include earthquakes, volcanic eruptions, hurricanes, floods, landslides, fires caused by lightning, and so forth. Throughout human history, they have had a spectacularly destructive effect on cultural property. A recent, archetypal example is the series of earthquakes that devastated the Friuli region of Italy in 1976, virtually obliterating cultural property within a 30 km (19 mile) radius of the epicentres.

The United Nations Disaster Relief Organization keeps a record of disastrous events, a sample of which, covering a period of two months, is given in *Table 1.1*.

After natural disasters, less drastic agents account for the normal and often prolonged attrition of cultural property. All these agents fall under the general heading of climate. Climate is the consequence of many factors, such as radiation (especially short-wave radiation), temperature, moisture in its many forms—vapour clouds, rain, ice, snow and groundwater—wind and sunshine. Together, these environmental elements make up the various climates of the world which, in turn, are modified by local conditions such as mountains, valleys at relative altitudes, proximity to bodies of water or cities, to create a great diversity of microclimates within the overall macroclimates.

In general, climatic data as recorded in the form of averages does not really correspond to the precise information needed by the conservation architect, who is more interested in the extreme hazards that will have to be withstood by the building over a long period of time. However, if questions are properly framed, answers that are relevant to the particular site of the building in question can be provided by an expert in applied climatology.

Human factors

Man-made causes of decay need careful assessment, as they are in general the by-product of the industrial productivity that brings us wealth and enables us to press the claims of conservation. They are serious and can only be reduced by forethought and international co-operation. Neglect and ignorance are possibly the major causes of destruction by man, coupled with vandalism and fires, which

are largely dealt with in Chapter 17. It should be noted that the incidence of arson is increasing, putting historic buildings at even greater risk.

What is conservation?

Conservation is the action taken to prevent decay and manage change dynamically. It embraces all acts that prolong the life of our cultural and natural heritage, the object being to present to those who use and look at historic buildings with wonder the artistic and human messages that such buildings possess. The minimum effective action is always the best; if possible, the action should be reversible and not prejudice possible future interventions. The basis of historic building conservation is established by legislation through listing and scheduling buildings and ruins, through regular inspections and documentation, and through town planning and conservative action. This book deals only with inspections and those conservative actions which slow down the inevitable decay of historic buildings.

The scope of conservation of the built environment, which consists mainly of historic buildings, ranges from town planning to the preservation or consolidation of a crumbling artefact. This range of activity, with its interlocking facets, is shown later in *Figure 1.21*. The required skills cover a wide range, including those of the town planner, landscape architect, valuation surveyor/real-estate designer, conservation architect, engineers of several specializations, quantity surveyor, building contractor, a craftsman related to each material, archaeologist, art historian and antiquary, supported by the biologist, chemist, physicist, geologist and seismologist. To this incomplete list the historic buildings officer should be included.

As the list shows, a great many disciplines are involved with building conservation, and workers in those areas should understand its principles and objectives because unless their concepts are correct, working together will be impossible and productive conservative action cannot result. For this reason, this introductory chapter will deal briefly with the principles and practice of conservation in terms suitable for all disciplines.

Values in conservation

Conservation must preserve and if possible enhance the messages and values of cultural property. These values help systematically to set overall priorities in deciding proposed interventions, as