wiring. Workmanship standards can generally be assessed by the proper fixing of wires and the use of junction boxes.

Conduit may be rusty and the joints pulled, thereby breaking earth continuity. Drops should always be in conduit embedded in plaster.

The size and position of the electrical intake, the distribution boards, arrangement of circuits and wiring system should be given with readings for their insulation polarity and earthing resistance and continuity. Socket outlets and lights should be checked for polarity. Light pendant cables are particularly liable to decay and short-circuit. The specialist should be asked to report on potential hazards, as poor electrical installations are a major cause of fire in historic buildings.

Inspection of drainage

It is often very difficult to trace drainage runs; electromagnetic detectors may be found useful for this purpose and also finding other buried services. It is sometimes possible to send sound waves down a pipeline by tapping, using a garden fork as a listening device, and thus find a lost drain.

Almost all old drainage systems are defective and would be damaged by water tests as applied to new work. It is a matter of judgement whether the faults really matter to health or the structure of the historic building. For example, broken drains may leach out soil from under the foundations or cause moisture to penetrate basement walls. Using a smoke test, it may be possible to detect a breakage by the greater volume of smoke percolating through the soil. Other defects will show by smoke emission at joints and between drain and shaft and toilet bowl. To make the test, a smoke machine which pumps smoke into the system is used after all unsealed outlets have been stopped. Another method is the pneumatic test, which uses the same machine but with a pressure gauge and has the advantage that by moving a plug down the drain it can detect where the rate of air leakage is greatest, thus indicating a breakage. The danger points for broken drains are at the point of entry to a building, if settlement has occurred, and under a lightly constructed drive over which heavy loads may have passed.

Visual inspection will show the general condition of drains which should be clean and allow a bucket of water to run freely from manhole to manhole. If there is a delay or only percolation, there is a fault. The condition of manholes should be checked as well as the fit of manhole covers, which may be cracked and rusty and without lifting lugs. They should be bedded in grease and made airtight. Ventilation of the top and bottom of the drain should be checked, together with the condition of the septic tank and sewerage disposal.

Provided that an old drainage system is working without offence, it should be left alone, as otherwise the bacteriological system for disposal of effluent may be upset.

Presenting the initial report

The initial report will have listed all the visible defects such as cracks, poor masonry, rising damp

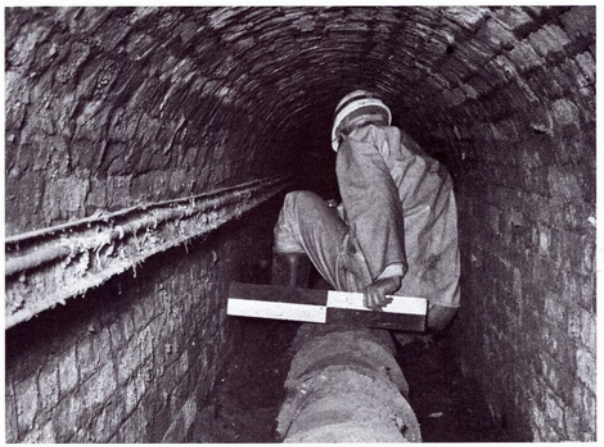

Figure 14.11 Original rainwater disposal system, St Paul's Cathedral, London, England
(Courtesy: Feilden & Mawson)

A view along the north branch before cleaning out took place. The drain was found to be blocked, causing storm water to flood over the sensitive foundations of the north-west tower. After cleaning out, the movements of the tower ceased, at least for the time being

Figure 14.12 West porch, St Paul's Cathedral, London, England
(Courtesy: Feilden & Mawson)

A view inside the jack-arch on the middle cornice of the west front porch shows the Lewis bolt which appears to be in good condition: it was not known that the lintel was held up by the Lewis bolt until it was opened up

Figure 14.13 South transept, west wall, St Paul's Cathedral, London, England
(Courtesy: Feilden & Mawson)

Differential settlement in the west wall of the south transept is due to the enormous weight of the dome on the right-hand side