Injections for rising damp

Rising damp is one of the main problems people renovating old houses come up against, and it is far from unknown in new houses.

Fortunately, in most parts of the country soil salt levels aren't high enough to produce 'salt damp', a form of rising damp whose destructive effects on brick and stone walls in South Australia were described in *Ecos* 28. But the more common form of rising damp, although it does not normally affect the structural soundness of walls, is not a pleasant thing.

As an unsightly 'tide mark' moves up a wall, paint blisters, wallpaper becomes discoloured and lifts, mould starts forming, and a musty odour develops. Quite soon, skirting boards and other woodwork begin to rot.

Since its inception 35 years ago, the CSIRO Division of Building Research has received a constant flow of inquiries for advice on how to cope with rising damp, and has developed considerable expertise in the matter.

The 'tide mark' rises up a damp wall.

One of the Division's scientists, Mr Les Armstrong, is an advisor on rising damp to the Victorian Ministry of Housing, the Glebe Estate reconstruction project in Sydney, the South Australian Housing Trust, the Australian Heritage Commission, and the National Trust of Australia.

His experience shows that, in most cases, relatively simple measures directed at the cause of the problem provide a remedy. These either prevent the build-up of water at the base of walls or stop porous materials carrying moisture to portions of wall above the damp-proof course.

One common cause of water accumulation at the base of walls is faulty guttering, downpipes, and ground drainage. Others are leaking plumbing and excessive watering of gardens.

Ground paving, garden soil, renders on internal and external wall surfaces, and rubble in the gap in cavity brick walls are some of the bridges that water uses to cross damp-proof courses.

Paving sometimes also contributes to rising damp by blocking the vents that are supposed to allow air to flow under the floor. The result is that water in the ground and the base of walls does not evaporate nearly as rapidly as it should.

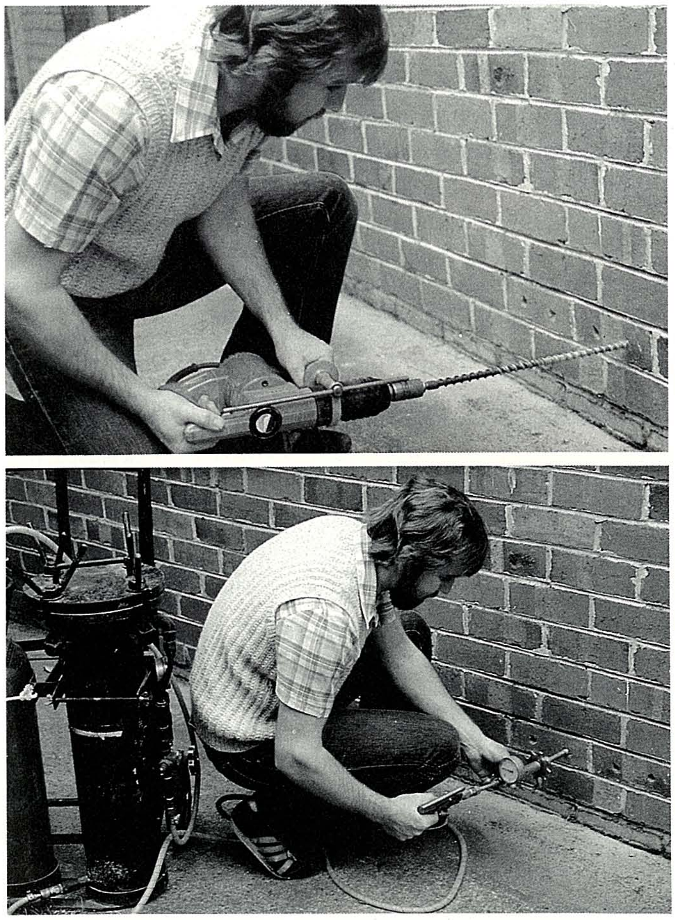
Mr Armstrong and his

colleagues have found that tackling the problem at its cause is much more effective than treatments — such as removing the paster from a damp wall and replacing it with a render containing a waterproofing agent — aimed at covering up the dampness. These usually provide only a temporary solution.

Sometimes considerable ingenuity is needed to solve the problem. For example, the CSIRO team has found that, in some houses where it is difficult to instal enough vents to keep the under-floor area dry, disused fireplaces can be modified to provide highly efficient ventilation.

Inevitably, there are cases where the only permanent answer is to insert a physical barrier in a wall to stop the water rising.

The obvious method, slotting in a new damp-proof course, is difficult and very expensive, and can damage the wall. However, about 15 years ago scientists in Europe found they could stop the upward progress of water in walls by injecting water-repellent substances such as latex and silicones into bricks. These block or form a lining on the surfaces of the pores — usually with diameters of between 0·0001 mm and 0·01 mm — that normally provide a passage for water.



The injection technique involves drilling two holes in each brick in one row and injecting a silicone solution.

In tests at the Division of Building Research on a variety of Australian bricks, Mr Armstrong and Mr Craig Seath found that they could not produce any worth-while dispersion of commercial latex solutions into the pores. However, they had much more success with a solution of silicone resin in white spirit, and developed a technique that ensures wide dispersion of the silicone through the bricks. The method has been taken up by a number of commercial firms.

Following initial investigations to determine the porosity of the bricks and their suitability for treatment, two holes are drilled in every brick in one row in the wall to be treated. Then the fluid is injected into them at a pressure between 350 and 700 kilopascals — care being taken to monitor fluid pressures in the line and at the injection nozzle, the volume of fluid used, and the pattern of flow of surplus fluid out of the bricks.

It usually takes 1–3 minutes to fill a brick's pores, with between one-quarter and half a litre of fluid.

Terrace houses in the Glebe restoration project are among those on which the scientists have tested the technique. The results so far have been good, and there seems no reason to doubt that treated bricks will constitute a permanent barrier to rising damp.

Inhibiting dampness in buildings. L. D. Armstrong. *Architectural Science Review*, 1980, **23**, 4–6.

Managing to save fuel

The article 'Managing to save fuel' in *Ecos* 28 (May 1981) reported the finding by researchers from the CSIRO Division of Energy Technology that a net 10% fuel saving resulted when the traffic lights' cycle length on a section of Military Road, Mosman, N.S.W., was changed from 90 seconds to 140 seconds. It said that, if such a saving was repeated nationally on the 1000 km of arterial roads on which current speeds are below 25 kilometres per hour, drivers would save $15 million a year.

The article did not make clear that the 90-second cycle was adopted temporarily, specifically for the experiment. What the study did was put precise figures on the effects of a variety of important factors affecting the traffic flow. In so doing, it confirmed expected benefits of the longer cycle lengths normally in use there. Naturally, optimum cycle lengths vary with location and traffic load.

Also, the article could be read as suggesting that a general change of traffic light cycle lengths from 90 to 140 seconds would save $15 million a year. What was meant was simply that a 10% reduction in fuel use on the 1000 km of congested arterial roads would give that saving. The CSIRO team believes a saving of that order could be achieved nationally through greater use of traffic light co-ordination and fine tuning of cycle lengths.