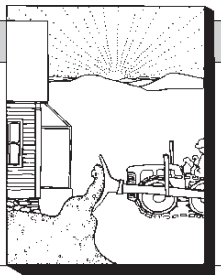
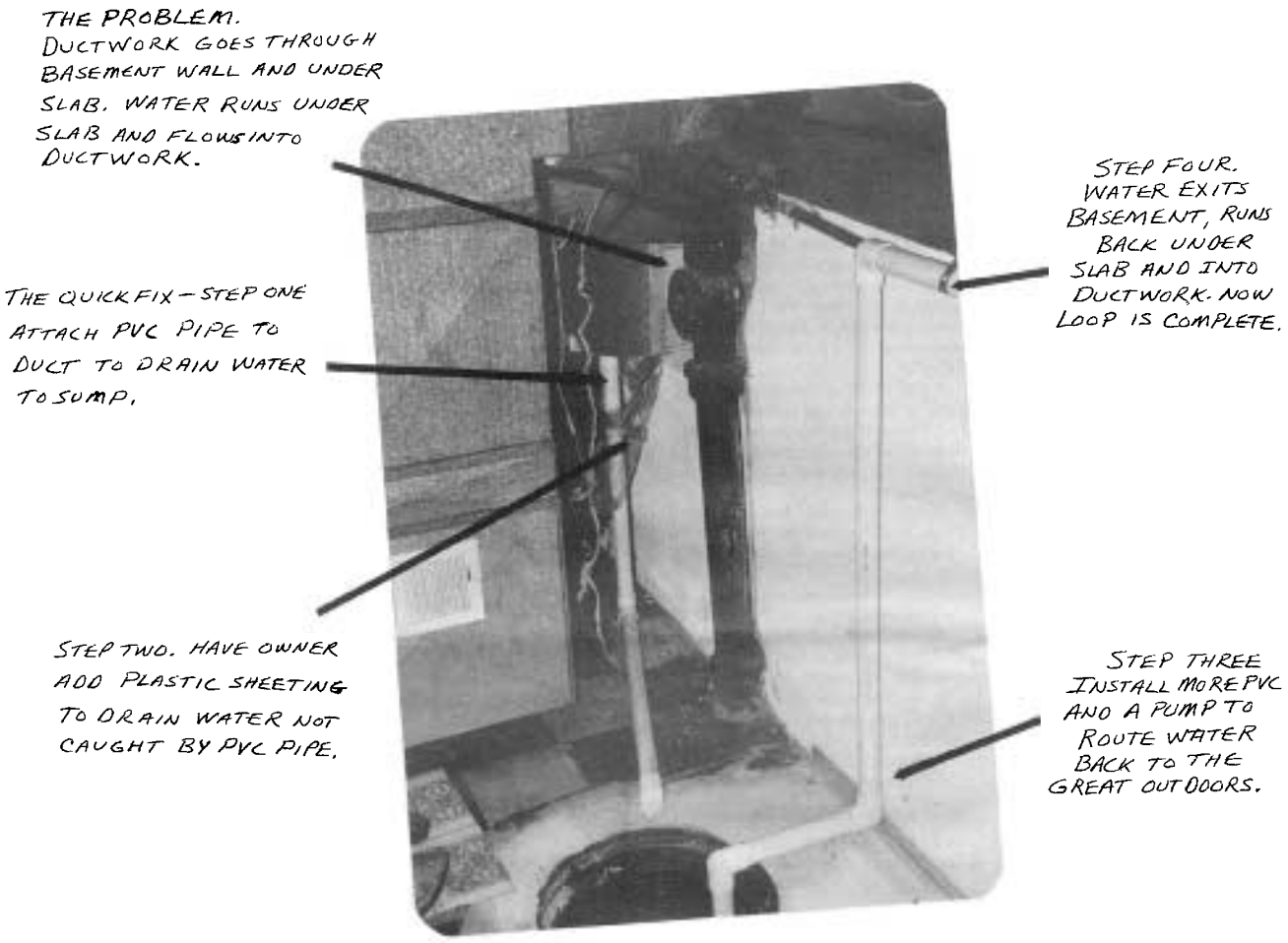


How to Waterproof a Furnace

by Alvin Sacks



Alvin Sacks is a construction consultant whose work often involves water problems. Over the years, he has seen many cures that addressed the symptom but totally ignored the cause. In Sacks's experience, this was one of the stranger and more creative cures for a wet basement.

The house was a 20-year-old split level. One half of the building was on a slab on grade. A large air trunk line ran under the slab from the furnace in the adjoining basement.

According to the owners, the problem started years ago with water running from inside and around the trunk line into the basement during rainy periods. The owners finally called a local waterproofing contractor who proceeded to treat the water running out of the trunk line. As the photo shows, the contractor attached a white PVC pipe to the underside of the ductwork and led it to a sump pit. From there, the water was pumped up another PVC pipe to outside the basement wall at grade. The waterproofer installed the plumbing and pumping system.

The owners soon found that this "solution" did not cure the problem. They attached polyethylene sheeting to the trunk line to collect leakage from the ductwork, and direct it to the sump pit. The owners also complained to the waterproofer. When their complaint went unanswered, they consulted me.

I checked the new roof and flashing, the chimney—outside and inside—and the gutters and downspouts. I found only some dirty gutter screens, so I checked the yard grading and the runoff from neighboring properties.

Along the left side yard, the property received surface flows that ponded close to the foundation walls, and *penetrated* under the front-porch slab. On the left corner of the front porch, the downspout outflow curled back toward the building.

Along the rear foundation wall, near the areaway whose steps entered the garage, there were signs of water penetration. This probably was caused by the rear yard sloping down toward the building. Compounding the situation was the fact that the sump-pump exhaust water dumped too close to the wall.

The uphill source of this home's water problems is typical. But in a split-level home, the *effect* of the penetration usually occurs close to the foot of the party wall, or at the base of the steps between the bottom two levels. Since, in this case, the result was water flowing over the top of the party wall, regrading the yard and improving the roof runoff would have solved the problem with no need for a plumbing system.

While this solution may have been obvious to some of us, there is a lesson here. In treating problems, you should look beyond the symptoms to the underlying cause. When a basement window well is filling with water, for example, a troubleshooter must determine whether the water is coming down from over the top or percolating up from below.

Some building problems have multiple causes that are complex and interactive. These require a true understanding of the mechanisms involved. For example, a simple buzzword such as "settlement" fails to explain the cosmetic defects of a new house, and will not lead to effective treatments.

When the specific cause cannot be known, we sometimes must recommend a phased series of treatments that escalate in cost and complexity. The cause may not be visible or obvious, but our goal should be to find and treat it, not just the symptoms. ■