punctures somewhat during backfilling, it will still help isolate moisture and conduct water down to the drain tile.

For poorly drained sites, look into true waterproofing. There are many products on the market. None is foolproof and all require careful installation to make them worth their money. Two interesting options, often used for underground houses, are bentonite—an organic clay that seals itself when wet—and synthetic rubber membranes. Membranes are probably the best and most expensive option.

Whatever system you choose, pay special attention to the joint between wall and footing and to pipe penetrations. Continue the waterproofing over the joint and right onto the footing—which needs to be clean of soil and debris if you are to get a reasonable seal. Even a full waterproofing job, though, isn't foolproof and needs the backup of good drainage.

Drain tile. Water takes the path of least resistance. Drain tile should keep that path out of your house. Perforated 4-inch PVC or flexible ABS are the cheapest and most foolproof drain conduit. Its pitch should be at least 4 inches in 100 feet. The top of the tile should be below the top of the finished slab. From the low corner, the tiles should drain to daylight, to a drywell away from the foundation, or to a storm sewer. If you use tiles with perforations on one side only, face them down. The water collects on the bottom.

Backfill. Directly over the perforated pipe, use gravel larger than the holes in the pipe. In soil that drains well, you'll only need granular backfill around the tile. In clay soil, add granular backfill—gravel or coarse sand—half to two-thirds of the way to grade. If the soil has a lot of silt or fine sand, place a layer of 15-pound felt sheets lapped loosely over the drainage bed to keep silt from clogging it. The top foot of backfill should be a low-permeance clay cap to keep surface water away from the foundation. If plantings are planned, add 4 to 6 inches of loam on top.

The backfill should be compacted for a couple of reasons. One, if the backfill settles too much, the grade is changed and water will collect at the foundation wall, run down, and cause leaks. Second, as the backfill settles, it will tend to drag down any exterior insulation or poly that touches the soil. Some builders add poly over rigid insulation so that the poly will slide, not the insulation.

Finish grading. At grade, the main object is to get the water away from the foundation as quickly as possible. If you use gutters, bring the downspouts to either a splashblock or to short subsurface drains to daylight. Do not tie into the main drainage system or you're asking for trouble with overloading and deposits of sediment.

The finish grade should slope away from the house for 10 to 15 feet with a slope of at least 3 inches in 10 feet. Avoid any grading that will encourage standing water.

Retrofit

You can sometimes cure basements that leak without major work. I recently stopped a substantial leak (a couple of gallons per rainstorm) by chipping out around a waste pipe where it passed through the foundation wall and patching it with hydraulic cement. Other simple and successful repairs I've seen include rerouting of a drain pipe (to a drywell), adding a large concrete splashblock around a chimney, and regrading a basement entrance that was connected to the street via a short river.

For porous block walls where water is seeping through the block, there are cementitious coatings that manufacturers claim will stop water even against hydrostatic pressure. I saw one of these products, Thoroseal, demonstrated recently at a trade show, but I haven't seen it in actual use.

In general, though, the after-the-fact leak is a real headache and is better prevented beforehand. As architect Malcolm Wells points out, even in the best porous soils, such as what he's used to on Cape Cod, a good rain can saturate the soil and give the waterproofing a run for its money. Below grade, the rules are complex and Murphy's law will prevail. A multiple defense is the best approach.