cent RH and up, for instance, in a wet crawl space or wall cavity, other microorganisms such as mold and mildew will breed. Fortunately, fewer than 1 percent of cold-climate inhabitants are allergic to dust mites (10 to 15 percent in tropics) and fewer still are allergic to molds. Though there's little hard evidence, it's reasonable to expect that drier, well-ventilated buildings (with filtered intake air) will have fewer allergy-producing microorganisms floating about.

Organics

Many toxic organic compounds are used during construction. Others are used daily in cleaning fluids, cosmetics, and hobby materials. These include the solvents used in paints, caulks, and adhesives, and the ingredients in hair sprays, carpet and oven cleaners, floor and furniture polishes, and pesticides. Many of these products contain suspected carcinogens.

The builder has little control over most of these substances, but might suggest that the homeowner vent the house well when using them. Home workshops or hobby areas such as darkrooms should be built with extra ventilation. When not in use, paints, solvents, and other strong chemicals should be stored away from the main living area. In many cases, the consumer can replace complex cleaning products with simpler alternative products.

If termiticide has been added to the soil around a building, be extra careful to isolate any ductwork or airflows from the soil. Several cases of chlordane poisoning have been linked to underslab ducts picking up the fumes from the soil. Avoid insecticides that use chlordane, heptachlor, aldrin, or dieldrin.

In its TEAM study, the Environmental Protection Agency found the average level of 12 volatile organic chemicals two to five times higher in houses than outdoors, though still 1000 times less than short-term occupational exposure limits. Research is under way at EPA to identify which organic pollutants are most frequently introduced into the indoor environment by either building materials or household products.

Asbestos

If you encounter asbestos pipe or boiler wrapping in a renovation project, you don't want to do anything that will crumble the material and send it airborne. Two sources of information on the safe removal of asbestos are: EPA at (800) 424-9065 and the National Association of Asbestos Removal Contractors at (913) 749-4032.

Make-up air

In commercial buildings, where indoor air is recirculated to save energy, air problems have been linked to the unwise location of air inlets—over a bus stop, garage space, or some other source of noxious fumes. To avoid repeating these problems, we should keep air inlets away from garages, exhaust ducts, or busy streets.

Similarly, in polluted urban areas or rural areas thick with woodsmoke, outdoor air may be more polluted than indoor air. If this is the case, you may want to consider mechanical air cleaners. In general, I'm told you have to spend about $100 to get one that's effective.

New buildings

Sweden now requires a six-month airing out period for new public buildings. During this time outside air must provide 100 percent of the make-up air. New houses should also have high-ventilation break-in periods.

Research shows that within a month, the level of organic pollutants in the air of a new home will drop by a factor of 10. This suggests that maximum ventilation should be supplied for the first two to four weeks while paints, caulks, and materials dry out. For up to a year, there are likely to be elevated levels of moisture and formaldehyde from new building materials. These will require extra ventilation as well, but probably at a lower rate. You can gauge the need for extra ventilation by the presence of odors and condensation on windows.

After the break-in period, if you've provided a reasonable ventilation rate from 0.3 to 0.5 air changes per hour and have no excessive sources of indoor pollution, your energy-efficient homes should also be healthful homes.