

Healthful Buildings

If a well designed building can be a sound investment... one that is not well designed can lose value.

A building can, in fact, be dangerous to your health—as we are seeing more often these days. We even have a name for it—“sick building syndrome”!

Here are some ways to avoid this risk to your health, and to your investment, by:

- sealing combustion devices.
- excluding radon.
- using safe methods of controlling insect pests such as termites etc.
- controlling moisture to reduce mold and mite induced allergies.
- providing ventilation and filtration to eliminate noxious emissions.
- choosing materials to reduce immune system stress and respiratory aggravation.

Let me take each of these in turn:

- **seal combustion devices.**

We all know wood stoves, fireplaces, furnaces, etc. have flues to take smoke and fumes out of the house. But the air required for combustion should also be obtained directly from outdoors. We are taught that smoke rises and whilst that is usually true, sometimes it doesn't. With an odd shift of the wind, or with a tightly constructed house, sometimes the smoke will come down the flue.

This is called backdrafting. If the backdrafting is caused by one combustion device—say an oil furnace—drawing its combustion air down the flue of say a fireplace as the fire is dying down late in the evening, then this is an example of backdrafting that can be lethal. All furnaces, fireplaces, and boilers should have combustion air ducted directly to them.

- **exclude radon.**

Radon is a mildly radioactive soil gas that causes cancer much as cigarette smoke does. Measures can and should be taken to prevent radon from seeping into buildings. Mostly, these measures involve sealing the sub-floor or sub-slab space from the house or basement, and providing a means of sucking air (and the radon with it) out of the sub-floor spaces. We basically create a path for the radon to escape that is easier than seeping into the house.

- **use safe methods of controlling insect pests such as termites etc.**

Some time ago I was asked to look at a house for a buyer who suspected the structure was rotten. As I was crawling under the floor something struck me as odd—there were no cobwebs—the place seemed unnaturally clean. It occurred to me that maybe the real problem was not with the structure ... any more. So I thought to have the soil tested. It was terribly contaminated with pesticide. Ironically, the treatment that was supposed to protect the value of the building had the exactly opposite result.

- **control moisture to reduce mold and mite induced allergies.**

Uncontrolled moisture—whether liquid or vapor—stimulates the growth of mites and molds. These cause allergic reactions in humans. It also supports mold and insect activity which cause structural decay. Controlling moisture is very important to the longevity of the building and the comfort and health of its occupants. Controlling moisture requires more than a good roof — though that’s an important first step.

It also means keeping the humidity levels within reasonable bounds. It means careful design and construction so that moisture does not become trapped in walls or attics for any extended periods. And it means avoiding cold surfaces—cheap windows and “thermal bridges” —where moisture condenses and molds can grow.

Cold surfaces occur in walls and floors where insulation is diminished.

- **provide ventilation and filtration to provide good air quality.**

We tighten our buildings to improve efficiency, then we ventilate them for health reasons. (That makes sense because controlled ventilation is far more effective than uncontrolled ventilation which occurs—or does not occur—at the whim of strong winds or cold nights). I often encounter concerns about air quality in tight houses—but always when the houses are inadequately ventilated. A tight house without ventilation is like a car without brakes— but with a car, we don’t advocate the removal of the accelerator; we say ...

“Fix the brakes!” So it should be with houses. Ventilation also helps to keep humidity levels down in tight houses—and therefore contains moisture problems that would otherwise lead to the growth of molds and mites.

- **choose materials to reduce immune system stress and respiratory aggravation.**

Modern building materials release all sorts of chemical vapors—particularly when they are new and when they are heated. These vapors aggravate the immune and respiratory systems. A good designer selects materials to minimize these adverse effects. The less the materials within a building give off noxious emissions, the less we need to rely on corrective measures such as ventilation to alleviate the problem.

Sick Building Syndrome is becoming more widely recognized. This is partly because building products are largely synthetic concoctions of countless chemicals with very long names—that are aggravating. But it is also because, after 40 years of this revolution in materials technology, we have a generation—my generation—that has grown up in these surroundings, and our bodily systems have been diminished in varying degrees by these exposures. The researchers who count sperm cells inform us that we are but half the men our grandfathers were. It seems that this constant, low-level assault that our bodies have been experiencing for forty years is now emerging as an issue that we all must take seriously.