

THE  
COMPLETE  
BOOK OF

# HOME ENVIRON- MENTAL HAZARDS

"Of the many books published lately about hazardous products in your home, the best may be *The Complete Book of Home Environmental Hazards*."

—*Detroit Free Press*

How to find RADON, ASBESTOS, LEAD, ELECTROMAGNETIC FIELDS and other harmful substances in your home and your neighborhood—

AND HOW TO GET  
RID OF THEM

Roberta Altman

# THE COMPLETE BOOK OF HOME ENVIRONMENTAL HAZARDS

ROBERTA ALTMAN

 **Facts On File**  
*New York • Oxford • Sydney*

## **THE COMPLETE BOOK OF HOME ENVIRONMENTAL HAZARDS**

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# INTRODUCTION

The Environmental Protection Agency estimates that over 26,000 deaths a year may be caused by exposure to hazardous substances inside the home. *Indoor* air pollution is considered to be a far more dangerous public health problem than *outdoor* air pollution. Dr. John Spengler, professor of public health at Harvard University, says that “concentrations of contaminants inside homes often exceed the maximum safe levels established for hazardous waste cleanup sites.” The average American spends at least 90% of his time indoors; 65% of that time is spent at home.

Today, there is much more awareness and knowledge of what substances and circumstances can be harmful. Materials used innocently years ago, we now know cause cancer and other illnesses. Our industrial “progress” has led to a whole new range of problems: contaminated homes; bodies of water unsafe to drink, fish or swim in; soil that emits fumes that can kill; pollution of the very air we breathe.

Without a book like this, it can be very difficult to track down the information you need to make sure that your home is “healthy.” It is virtually impossible to find all the information you need in one place. When I was looking for a house several years ago I could have used a book like this, but it hadn’t been written.

Today it is probably impossible to have a totally healthy house in a completely safe environment. If you check out all the possible hazards in this book and your house emerges with a clean bill of health—that is great. If your home does have one or more of these problems, consider yourself lucky that you’ve found out, and then get to work.

Frequently, the solution is simple and is something you can do yourself. The worst case scenarios are rare. It is possible to eliminate, or reduce, just about any health hazard in or around your home. And while you may not be able to make your home completely risk free, you can get much closer to a zero risk factor.

Major and minor disasters, and life-threatening situations, are not common. What is common, however, are various pollutants in the home environment that can cause headaches, a runny nose, sneezing, coughing, difficulty breathing—any one of a number of different health

problems. They may not be life-threatening, but they can be very annoying and make your life at home miserable.

Sometimes it is obvious that there is a problem in the house—you get headaches that disappear when you leave your home—but other hazards are not obvious at all. For example, radon has no smell or color. Without testing for radon in your home, you would have no way of knowing that you are inhaling this potentially deadly substance.

*The Complete Book of Home Environmental Hazards* is for anyone who lives in a house or apartment, or is shopping for a home, and is concerned everytime there is another story in the newspaper, or another report on TV, about a dump site leaking toxic fumes; contaminated drinking water; a “minor” accident at a nuclear power plant; leaded paint on the walls or a faulty heating system. It is for *anyone* who has some kind of health problem at home that magically clears up in a different environment.

In this book you’ll find the latest information available on the environmental hazards that can affect your health. It will tell you what the problems are, how the different pollutants or environmental factors affect you, the signs and/or physical symptoms that signal a potential problem, how to find out if pollutants are present in your home and to what degree. It will tell you how to find the right authority if some further action is needed and, finally, how to get rid of, or reduce, the problem and the risk it poses. Cost estimates for various testing devices and procedures are included. Some of the costs may increase after publication of the book.

Virtually any phone number you may need is in this book, saving you a lot of time and aggravation, as well as costly phone calls. As a reporter I learned how difficult it can be to find the right official, the one who can give you the answer instead of another number to call. When I phoned I had the advantage of being able to say I was calling from a major news organization. And even then, it could take many calls to track down the right person to answer a question. You don’t have to do any of that time-consuming tracking down. It’s been done for you. Where appropriate, the specific phone numbers, by state, are at the end of the chapter. In addition, there is an appendix with more general numbers, which could be helpful, along with a list of toll-free 800 numbers.

*The Complete Book of Home Environmental Hazards* is written and organized to make as easy as possible *your* part of making your home healthy. It isn’t a textbook, and every effort has been made to stay away from very technical language. Words that may not be all that familiar are in the glossary in the back. This is a *practical* guide with easy to follow

steps so that you can figure out what you may be up against, healthwise, in the house you live in, the house you're planning to buy or renovate, or the apartment in which you reside.

This book is divided into three parts: environmental hazards inside the home, environmental hazards outside the home, and what to look for when buying a house to make sure it is environmentally sound. The section on buying a house is there to prevent, if possible, the need of ever having to use the first two sections of the book once you move into your new home.

Checking out your home fully can take quite a bit of effort, but it has some tremendous benefits. To buy and live in a house without inspecting it first can be very costly—for your pocketbook as well as your health. It's up to you to set your priorities, to decide how important it is to you to live in a healthy home; how much of an effort you want to make; what you can live with and **WHAT YOU CAN'T LIVE WITH**.

This book has been designed to help you make your home the safe haven that it was meant to be—as easily, as quickly and as inexpensively as possible. The house of your dreams *can* be the house of your dreams; it just takes a little more effort today.

# ACKNOWLEDGMENTS

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## **PART ONE**

# **Environmental Hazards Inside the House**



# 1

## RADON

"Radon is one of the most serious environmental health problems today...the second leading cause of lung cancer in this country." That was what William Reilly, administrator of the Environmental Protection Agency, said in October 1989 as the Agency called on all Americans to test for radon in their homes, including detached homes, townhouses or row houses, trailers with permanent foundations, as well as basement, first and second floor apartments. At the same time, he released findings from the Agency's latest survey of radon levels in thirteen additional states, bringing to twenty-five the total number of states surveyed. In the survey, done in the winter of 1989, some of the highest radon levels to date were found. In addition to the EPA, others urging Americans to test for radon include the U.S. Public Health Service, the American Lung Association, the American Medical Association and the American Public Health Association.

### WHAT IT IS AND WHY ALL THE FUSS

Radon is an invisible radioactive gas. You can't smell it, feel it or see it. When it is outside, it is virtually harmless. It dissipates into the air. It can become a BIG problem when it enters a home and becomes trapped there. As it accumulates it can reach dangerous concentrations.

Radon comes naturally from uranium, which is in the earth's soil and rocks. Black shale, phosphatic rocks and granites are some of the rocks that may have higher than average concentrations of uranium. As uranium decays it gives off radiation and transforms into a series of elements. Radon, a gas, is one of those elements.

Radon may also be found in areas that have been contaminated with certain types of industrial wastes such as by-products of uranium or phosphate mining.

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Radon itself poses a minimal risk. It becomes dangerous when it decays—by undergoing a radioactive transformation. Elements called “radon daughters” or “progeny” are formed. It’s the decayed radon (radon daughters or progeny) that is deadly. When the radon (gas) in your home undergoes the radioactive decay that produces the deadly radon progeny, the trapped progeny attach to dust particles in the air. When you inhale, the radon progeny on the dust particles attach to the surface of your lungs, damaging lung tissue. The more damage, the greater the risk of getting lung cancer. The amount of risk you face is primarily determined by a combination of the radon concentration in your home and the length of time you’re exposed to it. The higher the concentration, the longer the exposure, the greater the risk.

Virtually every house in the United States has some level of radon in the air. Most homes will not have levels high enough to require reduction measures but a significant number will. In October 1989, the EPA estimated that at least eight million, or more than 10%, of the roughly 75 million homes in the United States could have levels above its guidelines.

According to the EPA, radon is the second leading cause of lung cancer deaths. It estimates that radon causes as many as 20,000 each year. Smokers exposed to radon are at a much greater risk. Tobacco smoke makes the lungs more susceptible to radon, according to Assistant Surgeon General Houk. In addition, the smoke attracts radon particles, which are then inhaled. Of the 20,000 suspected radon-related lung cancer deaths each year, 15,000 are smokers. Another study, by the National Academy of Sciences, says radon is responsible for about 13,000 deaths from lung cancer yearly. And there are some scientists who believe 20,000 deaths may be too low an estimate!

We know that exposure to radon can cause lung cancer because of numerous studies of underground miners who were exposed to radon for years. Studies of Colorado miners were used to establish projections of cancer risk due to radon exposure. Currently, studies are being conducted on the effects of exposure to household radon in a number of states and countries.

### RADON’S “DISCOVERY”

Since the late ‘60s there has been concern about radon in homes. At that time, some houses in the West, built with materials contaminated by waste from uranium mines, were found to have high levels of radon. The concern in the ‘60s, and into the ‘80s, was always with man-made radon, radon that resulted from some action taken by man.

It wasn't until the mid '80s, that naturally occurring radon in homes became a concern. And its discovery came about in a bizarre way.

In December of 1984, Stanley Watras, an engineer working on the construction of the Limerick Nuclear Plant in Pennsylvania, went to the company Christmas party. When he entered the plant he set off alarms that had been installed to detect any worker leaving the plant with radioactive contamination. He was bringing radiation *into* the plant. A short time later his house was tested for radiation. His living room had the highest level ever found in this country. The level of radon in Stanley Watras's living room was 16 working levels! The EPA recommends levels of no more than two one-hundredths of one working level or 0.02. A person living with a working level of 16, over a lifetime, is at 100% risk of getting lung cancer. In other words, Stanley Watras was living in a home with a virtual death sentence hanging over his head with every breath he took.

The discovery made headlines. Neighbors panicked. One of those neighbors, Kathy Varady, lived across the street from Watras with her husband and four children. They had their house built and had been living in it, happily, since 1977. She thought it was the perfect place to raise a family. "It was close enough to a town," she says, "and at the same time far enough out so that my children could grow up with rural values." Her home is on a knoll overlooking hills and orchards. When her house was tested for radon the following January very high levels were found. State inspectors first did a five-minute grab sample test. (See page 11 for a complete explanation of grab sampling.) They returned several hours later to redo the test results because the levels were so high. A month later the results of a more accurate and sophisticated test showed levels three times what was originally found. It didn't really sink in until she was told that the level of radon in her home was the equivalent of her kids smoking 21 packs of cigarettes a day! She was terrified. She asked the EPA for guidelines. Guidelines didn't exist. The problem was still too new. A state official told her to keep her windows open, it was the middle of February, and to keep her four children out of the basement!

Kathy Varady's house became one of 20 in the EPA demonstration program to determine the best way to treat radon. It was months before the levels in her home were lowered as engineers tried different methods. The levels in her home are now considered safe. She is happy about that. But a lot of anxiety remains. The latency period for radon can be as long as 40 years and she has no way of knowing how her four children will be affected. "We just have to live with what is down the



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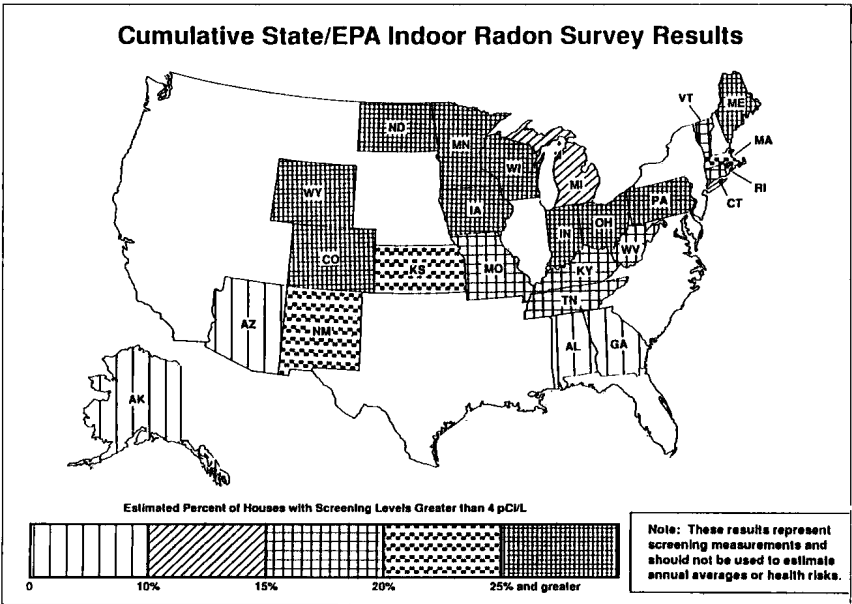
road,” she says. “It never leaves you.” Kathy Varady never knew that even the possibility of such a problem existed. No one did, then. Since 1984 the EPA has learned a lot about radon but acknowledges it still has only some of the answers.

HOW RADON GETS INTO A HOUSE

Radon comes from the soil. You may think of soil as dense and compact but it’s not. Air is always moving in and out. Different factors affect the movement of the air: weather conditions (frozen ground inhibits air movement); soil conditions; and type of soil. Air is drawn into the house when the pressure in your basement or the lowest level of your home is less than the air pressure in the surrounding soil. Radon can enter your home in a variety of ways—through dirt floors, cracks in concrete floors and walls, floor drains, sumps, joints and tiny cracks or pores in hollow block walls.

Because radon is a gas, it is able to move through small spaces in soil. Since air is constantly moving in and out of soil, a wind moving across the soil can push the radon that’s in the soil into your basement through minuscule cracks in the walls or floor of your basement. The cracks may even be too small for your eye to see. (Obviously, if your basement has a dirt or partial dirt floor your problems can be much greater.)

Oil burners with condensation drains that drip on the floor can be a source of radon.



EPA.