RADON: A PROBLEM WITH PROBLEMS

Like the man who suddenly discovered he'd been speaking prose all his life without even knowing it, most of us have been breathing radon with equal ignorance. Now a growing number of informed and interested scientists augmented by a larger chorus of alarmists, doomsday criers and professional worriers have alerted just about everybody to the possibility of lung cancer breathing radon. Of course it is not radon, but those pesky radon daughters that cause all the trouble, trouble that is not made any easier to understand by the antiquated and inaccurate nomenclature of the elements involved.

$^{222}\text{radon}$, a natural radioactive daughter in the uranium series, has a 3.8 day half-life and decays as follows:

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As indicated below the chain, all these elements were originally designated as various alphabetical variants of radium. This whole area of natural radioactivities is fraught with confusion due to the use of these fraudulent elemental labels. When one reads of the efforts to change the shape of the periodic table /not to mention the attempts to push strange new units onto the poor suffering radiochemist/ one wonders why these masterchangers don't decree an abolition of all the counterfeit radiums, thoriums and actiniums that clutter up the decay charts. Already we see there is a major problem just in understanding which elements are being talked about.

Radon, of course, is a noble gas and really no problem. But when the daughter products deposit in the lung they either emit or to decay to an emitter of α-particles. And this is bad news because short range high energy deposited in tissue is known to cause damage.

Anyone who attempts to measure and understand radon and radon daughter concentrations /RDC/ needs to be securely grounded in fundamentals of radioactive decay. One of the best references on this subject is a paper by Robley Evans, author of the classic book "The Atomic Nucleus" and at the time Professor of Physics at MIT. This paper, "Engineers' Guide to the Elementary Behavior of Radon Daughters" appeared in 1969. Though primarily