

Puffing On Polonium

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By ROBERT N. PROCTOR (NYT); Editorial Desk

WHEN the former K.G.B. agent Alexander V. Litvinenko was found to have been poisoned by radioactive polonium 210 last week, there was one group that must have been particularly horrified: the tobacco industry.

The industry has been aware at least since the 1960s that cigarettes contain significant levels of polonium. Exactly how it gets into tobacco is not entirely understood, but uranium “daughter products” naturally present in soils seem to be selectively absorbed by the tobacco plant, where they decay into radioactive polonium. High-phosphate fertilizers may worsen the problem, since uranium tends to associate with phosphates. In 1975, Philip Morris scientists wondered whether the secret to tobacco growers’ longevity in the Caucasus might be that farmers there avoided phosphate fertilizers.

How much polonium is in tobacco? In 1968, the American Tobacco Company began a secret research effort to find out. Using precision analytic techniques, the researchers found that smokers inhale an average of about .04 picocuries of polonium 210 per cigarette. The company also found, no doubt to its dismay, that the filters being considered to help trap the isotope were not terribly effective. (Disclosure: I’ve served as a witness in litigation against the tobacco industry.)

A fraction of a trillionth of a curie (a unit of radiation named for polonium’s discoverers, Marie and Pierre Curie) may not sound like much, but remember that we’re talking about a powerful radionuclide disgorging alpha particles — the most dangerous kind when it comes to lung cancer — at a much higher rate even than the plutonium used in the bomb dropped on Nagasaki. Polonium 210 has a half life of about 138 days, making it thousands of times more radioactive than the nuclear fuels used in early atomic bombs.

We should also recall that people smoke a lot of cigarettes — about 5.7 trillion worldwide every year, enough to make a continuous chain from the earth to the sun and back, with enough left over for a few side-trips to Mars. If .04 picocuries of polonium are inhaled with every cigarette, about a quarter of a curie of one of the world’s most radioactive poisons is inhaled along with the tar, nicotine and cyanide of all the world’s cigarettes smoked each year. Pack-and-a-half smokers are dosed to the tune of about 300 chest X-rays.

Is it therefore really correct to say, as Britain’s Health Protection Agency did this week, that the risk of having been exposed to this substance remains low? That statement might be true for whatever particular supplies were used to poison Mr. Litvinenko, but consider also this: London’s smokers (and those Londoners exposed to secondhand smoke), taken as a group, probably inhale more polonium 210 on any given day than the former spy ingested with his sushi.

No one knows how many people may be dying from the polonium part of tobacco. There are hundreds of toxic chemicals in cigarette smoke, and it's hard to sort out how much one contributes compared to another — and interactive effects can be diabolical.

In a sense, it doesn't really matter. Taking one toxin out usually means increasing another — one reason "lights" don't appear to be much safer. What few experts will dispute is the magnitude of the hazard: the World Health Organization estimates that 10 million people will be dying annually from cigarettes by the year 2020 — a third of these in China. Cigarettes, which claimed about 100 million lives in the 20th century, could claim close to a billion in the present century.

The tobacco industry of course doesn't like to have attention drawn to the more exotic poisons in tobacco smoke. Arsenic, cyanide and nicotine, bad enough. But radiation? As more people learn more about the secrets hidden in the golden leaf, it may become harder for the industry to align itself with candy and coffee — and harder to maintain, as we often hear in litigation, that the dangers of tobacco have long been "common knowledge." I suspect that even some of our more enlightened smokers will be surprised to learn that cigarette smoke is radioactive, and that these odd fears spilling from a poisoned K.G.B. man may be molehills compared with our really big cancer mountains.

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