



## IAQ RADIO EPISODE 695

Hal Levin

### IAQ Pioneer – Memorial Show Part 2

Originally Broadcast: June 18, 2010

Good Day wherever you are reading from and welcome to the Indoor Air Quality (IAQ) Radio blog for Friday, June 18<sup>th</sup> 2010. Episode 171 was recorded in Studio B which was in Coraopolis. Radio-Joe and the Z-Man were there along with our engineer “intrepid Environmental Annie Ann Kowaleki” at the controls and our Technical Director, Dr. Dieter Weyel via phone. The episode was recorded in pre-blog days. Fortunately, we have archived the recordings of all IAQradio Episodes. It was great to hear Hal’s voice sharing his wisdom again. Radio Joe and Z-Man were glad to hear Dieter’s voice and comments once again.

#### **Nuggets mined from this episode:**

***Tell us about how you provided consulting services when working with new construction or renovation projects?*** Early on, nobody knew what an IAQ consultant was or did, so I had to invent it. I clearly was not like the lighting or acoustic or structural design consultants of that era in that I wanted to involve the whole design team in the discussion. This is part of where the need for understanding building ecology came from -- everything was inter-connected, but design wasn't being integrated.

***You have worked on a lot of interesting projects please tell us about several of the most interesting projects you have worked on?***

Waterside Mall was originally designed as a housing project in S.W. Washington, DC. In 1988 the EPA was headquartered there. After new carpeting was installed the agency received complaints from 30 workers. Hal was known to the EPA as he was advising the agency’s Indoor Air Program. The agency moved the 30 employees out of the building and set aside a space for them in the corner of another building. Hal found windows in the building to be operable and the IAQ to be poor due to being close to a busy traffic intersection, presence of particle board

cabinets, etc. Hal polled the 30 agency employee about their preference on open or closed windows and found the employees to be evenly split. After his mitigation recommendations were followed; only 15 of the people were willing to work there.

**PCB Contamination in a high rise building.** The building's electrical transformer was located in a concrete vault underneath the sidewalk. The transformer exploded during the "Bay to Breakers footrace" in San Francisco. Smoke and contamination entered the building through electrical conduit while the HVAC system was operating; spreading PCB and benzofuran contamination throughout the building. Hal was hired to measure contamination levels and determine if the levels exceeded  $1\text{mg}/\text{m}^3$  which was the lowest level at which PCBs could be measured at that time. The building was shuttered for 9 months during remediation. While testing for background levels of PCB in other buildings and homes; Hal discovered that leaking fluorescent light ballasts caused high PCB contamination levels. He found that PCB in the air would attach to dust and contamination widespread. As PCBs, furans and dioxin are known to cause liver damage, chloracne, and cancer; Hal followed NIOSH guidance outfitting his assistants with "space suits" and independent breathing devices. The science of furans, dioxins and furans is complicated with conjoiners; some dioxins are significantly more hazardous (3000x) than others.

**Termiticide applications.** Termites destroy wood causing costly property damage. While investigating occupant complaints Hal found: while pesticide control firms are regulated, trained and licensed, their employees may not be. Most homes in California have crawl spaces beneath, not basements. As it is difficult and uncomfortable for workers to crawl under homes to make treatments, long rods and hoses are used to treat under homes. This resulted in inconsistent treatment and excessive quantities being used along outside perimeters. In order to avoid costly call-backs, applicators under-diluted termiticide concentrates. Children have greater exposure than adults, when Hal investigated a log cabin kit home treated with pentachlorophenol he found the children had 5X higher levels than the adults.

***International Society of Indoor Air Quality and Climate (ISIAQ)*** was founded in 1992 by 109 international scientists and practitioners following the 5th International Conference on Indoor Air Quality and Climate, Indoor Air '90 (Toronto, 1990). It is an international, independent, multidisciplinary, scientific, non-profit organization

whose purpose is to support the creation of healthy, comfortable and productivity-encouraging indoor environments.

<https://www.isiaq.org/>

***You have been successful in getting to work with architects and engineers early on during projects to help ensure IAQ was taken into consideration throughout the project. What tips can you give the next generation of IAQ professionals to help them get a seat at the table from the beginning of projects?*** LEED has changed the availability of "seats at the table" but architects are learning less, not more about IAQ. As houses get tighter and more energy conscious (not energy efficient), the risk of IAQ problems will rise and there will be a revival of interest in IAQ.

***What is on the horizon with respect to achieving zero net energy buildings what promising research is going on now?***

Reduce the loads -- efficient appliances, low-energy cooling, cleaner consumer products and building materials and furnishings that are lower emitting sources to reduce the pollutant loads, natural and hybrid ventilation, materials that actually react with pollutants to remove or transform them.

***California has a reputation for being an early adopter in the country. What is California doing to help ensure that the built environment will be more energy efficient?***

Long history of subsidies - State of CA paid 1/3 the cost of my rooftop PV system 5 years ago and 1/2 the cost of my solar DHW system 30 years ago. Codes and standards .... research.

***What part of IAQ or building science are you most passionate about today?***

Detailed understanding of chemicals, particles and micro-organisms (Sloan Foundation grants for microbial ecology of the indoor environment) integrated with building science and indoor air science.

***Where do you see the biggest disconnect between the research and practice of IAQ today?***

It still takes 20 to 35 years for the knowledge gained from research to make it into practice, codes, standards, and guidelines. Practice seems to need to oversimplify, dumb down the findings of research, The market controls what happens in the real

world, not research.

***How do we get researchers and practitioners on the same page with respect to IAQ issues?*** Not really the issue. Everybody has to do their own job well. For researchers, that means being more aware of what goes on in practice, for practitioners, that means being more interested in incorporating the findings of research.

***Scandinavia has earned the reputation as being ahead of the curve in IAQ and building science.*** Scandinavia --early awareness, good outdoor air quality, more acceptability of regulation

***What are your general thoughts on the USGBC LEED program?*** Too quickly developed and too successful to be susceptible to significant change, oversimplifies IEQ and undermines the potential for designers to recognize the need to understand things better. As LEED is not rigorous in IAQ and other areas, Hal is not a fan. According to Hal, "point shoppers" can attain LEED platinum without any points for IAQ. ASHRAE 62 is the minimum code intended to prevent problems.

***The LEED program has gotten some bad publicity lately in particular for encouraging the use of new products without having done enough research to find how these products will work in buildings over time. What are your thoughts; is this criticism legitimate or not?*** The chemicals in the new products haven't been adequately researched (e.g. plasticizers, flame retardants, etc.)

***What does sustainability mean to you?*** Sadly, "sustainability" has become a meaningless term used mostly for marketing, cannot be taken very seriously anymore. But the fundamental question remains: how do we get there? It's not about reducing 10 or even 50% -- It's about setting targets based on the Earth's carrying capacity, then figuring out how to get along on a budget based on reaching those targets.

***During the last show we touched on zero net energy buildings but we didn't have time to go into any detail. Can you tell us a little about the most promising developments you are aware of in achieving that goal?***

My passive solar houses, 2.5KW of PVs on my own roof and my zero net energy bill although my net energy use is not zero. Obvious design features: proper

orientation on the site, insulation, glazing, and overhangs, use of natural ventilation, highly efficient appliances, Solar Domestic Hot Water (DHW), PVs, source control to reduce the need for ventilation.

***What should they do or are they doing that will help ensure any new energy efficiency requirements do not cause IAQ problems?***

Focus on sources -- CARB regulations on HCHO emissions from comp wood products are the best example.

***We hear a lot about damp buildings and lately more about VOC's in tighter buildings what other IAQ problems do you feel do not get enough attention today?***

SVOCs are the next group of "pollutants du jour" - these are the plasticizers, flame retardants and pesticides.

***What questions about IAQ would you like to see more research focused on?***

- SVOCs.
- Consumer products as sources of pollution.
- How to educate individuals (general population) on the importance of the products they buy and bring home and use in their residence.
- Moisture and bioaerosols other than mold -- viruses, bacteria -- as possible co-factors in building illnesses.
- More study of real building types where the people are -- the EPA BASE study looked at larger office buildings, but the majority of office workers are in buildings that are smaller than the minimum size criterion for the BASE study. Residences -- they are so different from each other, we need a lot more studies. The California study was just cracking the lid of the jar open, we need far more details. And, of course, schools and healthcare facilities including long-term care and retirement communities, where the most susceptible members of the population spend much or all of their time.

"The best questions lead to better questions." – Hal Levin

***Z-man signing off***