Mutton Dressed as Lamb

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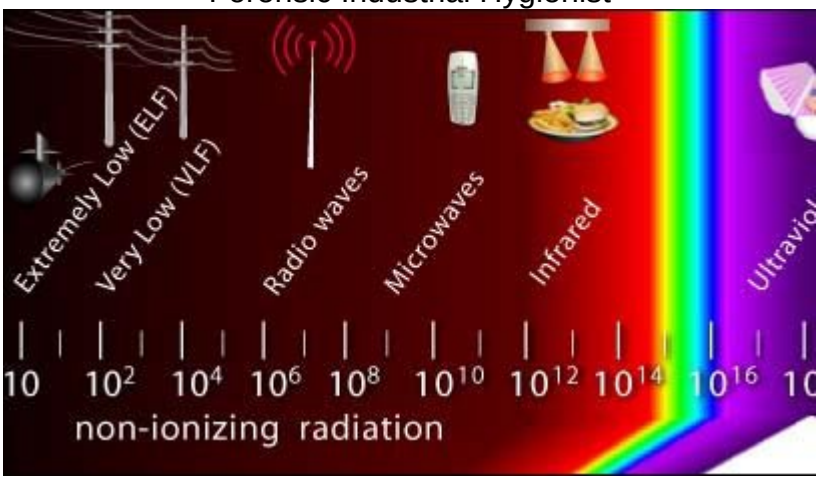

The danger of thinking in black and white often leads one to assume that all concepts must fall under exclusionary rules. Either a thing is one or it is the other. For example something is either credible or it is snake-oil; with no room in between. Yet reality is not like that, and sometimes the nonsensical is credible and the "well established" is bunk.

Novel concepts come along from time to time, and indeed, occasionally, the novel concept is truly novel; but sometimes the "novel" idea is mutton dressed as lamb. One such old sheep is the One Atmospheric Uniform Glow Plasma Discharge (OAUGDP).

I'm sometimes asked by Home Inspectors to wade in on the OAUGDP process – this is the idea of shining an ultraviolet light into a ventilation system to kill moulds and Bacteria and thus "purify" the air. "Is it real or 'snake-oil'?" they ask.

It has been long known that UV, at the appropriate wavelength and intensity, can be a very effective disinfectant. I have a classic 1955 text titled "Airborne Contagion and Hygiene" by the imminent W.F. Wells. Even in 1955, Wells discussed his experiments with UV light in New York's hospitals; and even at that point, it was a well advanced technology, properly implemented and rightfully understood. Wells' described the physics, physiology and effective parameters of irradiating ambient air with UV light as a form of "antimicrobial" and how the application could increase "effective air-changes per hour."

What Wells discussed in detail is the effect of optical length, retention time, relative humidity and a variety of other parameters that affect the outcome of a UV source used as

an antimicrobial. Ultimately, retention time of the airborne contagia in the UV beam is of paramount importance and is an inverse function of the intensity of the light.

For whatever reason, Wells' work fell into the land of the forgotten, and thus made fertile the soil for "ground-breaking" new ideas that are, in fact, mutton dressed as lamb.

If one has an air-stream containing Bacteria, and that air steam is moving through a duct irradiated with a UV beam or UV bank, the organisms' residence time in the incident light is usually insufficient for effective killing. The way to increase the residence time is to either increase the length of the optical path, significantly increase the intensity, or reduce the velocity of the air stream – neither solution being feasible because as it turns out, the velocity needed is so low that effective ventilation is lost or the length of the bank of UV lights is so long as to be cost prohibitive, or the lambs are run at such an intensity, the quickly burnout. Wells' common-sense solution to the problem was as simple as it was effective – place the lamps in nice decorative shades above the viewer's line of sight and shine the light upward into the room of ambient, slow moving air.

With regard to mould spores, the matter is very much more pronounced since mold spores are far less liable than Bacteria. While OAUGDP and UV lamps may help to reduce the viable population of an organism, it is not a "cure-all" and generally does nothing to reduce the allergenicity of the airborne contagia since the predominant adverse effect of molds on humans is not incumbent on viability. That is, dead spores are just as effective allergens as are viables. Similarly lipopolysaccharides associated with the endotoxins of Gram-negative Bacteria may also be unaffected.

So the theory is sound, but the application in an airstream (especially a residential model), may be less than that for which one bargains.