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**Subject:** We submit a proposed opinion piece documenting the parallels between the health effects in US diplomats in Havana and the US government official in China, and persons with so-called “microwave illness.” Reports of these individuals’ experiences, and published evidence in relation to the health effects in diplomats, cohere in every particular with known effects of radiofrequency/microwave radiation. Of possible relevance to the cases in Cuba, the US embassy in Moscow is known to have been subjected to microwave radiation, from the 1950s to the latter 1980s (or later per some sources).

**Word Count: 885**

**Golomb Expertise to Comment:**

**BS physics**, summa cum laude (age 19); physics graduate fellowship offers from Harvard and Cal Tech  
**PhD Biology. MD**, medical resident then Chief Resident in internal medicine. >20 years clinical experience. Postdoctoral fellowship, Salk Institute; Robert Wood Johnson Clinical Scholar (RAND/UCLA); Robert Wood Johnson Generalist Physician Faculty Scholar.

**Focus of my research:** My lab focuses on exposures and conditions related to oxidative stress and damage to mitochondria, and persons with conditions caused by this.

**Clegg Expertise to Comment:**

CEO, Canadians for Safe Technology.  
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**Citation Supplement:** A citation list is provided for the Editor, to illustrate that the points made are supported by evidence (science or news/other media, as suited to the statement). It is not expected that this will be published.

## **Re: Mystery Illness of US and Canada diplomats in Havana; and US Government Official in China: The Case for Radiofrequency/ Microwave Radiation**

A “mystery” illness striking US and Canadian diplomats to Cuba --and now a US government official in China (“First Cuba, now China? An American falls ill after ‘abnormal sounds’” *NY Times* 5-23-2018) has, according to the Associated Press, “confounded the FBI, the state department and US intelligence agencies.” Possible sonic injury previously dominated media reports – but experts reject this cause.

Pulsed radiofrequency/microwave radiation (**RFR**) has caused the same symptoms and peculiar features in others, and should be seriously explored as a cause of diplomats’ health experiences.

Comparing rates of symptoms cited in the one published study in diplomats, to those in a published study of people affected by electromagnetic radiation (**EMR**)/RFR in Japan, rates were: Headache 81%-vs-81%. Cognitive problems 81%-vs-81%. Sleep problems 86%-vs-76%; Irritability 67%-vs-56%. Nervousness/Anxiety 52%-vs-56%. Dizziness 67%-vs-64%. Tinnitus 57%-vs-63% (considering symptoms tallied in both). Hearing loss, not tallied in both studies but cited in diplomats, was a reported effect in 30% of >200 RFR/EMR affected persons in a survey we conducted at UCSD. An imaging study of RFR/EMR-affected persons showed evidence of traumatic brain injury, paralleling reports in diplomats.

Cementing the parallels, some diplomats (and the government official in China) heard strange noises in connection with triggering episodes – e.g. a high pitched chirping or grinding. Some RFR-affected persons also cite sounds including chirping and grinding in episodes that produce symptoms.

Sound derives from air-pressure waves; it is distinct from radiation from electromagnetic waves. Yet just such perceived “sounds” arise nonetheless with RFR, via the “Frey effect”, also called “microwave hearing” or “RF hearing.” As reported in *Bioelectromagnetics* (Elder and Chou 2003), this occurs with RFR in the range of 2.4-10,000 MHz, and can resemble sounds “such as a click, buzz, hiss, knock, or chirp” just as diplomats report. Perceiving RF-induced “sounds” depends on good high frequency hearing -- and low ambient noise. This fits reports that only some diplomats heard any sound – and usually at night. The primary pitch heard relates not to the frequency of the radiation, but to head dimensions: This accounts for different sounds heard by different diplomats, even assuming the radiation was the same. Induction of “sound” – and also of injury -- is not governed by the *average* radiation level, but the energy in a single pulse. (Analogously, if a jackhammer hit at 2 minute intervals, the low time-averaged pressure would not explain the damage produced.)

Health effects of RFR have long been known. A 1971/2 Naval report on RFR effects bore over 2300 citations (many from Russia and Eastern Europe), emphasizing effects of “non-ionizing radiation at these frequencies”. (Contrary to the prevailing mantra of stakeholding industry, radiation that is not “ionizing” also causes health effects, and not only by heating.) Entire sections of that report were devoted to insomnia, headache, fatigue, cognitive problems, and dizziness, symptoms that diplomats now report – as do RFR affected persons in many nations.

How can RFR cause such effects? Oxidative stress is a kind of damage by so-called “free radicals,” that affects structures and functions in the body; it provides a basis for the symptoms. (“Antioxidants” help defend against this injury.) In a published analysis of 100 studies examining if low-level RFR produced oxidative injury, 93 found that it did. People who experience symptoms from RFR, compared to others, were found, in a Russian-

Italian collaboration, to have higher prevalence of gene variants that confer weakened protections against free radical injury. A French study showed that persons affected by legally allowable levels of RFR consistently show low levels of a specific antioxidant (made by the body), an antioxidant that, as scores of studies have shown, is critical for defending against oxidative injury from radiation, including RFR. Not just genes, but certain exposures, including to radiation, can depress important defenses.

While scientific “skepticism” about RFR injury exists, it is of the industry-fueled stripe (think tobacco). In one published analysis of the relation of funding source to findings, the odds of significant findings of health effects in industry funded studies were *a tenth* as great as for studies funded independently (by government or charities).

In Cuba or China, causative RFR could emanate from surveillance devices, electronic weaponry, or possibly “innocent” communications sources – like those producing cognate symptoms in nondiplomats. Surveys, research studies and news reports document RFR-induced health problems in the US, Japan, Korea, Turkey, Israel, Australia, France, England, Italy, Switzerland, Austria, Holland, Sweden, Denmark, Norway (afflicting 3-time Prime Minister Gro Harlem Brundtland), Finland (affecting former Nokia Chief Technology Officer Matti Niemela) -- and Canada (where Frank Clegg -- coauthor of this OpEd -- formerly president of Microsoft Canada, now CEO of Canadians for Safe Technology -- spearheads the effort toward recognition).

Of note, the US embassy in Moscow was radiated with microwaves from 1953-1988, spawning shielding efforts by the US – and reports of health effects (e.g. Association for Diplomat Studies and Training, [adst.org/2013/09/microwaving-embassy-moscow-another-perspective/#.WeOGODtrxfjg](http://adst.org/2013/09/microwaving-embassy-moscow-another-perspective/#.WeOGODtrxfjg)).

The RFR “hypothesis” explains the facts – and makes testable predictions: Some diplomats may develop new intolerance to previously tolerated radiation sources. Some may experience heart-related symptoms, including palpitations/arrhythmia. And effective RFR shielding in homes/offices may thwart occurrence in future diplomats to Cuba, to the extent that homes/offices are the target.

Greater attention to RFR in Cuba diplomats’ plight (and that of the American government worker in China) may aid identification of causative devices and culpable actors, abet efforts to protect future personnel, and improve care for those currently suffering: Perhaps it may help to ignite awareness of the many others beset by similar problems.

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