My cataract, the death of Milton Zaret and Jon Fredrik Baksaas' retirement job

*by Einar Flydal**

A few weeks ago, my eye doctor told me I have gotten a cataract in my left eye. This presented me with some interesting threads to unravel:

The feeling that something was wrong wasn't new to me. I assumed it was caused by a fragment that struck my eye due to my somewhat careless handling of a metal grinder. No fragment could be found, so that assumption was probably wrong. My left eye no longer has clear vision, and bright light makes everything a little hazy - as you would expect from cataracts. I'll probably have eye surgery at some point – an unpleasant prospect, but these days in our part of the world, the procedure is straight forward and done in just a few minutes.

An article in the Journal of The Norwegian Medical Association[i] points to a dramatic increase in the number of people receiving cataract surgery in Norway - from barely 3 400 in 1983 to nearly 45 000 in 2003. The article points to the following reasons for this extreme increase:

- new (cheaper and faster) surgical methods,
- surgery is performed on outpatients - i.e. without hospitalization,
- low risk of complications,
- government has prioritized cataract surgery, and
- increased demand has been met by the emergence of private clinics.

Other sources point to an aging population as a major cause of the increase. I'm 66, so that could make sense also in my case, although I'm in the lower area of the age bracket. Nevertheless, I have serious doubts as to whether the causes of the increase in cataracts are well identified: Could it not also be that a larger proportion of the population is getting cataracts? And could it be that I belong to that group?

Why do I think this could be the case? Well, because of the works of the ophthalmologist Milton Zaret, who died in 2012, at age 91, leaving just a small notice in The New York Times[ii]. An obituary may be read at Microwave News.com[iii]: In the late 1950s, Zaret began studying the effects of microwave radiation on the eyes. At the time, radar was the main source of radiation, and microwave ovens were just about to arrive. Since then, the exposures have increased tremendously – approximately 5 000-fold in the industrialized countries between 1985 and 2005 alone – *indoors*[iv], and that is even prior to the real explosion of the wireless age. Zaret demonstrated that radiation induced cataracts, at significantly lower radiation levels than the current Norwegian (and e.g. American) safety standards, has a distinctive development: It originates in the lens capsule. Few other cataract varieties start there. This means that the appearance of the initial, characteristic 'cloudy lumps' in this particular area, points to EMF (electromagnetic fields) as a likely cause.

My research colleague at the Norwegian telecommunications research institute in the early 1990s, Knut Nordby, was a psychologist and an eyesight specialist, and severely visually impaired himself. At the time, he claimed that a cell phone antenna held to the eye would

cause clouding of the lens capsule. For the rest of us social scientists, that was intriguing, but well outside our field of expertise. I also remember him at one of our coffee breaks talking about the risk of injury to the eyes of toddlers who were allowed to play with their father's mobile phone. Such research was apparently known to some, but didn't really concern us social scientists; it was an issue we assumed the radio technicians would handle. In any case, nobody imagined that every young mother soon would be pushing her baby around with a mobile phone in her stroller, or that baby call systems based on the DECT-standard would emerge, with radiation levels just as powerful as cell phones, and with base stations always emitting. Today, such transmitters are willingly placed in strollers, next to the baby's head, or hung on the baby cot when popping next door or watching TV downstairs.

Zaret's findings fit well with later findings, such as cataracts discovered in calves grazing near mobile phone masts[v]. Other studies have found increased prevalence of cornea damage[vi], and increased incidences of cancer of the eyes[vii]. (See more findings among the research reports on EMF and eye-effects listed by the Swedish NGO Strålskyddsstiftelsen[viii]). Common to these findings are the exposure of radiation levels substantially lower than the safety standards currently applied in Norway.

In brochures, on their website, at public conferences as well as in courtrooms, the Norwegian Radiation Protection Agency (NRPA, as many other national RPAs) repeatedly states that there is no sufficient scientific basis for claims that microwave radiation at such low effects can damage people's health. But the findings were good enough for Milton Zaret, and they did fit the bigger picture he saw. In 1973 he stated at a US congressional hearing:

> "There is a clear, present and ever-increasing danger to the entire population of our country from exposure to the entire non-ionizing portion of the electromagnetic spectrum. The dangers cannot be overstated because most non-ionizing radiation injuries occur covertly, usually do not become manifest until after latent periods of years, and when they do become manifest, the effects are seldom recognized."

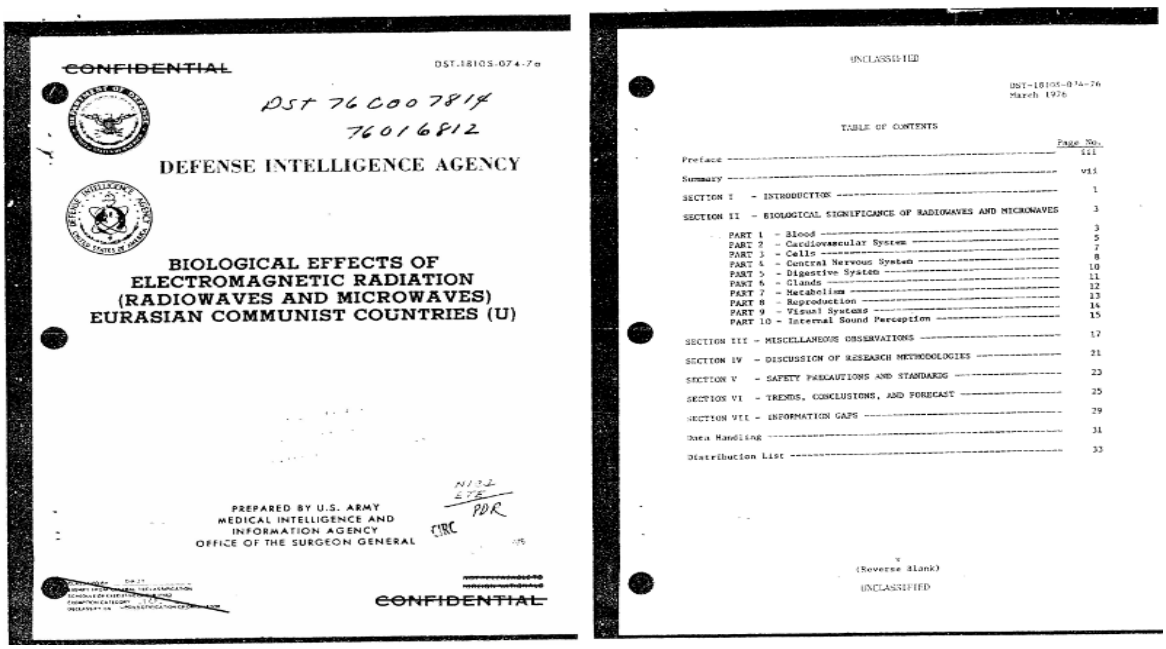
The findings were also good enough for the US military. Zaret's statements in Congress echoed what the military already knew - a fact documented by reports from a number of research projects the US military carried out or had translated at that time. The reports documented physical damage and other effects of EMF exposure above as well as below the threshold needed to create heat-effects. (Figure 1 shows two pages of an example.)

Milton Zaret lost his contracts with the Air Force, Army and Navy after he began publishing his research. A substantial effort was made to discredit him and his research findings. The justifications for such actions were both financial and strategic. An example of the military rationale can be seen in the following "executive summary" of the advisory board of a joint research program for the three defense branches as to the biological effects of electromagnetic radiation - "the Tri-Service Electro-Magnetic Radiation Bioeffects Research Program"[ix], dated 11 June 1975:

> «The principal objective of the EMR research program is to maximize personnel safety while minimizing operational constraints. In these austere times, where it is mandatory that all military organizations "do more with less", the Department of Defense cannot afford a program that would "avert all risks" on a short term basis. Rather, the program is being organized to apply a practical "level of effort" to achieve

answers to logical questions in a priority sequence. While proceeding in this manner, it is recognized that many isolated reports of so-called “low level bioeffects” will not be adressed nor, therefore, resolved in the near future. On the other hand, the program will provide the best available collective data base of EMR bioeffects to make timely and appropriate decisions in support of specific DOD systems operations. This means, in effect, that through this program each service can provide the best guidance available at any point in time to prepare and/or defend everything from environmental impact statements to detailed operating procedures concerning any of their EMF emitters.”

"Counter-research" was also initiated to discredit Milton Zaret and restore the belief that the only way detrimental health effects could be caused by microwaves, was through acute and powerful heating. His findings were sought to be refuted, both sides claiming that their scientific standpoint had not been disproven. This story, and sources, is also detailed in Zaret's obituary in Microwave News.



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DEFENSE INTELLIGENCE AGENCY

BIOLOGICAL EFFECTS OF
ELECTROMAGNETIC RADIATION
(RADIOWAVES AND MICROWAVES)
EURASIAN COMMUNIST COUNTRIES (U)

PREPARED BY U.S. ARMY
MEDICAL INTELLIGENCE AND
INFORMATION AGENCY
OFFICE OF THE SURGEON GENERAL

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Figure 1: Military report on findings in the "Eurasian Communist countries" from research on EMF and health. Classified, later declassified. The report shows findings of health effects on all body systems, caused by radio and microwave radiation, at levels both above and below the current safety limit. (downloadable at many Internet sites)

The smear campaigns succeeded, and Milton Zaret's voice was drowned out by the noise. Nonetheless, history of science has proven Zaret right, as many prominent researchers in the field have upheld: The research findings supporting him are overwhelming, and cannot be explained by the dogmas that underlie our radiation safety standards - the belief that non-ionizing radiation below standards cannot possibly have sub-thermal biological effects, and the dogma that the only proven damage that can possibly be caused by such radiation, is linked to acute heat effects. Zaret's research findings, which appear incomprehensible as well as unacceptable for the adherents of the old teachings, can be clearly and stepwise explained by new knowledge within biology and what is now called *bioelectromagnetics*:

1. Cataracts as well as host of other disorders may result from damages caused by oxidative stress to proteins, DNA, and other basic elements within cells as well as the signalling between them;
2. 2. Oxidative stress can be caused at the cellular level by excessive calcium influx in cells; and
3. 3. EMF from external sources can open the cell-membranes' calcium ion channels (VGCCs) for such influx and can also work through other mechanisms - at EMF effects way below the current Western safety limits.

These mechanisms, whether VGCC based or not, have now been thoroughly documented over the years – most recently in a 2015 research review of one hundred currently available peer-reviewed studies testing the link between EMF and oxidative stress[x]: The studies were conducted *in vitro* and *in vivo* - on cells, on plants and animals, as well as humans. Out of the hundred studies, only seven did *not* find a significant relationship in terms of oxidative stress caused by EMF – at levels considerably below the Norwegian (and most national) radiation safety limits. Those seven studies found no significant link. Thus, the 93 positive studies are the ones that matter - unless they all turn out to be the victims of incorrect measurements, sloppiness in the laboratory, poor analyses or foul play.

You, the reader, may consider by yourself the likelihood that all 93 would be wrong. The 93 experiments, separately and summarily, support the epidemiological and theoretical findings that a number of other scientists previously have made, and that prof. Martin Pall also summed up in my interview with him on my blog[xi] and at his presentation at the Oslo House of Literature, in the autumn of 2014[xii]. These findings are pretty much as close as one get to conclusive evidence within complex empirical sciences.

The institutions that set safety standards in the Western hemisphere – the ICNIRP foundation, the WHO's department “The EMF project”, and the various national radiation protection agencies - have not yet fully taken these new realities into account: Their understanding of health effects and science were adapted from the operational needs of the military during the Cold War, but has now fallen apart as it cannot explain the new research findings, while newer insights in biomedicine provide us with plausible explanations. It belongs to the nature of paradigm shifts that these institutions have major problems digesting this new reality. The NRPA’s cliché loaded defense of the current radiation safety standards is part of this picture, as is the Health Ministry’s clambering to the NRPA with the common wording: "Overall, there is currently no scientific basis” etc... This statement appears to be once learned by heart, and the more used, the more these authorities lock themselves into a position of defending the undefensible.
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It seems I will need to visit my eye doctor again to ask where my cataract first made its appearance: In the lens capsule, or in the lens itself? Whichever it was, the surgery will be the same, but my view of things may not be.

Moreover, I wonder about the following:

US military and American ICT business have, from what it seems to me, led a far more aggressive line defending their microwave based core technology than the Europeans traditionally have, including documented scientific manipulation, deceit and outright fraud.[xiii]

My defense-community friends in Norway do not believe that anyone in this country would knowingly and deceitfully protect a technology that research since long had shown does substantially increase the risk of serious illnesses. Neither have I personally seen any indications of such underhandedness amongst collegues in the ICT industry that I worked for for so long. I suppose they - like me - simply didn't know any better, as we in our work took the established view on risk, "the thermal paradigm" (i.e. no hurt unless heating), for granted, and did not see through the smokescreens. The available knowledge of the time, within those circles, stated that such damage could not arise from non-ionizing radiation unless it was powerful enough to cause acute heat effects, and you got close enough. Thus, preventing personnel from coming too close to RF towers or in front of radars was considered sufficient to protect against such immediate problems.

My old boss at one of the world's leading mobile phone companies, Telenor, mr. Jon Fredrik Baksaas, has just retired from the CEO job he held for 14 years. But he will continue to serve as the chairman of GSMA - previously the international association of the GSM industry, now in fact the lead association of the global mobile industry. Baksaas left behind a long career as head of one of the globe's leading telecommunication companies, a company where social corporate responsibility has been a main pillar, and where the social benefits of mobile communications has since its inception been an important source of motivation - for Baksaas as well as for myself and many others. However, now it has been excessively documented, and evident, once we accept that the thermal paradigm has fallen, that this industry's core technology was accompanied by a substantial risk-increase in general morbidity – in principle already since the days of Marconi, but only since the last few decades of significant relevance to us all.[xiv] This applies to the core technology as well as to the customers, but also to this business' employees. However, surveys looking for EMF related injuries or illness among office workers would normally conclude with "no findings", as they would find radiation levels to be below standard limits, and various sufferings would appear spread and unrelated. So, Zaret was right here as well, when he stated that suspicion of EMF being the cause would probably not arise, even if a higher rate were found, - of, say, cataracts. With wrong maps, you don't get the terrain right.

I dare hope that Jon Fredrik Baksaas will approach this issue in his retirement job. He has the ability to listen, the ability to decide, and the ability to take action. And he will quickly understand the societal implications. He will also find a number of reasons for taking on the issue by turning to ISO 26000, the international guidance standard for organizational social responsibility (SR): As a senior adviser in the corporate staff, I headed the Norwegian contribution to its development - at Telenor's expense. Now mr. Baksaas may profit from that investment, using this global standard as a lever - whether for disruptive change or a stepwise, more precautionary approach.

So what matters should Fredrik, as he is most informally adressed within Telenor, see as prime concerns?

- ICNIRP, the European foundation behind the recommendations as to safety standards for non-ionizing radiation, setting the stage in Europe and with the WHO, should be given a new mandate, recognizing the evidence from biomedical research as to increased health risks from EMF, rather than fighting against even the strongest evidence by declaring it "not proven". (Strictly speaking, nothing is ever "proven" in

empirical sciences.) GSMA has the power to achieve this change, and to show that the industry aims for a sustainable future.

- WHO's subdivision "The EMF project" constitutes an important and orderly international effort to establish limits for public radiation protection, but it works on the basis of the ICNIRP recommendations and in close cooperation with ICNIRP. These ties need to be loosened. As an important contributor to the WHO's work on EMFs, GSMA has the power to achieve this.
- The GSMA sponsors, i.e. the major telecom companies and equipment manufacturers, need education. They have to build in-house competence on the collateral damage on health from their business. They have chosen, for reasons that no longer are legitimate, just to adhere to the lax radiation level standards proposed by ICNIRP, with no precautions added to account for risks for long term effects. The GSMA sponsors have the power to change this devastating practice, and should do so if they take their social responsibilities seriously.
- Research for alternative technologies compatible with known human sensitivity to EMFs, should be encouraged. Research done at present to reduce EMF *within* the present ICNIRP/WHO "termally based" world view[xv], is just a waste of time and money if judged with the knowledge from Milton Zaret and his collegues within bioelectromagnetics in mind. There is room for far tougher grips. GSMA has the power to create a change, and a moral obligation to take lead in this needed transition.

Fredrik, this challenge is at least as large, and more important than any challenge you have faced in your career until now! Ironically, the tremendous success of the mobile industry will make the task much harder. But for your achievements in this domain, you will be remembered for much longer!

Einar Flydal, 16. August 2015

PS. After I published the Norwegian version of this blogpost, two friends, both ICT people in their early fifties, very sceptic to my involvement in "this radiation maze" and both responsible of operations of WiFi school networks in entire their cities, adressed me independently to tell that they were already treated for cataracts... Just an incidence? Shurely, if you use the wrong map.

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Footnotes: See next page

[i] In Aasved, H.: Kataraktoperasjoner og ventetider i Norge, Tidsskrift for Den norske legeforening 2008; 128:466-7

[ii] http://www.legacy.com/obituaries/nytimes/obituary.aspx?pid=157878136 (read 7th August 2015)

[iii] http://www.microwavenews.com/news-center/milton-zaret-early-prophet-microwave-hazards-dies-91, read 01.08.2015. Information on Milton Zaret and quotations is mainly from here. There are numerous references to Zaret in Paul Bordeur's book referenced in a footnote below.

[iv] Maes, W.: Stress Caused by Electromagnetic Fields and Radiation. Neubeuern, 2005, oppgitt i Yakymenko, I & al.: Oxidative mechanisms of biological activity of low-intensity radiofrequency radiation, Electromagn Biol Med, Early Online: 1–16, 2015

[v] Hässig M & al.: Prevalence of nuclear cataract in Swiss veal calves and its possible association with mobile telephone antenna base stations, Schweiz Arch Tierheilkd. 2009 Oct;151(10):471-8

[vi] Akar A: Effects of low level electromagnetic field exposure at 2.45 GHz on rat cornea, Int J Radiat Biol. 2013 Apr; 89(4):243-9

[vii] Behrens T &al: Occupational exposure to electromagnetic fields and sex-differential risk of uveal melanoma, Occup Environ Med , online publication: 25. Aug. 2010

[viii] http://www.stralskyddsstiftelsen.se/risker/ogon/

[ix] Retrieved from Brodeur, Paul: The Zapping of America, 1977, ss. 230-231. Paul Brodeur is an investigative journalist. He did extensive work on the issue of asbestos and health. Health from microwaves was his next major focus.

[x] Yakymenko, I & al.: Oxidative mechanisms of biological activity of low-intensity radiofrequency radiation, Electromagn Biol Med, Early Online: 1–16, 2015, http://informahealthcare.com/doi/abs/10.3109/15368378.2015.1043557

[xi] http://einarflydal.com/2014/10/05/prof-martin-pall-vi-vet-det-na-elektrotaka-skaper-sykdom/, Norwegian only.

[xii] See video at https://youtu.be/_Up8bqiJN2k, English sound, Norwegian text.

[xiii] See, e.g., this scam story: Carlo, G: The Latest Reassurance Ruse About Cell Phones and Cancer, J. Aust. Coll. Nutr. & Env. Med. Vol. 26 No.1 (April 2007) page 1-4. PDF version at http://www.next-up.org/pdf/DanishStudyDrGeorgeCarlo.pdf (visited 7. August 2015)

[xiv] We may consider this the price we unwittingly paid for a technological development on one specific platform – rather than developing communications on a different one. Such a view was forwarded in the German sociologist Ulrich Beck's writings on how modern society repeatedly locks into areas where it cannot know the consequences of its own actions: Modern society storms towards the unknown without any kind of precaution. And then tries to deal with the problems as they arise. After all, it is impossible to anticipate them anyway. The precautionary principle is a countermeasure.

[xv] E.g., the Lexnet project (Low EMF Exposure Future Networks), http://www.lexnet-project.eu/.