

SCIENCE - really?

Health Risk of Mobile Phone Radiation, and not only that: What happened to its scientific recognition?

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What scientists have already proven is not necessarily scientifically proven. It took me a long time to understand this.

After having reviewed research results from around the world, the British radiation expert Dr. Neil Cherry found the "evidence simply overwhelming." I alone know more than 100 (there are many more) scientific studies of universities, governments, agencies, institutes and experts. Research in this field has been ongoing for years, millions have been invested, innumerable data have been collected, and the results are alarming: Yes, wireless radiation is hazardous, and mobile phone radiation even more so. And then the representatives of industry, ministries, agencies, the Research Association for Radio Applications come along and claim: "None of it has been properly proven, nothing is conclusive." And the likes of us think: Well, it's all bullshit, too bad, so it's not true after all. Those from the Radiation Protection Commission go even one better: "Everything is safe, this is just fear-mongering." And the German Environmental Minister Gabriel was obviously pleased to announce the conclusion of the recently completed German Mobile Telecommunication Research Programme: "There is no reason to lower the exposure limits." It looks as if not only industry but also lawmakers including radiation protection officials wish to protect the radiation from humans and not us humans from the radiation.

Independent scientists often use different approaches but come to the same results: Dr. von Klitzing finds unusual **EEG effects** triggered by mobile phone radiation exposures from handsets and their base stations, just like the Federal Institute for Occupational Safety and Health in Berlin did ("No doubt about it!") as well as Prof. Ross Adey from the renowned Loma Linda Institute in California, Motorola engineer Robert Kane, the Pro Science Institute on behalf of Telekom including another ten universities from Moscow over Munich and Zurich to Louisiana.

As a side-effect of mobile phonitis, world-class scientists from Lund in Sweden observe the **opening of the blood brain barrier** - and that several times. Teams from the universities in Cologne and Münster confirm these findings, as do scientists from all over Europe and Japan. Already in the 1970s, US-American scientists had delineated "significant leaks of the blood brain barrier" when under the influence of RF radiation. After having sifted through international study results, the brain scientist Dr. Lange fears: "Twenty years down the road, we will be a nation of dementia patients."

Prof. Varga exposes chicken eggs to RF radiation. The result: Almost all **chickens are dead** and only a few crippled. A number of scientists, the Russian commission on radiation protection, German Telekom and private chicken farmers, all of them arrive at the same results: Such microwaves - as always far below the exposure limits - damage and kill chicken embryos.

The WHO representative Dr. Repacholi finds **cancer** in mice, Prof. Löscher in rats, other researchers in cats and monkeys, in each case caused by mobile phone radiation. Experts from all over the world issue warnings, including the German Cancer Research Institute. The EU parliament worries: "In the face of so many scientific findings, the cancer risk or various other biological effects cannot be simply dismissed."

Reports of **DNA breaks, leukemia** and **brain tumors** come from universities in the US, Russia, China, Israel, Italy, Great Britain and Germany, from Prof. Adlkofer and the researchers of the REFLEX project, the Charité in Berlin, the Ecolog Institute, the European Environment Agency, the EU parliament, even from Nokia itself.

Less than a one-minute mobile phone call is sufficient, and the **red blood cells**, which usually float freely and separately in blood, start to **clump together**, forming rouleaux as if attracted by magnetism. Dr. Petersohn observes it, and other environmental medical doctors as well, they are worried. Students from the high school in Spaichingen, Germany, have been awarded the first prize of 'Youth Researches' for their presentation of microscope evidence of this rouleaux formation.

Mobile phone radiation disrupts, irritates, damages and kills **nerve cells**, a dozen universities from Frankfurt, Wales, Bristol, Warwick, Verona, Florence, Lund and others say so. Similar research results also come from the US, Australia, New Zealand, India and Japan.

Fertility in adults and adolescents is at risk when the mobile phone is in stand-by and carried in one's pants pockets. Medical researchers, biologists and universities from four continents demonstrate: Sperm motility is reduced. The electrosmog expert and WHO consultant Prof. Huai Chiang from China shakes her head: "In the past, we applied microwaves for birth control. Today we make phone calls with it. Go figure."

Children should **not use mobile phones**, adolescents only in emergencies, so says the Federal Ministry of Environment in Germany, the British health minister, the Academy of Children's Health, the Heidelberg Cancer Science Center, the Russian commission on radiation protection, the Competence Initiative, medical doctors and neurologists. Pediatricians issue warnings. Schools and the teacher association Education and Nurturing demand a ban on the use of mobile phones, the Vienna Medical Association too. When Prof. Sir William Stewart chaired an international commission of scientists, he came in this to date worldwide largest mobile phone study to the conclusion: "Whoever encourages 16-year olds to purchase a mobile phone acts irresponsibly."

The **Radiation Protection Commission** of the German government knows: "There is a wealth of findings that implicate health impacts." The **Federal Medical Association** of Germany calls on the Federal Office for Radiation Protection to substantially lower the exceedingly high exposure limits. While reviewing 200 scientific studies, the **European Environment Agency** EEA, which is the environmental expert agency of the EU, comes to the conclusion: "Mobile phone radiation is dangerous!"

It's all a **false alarm**? No, the studies are competent, conclusive, powerful, scientific, factual and most certainly correct. The chicks are now dead as a dodo, the peaks in the EEG are obvious as are the dark spots in the brain, the leaks in the blood brain barrier, the breaks in the DNA, the irritation of the nerves. Red blood cells look like frog spawn, ears start to ring, the blood pressure goes up, and the level of concentration goes down. These are the facts. The researchers who made those and many other findings are competent, they are well-known and renowned the world over, coming from prestigious universities, institutes, laboratories, agencies, from the WHO, even from the mobile phone service providers themselves. False alarm? No way. Where is the catch?

The legally binding regulation claims: "We set exposure limits based on **proven** effects. It is our goal to protect from **scientifically proven** risks." But they are not doing it, or are they? There is so much evidence all over the place, but when exposure limits are set, you won't find any of it. Yet somehow these traditional scientists - from their point of view - are right, those conservative law enforcers who have made the **thermal** concept or heat the sole basis for all of their theoretical and premature calculations and evaluations are correct. Why? Because presently the conversion of electromagnetic radiation into heat is still the only biological effect mechanism that goes globally uncontested and is recognized as absolutely scientifically proven by everybody including the industry. Whether we like it or not, whether it is justified or not, outdated or not, simple-minded or not, cunning or not, political or not, intentional or not, this is what it is.

Cancer, leukemia, brain tumors, leaky blood brain barriers, EEG peaks, neuronal stimuli,

headaches, sleep disorders, and other troubles have next to nothing to do with thermal aspects. These are about other **nonthermal effect mechanisms**, consequences that cannot be explained with the simple formation of heat. In the case of mobile phone radiation, heat is not the issue; the respective radiation levels are too weak. In order to heat the human body or any of its parts, very high radiation levels are required similar to those in a microwave oven and which are not found in the everyday environment of mobile phones. Yet the thermal concept is the basis of exposure limits. It is difficult to penetrate the ancient walls of thermal considerations with the many existing but not thermally explicable biological effects and problems. This questionable thermal hypothesis is the science the exposure limits are based on. If heat scares them stupid, then why are hot-water bottles, hair-driers, saunas and sunbathing not banned? These devices can do a much more thorough job.

Thus the proponents of all things thermal argue as hard as they can. Radiation protection official Prof. Bernhardt: "As far as wireless radiation is concerned, we only understand thermal effects beyond doubt, and this is the only foundation we can base exposure limits on." Radiation protection official Prof. Silny: "Thermal effects are irrefutably proven, which is why they are the only ones considered to be relevant to exposure limits." And the others who know that the effect of electrosmog cannot be reduced only to thermal aspects take objection to it. Dr. Becker: "Mobile phone radiation shows significant effects well below the thermal threshold." Dr. Cherry: "It is scientifically untenable that there should be thermal effects only." Prof. Popp: "We must finally let go of this conventional notion that all electromagnetic fields could do was cause thermal effects." Dr. von Klitzing: "The thermal hypothesis is wrong." The conclusion of 16 international scientists at Vienna: "Nonthermal biological effects are considered to be scientifically validated." The Federal Institute for Occupational Safety and Health of Germany: "Mobile phone radiation that does not trigger any thermal effects can be biologically active." That should be sufficient, but it's not. Why?

What is required for the distinction "**scientifically validated, proven...**"? Some clear-cut criteria must exist. Where is the topmost authority on science, the gray eminence that is above reproach and decrees: "This is considered to be correct or objective at this point in time, and we must lower the exposure limits now." I made many phone calls, I asked scientists from one university after another. They themselves were not quite sure. "Well, as long as there is still the slightest doubt by someone..." This "someone" usually translates into "industry" and those that rely on it, including the law-abiding academics or politicians, authorities, medical doctors, and decision-makers that hold on to that old thermal concept.

Here are the two essential criteria for the traditional, strong and absolute distinction of "scientifically demonstrated, proven, validated, and substantiated":

- Several **independent investigations** done under the **same conditions** but separate from each other
- A recognized **conclusive effect mechanism**

Only that is considered to be proven which can be "replicated intersubjectively" and can be "explained in a linear-causal manner." This means: It can repeatedly be reproduced under the exact same conditions by different universities, institutes or experts, and at the same time adhering to an absolutely linear cause-effect relationship. It's this simple - or so complicated.

When I run up against a brick wall all of ten times and develop a blue bruise each single time, this would be an accurately observed and easily reproducible fact. If I am concerned about it, trying to tell my story or even publish it because I wish to stop this type of wall running, such action will be regarded as premature and unscientific, even as downright fear-mongering. And that because there were simply not enough others before or after me who would have done the same thing, thus replication did not take place. Or if it did, the bruising in other people, age groups, skin colors, and with different momenta did not turn quite as blue but rather a shade of green. Anyhow, something is still missing, that is the conclusive explanation of the effect: Why does the bruise develop? And why in this way and no other, why this color, pain, dizziness? What is going

on here? Without clear answers to these questions (and a lot more), it will remain scientifically untenable - by a long shot - despite the bruise, despite the pain and dizziness.

Animal experiments cannot readily be extrapolated to humans. When some spots form in the brains of rats and cancer develops in mice, this may bode ill for humans, but it is a long way from being binding evidence for the same effect in humans. What was the reaction of a senior industry official to the news that latest studies again had demonstrated cancer in mice when exposed to mobile phone radiation? "It follows that mice had better not use mobile phones."

Epidemiological studies with humans often are not accepted as sufficiently powerful by industry and selected agencies. Well, it is a concern when members of the RF exposed population group develop leukemia, blood pressure or tinnitus more frequently when compared to those without exposures. But does this constitute conclusive evidence?

A **biological effect** does not necessarily have to be negative or inevitably translate into a health risk. Our body is endowed with an immune system and sophisticated repair mechanisms. An odd, steep peak in the EEG? A brain opening its barriers? Nerves getting nervous? Only doomsayers would think of headaches or brain tumors in such an instant.

And then there is **causality**. No recognition without a plausible cause-effect mechanism, e.g. from a first stimulus and a cell's reaction to it via the subsequent registering of an imbalance in a cell and the resulting functional cell damage right up to the manifest and clearly diagnosable disease. And this must be done detail by detail, step by step, and the cause of each single one must be confirmed. That can take some time.

As of yet, we do not have a generally accepted **effects model** for all those nonthermal effects and the damage they can inflict, which demonstrably are caused by RF radiation. Why and how does the DNA break? Why and how does the brain respond? By means of field strength or frequency, modulation, pulses, exposure dose, exposure duration or do all of these variables interact - including even other types of fields and risk factors? Maybe by means of biochemical or enzymatic chain processes? We know that the blood brain barrier, the EEG, the blood cells and others respond, no doubt about it. But often we do not know exactly why, and if we do so, the radiation protection officials as well as industry representatives and politicians refuse to believe it. Some, however, can see mechanisms: The independent scientists of the Competence Initiative present plausible cause-effect relationships for e.g. DNA and cell damage. Dr. Warnke reports about the imbalance between free radicals and antioxidants, about the oxidative and nitrosative stress. This would explain a wide variety of the impacts. Medical doctors supply reasonable arguments. But even that is not to everybody's taste or satisfaction, certainly not to those close to industry. Therefore, it is only this pending effects model, which some find elusive or simply ignore, this ultimate understanding of complex processes and all their interactions, for which there has been no scientific recognition.

What is more, others should be able to **replicate** the effect under the exact **same conditions**. Optimal reproducibility is sought after. How should that work? Thermal settings are rather simple, warm or cold, a thermometer will do. But what about biological processes? In live individuals, there are never two with the exact same conditions or responses. Rat is not hamster, cat not monkey, isolated cells not cell groups, in vivo not in vitro, Rio not Cologne, today not yesterday, and no two humans are exactly alike. Moreover, the **replication** of a study is not appealing and rather unoriginal, hardly any renowned scientist can work up any enthusiasm for it. With a replication study, you would gain no laurels, win no noble prize. It doesn't pay well; it will hardly make the press.

The **press**. Nothing works without the media. The benchmark for scientific respectability is measured in how frequently and what papers are published in which international journals. Professional journals have their very own selection criteria. The mouse study by the WHO representative Dr. Repacholi, who was the first one to find cancer from mobile phone radiation exposures, was rejected by such renowned science journals as 'nature' and 'science', supposedly for fear of causing a public panic. Instead, forged results were allowed into professional journals. Daily media such as radio, TV, tabloids and newspapers are appealing. It depends on how frequently, convincingly and powerfully a

problem is addressed or hushed up, doesn't it. You only have to keep repeating something often enough, and slowly but surely it will turn into the truth. You only have to suppress a fact for long enough, and the critical questions won't be voiced anymore.

Besides, anything and everything takes **time**. Digital mobile phone use is new, just a little over ten years. How can I expect conclusive evidence for cancer when the latency period of cancer is 20, 25 or 30 years? Decades elapse between the initial trigger and the detection of cancer. Considering the lightning speed with which mobile phone services are expanding in such a short time, how could one possibly expect to already have scientifically verified research results by the dozens - and then even have them all explained by the favored cause-effect relationship?

And then there is money. It's in short supply. Most of the **research grants** are funded by **industry**. The latter has almost always a substantial say in the matter and no interest in financing expensive results that may cause damage to them. And if it happens anyhow, the industry exercises utmost restraint or even abstinence as regards publishing them. Repacholi's mouse study had been withheld by its sponsors for two years - and that at the height of the mobile phone rollout with the largest numbers of mobile phone purchases. The study had cost 1.1 million dollar, 90% of which had been paid by the mobile phone corporation. Today, we are awaiting the results of the large-scale Interphone study which are a suspiciously long time in coming. Researchers from Bern University took a real close look at 59 studies and concluded towards the end of 2006: "Industry-sponsored researchers are far less likely to report biological problems with regard to mobile phone radiation than those independent of industry. Control of the funding sponsors should be ruled out." Dr. von Klitzing points out: "Researchers depend on research grants, and the grantee tells them what to investigate. After one year, an interim report is provided. If it doesn't meet the expectations, the money is gone. It should be the other way, as in the old days: First, there is an interest, then the researcher goes out and seeks a sponsor. Independent research like that hardly exists anymore, and often it appears to be undesirable." Dr. von Klitzing, on studies that did not produce the results hoped for by the sponsors: "Such results are often hushed up. In the case of the cow study from Bavaria, the operating procedure of the politicians in charge was rather alarming: Citizens no longer have access to the original paper. The content of the original study report is completely different from the abridged version published by the Bavarian State Ministry of the Environment. The contributing scientists have been deliberately misquoted. Scientifically speaking, this type of bending the results by the authorities is unacceptable."

Politicians are in no rush to push ahead research and uncover the truth. After all, our government alone collected all of 50 billion euros from industry for granting the new UMTS licenses, the largest wad of dough changing hands in one single piece after World War Two, not mentioning all the other sources of income, taxes and jobs associated with the installation and maintenance of the mobile phone networks. 50 billion just for the licenses. And new licenses are continually auctioned off in Germany, and all over the world where there is money rolling in. Next year, it will again happen in our country with a huge UMTS auction. It is simply not possible for the powers that be to make, right now, life more difficult for industry.

Economic growth comes before **public health**. Whenever the marketing of technologies worth billions is involved, risks are accepted. This can be found in the information leaflet under - let's say - side-effects. The same thing has happened with many other risk factors whose hazards became apparent only after years, decades and after thousands of people had gotten sick or even died. Why should it be different with electrosmog? In fact, for how long and in which direction is the economy supposed to grow? And at what cost? In the course of chemistry's progress over the past decades, industry introduced with political backing more than 100 000 single substances and over one million mixtures. Every year another 5000 substances are added about whose biological effects we know next to nothing. Yet this and many other activities are perfectly legal until the time that damage to human health becomes obvious, long overdue research is started, and conclusive evidence becomes available. Until such a time, one must have patience and would be well advised to protect oneself.

Thus, until the cows come home, anything can be dismissed as unscientific - even the

risk of smoking. Dramatic warnings can be found on any package. Strictly scientifically speaking, for example, it is not totally clear yet that there is a causal relationship between smoking and cancer. Lots of money, billions were invested. Lots of research was done for decades. Some statistics even speak against it. How, for example, can it be explained that the Balkan countries with their high percentage of smokers do not head the cancer statistics list but are found at the lower end of it? How come that industry and science make claims about the toxic pesticide permethrin being tightly bound by the fibers in the carpets treated with it, and therefore being safe, when building biology environmental consultants find alarming concentrations in indoor air and house dust? How come that amalgam is allowed in teeth but considered toxic waste after its removal? How come that compact fluorescent lamps are supposed to be an ecological choice when they are also a toxic waste product because of their chemical make-up and mercury content? Or is this similar to the statement that says mold would be dangerous only for those with a weak immune system? When we find molds such as aspergillus or stachybotrys in a house after moisture damage, masses of yeasts in kitchen gadgets, or tons of bacteria in water filters, then even the fittest will be in danger. Who could possibly explain why - long before mobile phone services were introduced - politicians, industry, and the Radiation Protection Commission had known and even published that "cells are affected and other biological problems may occur", and in spite of all that, an uninformed humanity was supposed to put up with this technology? Where is science? It squanders tax dollars only to prove that some hazard cannot cause any damage?

There are studies that were unable to confirm demonstrated critical effects because they could not find anything. These are the ones that receive the highest praises by politicians and industry representatives and are regarded as the **counterevidence**. When an effect could be demonstrated, this would be more credible in my book than if nothing could be found. Anybody can find nothing. When I hide Easter eggs and Peter finds them but Fred doesn't, who is right? I am not aware of a single study that would confirm the safety of mobile phone radiation and that even in passing would have been called into question by representatives of industry, politics or science. Only those studies that discover a risk and bring up painful subjects are scrutinized with a skeptical eye, found fault with, and declared untenable. Prof. Varga was reproached for having produced studies that were "not neat enough." Dr. von Klitzing and others who came up with inconvenient results were accused of the same. Whether the accusations are justified or not, what counts is this: The chicks are dead and the EEG peaks are steep because of mobile phone radiation well below all exposure limits.

When it's difficult to garner **evidence**, the term **indication** is favored because that which is not permitted is forbidden. But when several similar indications of different institutes from various countries start to accumulate over the years, then the noose is very slowly tightening. And then comes the time when it is conceded that a little more protection is warranted, a first cautious conclusion is drawn indicating that "in view of the many indications" **precautionary aspects** should, might, may now be considered... With regard to electrosmog, the federal office confirms "many indications" and the Radiation Protection Commission "a wealth of indications". It is the intention of the Maastricht agreement that measures should be taken "when adequate findings are available, but not necessarily 100 percent proof". The United Nation's resolution demands: Act immediately "if consequences are suspected even though there is not yet evidence". According to the UN, scientific uncertainty should "not be used to delay precautionary action". Yet, it is delayed. We have more than enough evidence in the case of electrosmog or electromagnetic pollution. Where is the action? Officials like to talk about precaution, but a serious act of precaution is not to be found anywhere.

Instead, one waits for the umpteenth scientific study for confirmation and the conclusive effects model. The radiation protection office: "Many of the research results have not been independently confirmed, we are especially lacking a conclusive effect mechanism." Prof. Alexander Lerchl, radiation protection official and industry-funded researcher, says in the news magazine 'Spiegel': "There simply is no conceivable effect mechanism." Gerd Friedrich, the spokesperson of the Research Association for Radio Applications: "We know of no robust effects that would repeatedly occur in the same manner, nor do we know of any effects models." Thus the premature conclusion: "There is no such thing as a risk." Here you go, not even conceivable, not even indications? That goes

too far. The research world is full of findings indicating a risk. The Siemens employee Dr. Uwe Kullnik who is unable to suspect "any nonthermal effects" and calls anybody with a different opinion a "professional pessimist" has also gone too far. The ex-chief of the Federal Office for Radiation Protection Prof. Jürgen Bernhardt, member of all commissions on radiation protection and jointly responsible for the exposure limits, says in the news magazine 'Focus': "I consider the exposure limits to be sufficient. Though we suspect electromagnetic fields to be a cause for cancer, we do not know the biological mechanism." Cancer is to be expected, but why and how it develops leaves mostly question marks on the faces of the smart. And this is the only reason why; let scientific logic take its course. You remember: no recognition.

An example from Naila, a town in Upper Franconia, will illustrate this point most clearly. It was here where, after ten years of studying 1000 patients, eight physicians had observed that those who lived closer than 400 meters to and longer than five years at a mobile phone base station suffered 3.4 times more often from cancer. The physicians' response: "Dramatic!" The Federal Office for Radiation Protection: "We doubt that mobile phone radiation can actually cause cancer." Why, you may ask? Once again: "There is not yet a plausible explanation of an effect mechanism." That is good enough for them. No trace of precaution. Prof. Bernhardt on cable TV 3sat: "I dislike precaution if it is not based on solid science." Hold it, now it starts all over again.

Now it goes out on a limb, this self-appointed, so-called established science, which pronounces itself the supreme authority and knows the government is behind it, criticizing others who have something to show for themselves and they themselves having very little to counter. As long as the absolute evidence whose criteria lack practical relevance is lacking, where is the absolute **exclusion** of a risk? Where is the **basic research** prior to the introduction of new technologies? That would be precaution! If there was risk exclusion and research in advance, we would not need any research activities, after the fact, when things have gone wrong.

Instead, officials assume that mobile phone radiation is harmless and that the exposure limits are safe. Ever so conveniently, they even include in their untenable assumption the hotly debated and so vehemently contested **nonthermal effects**, from headaches to sleep disturbances through cancer. They shamelessly claim that the exposure limits would protect people even from these biological impacts, which cannot be explained by the generation of heat. How come? The exposure limits were calculated by following exclusively the physical laws of heat generation during electromagnetic radiation exposure, stubbornly and strictly mathematical, absolutely theoretical, nothing else was considered, this alone is accepted to be science based. In face of so many health problems without any thermal involvement, they quickly leap at and rely on the alleged lack of solid, multiply replicated, causally explicable research results - which is why they are a long way from calling for action. This is regarded as being scientifically correct. When something is in its early stages and not yet enough is known, the phrase "according to the current state of knowledge" is favored in arguments, no matter how pathetic this state actually is. And in the same breath, messages of safety are pronounced where there is no basis for them.

Where are the **long-term studies**? Without long-term research based on real life, it is impossible to draw any scientific conclusions. Ten minutes in a laboratory are not the same as ten years at home, and day is not the same as night. Prof. Bernhardt: "We lack long-term studies." When they are lacking, how come that premature conclusions are drawn and exposure limits set? According to Kullnik, no long-term effects are to be expected, we have had studies on RF radiation for 60 years. He, however, conceals the fact that the latest development of mobile phone technology operates with new types of microwaves whose pulse-modulations and ultrabroad frequency bands have never ever existed in this form before and, biologically speaking, need to be evaluated quite differently. The physicians from Naila provided long-term studies. Citizen groups too, deeply committed and at their own expense. Other physicians and building biology environmental consultants too. Hundreds, nearly thousands who had their blood tested before and after the installation of a mobile phone station found worrisome changes. The federal office replies with criticism instead of gratitude, demanding a more scientific approach. The Environmental Minister Gabriel concludes from the German Mobile Tele-

communication Research Programme that there is "no cancer risk". Research chair Prof. Weiss from the Federal Office for Radiation Protection admits in the ARD news: "We know next to nothing about long-term effects." If we don't know, how then can a risk of cancer be ruled out?

What else is known about **interactions** with other risk factors? Experimental laboratories are not the same as living spaces. In a living space, however, such factors as electric and magnetic fields, ELF and RF, pulsed and nonpulsed, indoor air, toxic and microbiological... occur in a diverse mixture, in a bed too. In math $1+1=2$, in biology it can be $1+1=20$. Asbestos is nasty, smoking too; both together do not double the risk but increase it exponentially. Something similar also applies to electromagnetic pollution plus amalgam, electromagnetic pollution plus fungi, electromagnetic pollution plus cancer. Dr. Scheingraber asks: "Can you cite only one single scientific paper that simulates a real life situation?" No, they don't.

Science makes it clear: With regard to new technologies, it first starts out with an **assumption of harmlessness**. Only if, after (!) the introduction of the technology, "clearly suspicious indications of harmful impacts" surface, will an investigation follow then. Science and assumption, the two are supposed to go together? This is pure speculation, naivety, gambling. Where did the ever so high standard of the scientific method go? Almost anything new is allowed onto the market, new technologies, new chemical mixtures... Get out of the way, here comes the assumption of harmlessness. Research will be done later when things go awry. Once again: First the profit, then humans and nature serve as guinea pigs. As early as 1984, the utility giant RWE admits: "The scientific debate about the accompanying symptoms of our technical civilization often only gets going when damage has already occurred and it is too late for precautionary action." During the implementation of the UMTS network, the radiation protection office confirms - will wonders never cease: "It is impossible to estimate the risks at this time because UMTS transmission has not even started yet." The EU on mobile phone radiation: "If a new pharmaceutical drug or food item had been met with the same lack of consensus and the same level of strong concerns, it would never have been approved."

Let's get back to **asbestos**. From first findings of a cancer risk around 1900 until its ban, 90 years would pass. By then the profit had been made, no more need for this scandalous material. This cost one million people their life worldwide. Today, 100 000 people continue to die annually from cancer owing to asbestos, and this grim statistic is going to increase because the fibers take decades to take effect. The name of the disease makes history: asbestosis. The European Environment Agency notes in fall 2007 that the mobile phone radiation issue shows parallels with the danger, politics and history of asbestos, PCB or nicotine. Let's hope that there won't be any mobilosis some day. Alarming examples can also be found with wood preservatives, insecticides, heavy metals, etc. Let's hope that the assumption of harmlessness may be justified regarding genetic engineering, nanotechnology, infrasound, the soon-to-be-released terawaves, the compact fluorescent lamps moving in with us, etc. In the case of CO₂ and the global climate disaster, dying forests, Chernobyl or ELF magnetic fields, it wasn't justified.

Let's recall the **magnetic fields** emitted by the electric current from e.g. high-tension power lines, appliances, transformers, etc. After having reviewed the international literature, the WHO points out in June 2001 that this type of electromagnetic pollution from the field strength of 300 nanotesla represents a "possible cancer risk for humans." This assessment applies to an exposure level that is 300 times lower than the exposure limit of 100 000 nT. It took over 30 years from the initial findings of a cancer risk to a first official statement. What's the use: The 300 times higher exposure limit remains in place. Why? The Radiation Protection Commission explains: "Since there is still no known effect mechanism for these type of low-intensity exposure levels." And again: Just because it is unknown why the cancer develops - even though it is known that it does develop - the general public is supposed to put up with the obvious cancer risk. The most comprehensive analysis of the existing body of research comes from the US environment agency EPA. Conclusion: "Electromagnetic fields may cause cancer." Demand: 200 nT. The exposure limit stays at 100 000 nT. Like wireless radiation, it's about tumors, childhood leukemia, sick and dead people. It's about everyday exposures that affect millions. Prof. Hans Schäfer, formerly with the radiation protection office and jointly responsible

for exposure limits, is satisfied with the knowledge that "the fields cannot be all that bad because you cannot even sense them with your finger". Science made in Germany.

Let's recall **PCP**. For decades, pentachlorophenol was found in over 90% of all wood preservatives. During the 50s, 60s, and 70s tons of PCP were manufactured and used, on the inside for a lot of furniture and wood paneling, on the outside for siding and fences. Though, at that time, manufacturers and agencies already had access to worrisome findings of adverse effects. PCP was recognized as a disease-causing long-term poison, being genotoxic as well as carcinogenic. It was only in 1989, at least in Germany, that it was banned. Tens of thousands of buildings show PCP contaminations; many people became ill - often severely ill - and some suffered irreversible damage. Even today PCP can still be found in contaminated areas of apartments, in the materials which had been treated with it, in the breathing air, or in the house dust, and that at critical levels.

Let's recall **PCB**. The group of highly toxic polychlorinated biphenyls was used by the truckload in residences, in concrete buildings, and prefabricated buildings, especially in public buildings such as preschools and schools: as caulking and sealant in doors, windows, sanitary areas. Varnishes, lube oil, plastics contained PCBs from the 50s until the 70s. PCBs are extremely stable, extremely hazardous, and degrade extremely poorly in the ecological cycle of things. PCBs are stored in fatty tissue, brain, bone and spinal marrow. This is about damage to the liver, kidneys, nervous and immune system. In 1989, after a long and tragic career, PCBs were finally banned, but they will continue to inflict damage for decades to come. And do you remember the seals, hundreds of which had been washed up at the shores of the North Sea and would eventually die for no obvious reason? Cause: PCB. The deadly substance had been dumped into the North Sea by the chemical industry with the consent of the environmental minister. More and more whales become stranded on shores, nobody knows why. One thing is for sure: The amount of toxins in the whale carcasses turns them into toxic waste. The PCB levels that were found by Greenpeace scientists were above the threshold value for sewage sludge. The former Federal Office of Public Health (BGA) tried to hush up the dangers of PCB. In the meantime, Bayer grew into the largest PCB manufacturer. Only when the chemical giant voluntarily ceased its production, was the ban implemented. In 1983 the BGA announced that 300 nanograms PCB in the air would be hazardous. In 1990, all of a sudden, the 300 turned into 3000. In schools and preschools, 10 000 nanograms could be found. Obviously reason enough to move the exposure limit up to 10 000. And once again, officials would make assurances: "There is no need for action."

Chlorpyrifos had to be taken off the shelves in the US in 2001, it was banned. Chlorpyrifos is a nerve toxin and - according to the US Environmental Protection Agency - "an excessive risk for human health." Are people more sensitive over there? In Germany, it happily continues to be sold: as insect killer in moth papers, moth balls and sprays. Exterminators just love it. When such poisoned items, freely available from supermarkets, are hung next to the sweaters, socks, pants or shirts in the wardrobe, the biological effect will be most pronounced because your body will make direct contact with the contaminated pieces of clothing.

When will **permethrin** be banned? "Mosquitos dead - Humans poisoned", warns the consumer protection initiative of the poison from the group of pyrethroids in electric vaporizers, moth killers or insect sprays. The toxicologist Prof. Helmuth Müller-Mohnssen is worried: "The poisoning of myriads of humans is accepted. Pyrethroids act like war gases, they need to be banned. The initial symptoms include nerve and motion impairment, memory loss, and infections. You would think someone must be responsible. It's an illusion. You can counteract the danger only by refusing to use these substances." For the past 20 years, permethrin has been utilized whenever insects need to be killed, including natural carpet manufacturing. You can bet your life on it: your pure wool carpet with the 'Wool Seal of Approval' contains it or some such similar poison.

Just recently, the Öko-Test magazine published critical measurements regarding **energy saving lamps** or compact fluorescent lamps, respectively. It is the hope of Environmental Minister Gabriel that they shall save the climate and be made mandatory. The downside of energy efficiency: They produce more electromagnetic pollution than incandescent lamps, even more than is allowed in computer monitors. They contain toxic

substances and heavy metals like mercury, some of which even smell and gas off pollutants. They are more costly to manufacture, have to be disposed of separately, show a dubious ecological performance, and do not even save as much electricity as touted. Quite startled by this, industry responded with the same old pattern saying: Such statements lack any basis in science. Yet where is this basis supposed to come from? So far no one from science, industry, public health or politics ever had the idea to actually check whether there might also be disadvantages beside the advantage of energy efficiency. This shows how great the confidence in the assumption of harmlessness was and is. After a 20-year delay, we have caught up now. Electrical associations hide, once again, behind the exposure limits, which do not even apply to lamps, taking the easy way out: "Electromagnetic fields are part of our lives."

Is it a coincidence that the **exposure limits** for electromagnetic pollution seem to match the demands of industry so perfectly? Not unlike the ones for radioactivity in times past, which were lowered by 99.9% over the course of eight decades? We building biology environmental consultants never come across exposure limit values of electromagnetic pollution in our everyday testing practice, not even after thousands of investigations. For what do we need exposure limit values that do not exist in everyday life? Who is meant to be protected in this case? Humans and nature or industry and their economic growth? What do we need science for if it does not serve life? Protective threshold values often are only issued after the profit has been made. And when we eventually have come to this point, then it is nobody's fault because it has happened such a long time ago and back then it was allowed. And in the event that damage or loss has occurred, the association can no longer be proven from a scientific point of view. I still can hear Prof. Bernhardt's honest reply to the question of the TV report on 3sat about why exposure limits are set without knowledge about a biological risk and why, as a precaution, they are not lowered at the slightest indication of an obvious problem: "When exposure limits are lowered, the economy will be wrecked." The Öko-Test magazine is right on target when it says on the issue 'Exposure Limits - A False Safety': "If you don't want to risk your health, you'd better not trust Uncle Sam."

The **regulation concerning electromagnetic pollution** is Dr. Angela Merkel's masterpiece. The physicist brought it to life as the then environmental minister, and today she has to account for it as chancellor. According to Merkel, the regulation is meant "to offer legal certainty with its exposure limits" and "to contribute to streamlining the procedures and keeping investments safe with regard to wireless installations and electricity supply." The industry is happy. And what about the people? The WHO points out: "No standard setting agency has ever set exposure limits with the goal of protecting people from chronic health impacts such as cancer risk."

Let's try following the chain of scientific thought that became a regulation thanks to Angela Merkel. We know: From her point of view, radiation only becomes a problem when it heats up tissue. No trace of any other biological impact. The whole thing is carried to extremes by **averaging the measurement values** over a given time period. This means that when the body is exposed to huge field strengths for certain time periods, which, however, are interspersed with no- or low-exposure periods, then the already far-too-high exposure limits can be exceeded even more outrageously because the exposed tissue would have time to cool down during the no- or low-exposure intervals. This would be the same as if Angela Merkel's arm was put in boiling hot water and then a few seconds respite were granted, then again back into the hot boiling water and so on. I bet you that the calculated average temperature between the boiling water and the cooler surrounding air is no more than 35 degrees - just like the feel-good temperature in a bathtub. Therefore, from a scientific point of view, the chancellor should have no problems, no scald, no burn blisters and no pain when looked at it in this light. Why then call 911? Or, you could shoot yourself with an alarm pistol right behind your ear every five seconds. Mathematically speaking, this earsplitting sound averaged with the quiet seconds in-between would result in a rather moderate noise level. Buzzing ears, hearing loss, headaches, ripped eardrum? That couldn't be true when looked at it in this light. The firing of a machine gun shouldn't kill you because when the noise level of the shots is averaged with the quiet intervals, the energy level of the bullets is comparable to the power of splashed tomatoes. Prof. Günter Käs, radar expert at the Federal Military University, puts it this way: "A hefty slap in the face turns into tender loving caresses when

you construct a mathematical average out of the slaps and the intervals in-between the slaps." This kind of averaging is not applicable in biological assessments; it does not have any basis in science.

When applied to mobile phone radiation, mobile phone base stations, mobile phones, DECT cordless phones, Wi-Fi networks and the like, this averaging business becomes particularly reprehensible. This is about a new technology, namely **pulsed microwaves**. Pulsed means that radiation is transmitted following a periodic pattern. In the case of mobile phone radiation, there is a pulse with a full load output and intervals in-between the pulses, fully on, fully off. Rhythmic data packets are sped across the ether, similar to the shooting of a machine gun. And all of this - based on a thermal concept - is averaged over a given time period, pulses are lumped with the nonpulsed intervals so that the biological impact is hideously underestimated.

Laypersons have a heck of a time seeing through the complexity of this game. You may even think that exposure limits would have something to do with biological safety. But between thermal and biological effects there opens a yawning chasm, spanning from 1 to 10000. Not until an intensity level of more than 10 million microwatts per square meter are reached, can you expect to see a slight 1-degree temperature rise in a human body or its parts, respectively. Yet in the range of 1000 $\mu\text{W}/\text{m}^2$, a whole raft of adverse biological responses can already be demonstrated. Neurological, cognitive, hormone, immune system or cellular disorders and damages could be found well below the exposure limits. As mentioned earlier: 1 to 10000. To say nothing of individual symptoms, sleep disorders, and other afflictions. When you ask federal agencies, the Telekom or Bitkom whether health risks are to be expected from the mobile phone transmitter next to the house, from the DECT cordless phone at the bedside table or the Wi-Fi router at the desk, you may be thinking of headaches, night sweat and a depressive mood, of your son's hyperactivity and your daughter's leukemia or maybe just of precaution. And the reply is: "Everything is all right, there is no danger." Your question is not answered because the only real thing said here is: "You won't heat up."

A layperson may think that something that is declared as "scientifically untenable" must be bad. It is possible, but often this is not the case. Or something that is declared as "scientifically accepted" may be good, meaning protection from danger. It is possible as well, but often this is not the case either. To get to the bottom of this, we will have to ask questions of who made the judgment and who paid for it, what and who is behind it, what is the goal of a policy or regulation, which interest groups are involved.

Prof. Weiss from the Federal Office of Radiation Protection says about the German Wireless Telecommunication Research Programme: "Based on the assumptions used for establishing exposure limits, we are certain of not having overlooked anything that would prompt us to change the exposure limits." We know what assumptions were used for the setting of the exposure limits: the thermal concept. If you use tunnel vision only, you certainly won't overlook anything, nothing will have to be changed. Only a few weeks after the release of the Research Programme findings, Environmental Minister Gabriel plans on issuing exposure limits for mobile phone handsets. Only a few weeks prior, he had announced in the media that mobile phones would be safe. Why, all of a sudden, exposure limits? A late insight? Or is this another chess move meant to support industry?

Dr. Olaf Schulz from the Federal Office of Radiation Protection: "What is proven, we cover in our exposure guidelines. But there is uncertainty. We do not know whether there is a risk or not." Prof. Jiri Silny from the Radiation Protection Commission: "The knowledge of what is hazardous comes too late." Yet all of them indulge themselves in passing judgment, radiation protection officials, agencies, politicians, scientists, industry, etc. They cover up the greatest and most problematic physical interference with nature and humans, that is, electromagnetic pollution, with absurdly high exposure limits. They hide behind rules, clutch only at the straw of a thermal concept, put the brake on crucial initiatives, regard those who shoulder the responsibility as doomsayers and fearmongers. They zero in on the fear of the radiation, and they do that even though they are uncertain themselves. Well, it's good to hear: "We do not know enough." But the exposure limits are still in place! Millions depend on them! Established science will do battle for the current exposure limits, judges, authorities and politicians make them the basis

of their rulings. What a burden of responsibility.

It is not the scientific concept by itself that is so reprehensible, even though it is totally absurd and out of touch with reality. Really reprehensible is the part about the pretense of safety even though there is no scientific research to back it up, and we are groping in the dark of assumed harmlessness and lacking effect mechanisms. Solid research results defy being forced into the straitjacket of a thermal hypothesis, or the far too high, partly unattainable expectations and the far too outlandish theoretical objectives were not met, actually could not be met even though the quality of the scientific papers is there. And there are so many of them, all of which essentially come to similar results. And once there will be sufficient evidence even for the most unappeasable, the time of recognition will have come. Then it will be impossible to turn back the clock, economic chaos would be the result and jobs would be at stake. Moreover: Who would want to do without the technology? This is not about abandonment or regression at all; this is about the opportunity of having done a much better and smarter job right from the start: biologically compatible with the same benefit, the same appeal.

May I remind you of article 3 of the German building code: "Buildings shall not jeopardize human life and human health and the natural basis of life." The countrywide and unlimited service or radiation exposure from hundreds of thousands of transmitters on top of buildings and towers in Germany alone, and the millions of mobile phones next to the brain, the millions of cordless phones transmitting nonstop, the millions of internet access points radiating constantly, all of this is more than jeopardizing "the natural basis of life." The "right to physical integrity" degrades into a farce. "The countrywide introduction of mobile phone services without a comprehensive risk assessment is irresponsible", complains the legislative assembly of North Rhine-Westphalia two years after the first transmitters had gone on the air. The assessment of respective risks has not occurred until today, which is 15 years later. Rooftops and church steeples are packed with transmitters instead, as there are more mobile phones than ears. More and more transmitters everywhere in the city and the countryside, more and more mobile phones, more DECT cordless phones, more Wi-Fi networks, more radiation exposure. With a worried look at the residents next to mobile phone base stations, the EU publishes: "In the end, they are involuntary subjects of a massive experiment." The Düsseldorf environmental protection agency: "We are all part of a large-scale experiment." Dr. Alexandra Obermeier in an open letter to Environmental Minister Trittin: "As a physician, it is beyond my understanding how, on the part of the government, the most fundamental capital of a society, namely the physical, emotional and mental health of its members, can be gambled with in such a manner and to such a degree. The political course charted for wireless telecommunications sanctions criminal greed for profit at the expense of the general well-being of millions of people, thereby abandoning the rule of law."

Our science has the hots for everything thermal and sleeps the day away. It simply watches how even the last square inch on earth is radiated by millions and millions of new microwave radiation sources, and it doesn't even wonder at the fact that during the exact same time global warming has increased exponentially. Planet Earth turns into a global microwave oven owing to mobile phone radiation, TV, broadcasting, radar, satellites, HAARP and the like. Something can sure heat up in the process.

I remember Albert Einstein's words: "Science is a great tool. How it is used, whether for healing or destruction, depends on the humans using it, not the tool itself." And there are the words of the Indian master Shree Rajneesh: "Science is dangerous without wisdom." The federal Supreme Court points out: "The risk associated with wireless radiation does not have to be proven by scientific research first. The experiences of real life are sufficient in order to conclude that a technology poses a risk." Some people are so dependent on science that they doubt practical experiences because of a lack of scientific underpinning and they deny real-life experiences because of the lack of a theory. The psychologist Thorwald Dethlefsen said: "The strength of faith in science can easily surpass the one in a religious sect." And: "The history of science is one of human errors." Meanwhile a special kind of statistics comes from Ioannina University, namely the observation that most scientific papers are wrong. It's made possible by sponsorship dependence, conflict of interest, bad design, premature conclusions, highly competitive research areas, pressure to publish, securing of financing, preference of positive results

and holding back inconvenient results, etc.

Building biology is experience and real life. We work scientifically in the sense of independence and responsibility. I feel committed to science, the one science that generates knowledge - not to anything else. I feel committed to life, nature and creation, which we bring down and lead to the edge of the abyss, using every nasty trick in the book. Our building biology future, our strength, opportunity, authenticity, our very meaning lies in the alternative to the type of science, which is too entrenched in its ivory tower and too deeply mired in interests, and in the alternative to the authorities of industry and politics that rely on the latter. We wish to get involved, help, raise awareness of problems, and make suggestions for potential improvements. We do not vie for being liked by industry or established organizations. We do not strive for compliance with the exposure limits, but we are committed to helping minimize risks based on the precautionary principle and within an individual's framework of possibility. We need no special attention from universities or the seal of approval from official agencies. We are not standardized by DIN, the German Institute for Standardization. We have our very own concepts, ideas, and experiences with which we wish to serve humanity.

The medical researcher and physicist Prof. Dietrich Grönemeyer said in Beckmann's talk show that there was no binding criterion for what is regarded as "scientific" or as "unscientific." Despite this fact, representatives of politics, authorities, industry and insurances always tend to act as if this was not the case, quickly producing scientifically sounding explanations in order to support their own goals. It looks as if science has degenerated into a vicarious agent of political and economic interests. Prof. Maria Blettner, project leader of the Interphone study group, says: "A lot has to happen before science can eliminate prejudice." Prof. Ronald Herberman, director of the University of Pittsburgh Cancer Institute, adds with a worried look at mobile phone radiation: "We should not wait for the ultimate study, but rather err on the side of caution now than regret it later."

Now, we may have a little better understanding of what scientists (one group of them, not the others!), authorities, radiation protection officials, exposure limit finders and the CEOs of industry actually mean when they claim: "Nothing is really proven yet." They mean: "Close your eyes... get through... as long as you can make a profit..., that will go off all right." Those believing in the exposure limits bank on the thermal concept and the power of resilience in humans and nature. They rest on their assumption of harmlessness and have the patience of a saint until the effect mechanism is being found. This is where science stands right now, here in our country and in the rest of the world. And it is not just about the question of whether a study is more or less well done, comforting or upsetting. It has always been about whether it fits the traditional mold: right from the start, for decades, already in the past when nobody would think of mobile phone radiation, the Internet, and cordless phones, when pulse modulations were a non-issue. And so it continues. And if it should go awry? Sorry, we couldn't know that, the scientific body of evidence spoke against it - back then. Looked at it from this angle...

Yet doesn't it exist after all, this topmost authority on science, the gray eminence that has the ultimate say and power in determining what exactly is a proof or indication, result or question, sense or nonsense, knowledge or assumption? In the case of electromagnetic pollution, it is maybe the VDE, TÜV, Research Association of Radio Applications, Radiation Protection Commission? Oh dear! The regulation concerning electromagnetic pollution? Oh dear! You can keep searching for a long time. I haven't found it to this day. And if you should come across it, this all-important scientific authority, please let me know right away.

Until then: Take care of yourself, rely on precaution and protect yourself as well as those in your care - even without conclusive evidence.

Translated into English by Katharina Gustavs, Building Biology Environmental Consultant (IBN).
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