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Health risks from mobile communications?

A look back at the international debate on the 5G standard

Introduction

Things have quietened down around the controversial topic of "5G". This mobile communications technology has – together with digitalization as a whole¹ – become an increasingly natural part of the overall societal infrastructure, especially since critics of the technocratic development seem to have run out of steam. Anyone who continues to view digital transformation and 5G in particular with scepticism and links health risks to them is all too quickly regarded as an esoteric or even a conspiracy theorist.

In Germany, for example, Kai Funkschmidt made condescending comments by equating "the fear of electro smog" with "belief in the paranormal is on the decline" under the headline "Belief in the paranormal is on a par with belief in UFOs"² and speculated that the relatively high percentage figures of critical attitudes towards mobile phone radiation might be influenced by conspiracy theories "in connection with the G5 mobile phone standard". The mere fact that Funkschmidt speaks of "G5" instead of the usual "5G" suggests that he has little knowledge of the topic or of language usage in Germany. In fact, unlike dowsing or UFO beliefs, for example, there are a number of serious studies on the controversial new mobile communication standard at national level, which certainly give cause for concern from a health point of view. Invisible radiation is not something "paranormal", but is physically measurable and at least to some extent testable in terms of its biological effects. However, the sometimes contradictory scientific results in this area are undoubtedly linked to different philosophical, ideological and economic interests, so that more intensive communication about this is urgently needed politically.

In most countries, large parts of the population are already "supplied" with the first 5G variants. In many cases, the aim is to achieve almost complete coverage. This is why issues relating to the health compatibility of this still new technology are of great importance. Especially since 8 October 2021, when a new human right was acknowledged by the United Nations: Everywhere in the world, i.e. across the board, people have the right to live in a healthy environment³. What this human right means in view of the 5G mobile communications planned for the whole of the world has yet to be explored. In any case, the following question has become more pressing since then: Is 5G really as harmless as is often claimed, or is it actually a health risk? In view of the seriousness of the issue, reductionist treatments of this problem, which needs to be scientifically investigated, are actually out of the question.

While some enthusiastically welcome 5G as the "key to the future"⁴ and can no longer wait for it to be rolled out across the country, others fear its threatening properties in terms of data protection and health. It is precisely because the population is divided in these respects that expensive advertising measures are apparently needed. TV commercials suggest wonderful interpersonal ties with romantic images thanks to transmission technology that works almost in real time. Greater closeness can be bought according to a German YouTube commercial: "Be

present when there's nothing between us with **5G**. To be ordered from Telekom now!"⁵ Such advertising does indeed bear fruit: concerns among the German population about 5G have diminished in recent years⁶. However, couldn't and shouldn't a court ban have been imposed on the basis of public concern and political precaution with regard to the potential biological effects of electromagnetic fields (EMF)⁷?

There are essentially three different types of opinions on this important issue - after all, it concerns the fundamental right to physical and mental integrity, which is enshrined at the very top of the *Charter of Fundamental Rights of the European Union* (Art. 3), for example. The first is the official one with its references to scientific studies and to the – albeit controversial – institution with the name *International Commission for Non-Ionizing Radiation Protection* (ICNIRP). The second type concerns scientific and medical studies critical of 5G, which above all also emphasize the precautionary requirement. And the third type consists of conspiracy theory schematic or esoteric alarmism, which is characterized by the fact that it tends to have "secret scientific" factors and little serious scientific evidence I would like to address all three of these carefully distinguishable 5G topics here.

I. Official trivialisation of 5G mobile communications

It goes without saying that the government is unlikely to be critical of mobile communications, given that mobile phone frequencies have been auctioned off by the state to the relevant companies for hefty sums. On December 1, 2020, the German government launched an online livestream of a citizens' dialog on the topic of 5G to "educate" and answer questions. The Federal Minister of Transport, Andreas Scheuer, the Federal Minister for the Environment, Svenja Schulze, and Inge Paulini, President of the *Federal Office for Radiation Protection* (Bundesamt für Strahlenschutz = BfS), declared at the time that 5G could be used in all frequencies without hesitation. The health effects of mobile communications have been very well researched in many studies and no health effects have been proven to date below the applicable limits. At most, there are still uncertainties regarding the higher frequencies above 20 gigahertz⁸. But why then did the Federal Network Agency already make the first allocations in May 2021, even in the high 26 GHz range for local and regional 5G networks⁹? In fact, very little research has been carried out into these higher frequencies. At the same time, Germany and France have launched a call for funding for 5G. Is the problematic culture of constant growth and progress¹⁰, in this case: is the ever-faster transmission speed, being subordinated to everything else? In any case, the German government is issuing an all-clear signal about 5G¹¹. Obviously, it cannot be true what must not be true¹².

And indeed, scientific studies also sound reassuring in the face of widespread fears about 5G¹³. For example, Professor Georg Fischer from the Chair of Technical Electronics at the University of Erlangen-Nuremberg is quoted in the university journal *friedrich* (no. 120/2021) as follows: "If there are any negative effects on health at all - none of which have yet been scientifically proven – I think that these are more likely to be due to non-thermal effects." According to his explanations, the mere thermal effects referred to here could only occur with 2G systems such as GSM and TETRA; the 3G (UMTS), 4G (LTE) and 5G wireless communication standards would not have any corresponding pulsation. Fischer therefore believes he can say: "According

to the current state of knowledge and technology, no negative effects of 5G on health are to be expected." After all he concedes that when considering the health risk of a new technology, it is important to be aware that the relevant findings cannot go beyond the current state of science.

"ICNIRP" and "Technology Assessment" - neutral institutions?

In particular, the *International Commission on Non-Ionizing Radiation Protection* (ICNIRP), mentioned at the beginning of this article, always provides the all-clear. In 2020, it published its revised safety guidelines for exposure to radiofrequency radiation emitted by wireless communication devices and networks¹⁴: This also assures users that their health remains fully protected with regard to 5G radiation. ICNIRP Chairman Rodney Croft, Professor of Psychology at Wollongong University in Australia, expressly affirmed in an interview on Australian television on June 16, 2020, that there is no harm associated with 5G¹⁵. He also conceded that the number of studies dealing specifically with 5G is very limited - but from a scientific point of view, this is "not relevant at all."

Of course, it is important to note that the ICNIRP has long been accused of having close links to those industrial sectors whose technical new developments have benefited from the highest possible threshold values in all EMF frequency ranges¹⁶. To date, the ICNIRP guidelines have been formally recognized by the World Health Organization (WHO) and are also in force in the EU. However, their suspicious proximity to industry was already confirmed in 2019 in the Berlin *Tagesspiegel* thanks to thorough journalistic research¹⁷. In mid-2020, the two EU representatives Michèle Rivasi (Europe Écologie) and Klaus Buchner (Ecological Democratic Party) published the report *"Die Internationale Kommission zum Schutz vor nichtionisierender Strahlung Interessenkonflikte, 'Corporate Capture' und der Vorstoß zum Ausbau des 5G-Netzes"* (*The International Commission on Non-Ionizing Radiation Protection: Conflicts of interest, 'Corporate Capture' and the push to expand the 5G network*); they commissioned, coordinated and published it. It was published in English, French and German in Brussels¹⁸. It is no coincidence that a court in the Netherlands confirmed in 2021 that the limit values proposed by ICNIRP and prescribed by law in many European countries do not ensure the protection of health. In the same year, a European Parliament committee dealing with science and technology assessment published an explosive study entitled "Health effects of 5G. Current state of knowledge on the carcinogenic and reproductive development risks associated with 5G, as derived from epidemiological studies and experimental in vivo studies"¹⁹: This review of the state of research also explicitly criticizes the ICNIRP.

If authorities refer directly or indirectly to the ICNIRP, this is not very credible from a serious point of view. It will therefore be necessary to look to another institution, namely those offices that officially deal with so-called *technology assessment*. But is at least this "technology assessment" neutral? In the journal for technology assessment in theory and practice (TATuP), Linda Nierling and Helge Torgersen explained that although neutrality had long been regarded as an unquestioned basis in the self-image of technology assessment, "neutrality as a myth of technology assessment" has since been disenchanting²⁰. While the claim to neutrality was once a "prerequisite for installing technology assessment in a political context", today we are trying to reach an agreement on the fundamental values of technology assessment – and we are still "at the very beginning". So, should 5G mobile communication be considered and evaluated by

a technology assessment that is not yet really clear about its own values? Such a finding opens the door to lobby-driven arbitrariness. And indeed, the cited journal article ends with a plea for the integration of different "interests and points of view or world views": There would remain a "central challenge" for those involved in technology assessment to negotiate and "adapt certain normative settings"²¹. The term "adaptation" sounds somewhat strange, even suspicious. The same issue of the aforementioned journal promptly states: "As a result of changes in the scientific community ... external sources of funding are playing an increasingly important role in day-to-day project operations and at the same time are visibly changing their character."²² The topic of 5G is particularly striking: In 2021, the Office of Technology Assessment at the German Bundestag commissioned a study on the health risks of mobile phone radiation from the Swiss mobile phone lobby, the Research Foundation for Electricity and Mobile Communications²³ – can't you imagine in advance that the all-clear will be given? After all, this "Office of Technology Assessment" knows that years of research into the effects of radiation on living organisms have so far led to findings that are in some cases not clear and not consistent, resulting in different and "conflicting interpretations."²⁴ This indirectly confirms that, from a scientific point of view, there are no unambiguous or one-sided results on 5G, for example.

Evidence of damage ignored for many years

In Austria, the Institute for Technology Assessment presented a study to parliament which underlines the fact that the health risks of established mobile communications are still the subject of controversial debate despite major research efforts, and there are still almost no relevant studies on 5G. This makes the scientific situation regarding 5G all the more honest. This also has to do with the improved educational work on the topic of mobile communications in Austria. Professor Thomas Szekeres, President of the *Austrian Medical Association*, explains: "Based on the information available to date, the development of 5G is likely to result in further, and indeed considerable, exposure of the population to radio frequencies, which is already too intense in many places. From a medical perspective, the transmission of large amounts of data using micro wave technology in the immediate vicinity of people's lives must be seen as an undesirable development."²⁵ According to this, risks are by no means to be excluded by the authorities.

It is no coincidence that *SWISS RE*, one of the world's largest reinsurers, has expressed "concerns about health, data protection and security risks" with regard to 5G technology²⁶. So, if the former Digital Minister Dorothee Bär wants to "do something about people who have concerns", as she said during the 2021 election campaign²⁷, she would also have to address the scepticism among large insurance groups. On closer inspection, official and political trivialisations of 5G prove to be highly one-sided and by no means reliable. A statement made by the Council of the EU in 2020 fits into this picture: in its "Conclusions on shaping Europe's digital future", it explicitly and very one-sidedly classified information that the 5G network poses a risk to health as a *false claim that must be countered*²⁸. EU Health Commissioner Vytenis Andriukaitis, who is in office until 2019, also previously stated that the application of the precautionary principle set out in the EU treaties to mobile communications technologies would be "too drastic a measure"²⁹. Whether it is too drastic or rather highly due - this classification depends on whether one perceives the scientific findings on 5G in their entirety or only

selectively. In 2021, the US Federal Court obliged the American regulatory authority, the *Federal Communication Commission* (FCC), to finally explain why it had ignored scientific evidence of damage caused by wireless radiation for many years – an internationally groundbreaking ruling that sheds light on the situation of the so-called electro(hyper)sensitive³⁰ and its lack of appreciation on the part of the authorities.

II. Scientific and medical warnings about 5G



The computer scientist James Bridle explains in his book "New Dark Age" (2023, translated here): "Science depends on trust – trust between researchers and public trust in research. If this trust is lost, it does enormous damage to the future of scientific research..." In the field of research into mobile communications and 5G in particular, such trust has clearly long since been squandered; the fronts seem to have hardened. At any rate, they exist in many countries: scientific studies and medical statements that classify "5G" as risky, contrary to the so-called "mainstream" of research³¹. Only a selection with a focus on Europe can be presented here; it is intended to illustrate that trivialising decisions by no means have the backing of

"the" scientific community³². In terms of scientific theory, it should be clear that science is only pluriform anyway, always in flow and rarely without conflicting opinions³³. This applies, for example, in the field of physics – and of course also in the field of mobile communications research, particularly on 5G³⁴.

5G signal with increased biological and health effects

Since 2017, many scientists and doctors from over 30 countries have signed a *5G Appeal* in which they warn against "exposing millions of people to an experiment with unclear effects on health".³⁵ In 2018, the International Society of Doctors for Environment reiterated its call for a standstill in the expansion of 5G in Europe in a statement on 5G, citing the ethical precautionary principle. At around the same time in Germany, the Stuttgart-based *Doctors' Working Group for Digital Media* wrote an open letter to the Federal Minister of Transport and Digital Infrastructure calling for a halt to the expansion of the 5G mobile communications structure³⁶. In the USA, two research groups led by Noa Betzalel and Cindy L. Russell called for the same

in 2018 in the journal *Environmental Research*³⁷ due to the cytotoxic effects of 5G. Calls for a 5G moratorium continued internationally. For example, the leaders of the European cities and government districts of Brussels, Geneva, Grenoble and Florence have expressly rejected the idea that their populations should become "guinea pigs" for the scientifically controversial and unclear 5G mobile communications standard³⁸. The same in Mill Valley, a city in Silicon Valley, and in the US state of Hawai³⁹. In the US state of New Hampshire, the two chambers of parliament also passed a memorandum on 5G and mobile radiation: It demanded a consistent protection policy from the aforementioned US radiation protection authority FCC – with success, as was shown a few months ago⁴⁰.

In Germany, various municipalities in Bavaria explicitly opposed the 5G rollout by Deutsche Telekom and other operators, which came as a surprise to them, in 2020; 22 mayors passed a resolution in which they expressed their "displeasure regarding the communication between Deutsche Telekom AG and the municipalities with regard to the current commissioning of the 5G network"⁴¹. In France, employees of the largest French telephone company undermined the 5G push in the same year, arguing that the enormous antenna infrastructure for 5G and the billions of wireless mobile devices to be connected would exponentially increase energy consumption for mobile communications and contribute significantly to the environmental footprint of this technology⁴². 11 mayors of major cities in France have also called for a moratorium on 5G⁴³. The municipal council of Lille, for example, has decided to postpone the installation of 5G antennas until the *National Agency for Health Security, Food, Environment and Labor* has published its report on the subject. In Italy, several hundred municipalities rejected 5G⁴⁴. Slovenia also said no⁴⁵. And in Switzerland, where the Federal Council may want to assign licences for higher 5G frequencies in the 6 GHz, 26 GHz and 40 GHz ranges, i.e. for the "millimetre waves" not yet used in Germany, the Swiss Association of Physicians for Environmental Protection (AefU) issued a warning statement in March 2024⁴⁶. All such considered scepticism and responsible refusal should not only make sense from an ecological and health point of view, but also economically – because going the wrong way would be expensive!

But what is the basis for the many calls around the world to suspend the expansion of 5G mobile communications until clear scientific warnings are on the table? A study overview on 5G from the USA by Ronald Kostoff and other researchers emphasized in 2020: "If 5G is added to the already existing harmful radiation situation, the already existing damage to health is worsened."⁴⁷ In the same year, the European Parliament's Scientific Service explicitly pointed out 5G risks in an MEP briefing: "Together with the type and duration of exposure, characteristics of the 5G signal such as pulsing appear to amplify the biological and health effects of exposure, including DNA damage, which is thought to be a cause of cancer."⁴⁸ This means that the somewhat different pulsation of 5G is not as simple as the above-mentioned professor Fischer had thought. Martin L. Pall in particular gives food for thought in this respect in his brochure "5G as a serious global challenge. Evidence of eight major health risks from electromagnetic fields (EMFs) and their mechanisms of effect" (2019)⁴⁹. Although his argument has been contradicted by other scientists, it remains unclear whether the US biochemist is right in assuming that higher-frequency 5G radiation does not end at the surface of the human skin but also has invasive effects insofar as the magnetic components of electromagnetic fields can penetrate the body even deeper than the electric ones. Overall, the debate does not justify a

blanket all-clear – especially not with regard to the double-digit frequency ranges of 5G, which are on the rise in industry in particular, but also everywhere in society.

64 beams per sector antenna

Furthermore, it is part of scientific seriousness to also consider the *indirect* health risks posed by mobile communications, which are very real as a result of the climate crisis⁵⁰. The fact that there may well be a connection between mobile communications and the climate should be discussed more intensively⁵¹. Miguel Coma warns: The claim that 5G will reduce CO2 emissions is a myth that is completely at odds with the unprecedented forecasts for energy consumption compared to previous generations. This is because "higher efficiency actually increases energy consumption."⁵² Due to 5G, the mobile industry expects an explosion in mobile data traffic and the production of new devices and infrastructure "on a scale that far exceeds the improvements that energy efficiency has to offer. The clear improvements in energy efficiency from 5G will therefore not lead to a reduction in overall global energy consumption. 5G will increase global energy consumption." The acceleration of data traffic thanks to 5G is also one of those types of growth that is not good for our planet and all its inhabitants.

In addition to a constant "pilot signal", 5G also uses a new form of "intelligent" antennas: In *beam forming*, transmitting antennas divide the transmission power in the room dynamically and radiate with high directivity to those areas of the room that require the highest power due to capacity demand and routes attenuation. Experts speak of adaptive antennas and "pencil beams" – the term pencil is a metaphorical allusion to the precision of these beams. However, these beams do not remain as slim as the image suggests: "Pretty fat pencils," scoffs Swiss Hans-Ulrich Jakob, President of the local organization *Gigahertz*.⁵³ According to Jakob, with 5G, the network is no longer *almost* everywhere, but because of its 64 beams per sector antenna "inevitably, seamlessly everywhere. Even in the furthest crack." With a 5G antenna, there is not just one of these pencil beams in a 120° sector, but 64: 8 next to each other and 8 on top of each other. According to Jakob, each of these supposedly pencil-thin beams has an opening angle of 15° and therefore a width of 25 meters after a distance of 100 meters and 50 meters after 200 meters. Will this look the same or similar outside Switzerland? And will this possibly mean that in some areas and at certain times high rates of increase in the previous exposure in homes and in certain places can be expected? Anyone whose house may be located in the direction of a "needy" neighbour will be out of luck if the radiation, which is barely measurable or verifiable due to its spatial and temporal inconsistency, is just below the high limit values or sometimes exceeds them. Others, on the other hand, can count themselves lucky if such pencil beams rarely or never hit them. 5G is good for surprises.

III. Conspiracy theory and esoteric perspectives on 5G

Campaigns in favour of 5G like to paint a distorted picture of a resistant, irrationally frightened citizen movement, as if it consisted mainly of esoterics or even violent protesters: "In addition, individual events and absurd theories are played up - although they have nothing to do with the citizens' movement and its organizations."⁵⁴ Unfortunately, such distortions can also be found in serious media. For example, *tagesschau.de* reported: "There are numerous conspiracy myths

about the new 5G mobile communications standard: it is said to enable 'mind control', cause mass deaths in animal species or cancer in humans. It is also said to be responsible for the corona pandemic – either by weakening the immune system or even as a trigger for Covid-19⁵⁵. Here, abstruse claims and reasonable concerns are mixed up in a big way. However, this is actually more typical of conspiracy theories than of the public media. Such *fake news* makes it increasingly difficult for serious analyses that take a critical scientific look at 5G to even find their way into the public media. In this respect, conspiracy theories about 5G and esoteric criticism are definitely counterproductive when it comes to providing helpful information in contrast to the trivializations that are widely used.

5G filter according to Hermes Trismegistos

Conspiracy theories have gained socio-political weight, particularly in the wake of the coronavirus pandemic, and there is now a flood of publications on the subject⁵⁶. It is with good reason that theories of confusion are often described as modern "myths", which characterizes their global view relevance. Known problems are explained in a supposedly knowledgeable and yet so simple way that in most cases no serious, especially scientific evidence is provided and differentiation is often omitted in an almost annoying manner. It is usually referred to as "secret" information – and you are already in the field of unverifiable claims in the broadest sense. Trust in apparent plausibility and mistrust of measures announced by the state, which in fact increasingly affect the private lives of citizens⁵⁷ are usually mutually dependent. In the age of ChatGPT, it is also becoming increasingly difficult to distinguish between truth and deception.

It is hardly surprising that this also applies to the controversial 5G mobile communications. Christopher Schrader comments on this invasive technology that "in terms of the possible health risks, this time things are actually different than usual. 5G is not just a further development of mobile communications, which has gone through the generations of analogue networks, GSM, UMTS and LTE. Instead, the new standard is opening new doors."⁵⁸ When the German Federal Network Agency – as already mentioned – made the first allocations in 2021, even in the 26 GHz range for local and regional 5G networks, it was significant that the identity of the new network operators was initially kept secret: "Information on frequency allocations is treated by the Federal Network Agency as trade and business secrets." What a tempting playground for conspiracy theories!

There is also an esoterically motivated fight against 5G. Here are just two examples from Europe. The sectarian group Organic Christ Generation around the Swiss Ivo Sasek not only has the unbiblical transmigration-of-souls-theory⁵⁹ in its programme, but also 5G warnings, which are widely disseminated through its own media platform called *Kla.TV*⁶⁰. The Austrian Jahn J. Kassl also makes esoteric arguments: in his book "Entscheidende Jahre der Menschheit" ("Decisive years of mankind", 2020), he explicitly and repeatedly warns against 5G. He, who sees himself as a spiritual "channel", claims to have learned from Jesus Christ: "The widespread introduction of frequencies, which are being made palatable to you as a progressive and indispensable 5G standard, contains the essence of great disruption" (154). 5G technology will have drastic consequences for nature, wildlife and people, and those forces that push this technology to the detriment of all and the benefit of the few will lose their *raison d'être* on this planet. The final battle for humanity has begun. With this in mind, Jesus Christ is said to have

announced that better times would come in the years 2026 to 2029: That is when "the vast majority of people will gain the awareness to play an active part in shaping the future full of light" (p. 144). Help is offered on the way there, as Kassl claims to have learned in a conversation with THOT (= Hermes Trismegistos) and explains under the chapter heading "Installation of the crystalline 5G protection grid in the morphic field" (p. 43). After an esoteric "inner look", the reader is invited to install the 5G filters as "spheres" in the "morpho genetic field of the planet": They are supposed to absorb, even neutralise, "any radiation that is harmful to life on earth". However, in order to ward off the entire influence of negative radiation, the installation process must be repeated several times: "The more people do this, the greater and more powerful this protection becomes." By virtue of their "divine awareness" (51), those who are convinced of this should speak out formally, mentioning their own name: I ensure "that any harmful radiation, especially that of 5G, is absorbed and neutralised by these crystalline spheres." An anxiety-reducing effect may perhaps be the result of such rituals – but hardly a reduction in the damage potential of 5G, against which not only conspiracy myths, but also – as explained under II. – serious doctors, scientists, politicians and associations warn⁶¹. In fact, well-founded concerns about the 5G technology should not be discredited by populist "myths" and the sectarian or esoteric programmes associated with them. The kind of differentiation and serious references that esotericists and conspiracy theorists tend to lack should be required here.

By no means all 5G criticism is "blather or gobbledeygook"

On a sober note, however, the propagandists of 5G in politics, industry and business are by no means free of "myths". This applies to the TV commercials mentioned above, but also to the myth of "the" scientific community, which - as already noted - does not exist in such a unanimous and neutral way, especially with regard to mobile communications. Even the reference to a "scientific mainstream" does not catch on insofar as this can very well be due to political or financial influence, which, as a result of their vested interests and power, do not handle scientific truth⁶² very carefully. In this respect, blanket assertions such as that no one should be afraid of wireless communication radiation and in particular of 5G⁶³ are hardly convincing: even if there may be no evidence of 5G effects that cause illness, there is also no evidence that this type of radiation is harmless vice versa. For precautionary reasons, this desideratum must still be pointed out⁶⁴. Traits of a conspiracy theory of the opposite kind, which is suspiciously directed against all doubters⁶⁵, reveal rather questionable interests. The German consumer organization *Diagnose:Funk* explains: "Politicians are currently building a protective mechanism. Anyone who criticizes is a conspiracy theorist. Absurd *fake news* from the internet, where you can find anything, is used."⁶⁶ Whether 5G is rightly scary or not⁶⁷, however, cannot be conclusively assessed based on the current state of research. Consequently, it is too cheap, even absurd, to dismiss all 5G concerns as conspiracy theory chatter from so called "tin foil hat wearers". Rather, in view of the precautionary principle enshrined in the EU treaties, it is quite wise not to accept the changed 5G radiation type and the increased monitoring possibilities it opens up. As Shoshanna Zuboff, the internationally renowned author of the book "The Age of Surveillance Capitalism", emphasizes in an interview: "It is reasonable to be concerned about 5G in the universe. This is because 5G was also driven forward also by technology companies independently of China. It would open the door to the kind of data extraction and data flow that we would find in an extreme surveillance capitalism and which would be much more

unprotected than it is today, with much less control over what is extracted. I would therefore like to expressly warn against 5G."⁶⁸

It should also be pointed out that the unanswered questions on the subject of mobile communications have become even more explosive following the publication of a large-scale survey study for the Swiss government with surprisingly clear and critical results. According to this study, the biological effects of the controversial radiation can be considered scientifically proven: In the *International Journal of Molecular Science*, David Schuermann and Meike Mevissen explained that exposure to radiation can lead to biological and health hazardous effects even at low doses⁶⁹. Thanks to this review, which was funded by the Swiss Federal Office for the Environment, it is no longer arguable that invasive mobile phone radiation, which will soon be installed across large areas, is likely to cause physical and nervous - and perhaps also psychological – disorders by triggering oxidative cell stress. The comprehensive review of 223 studies reveals: "The production of reactive oxygen species (ROS), which may lead to cellular or systemic oxidative stress, was frequently influenced by EMF exposure in animals and cells." In the overall overview and regardless of the one or other weaker study, *a clear* trend emerges that the controversial radiation can actually lead to "changes in the cellular oxidative balance far below the applicable limit values." As the authors explain, people with pre-existing conditions are particularly susceptible to health effects.

The days of completely one-sided, divisive statements on wireless communications and 5G in particular should be over by now. International mobile communications policy must change⁷⁰. However, the signs are still not good that this legitimate expectation will be fulfilled. After all, the increasingly rapid progress of "digital transformation" demands nationwide 5G and soon even 6G mobile communications, despite all the criticism of it and its real utopian possibilities⁷¹. This makes the ethical challenge for of designing and redesigning wireless technology in accordance with fundamental rights, truthful, humane and scientifically fair aspects all the more important. It is about the human right to a healthy environment. Economic, worldview or conspiracy theory interests must be put in their place, as must lobbied influences. The bold demand of our time should be based on facts: "Stop 5G"⁷² – or at least: Stop 5G expansion! A European association called Europeans for Safe Connections (ESC), founded in 2023, is now acting critically in this direction: This is a Europe-wide association of wireless-critical NGOs that is familiar with the dangers and negative effects of wireless communication technologies and acts as an umbrella organization on behalf of the national wireless-critical organizations (<https://esc-info.eu/en/>).

Conclusion

Scientific theoretical differentiation in particular⁷³ can and must contribute to questioning and relativizing inhumane scientific claims that are supported by one-sided, mostly capitalist⁷⁴ interests. The 5G debate must not be distorted or silenced as part of a misconceived *political correctness*. Rather, open political communication on the topic remains urgently necessary worldwide.

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Nuremberg and publicist (www.werner-thiede.de). Following numerous nonfiction and specialist books, he recently published a complete edition of his songs (some are also in English): "In Ängsten – und siehe, wir singen! (In fears – and behold, we sing! Songs of faith)" (Munich 2023).

Translation: Elisabeth Birgit Madsen

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- 1 Critical on this in Germany, for example: Christian Hoffmeister: Google Unser, Hamburg 2019; Marie-Luise Wolff: Die Anbetung. Über eine Superideologie namens Digitalisierung, Frankfurt a.M. 2020; Johannes Hoff: Verteidigung des Heiligen. Anthropologie der digitalen Transformation, Freiburg i.Br. 2021; Werner Thiede: Die digitalisierte Freiheit. Morgenröte einer technokratischen Ersatzreligion, Berlin 2014²; his: Digitaler Turmbau zu Babel. Der Technikwahn und seine Folgen, Munich 2021²; his: Im Namen des sogenannten Fortschritts. Zur zunehmenden Einschränkung bürgerlicher Schutz- und Freiheitsrechte, Bergkamen 2023.
- 2 In: Zeitschrift für Religion und Weltanschauung 5/2021, 360-362, here 361.
- 3 <https://www.zeit.de/politik/ausland/2021-10/vereinte-nationen-saubere-umwelt-menschenrecht-umweltschutz-klimawandel-un-menschenrechtsrat-resolution> (accessed 9.10.2023).
- 4 For example, former Federal Transport Minister Andreas Scheuer (<https://www.bmvi.de/SharedDocs/DE/Artikel/DG/Scheuer-Staedte-und-Regionen-machen-5G-erlebbar.html> - accessed 7.10.2021), who had to welcome 5G simply because the desired self-steering cars (see Werner Thiede: Autonome Autos ohne Technikfolgenabschätzung?, in: Zeitschrift für Evangelische Ethik 60 [2016], 131-138) are hardly conceivable without "real-time" radio.
- 5 See in total <https://www.horizont.net/marketing/nachrichten/markenchef-ulrich-klenke-zur-neuen-telekom-kampagne-wir-werben-jetzt-fuer-5g--und-zwar-massiv-194143> (accessed 7.10.2023).
- 6 Cf. e.g. <https://www.telefonica.de/news/corporate/2024/02/5g-mobilfunkstudie-zum-mobile-world-congress-2024-die-bedeutung-von-5g-fuer-menschen-und-wirtschaft-ist-verstanden.html> (accessed 8.3.2024).
- 7 See Joseph Mercola: EMF*D. 5G, Wi-Fi and Cell-Phones: Hidden Harms and How to Protect Yourself, Carlsbad/California 2020 (German: EMF - Elektromagnetische Felder: Schützen Sie sich jetzt vor den heimlichen Gefahren, die von 5G, WLAN und Mobiltelefonen ausgehen! Rottenburg 2020).
- 8 <https://www.diagnose-funk.org/publikationen/artikel/detail&newsid=1638> (accessed 5.10.2021). In fact, the higher frequencies are controversial (see my essay: 5G-Funk geht unter die Haut. Die Zukunft des Mobilfunks begeistert – und weckt international tiefe Besorgnis, in: Raum & Zeit 37, No. 216/2018, 30-35).
- 9 https://www.golem.de/news/vergabe-erste-deutsche-5g-betreiber-bei-26-ghz-erreichen-2-gbit-s-2105-156626.html?utm_source=nl.2021-05-20.html&utm_medium=e-mail&utm_campaign=golem.de-newsletter (accessed 5/20/2023).
- 10 See Paul Erbrich: Grenzen des Wachstums im Widerstreit der Meinungen, Stuttgart 2007.
- 11 <https://www.deutschland-spricht-ueber-5g.de/informieren/mobilfunkstrahlung-und-gesundheit/> (accessed 6.4.2024).
- 12 Werner Thiede: Kann wahr sein, was nicht sein darf? Über mögliche negative gesundheitliche Auswirkungen von Mobilfunkstrahlung, in: Die Tagespost, No. 27, 7.7.2022, 25.
- 13 <https://ueber5g.be/thema/literatur%C3%BCbersicht> (accessed 6.3.2024).
- 14 <https://www.icnirp.org/en/publications/article/ef-guidelines-2020.html> (accessed 6.1.2024).
- 15 <https://stiftung-pandora.eu/2021/04/28/5g-strapaziert-die-grenzen-unseres-vertrauens/> (accessed 1.10.2021).
- 16 MEP Jean Huss in his justification of the Council of Europe resolution of 27.5.2011, point 29 (<https://www.diagnose-funk.org/publikationen/artikel/detail?newsid=352> - accessed 11.1.2024).
- 17 <https://www.tagesspiegel.de/gesellschaft/elektrosmog-europa-ignoriert-moegliches-krebsrisiko-von-5g/23855700.html> (accessed 14.1.2024).
- 18 Since 2021, it has also been available as a brochure in German: Booklet 14 of the series "Effects of mobile and communication radio" of the *Competence Initiative for the Protection of People, the Environment and Democracy e.V.*, Saarbrücken 2021.
- 19 See <https://www.diagnose-funk.org/publikationen/artikel/detail?newsid=1740> (accessed 19.8.2023).

- 20 Linda Nierling/Helge Torgersen: Normativität in der Technikfolgenabschätzung, in: TATuP 28, 1/2019, 10-14, here 10.
- 21 Ibid, 14. See also Julia Valeska Schröder: Das Politische in der Technikfolgenabschätzung, in: TATuP 3/2019, 62-67.
- 22 Karen Kastenhofer and others: "Wes Brot ich ess, des Lied ich sing"? Technikfolgenabschätzung und ihre Auftraggeber, in: TATuP 28 (2019), 33-38, here 37.
- 23 According to *diagnose:funk*'s press release from June 17, 2021, "This is a real lobby scandal, what the Bundestag's Office of Technology Assessment is doing!" says Jörn Gutbier, Chairman of *diagnose:funk*. "Anyone who wants honest information about the health risks of mobile phone radiation should not commission the mobile phone lobby. The Bundestag's Office of Technology Assessment must rely on independent scientists and their studies: there are now almost 100 review studies that summarize and evaluate the state of the science in detail. And mobile phone and WLAN radiation does not come off well: this radiation causes oxidative cell stress, which in turn can lead to inflammatory diseases, reduced fertility and cancer. The Bundestag needs to know this when it comes to technology assessment of mobile communications."
- 24 <https://www.tab-beim-bundestag.de/de/untersuchungen/u30300.html> (accessed 21.2.2024).
- 25 Statement by Prof. Thomas Szekeres in the Austrian Infrastructure Report 2020: "Zukunftsinfrastruktur 5G: Vom digitalen Traum zur Wirklichkeit" (*Novomatic Forum* 4.11.2019). See also <https://www.oeaw.ac.at/ita/projekte/5g-und-gesundheit> (accessed 5.3.2024).
- 26 See <https://www.diagnose-funk.org/publikationen/artikel/detail?newsid=1412> (accessed May 29, 2019).
- 27 Cf. <https://www.zdf.de/nachrichten/politik/laschet-zukunftsteam-wahlkampf-bundestagswahl-100.html> (accessed 3.9.2021).
- 28 <https://data.consilium.europa.eu/doc/document/ST-8711-2020-INIT/de/pdf> (accessed 11.2.2024), point 36. This kind of non-dialogical positioning indirectly contributes to the promotion of 5G conspiracy theories.
- 29 <https://www.tagesspiegel.de/gesellschaft/elektrosmog-europa-ignoriert-moegliches-krebsrisiko-von-5g/23855700.html> (accessed 18.10.2023).
- 30 See Christine Aschermann/Cornelia Waldmann-Selsam: *Elektrosensibel. Strahlenflüchtlinge in der funkvernetzten Gesellschaft*, Aachen 2018; Werner Thiede: *Mythos Mobilfunk. Kritik der strahlenden Vernunft*, Munich 2012, chapter 11; also Giovanni Maio: *Ethik der Verletzlichkeit*, Freiburg i.Br. 2024.
- 31 Examples: <https://radiationprotection.se/5g/seven-case-studies-show-that-5g-is-a-health-danger/>; <https://www.diagnose-funk.org/forschung/mobilfunk-risikobewertungen/risikobewertung-von-5g-und-5g-aerzte-und-aerztekammern>; <https://kompetenzinitiative.com/5g-ein-experiment/> (accessed 8.3.2024).
- 32 See Wilfried Kühling: *Bewertungsdilemma Mobilfunk: Wie wir das Unvermögen staatlicher Risikobewertung endlich überwinden*, Marburg 2023.
- 33 See Michael Esfeld: *Wissenschaft und Freiheit*, Frankfurt a.M. 2019.
- 34 Cf. Werner Thiede: *Mythos Mobilfunk. Kritik der strahlenden Vernunft*, Munich 2012; Joachim Mutter: *5G: Die geheime Gefahr. Wie uns der neue Mobilfunk krank macht und wie wir uns schützen können*, Munich 2020.
- 35 The international appeal on 5G "Potentially serious health effects" can be found at <https://kompetenzinitiative.com/internationale-wissenschaftler-zu-5g-potentiell-ernste-gesundheitliche-auswirkungen/> (accessed March 8, 2024).
- 36 See <https://www.diagnose-funk.org/publikationen/artikel/detail&newsid=1305> (accessed 18.10.2021).
- 37 Noa Betzalel et al: The human skin as a sub-THz receiver. Does 5G pose a danger to it or not? in: *Environmental Research* 163 (2018), 208-216; Cindy L. Russell: 5G wireless telecommunications expansion. Public health and environmental implications, *ibid.*: <https://doi.org/10.1016/j.envres.2018.01.016> (accessed 29.2.2024).
- 38 For example: https://www.t-online.de/digital/aktuelles/id_85555326/5g-netz-versuche-in-genf-und-bruessel-wegen-strahlung-gestoppt.html (accessed 7.3.2024).
- 39 See <https://www.autonomes-fahren.de/mill-valley-schaltet-5g-ab/> (retrieved 2.2.2024; according to this, it will be prohibited in Mill Valley to activate 5G applications in the city in future) and <https://www.hawaiitribune-herald.com/2020/07/23/hawaii-news/council-exercises-caution-in-regard-to-5g-development/> (retrieved 1.3.2024).
- 40 <https://www.diagnose-funk.org/aktuelles/artikel-archiv/detail&newsid=2049> (accessed 11.3.2024).
- 41 Cf. https://www.golem.de/sonstiges/zustimmung/auswahl.html?from=https%3A%2F%2Fwww.golem.de%2Fnews%2Ffunkstrahlung-buergermeister-in-oberbayern-greifen-5g-der-telekom-an-2008-150026.html&referer=https%3A%2F%2Fwww.qwant.com%2Fmail&utm_campaign=golem.de-newsletter (accessed 4.3.2024).

- 42 See <http://www.elektro-sensibel.de/artikel.php?ID=179> (accessed 30.1.2024). See also Vincent Ialenti: Deep time reckoning. How future thinking can help earth now, Cambridge/MA 2020.
- 43 <https://www.diagnose-funk.org/publikationen/artikel/detail?newsid=1613> (accessed 5.3.2024).
- 44 <https://www.diagnose-funk.org/publikationen/artikel/detail?newsid=1604> (accessed 2.3.2024).
- 45 <https://www.kurir.rs/region/3422363/slovenija-zaustavila-uvodjenje-5g-tehnologije-nisu-sigurni-da-li-je-opasna-po-ljude> (accessed 8.3.2024).
- 46 <https://www.diagnose-funk.org/aktuelles/artikel-archiv/detail?newsid=2069> (accessed March 14, 2024).
- 47 <https://pubmed.ncbi.nlm.nih.gov/31991167/>; translation:
<https://www.emfdata.org/de/studien/detail&id=557> (accessed 24.2.2024).
- 48 [https://www.europarl.europa.eu/RegData/etudes/BRIE/2020/646172/EPRS_BRI\(2020\)646172_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2020/646172/EPRS_BRI(2020)646172_EN.pdf) (accessed 16.2.2024). Back in 2011, the World Health Organization classified mobile communications as "possibly carcinogenic". And the large NTP study in the USA indicated tumor risks in 2018.
- 49 See file:///C:/Users/Werner/Downloads/Pall_5G_EU-EMF2018-6-11_English.pdf. See also https://emfkeepers.co.il/wp-content/uploads/2020/11/OPINION_MARTIN_PALL.pdf and currently: https://www.gavinpublishers.com/assets/articles_pdf/Case-Report-The-Microwave-Syndrome-after--Installation-of-5G-Emphasizes-the-Need-for--Protection-from-Radiofrequency-Radiation.pdf (accessed 14.3.2024).
- 50 Wilhelm Krahn-Zembol provides general information on the ecological aspects of the mobile communications problem: (Um-)Weltmedizin – oder: Was heilt die Welt? Plädoyer für ein grundsätzlich neues Verständnis in Wissenschaft, Medizin und Recht, in: Umwelt – Medizin – Gesellschaft 4/2015, 301-312.
- 51 See Werner Thiede: Cloud frisst Erde. Die Illusion einer umweltverträglichen Digitalisierung, in: Salzkorn 4/2020, 34-36.
- 52 Miguel Coma: Energiepolitik im Zeitalter der Hypervernetzung. Das Umweltparadoxon von 5G, in: Wall Street International Magazine from 29.9.2021, here quoted from the German version:
<https://www.diagnose-funk.org/publikationen/artikel/detail?newsid=1751> (accessed 18.10.2021).
- 53 <https://www.gigahertz.ch/5g-achtung-jetzt-kommt-santina-russo/> (accessed 28.10.2023).
- 54 <https://www.diagnose-funk.org/publikationen/artikel/detail?newsid=1602> (accessed 30.8.2023).
- 55 <https://www.tagesschau.de/faktenfinder/5g-corona-mobilfunk-101.html> (accessed 8.10.2021).
- 56 See, for example, Karl Hepfer: Verschwörungstheorien. Eine philosophische Kritik der Unvernunft, 2021³; Matthias Pöhlmann (ed.): Verborgene Wahrheit? Verschwörungsdenken und Weltanschauungs-extremismus (EZW-Texte 269), Berlin 2020; Sarah Pohl/Isabella Dichtel: Alles Spinner oder was? Wie Sie mit Verschwörungsgläubigen gelassener umgehen, Gütersloh 2021.
- 57 One example of this is the problem of data protection, which is becoming increasingly virulent in the area of digital electricity and water meters (see the brochure by lawyer Margit Krug: Lauschangriff durch smarte Zähler, Bergkamen 2020).
- 58 Christopher Schrader: Krebs durch 5G?, in: <https://www.spektrum.de/news/schadet-der-neue-mobilfunkstandard-5g-der-gesundheit/1638246> (accessed 16.2.2024).
- 59 Vgl. Werner Thiede: Contra Seelenwanderung – pro Seelenunsterblichkeit, in: Informationsbrief der Bekenntnisbewegung „Kein anderes Evangelium“ No. 329 (September 2021), 13-18.
<https://www.kla.tv/5G-Mobilfunk> (Abruf 8.10.2021).
- 60 Vgl. Werner Thiede: Digitalisierung als Weltanschauung. Wie die rigorose Vernetzungspolitik mit 5G-Mobilfunk ideologische Züge offenbart, Bergkamen 2019.
- 62 Cf. Werner Thiede: Die Wahrheit ist exklusiv, Dresden 2022 (see www.werner-thiede.de).
- 63 The Baden-Württemberg Minister of Health, Manfred Lucha, commented on the status of research as follows: "There are always fears and concerns surrounding the topic of 5G and the expansion of mobile communications in terms of health risks. However, research and science have not yet been able to prove any negative health effects from electromagnetic fields below the applicable limits" (Press Release no. 77 from 1.4.2021).
- 64 See Werner Thiede: The digital progress trap. Why the gigabit society with 5G mobile communications threatens to take a step backwards in terms of freedom and health, Bergkamen 2019².
- 65 For example, a *mobile communications task force* has been in place in Baden-Württemberg since 2019 to combat the growing resistance to invasive radiation (<https://www.baden-wuerttemberg.de/de/service/presse/pressemitteilung/pid/taskforce-mobilfunk-nimmt-arbeit-auf-1/> (accessed March 12, 2024)).

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- 66 <https://www.diagnose-funk.org/publikationen/artikel/detail?newsid=1645> (accessed 21.1.2024). See also Jörn Gutbier/Peter Hensinger: Smart City, Smart Country, Breitband und 5G – die Folgen für Demokratie, Mensch und Umwelt, Bergkamen 2020.
- 67 See, for example, Felix Huesmann: Wie Mobilfunkgegner Angst vor 5G verbreiten (https://medwatch.de/2019/12/30/wie-mobilfunkgegner-angst-vor-5g-verbreiten/?utm_source=pocket-newtab - accessed 22.2.2024). Differently Werner Thiede: Desinformationen über 5G – Richtigstellungen zu Gesundheitsrisiken beim neuen Mobilfunk-Standard, in: Die Naturheilkunde 3/2019, 13-17.
- 68 Shoshanna Zuboff in the interview "Das Worst-Case-Szenario ist bereits da", in: Welt am Sonntag No. 46, 17.11.2019, 9ff.
- 69 <https://www.mdpi.com/1422-0067/22/7/3772> (accessed 8.3.2024).
- 70 Cf. Werner Thiede: Mobilfunk muss anders, in: Paracelsus Magazin 5/2021, 8-10 (also online: <https://www.paracelsus.de/magazin/ausgabe/202105/mobilfunk-muss-anders>).
- 71 See Werner Thiede: Digitalisierungsrisiken und Fortschrittsglaube. Literaturschau innerhalb wie außerhalb von Theologie und Kirche, in: Theologische Rundschau 84 (2019), 260-316; *ibid.*: Riskante digitale Transformation. Fortsetzung der Literaturschau innerhalb wie außerhalb von Theologie und Kirche, in: Theologische Rundschau 87 (2022), 141-226.
- 72 Klaus Buchner/Monika Krout: 5G-Wahn(sinn), Murnau 2021, 191.
- 73 Paul Feyerabend, a renowned philosopher of science, points out: "Observational findings can be reinterpreted and even trimmed in such a way that they lend support to a point of view that was originally incompatible with them" (Probleme des Empirismus I, Stuttgart 2002, 118).
- 74 On the monetary aspects of mobile communications technology, see Thiede: Mythos Mobilfunk, *op. cit.* 70ff; Peter Hensinger et al: Smart City und 5G- Hype, Bergkamen 2019.