

The new meta-study brings hope for a political rethink

In the following interview, renowned scientist Ulrich Warnke discusses the results of a new meta-study by Thill, Cammaerts and Balmori as well as the serious effects of insect mortality on ecosystems and human society. He takes a critical look at the political and media reactions to the issue and emphasizes the essential role of insects for biodiversity and ecological stability of our planet.



Dr. Ulrich Warnke

„The meta-study was carried out according to scientific criteria and therefore the results - insect decimation due to technically generated mobile and wireless communication - must be taken into account in political considerations.“

KOMPAKT: Mr. Warnke, the new BEEFI meta-study by Thill, Cammaerts and Balmori summarizes the current state of research. How do you rate the quality of this study? What is the most important result for you?

ULRICH WARNKE: The meta-study was carried out according to scientific criteria and therefore the results - insect decimation due to technically generated mobile and wireless communication - must be taken into account in political considerations.

Let me elaborate on this a little more: Since the generally recognized field study on the dramatic disappearance of insects in 2017, carried out by scientists led by Caspar Hallmann from Radboud University in Nijmegen, Holland, and with the crucial help of scientists from the U.K. and volunteer entomologists from the Entomological Association Krefeld, there has been a kind of panic in some political groups. This is because the results of the study, published in the specialist journal "PLOS ONE," showed that the total mass of insects counted will have decreased by 76 percent in just 27 years. Insect extinction is not limited to Europe. In July 2017, the International Union for Conservation of Nature (IUCN) reported that more than a quarter of cricket and grasshopper species worldwide are threatened with extinction.

Of course, all known environmental organizations have taken up and processed these data, but not a single organization - and this is the scandal - has mentioned worldwide radiation from mobile and wireless communi-

cations in the list of causes of insect decimation. This, in turn, is due to the fact that this radiation is simply not an issue (for them) - there is a lack of knowledge about it as the mainstream media miss the point and biological scientists generally have no knowledge of the physical possibilities of electromagnetic phenomena.

A well-done meta-study on this topic, such as the one presented here by Thill, Cammaerts and Balmori, is still the best way to bring the issue of insect mortality due to technical-physical effects into the public eye. It is to be hoped that the mainstream media will take appropriate notice of this.

KOMPAKT: This data on electromagnetic fields and their contribution to the rapid disappearance of insects, which has now been recognized in a major scientific journal, has obviously surprised environmental associations, in particular. Why should insect mortality be taken seriously?

ULRICH WARNKE: Insects have existed on Earth for more than 300 million years. They were already around when there were no humans, which can be seen as an evolutionary factor.

Insects are dying silently. They have no lobby to draw attention to themselves. Humanity, which is no longer close to nature, does not notice that they are dying. Nor do they know that insects form the basis of the food chain for most land-living animal species, which use them to cover their protein requirements. In Germany

alone, insects make up around three quarters of all animal species found here. Insect larvae, maggots, and caterpillars should not be overlooked. This means that when they disappear, hundreds of animal species lose their food source. Ecosystems are thus destroyed.

It is important for us to know that over 84 percent of crop species in Germany are dependent on insects, including medicinal herbs. Ninety percent of all wildflowers are pollinated by insects. Insects also provide - as the (German) Federal Environment Ministry puts it - "elementary ecosystem services." These services include transporting seeds across forests and meadows, loosening the soil, destroying carrion or disposing of animal excrement. They decompose organic matter such as dead wood or fallen leaves and maintain the fertility of the soil. And insects clean water bodies.

KOMPAKT: One of the arguments for the harmlessness of technical radiation points to the fact that electromagnetic fields also exist in nature.

ULRICH WARNKE: From an evolutionary perspective, that is precisely the problem. We and all of nature have always been permanently within electric, magnetic, and electromagnetic fields; this is a fact both in the open air and in any enclosed space.

Throughout its history on Earth, evolving life has "enveloped" itself in natural electric, magnetic, and electromagnetic fields. Living organisms have had millions to a billion years in their phylogenetic development to adapt to our planet with the help of these fields. But even more, organisms "learned" to use the various fields as mediators or carriers of a variety of information. Living beings have developed a wealth of sensors and even organs for this purpose. If you like, their life process became a constant navigation in this sea of specific vibrations, but also with the help of this sea. Here, navigation is not only to be understood spatially, but also temporally. In addition, electrical and electromagnetic communication between individuals has also been established; this has so far been demonstrated in insects such as bees and bumblebees.

The natural magnetic and electric or electromagnetic field sizes and frequencies have been covered by mobile and communication devices, with extra specificities regarding frequencies, polarization, and powers, for a relatively short time in the earth's history. Everything that is generated by technology is not part of the millions of years of adaptation and is initially unknown for the function of organisms and must be classified as stressors.

Never before in the history of the Earth have there been so many superimpositions of different fields of high-power levels and diverse frequencies from different sources as now. As a scientist, I have been observing this emerging problem intensively for decades and have repeatedly issued warnings in my publications.

KOMPAKT: You have been researching the effects of electromagnetic fields on insects, with a focus on bees, since the 1970s. Which of your early findings have now been confirmed?

ULRICH WARNKE: We have to reckon with three aspects:

1. As we know today, due to the natural conditions described above, living beings of all organizational levels have a magnetic sense resulting from evolution. This is proven in protozoa, algae, bacteria, higher plants, mollusks (sea snails), worms (e.g. earthworms), crabs, and crayfish, insects (e.g. beach flea isopods, ants, Australian compass termites, bees, butterflies, mealybugs, cockchafers), birds (e.g. migratory birds, pigeons), fish (e.g. sharks, rays, eels, salmon, trout) and seals, reptiles (e.g. turtles, newts, salamanders), mammals (e.g. whales, bats, grey cumulus and blind mice). In the meantime, it is becoming increasingly clear that many creatures also have electrical senses.

2. Senses for magnetic and electric fields are never created randomly in organisms. They are used for orientation in space and time and they organize internal bodily functions. This was not only proven early on for bees - in 1971 I named my doctoral thesis "The weather sensitivity of the honeybee" and made the electrical sense the focus, but also, for example, in 1974 for cockchafers by Fritz Schneider (*"Der experimentelle Nachweis magnetischer, elektrischer und anderer ultraoptischer Informationen"*, *Zeitschrift für Angewandte Entomologie Volume 77, Issue 1-4, Pages 225-236, January/December 1974*).

Passive detection of electric fields and electric currents is also widespread, such as in rays, sharks (sensitive to 0.1 mV), electric fish, birds, bees, bumblebees, platypuses, and salamanders; there are certainly more.

3. The additional energy from "technical mobile and wireless communication" can cause disorientation and body function disorders and even damage. Even if not every detail has yet been proven, we can logically think ahead with sufficient knowledge: if living beings of all organizational levels have a magnetic sense and many have an electrical sense, then it is very obvious that unnatural technically generated magnetic and electric fields influence and disturb this inherited natural orientation and communication. Consequently, natural scientists have noticed that precisely those species that are demonstrably dependent on magnetic and electric field orientation have increasingly disappeared in recent decades.

And if - as we now know for certain - all living organisms use non-thermal electromagnetic fields to keep their metabolism functioning, then it also stands to reason that these functions can be influenced externally and physically, something that has been proven for decades, but which those with political responsibility and their politically dependent authorities have repeatedly used

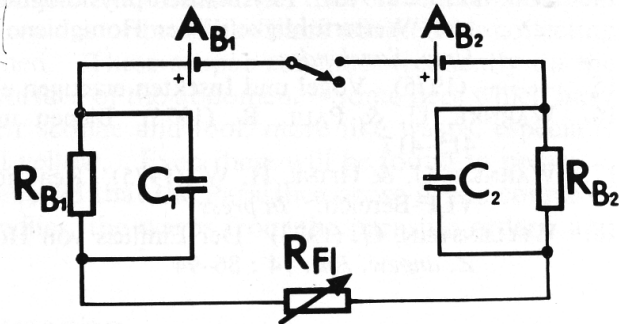
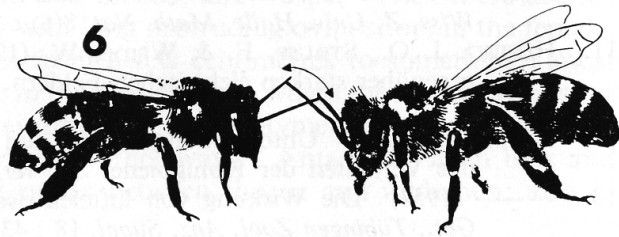
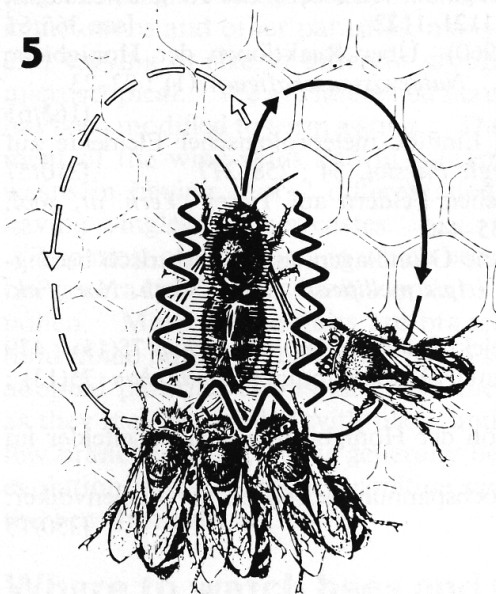


Fig. 5. The wagtail dance. Communication of information by means of the alternating field produced?
Diagram modified from von Frisch.

Fig. 6. Antennal contact between two bees produces a discharge current if the antennae had different polarities. The current is large enough to produce physiological stimuli.

In the circuit diagram:

- A_{B_1} , A_{B_2} represent the two bees as sources of electric energy.
- R_{B_1} , R_{B_2} represent the internal resistances of the bees' bodies.
- C_1 , C_2 represent the capacities of the two bees.
- R_{F_1} represents the resistance of the alighting board.

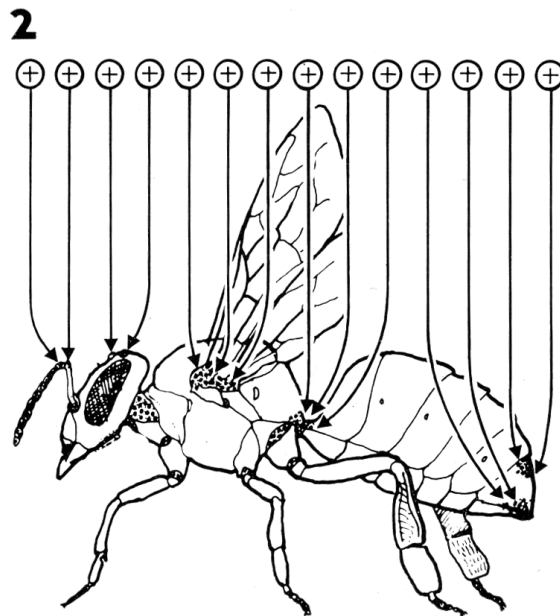
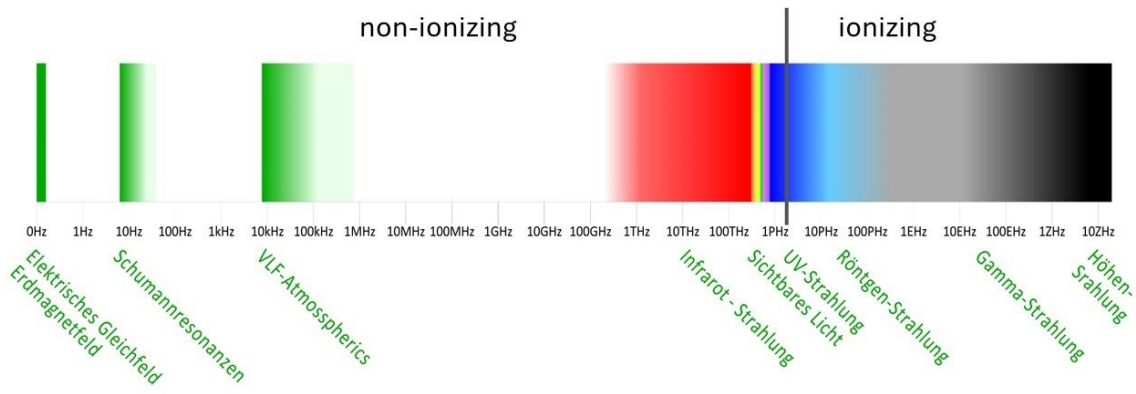


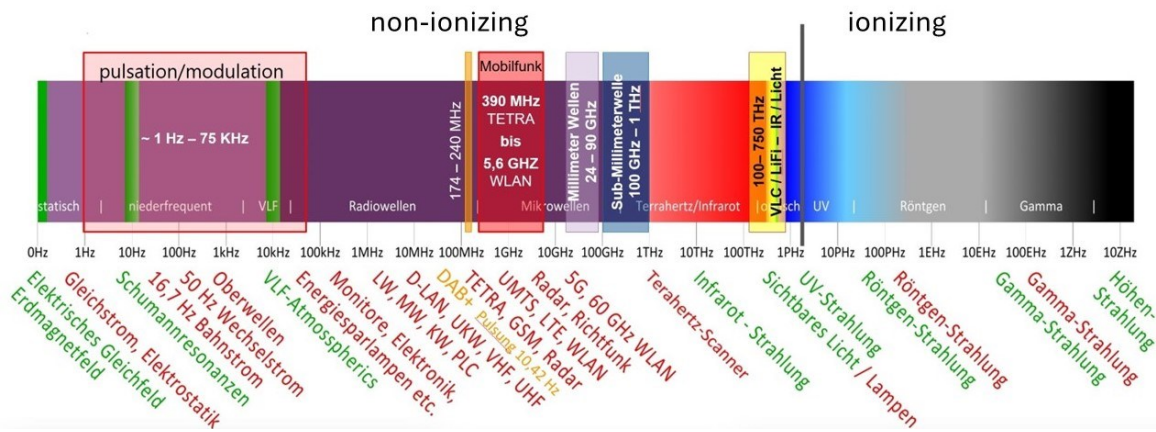
Fig. 1. Diagram illustrating the dipole effect of a bee's antennae. The bee is able to change the polarity of an antenna (e.g. from positive to negative) within seconds. The dotted lines give a stylized indication of the lines of the electric field.

Fig. 2. Diagram showing the lines of the electric field originating from the spatial charges; they are concentrated in cuticular areas of high electrical conductivity.

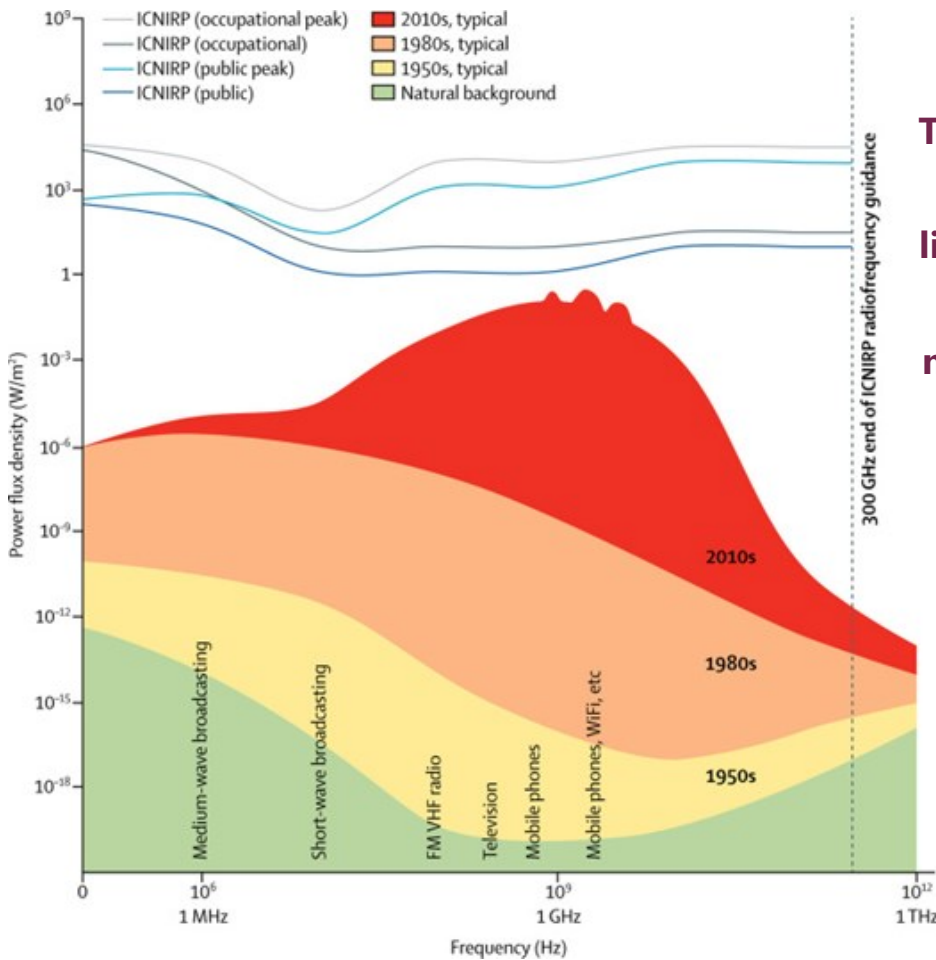
Natural spectrum



Current spectrum



Typical maximum daily exposure to artificial electromagnetic fields/radiation compared to natural background radiation (green)



The natural radiation exposure (green), to which all living beings are evolutionarily adapted, increased millions of times by technically generated radiation. Even the industry-related safety limits will soon be exceeded.

excuses to put off. For example, it has been known for a long time that radical pairs are highly frequency-sensitive in weak magnetic fields. And all organisms constantly form radical pairs in their metabolism (e.g. the protoporphyrin system).

KOMPAKT: The BEEFI study states that "biological effects of non-thermal EMF on insects have been clearly demonstrated in the laboratory, but only partially in the field, so the wider ecological effects are still unknown. There is a need for more field studies." How do you rate the validity of laboratory studies?

ULRICH WARNKE: As a young biologist with a knowledge of physics, I approached this field of work in my laboratory at the university. Of course, laboratory studies are extremely important to gain an overview of the parameters. For example, researchers at the University of Athens discovered that mobile phone radiation does not disrupt the reproductive capacity of insects (in this case fruit flies) due to thermal stress, but it does due to the pure electromagnetic field frequency effect.

Another problem that can be solved only in the laboratory is the physical characteristics of the antenna near field. In the near field we have a phase separation of magnetic and electric fields (90° shift), which causes different effects than an electromagnetic far field, where this shift decays to zero. (I explain these relationships in my book "*Diesseits und Jenseits der Raum-Zeit-Netze*", Scorpio-/Europa-Verlag, new edition 2023).

Laboratory tests provide a variety of signals for the harmfulness of technically generated and released electrical, magnetic, and electromagnetic impulses, waves, and fields. Any researcher with a normal mind can then draw sensible conclusions from the knowledge that has been available for many decades and thus prevent interference and damage. This used to be a recognized scientific craft and is now politically prevented.

Although the ecological effects can only be determined

in field trials, (German) legislation states that action must be taken if damage is suspected. Laboratory tests fuel such suspicions. However, when politics and commerce go hand in hand, they hide behind the argument that every affected area must be served with extra studies. And the results must be repeated many times before those responsible can no longer avoid paying tribute. This tactic then takes so many years that damage that has already been done across the board can hardly be repaired.

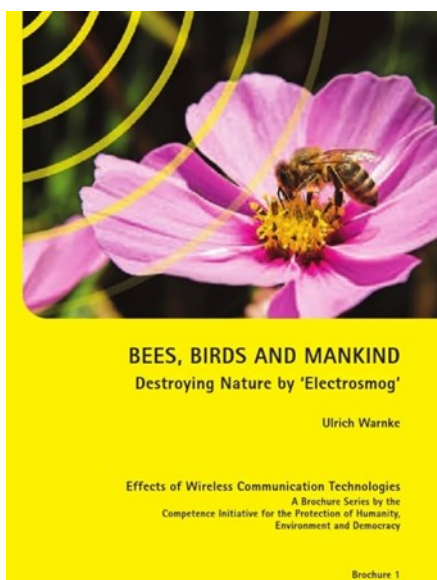
And there is another important aspect in favor of the laboratory studies: the question remains as to what causes the disruption of orientation, navigation, and communication and the subsequent damage, i.e. what we have as a mechanism of action.

And this is where we come up against an omission in our understanding of electromagnetic fields. The fields overlap; in some places they cancel each other out, in other places they add up. We consider almost exclusively the physically defined energetic force effect. However, we disregard the physically defined *informational* effect that also exists in the electromagnetic potential.

This informational aspect of the electromagnetic field has been known since 1938, was forgotten, and was published again in 1959 with regard to magnetic fields with the so-called Aharonov-Bohm effect and was subsequently proven experimentally several times.

KOMPAKT: We are always told that if Warnke's theory were correct, there would be no bees at all in large cities given the density of antennas, but it is precisely beekeeping in large cities that has successfully increased.

ULRICH WARNKE: Yes. The argument is spread by the BfS (German Federal Office for Radiation Protection): "In large cities, which are particularly well supplied with mobile communications, bees are increasingly spreading and thriving better than in intensively farmed areas." This



Ulrich Warnke: Pioneering publications on the effects of electromagnetic fields on insects and bees, collected for download at www.diagnose-funk.org/1977

is irritating insofar as the federal office rejects all previous experience regarding damage to bees caused by mobile radio as "not sufficiently scientifically proven." However, when it comes to denying damage, it uses just such experiences, even though there has been no scientific study to date.

Nevertheless, the experience of urban bees described above is real and can be explained with sufficient knowledge of bee behavior: bees are highly trainable, i.e. they are excellent at learning to find their dwelling and their central honey depot again and again after their excursions. This has been known since 1914 by the behavioral scientist Karl von Frisch. Thanks to their excellent learning ability, certain disruptive factors in the environment can be "factored out" as long as they are permanent and not overpowering. In other organisms, too, the perception of minor stimuli is lost through habituation after long-term exposure, but in many insects, habituation and learning are not as pronounced as in bees or bumblebees. How well bees learn depends mainly on their learning success. However, according to scientific experiments, the success of this learning in bees depends on the size of the reward: the more reward, the better the memory. The bees' reward consists of the honey, in other words, the presence of blossoming flowers with lots of nectar. The reward is particularly rich in cities: no monoculture, unused flowering meadows, high species diversity in parks, front gardens, allotments, backyards, and balconies. As a result, there are flowers in every month of the summer. And because cities are somewhat warmer (2-3°C), the flowering ability of the species is also extended at the turn of the year. Under these circumstances, the queen also lays a particularly large number of fertilized eggs, which leads to abundant worker brood. The good yield of nectar and pollen

has been shown to increase the effectiveness of the bees' immune system, which provides protection against diseases.

KOMPAKT: Now we have clear facts with this new study by Thill et al: Insects must be protected from artificial EMF. Do you hope that politicians will finally react?

ULRICH WARNKE: Hope dies last. There are certainly many colleagues at the Federal Environment Agency who would read this work and act. The directives from the top, i.e. from the government, are still dominated by IT lobbyists, especially when it comes to mobile communications. This must stop, there is nothing more important than an intact natural environment. I would like to summarize the dilemma as follows: Today, physically effective technologies are being introduced into the world, but hardly anyone knows whether and how they cause harm. Then, huge financial profits are made with these technologies and allowed to continue until the immense damage caused is tediously revealed with more or less private research funds and finally can no longer be officially tolerated. This new study is an important contribution to this. My thanks to diagnose:funk for funding it. The future would look better if technologies were only established across the board after the lack of harm has been proven beyond doubt by business profiteers.

KOMPAKT: Dear Mr. Warnke, that was very informative. Thank you very much for your detailed assessments and your pioneering work.

The interview was conducted by Peter Hensinger



"It seems plausible that such fields can trigger strong behavioral changes (in insects) ... What worries me most is the fact that so little research is being done in this area. We have introduced a succession of global telecommunication networks, in a huge, unreplicated experiment in which virtually every living thing on the planet is exposed to rapidly increasing doses of radiofrequency radiation, yet the consequences are not yet 100 percent clear."

(Prof. Dave Goulson, Biologist, in his book „Silent Earth“, p. 221/223)