

Dear Mike ...
An Informed Response to a Sixth-Former's Reasoned View
By Dr Grahame Blackwell

Mast Sanity recently received a communication from an intelligent and articulate sixth-form (16-18 yrs) Physics student, questioning the validity of the case for health concerns over mobile phone and mast emissions. Since the issues he raised are ones that many others also query, the response to that communication is copied below for anyone else who may find it helpful – either for themselves or to better explain the relevant points to others.

The main points raised by this student were:

- Lack of scientific evidence of harmful effects;
- It's not proven that radio waves harm humans and other creatures;
- We're already exposed to these frequencies from natural sources;
- Radio, satellite TV, navigation systems etc also use such frequencies;
- We're all exposed to sunlight, and "this is only a frequency too";
- We've all been exposed to radio waves since the radio was first invented, with no apparent detrimental effects;
- Campaign groups shouldn't scaremonger, but should have microwaves properly investigated.

The following is a copy of the emailed response to those points. In a subsequent reply to Mast Sanity the student, Mike, stated that this information has given him "a great insight" into what it is that we are campaigning about and the damage caused by this technology. It's very encouraging to see such an open-minded and true scientific attitude from one of our next generation of physicists.

Dear Mike

Your email has been forwarded to me, and I feel that your intelligent and carefully-considered observations deserve a response in kind. I hope, therefore, that as you asked and as I did, you'll read my response right through. Since in your last paragraph you accuse the likes of myself of "scaremongering" I hope you'll do yourself a favour and gain a fuller understanding of the issues by reading all of this. As a serious student of science I'm confident that you'll want to know the facts ('sciens' is literally translated as 'knowing', from the Latin scio: 'I know').

I should perhaps justify my right to speak authoritatively on this subject by saying that my PhD is in computers & communications and for some time I led my university's team in a multi-million pound European project in mobile telecomms - what we all now refer to as 3G - including working closely with researchers at the Orange test-bed outside Bristol as well as mobile telecomms experts from Italy, Finland, France, Greece and Holland. I've given keynote presentations on the subject to leaders at that time of all of the European telecommunications research projects at a conference at Lake Como, Italy and to delegates of the TINA-C consortium of the world's leading telecomms operators at AT&T Bell Labs, New Jersey, USA, so I hope you'll feel you're in good company.

You say that there is often no scientific evidence that what [Mast Sanity] are protesting against causes any harm. You also say "it is not proven that ..." These two are not quite the same thing. 'Proof' is based on evidence accumulating to the extent that it's much more likely that something IS so than that it ISN'T. That's why we have juries in criminal cases: some people may think that something has been proved beyond reasonable doubt whereas others may not - those latter people require more evidence. In the case of the possible harmful effects of smoking, for example, very many people (including many, many scientists) were totally persuaded that smoking was harmful long before the evidence was considered sufficiently compelling to count as 'proof' to everyone's satisfaction and therefore be recognised in the laws of the land. As a physics student you'll no doubt be aware that the only sort of 'proof' that can be relied upon 100% is one that's based on man-made definitions - i.e. a mathematical proof. Any scientific 'law' is simply an hypothesis that has stood the test of time sufficiently to be considered 'proved' - proof of such hypotheses is never absolute, it's always a question of "How much convincing do you need?" (and different people require different amounts of 'proof' - i.e. evidence - before they're convinced).

As for "no scientific evidence" of harmful effects from masts, I'm afraid that is simply not the case. On my website www.starweave.com you'll find a piece relating to SIX mast studies ALL of which show harmful effects, to a statistically significant level, from mast emissions (www.starweave.com/masts). At the time

that was written those were the ONLY studies, as far as I know, on effects of mast emission - and ALL of them flagged up 'hazard warnings'. [I should say at this point that I don't offer my website as a model of good practice in website design, it was thrown up some years ago to provide info for people in my own locality in relation to a proposed Tetra mast in that area. Since then it's grown like topsy and has clearly served a real need - it's been accessed regularly by people from virtually every country in the world. But it's still a mess, a fact for which I make no apology, it provides FACTUAL information free of charge that has proved of benefit to many thousands of people. It's also not been updated for some long time - for the simple reason that I consider the health problem to be beyond question, so rather than labouring that point I'm putting most of my time and energies into possible ways of overcoming that problem, given that we as a species clearly need mobile comms and society's infrastructure now depends on mobile phones.]

There is in fact a MASSIVE amount of evidence to indicate that mobile phone and mast emissions are a health hazard. You'll find some stuff on that on my website - look particularly at www.starweave.com/reflex - compelling repeatedly-replicated evidence that phone/mast-type emissions at levels within national 'safety' guidelines cause single and double-strand breaks in DNA chains. Double-strand DNA breaks are the precursor to cancer, as the cell doesn't know how to repair a double-strand break and will almost certainly get it wrong, creating rogue cells. The research team said in their conclusions that (to paraphrase): "There is NO JUSTIFICATION any more to claim that we don't know how this sort of radiation could cause ill-health effects in humans or other creatures." You should also look at www.bioinitiative.org, which documents an analysis of **over 2,000** research studies and reviews on this subject by an international group of world-class researchers and EMF health experts - including THREE former presidents (including the founder) of the Bioelectromagnetics Society, acknowledged by all to be THE leading research body in the world on this subject. We're not talking about armchair critics here (such as we sadly so often get deciding on our safety levels for us), these are **active researchers**, people who do the experiments and come up with the results - they know what they are talking about. Most importantly they are interdisciplinary, conversant with the various facets of the issue - electromagnetic fields, cell biology, neurology, etc, etc - unlike so many of those that make up government-appointed committees. They say unequivocally that " 'Business as usual' is unacceptable" and that this type of radiation at levels within gov't 'safety' levels IS causing ill-health effects.

It's also notable that the Russian National Committee on Non-Ionising Radiation Protection, like me and many others, regards proof of hazardous effects of mobile phone & mast emissions as 'a done deal'. I've attached herewith [below] a summary of an abstract of a paper recently published in a peer-reviewed international journal by representatives of that body, followed by a recent press article detailing their concerns about effects on children. This is the Russian equivalent of the relevant section of our own (so-called) Health Protection Agency - the main differences being (a) they represent a much bigger country than ours, (b) they are arguably rather more technologically advanced than us on this subject (they deployed microwave weapons in the Cold War, over 40 years ago, they were also the first nation to put a man into space), and (c) they do NOT represent a capitalist economy (think on that for a few minutes).

You refer to the EM radiation that exists around us from other sources. Firstly it's important to note that natural sources of radiation in the radiofrequency/soft-microwave range are pretty well nonexistent - that's exactly why those frequencies were chosen for radio & telecommunications purposes, the background interference is virtually zilch. If, as you seem to suggest, natural sources were anything more than absolutely miniscule, Marconi would never have got radiocomms off the ground. Within a few hundred metres of a typical phone mast the radiofrequency radiation density is now approximately one million billion (ten to the fifteen) times as much as natural background radiation - of the sort that we and other species evolved in over millions of years (and can therefore cope with).

You also say that we have all sorts of other electromagnetic radiation around us. Can I first dispense with the 'sunlight' red herring: this isn't "only a frequency too" - it's **the** set of frequencies that we've been immersed in ever since we crawled out of the swamps as protozoa, or whatever. Over millions of years our adaptive/evolutionary mechanisms have worked to not only enable us to cope with it but actually make beneficial use of it. To liken that to a totally new all-pervading element in our environment is like saying "it's fine to drink meths because we already drink water and water is only a liquid too". You also say that we've been exposed to radio waves for many years with no ill-effects (including people working on transmitters). I'd refer you to the wide body of research that shows graphs of the rate of increase of radiofrequency radiation over the 20th century and graphs showing the rate of increase in various types of cancer over that same period - the graphs are almost identical. This doesn't prove that one causes the other, it could be down to general lifestyle issues - but you certainly CAN'T claim that radio wave exposure has increased without a comparable increase in ill-health, the data contradicts you on that. As a point of detail, one specific piece of research evidence asked for by the Stewart Committee (Gov't-commissioned Report on Mobile Phones & Health, 2000) but claimed to be unavailable by the NRPB (forerunners of the Health Protection Agency, Radiation Protection Division) - even though it was later found to be freely available at the time - was a study of health effects of the Skruna radio station in Latvia on children living nearby (see www.starweave.com/hidden/ for Observer article). This study showed that "memory and attention was significantly impaired" in ALL of those children - that's not scaremongering, that's the proper appliance of science.

It's also important to understand the difference between mobile telecomms signals and other types of radio signal. It's NOT the case, as you suggest, that those concerned about phone & mast emissions believe that we're being cooked by the microwaves - if you think this then you clearly totally misunderstand the issues that quality science HAS thrown up about this sort of radiation. NOBODY on this side of the mast health debate (at least nobody properly informed) believes that the microwave heating effect is a serious threat - the 'safety' guidelines protect us ONLY against such heating effects, and research has shown definitively that there are other potentially hazardous effects happening at power levels WAY below those that could lead to tissue heating.

Digital telecomms transmissions use a phase modulated signal, following a regular pattern repeating several times a second. A side-effect of this protocol is the generation of amplitude modulation in those transmissions, which varies according to which technology is in use. For example, for GSM the primary modulation is 217 Hz, for Tetra it's 17.6 Hz. Some sources refer to this as 'pulsing', though that's a term that can be both misused and misrepresented. What is NOT in question is that this type of radiation includes an ELF (extremely low frequency) modulation component of a sort which has been shown in a number of research studies to have significant biological effects at power levels below heat-based 'safety' levels (as documented in the Stewart Report). This is not the case with conventional radio or any of the other EMF sources you cite.

To liken this to conventional radio - as some establishment 'experts' do - is equivalent to saying there's no difference between the consequences of having a jackhammer resting on your foot while it's switched off, then when it's switched on. You may wish to try that some time to see if it feels the same (but I don't advise it!!) The difference is that the microwave 'jackhammer' is aimed at every cell in your body - it's particularly pervasive in children who (a) have thinner skulls, (b) have smaller heads, so signals can penetrate deeper, (c) do not have fully-developed brain rhythms until puberty - and won't have then, either, if they're not allowed to settle down. There is also research evidence to show that the body's own inter- and intra-cellular mechanisms use those same frequencies (since evolution has allowed them to do so in the absence of natural external interference) - I leave you to figure out what might happen to an organism's own signalling protocols if it's bombarded by external sources of such frequencies. I'll give you a clue and say that one of the known effects (at power levels well within gov't guidelines), in organisms from nematode worms to tomato plants, is production of shock-reaction proteins ONLY produced in response to a direct threat, or damage, to the organism. One might accuse nematode worms of a psychosomatic reaction, or being scaremongered - but tomatoes??? I'd also be very wary of those worms if they've evolved to an extent that they can start being frightened of masts!!!

There's a lot more that could be said, but this is enough to be going on with

Thanks for your attention. I hope you've found all this helpful.

Best regards

(Dr) Grahame Blackwell

**Problems in Assessment of Risks From Exposures
to Microwaves of Mobile Communication**

J. Radiation Biology & Ecology, 2007

**L. Ya. Belyaev
Yu. G. Gregoriev**

**Russian National Committee on
Non-Ionizing Radiation Protection, Moscow.**

“Since pioneering investigations published in the beginning of 1970, various biological responses to non-thermal (NT) microwaves (MW), including adverse health effects, have been described by many research groups all over the world.

There is strong evidence that the NT MW biological effects depend on several physical parameters and biological variables, which must be controlled in replication studies.” ... “It has been shown that adverse effects of NT MW from GSM/UMTS mobile phones on human lymphocytes from healthy and hypersensitive to EMF persons depend on carrier frequency and modulation.” ...

“Identification of those types and frequency channels/bands for mobile communications, which do not affect human cells, is urgently needed as the high priority task for the safe development of safe mobile communications.”

“Numerous data on the NT MW effects clearly indicate that the SAR concept alone cannot underlie the safety guidelines for chronic exposures to MW from mobile communications and other approaches are needed.” ...

“It has been shown that NT MW affect cells of various types including stem cells and reproductive organs. Stem cells represent especially important cellular model because recent data suggest that different cancer types, including leukaemia, have a fundamentally common basis that is grounded in epigenetic changes in stem cells.”

[SAR: Specific Absorption Rate, the measure used in UK and other ‘safety’ guidelines. GKB]

Handsets pose danger for children

<http://eng.cnews.ru/news/top/indexEn.shtml?2008/04/18/297775>

April 18, 2008, Fri 6:20 PM [Telecom Security](#)

Handsets pose danger for children and teen-agers, state experts of the Russian National Committee on Non-Ionizing Radiation Protection having carried out experiments with animals of different age. The oncoming generation is recommended to reduce communication through handsets, as their nerves might be badly injured.

The Russian National Committee on Non-Ionizing Radiation Protection (RNCNIRP) has expressed its opinion regarding the possible influence of handset electromagnetic field on children and teen-ages. The experiments, consultations and discussions held led to the resolution ‘Children and handsets: future generations’ health is under threat’. The given resolution comprises opinions of leading Russian scientists in hygiene and radiobiology of Non-Ionizing Radiation. The given resolution is based on modern scientific knowledge and fundamental submission generated in many years of research into the influence of electromagnetic fields on human health.

Possible threat to human health is very high. One should not forget the electromagnetic field influences formation of higher nervous activity, while electromagnetic absorption in the head of a child is much higher as compared to adolescents (children’s cerebral tissue is of higher conductivity, the head size is smaller, cranial bones are thinner, etc.). The children’s organism is more sensitive to electromagnetic fields than that of adolescents; the children’s brain has the peculiar propensity to accumulation of adverse reactions in case of re-irradiation.

Specialists assert modern children are using handsets since early age and continue using them having grown, so the period of contact with electromagnetic radiation is longer as compared to adolescents. According to RNCNIRP specialists, children using handsets are prone to the following disorders: weakening memory, decline of attention, reduction of mental and cognitive capacity, irritation, sleep violation, increasing epileptic possibility. The other possible far-standing consequences are brain, auditory and vestibular nerve tumor (at the age of 25-30), Alzheimer’s disease, ‘acquired dementia’, depressive syndrome and other forms of neuronal degeneration of brain structures (at the age of 50-60). According to Oleg Grigoriev, the given forecasts are based on the data analysis received and long scientific debates.

‘Children using handsets are not able to understand that their brain and health are exposed to the electromagnetic field and risk, respectively, - the committee report reads. – The given risk is not inferior to the influence of tobacco and alcohol. Our duty is not to damage children’s health – our future – doing nothing.’