

A Special Interview with Alasdair Philips

By Dr. Mercola

DM: Dr. Joseph Mercola
AP: Alasdair Philips

Introduction:

DM: Welcome everyone. This is Dr. Mercola. Today I'm here with Alasdair Philips who is coming to us from the other side of the pond. He has training in electrical engineering and communications. In 1998, he started the organization Power Watch which is committed to finding out the specific details of how EMFs affect our health and how we can really apply it in a practical basis. Welcome for joining us today.

AP: Thank you.

DM: I'm wondering if you could relate to our viewers a little bit of your journey and how you came to be doing what you're doing at this point. It's always interesting to have that perspective as to how you're reaching your conclusions.

AP: In fact it's quite a long convoluted story as well. I was always interested from a child in radio and things. I bought my first radio valve receiver aged 11 in 1962 and then went on to do walkie-talkies and things while I was at school. I thought they were just wonderful. It's just fantastic stuff. I then went on from there to the university and qualified in electrical engineering, communication engineering and then went into industry for a few years doing various things.

From then I decided a change was necessary. I went and did a post graduate course in agricultural engineering which because I got an engineering background was almost all agriculture. I had some pretty intensive stuff on animal health and plant health and what things need to thrive. I also got an interest in the biological side of things.

And then I went into government research looking at solar powered grain drying bonds and various things that required plants and animals to flourish in I supposed a semi-industrial setting because that was agriculture is today.

I had another period out – I have periods out where I was looking after the maintenance of a medieval abbey for a couple of years. And from there I was involved in a group called Electronics and Computing for Peace. We were asked to go down in the 1980s to Greenham Common Airbase where the women claimed the American military were zapping them. It was quite a story in the press at the time.

We went down and we measured basically early non-lethal microwave weapons working at the same sort of frequencies that cellphones operate at about 1800-1900 MHz pulsed at the women. It was a story at the time. That's what got me interested in the biological effects of electromagnetic waves.

Interestingly many years later, 10 years or so later, I was invited to talk a lot of the first mobile phones and other health concerns through a series of international conferences in the late 1990s – industry conferences. I was the sort of token outsider saying yes I think there is a problem.

At one of the conferences, a very senior UK government person said yes, he had led the team that went out to investigate the zapping. He wouldn't let his men stand where the women were because of the pulse microwaves. Anyway that is jumping back. This is back into the 80s, I've got this interest and then I found...

DM: If I could just stop you there. These pulse microwaves at this air force base, where you able to confirm that in fact it was causing biological effects from your investigation?

AP: We believe so. The women believe so. They were considerable levels. The U.S. military and the UK military now admit to having these weapons – these non-lethal microwave pulse weapons. The Pentagon has actually demonstrated the big ones mounted on Humvees. They can down somebody at like 1000 meters. But at a lower power more close by, it disrupts you. It disrupts your headspace.

That's what the women had. They were getting sweats, headaches, confusion, ringing in the ears. Now of course some of that could be psychological. It was a very stressful camping in quite crude conditions on the outside of an airbase would have exacerbated any effects but there is no doubt that they were trying out these pulse microwave weapons on the women.

DM: And these pulse microwaves is that a similar technology that we use for cellphone transmissions?

AP: Very similar. The pulsing is different. It's at a different rate but it's very similar. Particularly with the GSM and the PCS cellphones, the second generation cellphones which are still widely used. Even if you have a third generation, UMTS 3G phone, a lot of the time it reverts back to the old method because there is more base stations out there still to handle your call. Those pulse in a very similar way. They turn on and off basically in bursts right next to your head. So that's very similar.

DM: You progressed from there and you actually started Power Watch (indiscernible 7:23)?

AP: That's right. I actually started looking in the literature and I found that in the States, it was the New York State power line project which had actually put quite a lot of money

into some quite good academic research into the effects of high voltage power lines. Dr. David Carpenter was one of the key people leading that. He is outspoken today again still about the need for precaution.

I would then sort of switch for quite a few years from microwaves to power lines because power lines and magnetic fields from substations and so on are ubiquitous in society whereas if you go and stand outside an airbase then you're almost going to take enough with the (indiscernible 8:07). The military may well react at something. At that point society wasn't being bombarded, mobile phones hadn't taken off, they were a new thing, a few people had car phones. So it really wasn't an issue back in the mid-80s certainly not in the UK.

We really concentrated on power lines, substations, childhood leukemia and things like that. I did quite a lot of work with the UK charity children with leukemia into researching these matters and helping manage some of the research projects. And then in the 90s it started to become clear that mobile phones were really becoming quite a big issue. So we gradually migrated back on our concentration is more on that side because that's the bigger exposure for most people.

DM: I'm wondering if you could briefly summarize your findings and beliefs on the effects of the power lines at this point because for some people it's an issue. Perhaps as an extension of that related to the risk that perhaps most people face from the power lines in their own homes which is the electrical wires they are typically not passed through conduits (indiscernible 9:13) electromagnetic fields from that perspective and how that might relate to the power lines outside their house.

AP: Power lines outside the house – actually both in the States and over here, in the States they are often on poles up the streets. These are the relatively low voltage ones that feed the houses. Over here we've got bits like that but most of them are under the sidewalk. They are often faults in that wiring that cause quite high fields that are often actually higher than the fields you get from the enormous big high voltage power lines.

There is without doubt, I don't have any doubt there is an approximate doubling in the incidence of childhood leukemia with magnetic fields above a certain level which is 4 milliGauss, 0.4 microTesla in U.S. units.

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It's being confirmed in over 20 studies. Most of the studies are showing a doubling at that sort of level between 3 and 4 milliGauss.

The problem with that is childhood leukemia on its own is very rare. So you go from about 1 in 1800 children with leukemia to 1 in 900 who don't have leukemia. The level 4 milliGauss is a tiny fraction of the 1000 milliGauss (100 microTesla) the international standard, the (indiscernible 10:44) standard set for our protection which is a joke isn't it.

I have actually sat with (indiscernible 10:53) who is chairman of (indiscernible 10:55) and said, can we have some kind of mix here? In fact they put it up to 200 microTesla. That's 2000 milliGauss. That's where acute effects may occur. But they actually state in their own guidance that it doesn't protect against cancer. They say we were not convinced of the effect of the cancer and therefore, we don't want to disrupt society too much by putting these (indiscernible 11:20) limits on.

But the trouble is that means people can build in their power – the fact that it then doesn't get taken into consideration when houses are built and when power lines are built and moved. They just won't deal with it. It's too big a jump that would disrupt society too much.

DM: Is this standard not only present in Europe but also in the United States, the same standard used?

AP: It's effectively a worldwide standard. The whole thing is actually a bit of a con in my opinion.

Back in the 1970s, there wasn't any organization in the world that looked after non-ionizing radiation and health – that's electromagnetic radiation and health. The body was IRPA which was a ionizing radiation protection organization. A young researcher Dr. (indiscernible 12:17) thought we're getting increased pressure on power lines and things, we ought to get an organization established. He started a thing, a sort of subcommittee of this IRPA that did power lines and things like that. This is 1978.

And then he went on to form (indiscernible 12:39) and become the first chairman of it in the 80s or '92 I think it formally became (indiscernible 12:46). He then went on in 1996 to form the World Health EMF project which was initially and primarily funded by industry because the World Health Organization is always short of money. So the industry basically funded a lot of what the EMF project did and he stayed there for 10 years until 2008.

So effectively we have this one person overseeing this whole standardizing process for 30 years. You couldn't get on the committee unless you're invited. There is no sort of open election process whereas in most – for (indiscernible 13:23) purposes in most public committees you have a turnover of the committee members every five to seven years and the chairman every three to five years. The idea is to stop a sort of incestuous inward looking relationship but this has never happened for EMFs.

(indiscernible 13:40) is in fact an NGO. It is actually a non-profit organization registered in Germany which they have managed to get recognized by WHO because partly they funded the World Health EMF project. It's sort of set in stone. We're really a bit caught by it at the moment. It's very difficult to move on this.

DM: Is there any progress at all being made in changing that as to levels that are more consistent with biological health damage?

AP: Not really no. Not at power frequencies. A few countries in Europe have brought in – Switzerland is one that has brought in 1 microTesla, that's 10 milliGauss level for new homes and new substations and new power lines where possible. It's not an absolute law but it's a pretty good one. Italy have brought in some – some areas of Italy – and went on to other countries but there is nothing solid.

DM: For most people where does this exposure occur at in their home if they happen to be and lucky enough to be one of these offending power line situations? Is it something that occurs more regularly as the power line enters the home and it's not shielded properly.

AP: It's not when the power line enters the home. The high magnetic fields can come from a number of things and it may be that high voltage power lines are slightly worse in the type of field that they produce which is quite technical by it's a rotating field. It's slightly different in form. It is a magnetic field. You measure it the same way but it has an extra property to it.

In the home, the main things are what used to be clock radios by the bed but now we've gone away from the old clock radios that had a motor inside them and modern clock radios particularly the liquid crystal ones tend not to give up magnetic fields. The plug top mains adaptors used to be very high in magnetic fields. Now they've got electronics in them. They have made (indiscernible 15:50) instead but at a much lower level.

Really, in a home, there are some things that are really bad. Electric storage radiators are bad. They give off very high fields when they are being heated up under cheap electricity. Some devices in the home give off quite high fields. Electric cooker rings give off when you stand really close to the cooker, you can get quite high fields. So there are things in the home that expose you.

DM: How about the electric hand hair dryers?

AP: They are a real problem if you use them at night. One of the big effects of electromagnetic fields including light – light is an electromagnetic field. It's just the same. It's just a higher frequency than our cellphones. The IARC (International Agency for Research on Cancer) World Health Organization have classified light at night as a probable human carcinogen, not possible but probable on the basis of shift workers.

DM: What was the basis again?

AP: It was on shift workers, people that work at night. They have got like a two to three fold increase chance of getting breast cancer and a number of other cancers. They think the mechanism partially is a melatonin one. Melatonin is a neurotransmitter that is related to mood and related to serotonin and mood and our circadian rhythm.

You know, the old adage, early to bed early to rise makes Jack healthy, wealthy and wise. Actually, there is a lot of truth in that. Light late at night can completely stop your melatonin synthesis in the pineal gland which is in the center of your head for that night basically can switch it off.

Hair hand dryers are exactly the same. If you use a hair hand dryer next to your head after about 7 or 8 pm at night it puts a significant magnetic field into your head from the motor which is enough to basically almost shutdown your production of melatonin. Melatonin is acknowledged as a radio protective anticancer agent.

There are some very good studies on animals where they have given them ionizing radiation or chemicals which will make them (indiscernible 18:13) cancer and then dosed some of the animals with melatonin and it significantly reduces the cancers. This is quite an important rhythm. Our circadian rhythm, our day and night rhythm is very important for us to be healthy.

So we recommend either drying your hair if you have to dry with a hair dryer earlier in the day. If you have to dry it at night, in a lot of hotels now, they've got wall mounted hair dryers with a tube, like a vacuum tube. So you're sitting like almost a yard away from it which is fine. They would be fine. So if people really need to dry their at night they really should invest in one of those.

DM: Excellent. It's nice that there are some alternatives. It was my understanding that those are one of the most pernicious devices in the home with respect to the magnitude of the electrical magnetic field that was generated.

AP: They are one of them. One of the other ones that really bothers me – it used to bother me for the food point of view but it's much less so now; I still got my doubts – are microwave cooking ovens.

DM: I would be interested to hear your views on that because that's certainly a controversial one that commonsense wise would seem that there are some problems with it. Why don't you share with us your insights on that.

AP: Initially, I was very concerned. There were some reports from Switzerland in particular, in particular (indiscernible 19:35) looking at what it did to amino acids in the food although there is still some evidence that that could be a problem.

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I was originally concerned what it did to food. It does do some things to the amino acids. It changes the rotation angle in the amino acids. Whether that's harmful or not, we really don't know. But what they do do is when they are cooking they leak microwaves but much more importantly they give off enormous power frequency magnetic fields.

We were talking about this 4 milliGauss for the childhood leukemia. Standing a foot away from a microwave oven, you can get 400 milliGauss when it's running not from microwaves, from the power frequency magnetic fields that are caused inside when they get the magnetron to run. Obviously that's something to avoid particularly I think for women. I've got a particular concern with breast cancer and magnetic fields.

So we recommend that you put your microwave oven either in the far corner of your kitchen or ideally in the utility area where you can just go through and put it in and go back when it's pinged a few minutes later. You don't actually use it right next to where you're working on the work surface.

DM: Terrific. Thank you for those words of caution. We need to be really careful with the hand dryers, blow dryers and the microwave ovens.

From your experience at least in the United States most of the conduit that people – from the same perspective you said the danger of the magnetic exposure at night is an issue that these magnetic fields typically generated in the United States frequently is a result of the power lines that run behind the walls that aren't running around through a conduit and they generate this magnetic field. I'm wondering how much of an issue that is from your perspective and what concerns you have about that?

AP: If the house is properly wired it shouldn't create magnetic fields. If go and return currents – to light a bulb or whatever, the current goes one way then it goes back down a parallel wire back in the other direction – if the house is correctly wired and the current is always going up and down the same piece of physical wire which has got two wires inside it, then they don't really generate magnetic fields but they do generate electric fields.

There are lots of houses with faults where it goes in one direction and then doesn't go back down the same wire and then you can get very high magnetic fields. Gauss meters are cheap. Power frequency Gauss meters are really cheap. We always recommend that people ought to get one or hire one just to check the house out.

Electric fields is another issue. We've got the same problem over here. In fact it's worse because our mains voltage is 230 volts instead of 110, 115, or 120. Electric fields are another issue. There is an increasing number of people that are electrically hypersensitive to power frequency electric fields. That is difficult.

There are some devices made in Germany which turn off your lighting and other circuits when you're not using power. They work out but nothing switched on and then they turn it off at the utility box. They are quite effective.

We actually recommend for new building wiring that people put wiring into screened wiring. Conduits are very expensive and there aren't many people that want to put it in these days. You can get mains wire with a screen built into it. That stops the electric fields. So we recommend that.

DM: So then maybe if you can share with us your progression into the concerns of the cellphones. We cover that area.

AP: We come into the sort of 1990s. I was working at that point in industry on various measurement devices, data loggers, electromagnetic compatibility. How electronic equipment interferes with electronic equipment.

I was also working on soil moisture meter for farmers to look out how much available water there was in the field. It used microwaves. I started getting these blinding headaches which were lasting several hours to 24 hours after I have been doing it. I kept a diary. It was very clear. I was reacting. I got a bit more interested in this issue.

As the 90s went on it became very clear that the fields we were exposing ourselves to from cellphones and cordless phones were really concerning. I began to react more to them. I don't react (indiscernible 24:49). I have met a lot of people that are far more electricity sensitive than I am but it gives me brain fog. I can't think properly. I can't concentrate properly. It gives me headaches. If I'm exposed at night it significantly disrupts my sleep. That was really when we started moving over and looking at those sort of devices.

DM: What have you found? What have your observations been?

AP: Even when we started, we looked back at the literature and the Russian will report – in fact, there were reports back in the 1930s of people living near some broadcast radio stations when they were starting up reporting these similar effects. The Russians were reporting it quite highly in their military people in the 1960s.

Charlotte Silverman in the early 70s in the States reported what she called microwave sickness which was headaches, general chronic tiredness, chronic fatigue. You couldn't really account for it. It seemed to occur in quite a few people when they were chronically exposed to microwaves particularly pulsing microwaves with pot microwaves. We were then getting more and more in the 90s. We've had the first brain tumor claims in the States that cellphones caused a brain tumor. The evidence was beginning to build up.

So in 1998, myself and two colleagues, Roger Coghill actually took a retailer to court in the UK for not applying warning labels to cellphones. It's got interesting with all the thing that is going on in San Francisco and now about cellphones and warning labels. We actually went to court in 1998 and it got on world TV. We had MTV and all sorts of people there. We lost of course. We knew we would. But we thought the evidence then was adequate enough to say there should be a label on this. This isn't a fun device. This is something you should use with caution when you need to use it.

Anyway we lost and since 1998 the evidence has just mounted and mounted and now I have no doubt at all today it causes brain tumors, increasing brain tumors and it causes

these other effects. The effects were getting reported at schools; lack of concentration, bad behavior, headaches, memory problems, autism. They are all in this (indiscernible 27:20) stuff which when you trace the literature back you can actually see back 1960s onwards.

DM: Many people have made the analogy between this type of radiation exposure and the type of health exposure that people were receiving from tobacco or cigarettes decades ago and that the industry was really pushing the notion these types of exposures weren't in fact harmful and that smoking tobacco did not cause lung cancer.

We were able to convince the public for many, many years of this that there was compelling evidence. Do you think something similar is going on with the telecommunication industry which is really in my perspective seems to dwarf the influence of the tobacco industry? They are far more powerful and have far more influence.

AP: Yes, without any doubt at all. The wireless industry, cellphones and Wi-Fi and routers and things is now a 300 billion world industry. It has phenomenal power – 300 billion. One financial guy I was talking to recently, investment fund manager, who looks after billions of dollars of telecom shares was saying it was just ridiculous. They are still in this complete state of denial. And yet the evidence is really starting to stand out. We need to get a better handle on it.

But with smoking – between non-smokers and heavy smokers, you've got something like a 20-fold odds ratio. If you smoke heavily, you're 20 times more likely to get lung cancer than if you don't smoke. But actually if you look between medium smokers and light smokers, you've got an odds ratio of about 1-1/2 to 2. In other words, it's quite a low number. That's exactly the odds ratios in fact they are higher than that in a lot of EMF things, we're getting from EMFs.

I actually based this with Richard (indiscernible 29:17) years ago. He said, I quite agree. With electromagnetic fields, we're so surrounded by them that we won't get these 20- and 30-fold odds ratios because everybody it's ubiquitous exposure now. Everybody is exposed. We're only going to get lowish numbers if the problem is real because everybody is just highly exposed.

DM: That is a very interesting perspective which actually leads into one of the original reasons I contacted you. Because of the pervasiveness of this challenge most of us have these concerns. We're convinced of the data as you obviously are that there is something to be worried about and concerned about here and that we should protect ourselves in some way.

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Obviously, we can do the simple basic things and use our own personal cellphones but while useful it still doesn't address the problem entirely because of this massive

exposure from everyone else. A big part of this issue is this protection and if there is any strategies or devices that you found in your evaluation to be useful in this process or is it just almost hopeless unless we go out into the woods somewhere and live as a hermit that we're going to continue to endure these exposures.

AP: I have sort of done that. I'm actually speaking to you in a place in Scotland where actually I can't get a cellphone signal in any network by choice. But it doesn't stop me going to London and Brussels and other places for meetings and doing what I need to do. I think our bodies always need somewhere to recover. They need some places where the pressure is off and the obvious one of those is the home.

I think the first thing we can do that everybody can do that you promote so well in your talks and website is a healthy lifestyle; diet, exercise, good night's sleep, no bright light late at night. And if you got to use a computer monitor have the level turned right down. Have it as low as you can in terms of brightness it it's after say 9 pm at night.

Try to have lights that are yellow, towards the yellow-orange end of the spectrum at night. The last thing you want is a daylight bright white light at night. That's what switches the pineal off and you don't produce this melatonin.

A good healthy lifestyle, good diet, and getting up in the morning and getting on is an enormous protective factor. Then if you spend the whole day highly irradiated you're still going to have problems. We say don't use a cordless phone unless you really need to. I think most people don't need to use a cordless phone. Always use a wired phone.

If you do have to go away, in fact in most areas now particularly with 3G cellphones, the cellphone will work at considerably lower power than your cordless phone. Your cordless phone is fixed at a low power but it's a fixed power. This is sort of indications that the industry know there is a problem.

The 3G UMTS cellphones, if you've got a cell tower near you, the old cellphones, GSM cellphones could turn themselves down by a thousand fold. So if you were inside a vehicle in a difficult area it could itself up to full power 1.6 watts per kilogram or whatever into your head. But if you were out and you had a good signal and the base was not far away it would turn itself down by several hundred times to a much lower level. While the new 3G ones can turn themselves down, wait for it by 50 million fold.

So if you've got a good 3G mass near where you live your cellphone will actually expose you a lot less than a cordless phone would. Cordless phones really should be out particularly (indiscernible 33:11) cordless phones because they pulse 24/7 even when you're not using them. That's something we can do.

Wi-Fi routers in our house in my opinion completely unnecessary. Put some cable or Ethernet cable in or if you really have to go from various rooms you can get things called dLANs. You plug your Ethernet cable into a main socket in one of these devices and then in any room in the house, you can plug another device which gets you your

broadband signal to your laptop. You can get the signal around the house without laying extra wires and without irradiating yourself with pulsing microwaves.

I did a BBC Panorama program a few years ago on Wi-Fi which we got really slated for at the time. We were comparing Wi-Fi levels with the levels you get 100 meters from a cellphone tower. That's roughly the same. If you're a yard away from a Wi-Fi router it's about the same or sitting next to Wi-Fi laptops is about the same as what's coming from a mast 200 yards away.

The UK government gave the UK Health Protection Agency 300,000 pounds sterling to go and do the work to just prove us wrong. Actually they found slightly higher levels than we reported on the Panorama program which they then say it's perfectly safe because they are below these (indiscernible 34:35) levels.

But basically if you are sitting next to a Wi-Fi laptop with a Wi-Fi router in the house it's equivalent to having a small mobile phone base station in your house. Does that sound sensible? Not to me.

DM: Sure absolutely. There are different type of cellphone technologies; I think CDMA and GSM. I believe that I recall reading an article once that suggested that one or the other chips provided about 40 times more radiation exposure.

AP: Yes, it's difficult. We don't know what the biologically active part of the signal is. George Carlo who was vitrified at one point when he ran the 27 million dollar CTIA program in the 90s on cellphone, was it causing harm. And then at the end of it fell out with the industry because they wouldn't admit the findings on acoustic neuroma and (indiscernible 35:30) some that they found that there was evidence of harm.

He says it's information carrying radio waves. It's how do you get the information modulated on to the radio waves. We don't know whether it's the pulsing, the pulse rate, the type of modulation. The trouble is the industry tried to get more bandwidth, more video down and everything else is changing the way this is done year by year. We don't know whether GSM cellphones, the second generation cellphones are worse or not.

The third generation, if you are broadcasting video or you are streaming from your camera then there is a lot of power coming out of your camera and you flatten the battery quite quickly. So you can have higher power from them but actually if you're in a good area and you're just using a voice call then they irradiate to you less than the older cellphones. However, we don't know if that's safer. We just don't know.

I would always recommend an air tube – any hand's free kit is good. Hand's free kit to the ear piece, hold the phone away from your body when you make the call. Don't put it in your pocket where it can't get the signal out. Ideally use an air tube. Do you sell air tube hands...?

DM: We do or did at one point. The challenge with it is to produce that cost effectively. We've had challenges with manufacturers over a number of years so much so that the reliability of the quality is an issue that we – I think we had decided to stop carrying them.

AP: There are a couple around at the moment. We've started stocking. One of them is quite delicate. You (indiscernible 37:25) air buds and it's still (indiscernible 37:26). The other one is really quite robust. It only goes into one ear. It's not cheap. It's about \$40. Actually a lot of people with their cellphones are paying \$100 a month for their cellphone calls.

DM: Or more.

AP: Or more – so it's \$40 for a hands free that works quite well. It's been worth it. But even in wired hands free, it's better than holding it to your head. It's interesting a lot of people with these modern phones, they are not holding it to their head nearly as much because they've got like videophones and they put in on their desk and they speak to it with a speakerphone effectively. A lot of business users are not holding it to their head nearly as much anyway.

DM: That's certainly progress. I'm wondering too about some of the newer higher speed technologies like in the U.S. 4G or at least the real 4G which is in the United States really only implemented by the carrier Verizon which has the LTE variant which has speeds that are about 10 times faster than the traditional 3G. So does that extra bandwidth produce more of a biological effect?

AP: Extra bandwidth almost invariably produces extra power but of course, if you're doing a voice call you're not using the bandwidth anyway. It reduces its bandwidth. So if it's only an ordinary voice call. It's when you start sending videos and pictures and things that the power really ramps up.

LTE is not finally agreed as a standard yet. There are two or three versions of it. I have no reason to assume it's any worse or any safer than 3G which maybe safer than GSM 2G. There is not enough evidence to show. It could all be avoided really. If you don't need to use it, if you don't need to do it when you're mobile and it's an important call don't do it.

DM: The general recommendation of course is to use a speakerphone which is probably even better than the air tube headset because you are typically able to at least put it away from your body and not hold it. How would you compare actually using the speakerphone and holding it because the volume is louder like 6 to 12 inches away from your head but you're still holding it so there is some transfer of the radiation through your hand relative to your brain? How would you compare that?

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AP: That would be enormously less in your brain without any doubt. Most cellphones, not iPhones interesting enough because they put their antenna right at the outside which is why they had to introduce those rubbery plastic holders for them because actually they were exceeding the SAR because you're actually touching the metal antenna when you are holding it. So if you've got an iPhone make sure you got one of their plastic retrofit holders for it.

But most other phones have the antenna in the back. So if you're looking at the front of the phone, the radiation is actually going away from you.

DM: It's directional so it's pointing outwards so it's not broadcasting to your brain.

AP: It's going in quite a big arc but very little is coming straight towards you now.

DM: That's good to know unless you have an iPhone.

AP: Yeah, that's not iPhones but the downside of that of course is if you're sitting on a bus or a train and somebody is next to you, you are getting their radiation.

DM: Or an airplane. That's good to know. Tell them not to point that darn thing at me.

AP: (indiscernible 41:06). The only slight concern there is Sam Miller years ago found that radio amateurs got a particular type of cataract on their eye which is a uveal cataract which is actually on the inside. It's inoperable because it's not on the outside where you can remove the outside lens of the eye which is where the cataract is. It actually forms on the inside of the eyes. If you get those, it's serious you lose your vision.

He found that radio operators in the military and hand radio operators got those a lot more. The eyes, the breasts, and testicles are the three bits of the body that absorb microwaves most that are near the surface. Your other organs, liver and kidney and things they are protected by your body. It's not good to have it too close to your eyes. I suppose to hold it down a bit or look down rather than hold it up there. But I think most people do that anyway. But it's much better than holding it to your head and probably better than a hands free not much really.

DM: You're not too much concerned of actually holding it because really the bulk of the danger is going to be exposing your brain to it from your perspective although you're still getting some biological effects by holding it.

AP: Yeah. There are scientists around world predicting this enormous pandemic of electrical sensitivity, electrical hypersensitivity in which case somebody using a cellphone in the room affects you and there are people like that.

In fact, the previous head of the World Health Organization wouldn't have people put their cellphone on in her room because she found that it gave her headaches. She

asked them to turn them off or leave them in the outside office when they came to see her.

Yes, if you're sensitive it won't make any difference but for the majority of people if they are healthy then that's taking an awful lot of the problem away just by holding it away from you and minimizing your calls.

And certainly not using – I mean Bluetooth, you see these people with a thing in their ear, the droids. The levels of microwaves are quite low but if you go about with something in your ear, your ear doesn't ventilate properly, it gets warm because it doesn't cool properly and that in itself could cause ear problems and possibly cancer because cancer as you know is stimulated by temperature. So having something stuck in your ear and even with low levels of microwave seems to be crazy. I wouldn't use a Bluetooth adaptor at all.

DM: One of the parameters or guidelines that the industry has come up with is this index called the SAR. I'm not sure specifically what it stands for. I'm sure you do. It is my impression that this is really an attempt to identify harm from really the thermal effects which don't seem to be the bulk of the cause of the concern. The thermal issues are really not what's causing the biological issues with the cancers. I'm wondering if you could comment on that because frequently the industry is seeking or even well-intentioned media is seeking to use that as a guide to find and select a safer phone.

AP: Absolutely. I had some quite difficult conversations with activists on both sides of the pond over this because I have long said it's a red herring. We know what we don't know but we've got a good idea what thermal effects are and the 1.6-2 watts per kilogram of absorb radiation probably protects us from those. None of the concerns about cancer come from that.

There is evidence for light dead brain cells (indiscernible 44:56) down at 1000th of the SAR that's allowed for a phone, enormously lower levels. It was probably done with good intention. It was set on the basis of (indiscernible 45:11) and it doesn't heat your tissue. It won't hurt you so they worked out what level might hit your tissue and then put a safety factor and then they came up with that number. It wasn't done on any other scientific basis other than stopping a thermal temperature rise.

DM: So you were in agreement that is something you could probably ignore in your efforts to identify a safe phone.

AP: An interesting side on that. It was an ITC unit in Switzerland that does a lot of industry work and other. It's a very good institute. It was close to that. It was one of the earlier (indiscernible 45:47) Sweden newspaper back in the late 90s – the first big table of SARs but he produced two tables. One was maximum SAR which is actually what the cellphone will do at full power held next to a phantom head, a head that is filled with a gel that's meant to resemble brain tissues. Of course it doesn't but electrically absorbing.

The second one was the efficiency of phones. One of the highest cellphones for peak SAR was a Nokia but actually under practical core conditions it was one of the lowest because it had a very efficient (indiscernible 46:26) signal away and it could turn itself down several hundred fold. What the industry would be doing in the middle term is making low SAR phones.

Now some low SAR phones are actually slightly lower powered phones. You won't make a connection in some areas because they can limit their maximum power but an awful lot of them instead of...

How do we reduce SAR? SAR is defined as the highest level in a small spot where the phone is working at full power. So what they do is they split the antenna out, make it less efficient but it lowers the peak SAR value. It increases the average but the average isn't what is in the SAR table, the average is that is the peak. So a lot of phones from like year 2000 to 2008 if you like had antennas that were really inefficient because the idea was by putting an inefficient antenna in, they could lower the SAR value that was in the table or are fairly safer. It was a complete con.

DM: It's just actually counterproductive to the intent of the original design.

AP: Yeah absolutely.

DM: It happened so frequently. There are devices though that are being sold across the internet and in a variety of different other formats that are marketed to protect yourself from cellphone radiation. There are a whole range of device of course. One of the more common strategies too is a thin wafer perhaps printed on an electronic circuit that is a size of a small coin but much thinner of course and actually is inserted over the battery inside the actual compartment of the phone.

I'm wondering if you could describe and sort of summarize the position of these types of devices and the type of investigative efforts you have done to document either the effectiveness or ineffectiveness of this strategy.

AP: They come and go. There one or two that had been around a long time. They come and go. We can find no evidence of any of them producing the measurable electromagnetic fields, microwave fields and other fields that uses head. None of them. There are some protective pouches you can put the cellphone in which can help but you got to be cautious of those.

But the stick on stickers and the pendants and the things do not change the levels of microwaves you are exposed to. Some of them put some gobbledygook in that say special resonance technology. We take the nasty bits out of the fields and change them into nice bits so they won't hurt you. No they don't. It still looks exactly the same when you look at the way they form. I'm not saying there aren't some subtle energies that

may or may not improve your health but what they don't do is reduce your exposure from your phone.

One of the problems without doubt is a semi-psychological one. It's a (indiscernible 49:36) blanket if you like. If you've got something and you feel less worried about it you do feel better. I'm not saying they are worthless but what they don't do is they don't reduce the effect of EMF. There is no evidence of that at all.

DM: There is one device and the specifics of it escape me currently.

[----- 50:00 -----]

George Carlo was working with a company at one time that supposedly had taken this technology from the military that had developed something to mitigate against this type of radiation effect. It was an active field that was produced but it wasn't long lived. It had to be replaced or renewed. Do you know what I'm talking about?

AP: Yes I do. I asked you about it anyway. It's what was called – you can still find it. It only really went into production for a few Nokia phones, Nokia batteries. It's called EMX technology. It was originally discovered at the Walter Reed Army Institute and Ted Litowitz of the Catholic University in Washington did a lot of work on it and took out patents on it.

Basically, what they found was that by breaking up the coherent fields, this is regularly pulsing fields with noise ODC which is part of our cellular process, chemical (indiscernible 51:00) process activity wasn't disrupted. The problem with that is if the field – it was primarily done at power frequency rather than microwaves. They seem to work for pulsing microwaves too.

If you have a 1 milliGauss field that is there that is giving you problems you need to add the same amount of random field to cancel it out. So you need another milliGauss of EMF coming from this device and then it does seem to mitigate the effects. But it doesn't strike me and I don't think it strikes anybody as a good way forward. The industry has fought it tooth and nail.

Ted Litowitz, he is dead now but he tried to get them to build it into the cellphone batteries or into the cellphones as a standard thing because potentially it would have made them safer. But they said they are a hundred percent safe anyway. By putting it in there it is a semi-admission that we think there is a problem.

It does seem to work. It certainly got some validity. It might be very useful for mitigating Wi-Fi routers and all the other signals that we get in our homes from our neighbors. It's not being tested. There is no scientific work on it for that purpose. It is the one technology that has been shown to work. There are others.

There is one or two which I won't mention by name but very, very well known. One of them looks like a little chip with a circular copper coil and a piece of plastic. You go from that and you can go up to really quite expensive versions in silver and platinum and things. It's a complete con in my opinion. It's got a coil that is not connected to anything. The microchip is a surface mount resistor that's worth one cent, not connected to anything. It's a placebo. People wear it and they think great. Now they feel better. Fine. I shouldn't (indiscernible 53:02) because it doesn't do anything to the fields. I have taken them apart.

There were three researchers that were approached by that company to do proper scientific studies on it. But each time they found out that it had to be a double blind study and they have to produce inactive ones as well as active ones and nobody had to know what they were. The company refused to fund it despite the fact it's made an awful lot of money by selling them. They acknowledged that it's primarily a placebo thing. It's a very lucrative placebo effect device. It's a difficult one.

There was certainly no evidence that I have seen from of the stick on patch. Some of the stick on patches actually do. There is a new one in Australia which modifies the antenna of the cellphone. It's got built in metallization and a plasticky back that fits on your phone that doesn't know the SAR but it interferes with the way the phones gets it signal out and my gut feeling is if you're going to use a phone, the manufacturers have tried to minimize how much it puts into anyway. I wouldn't fiddle with the sort of stick on device or fit in device on the back because the phone is not tested to be used that way. It could make it worse.

DM: So a fair summary would be from your investigations and all the scientific documentation, analysis and instruments that you have used, you haven't been able to identify any technology that actually lowers the field exposure although you don't rule out some potential beneficial subtle energy influence in the body to help the body fight against that.

AP: Yeah, absolute influence.

DM: I'm just wondering just out of curiosity you did mention that there was this one technology that was produced at Walter Reed that was somewhat squashed by the industry because it would be an admission of guilt so to speak if they endorsed the use of that in their battery technology. I'm wondering if there is any company that you know of that is starting to look at this or is it just sitting on the shelf somewhere just wasting away.

AP: I tried to have a quick look today to see if anything is available. It looks as if it's all sort of (indiscernible 55:28) death at the moment.

Cellphones, the 3G and the LTE have basically done it in the encoding. For a different reason, they have sort of got this semi-random, pseudo random pulsing in the signal. It doesn't pulse 217 times a second like the old cellphones did. It does have quite a wide

range of frequencies in there. So they have sort of already done it in the latest generation of phones.

DM: How do you know if you have the latest generation? What would qualify for that designation?

AP: It would be a 3G or later. There is this problem that in a lot of areas it is changing because they are gradually decommissioning 2G but in a lot of areas if you have a 3G phone unless you can in the setup say I wanted to work on 3G and then you'll find there is lots of areas it won't make a call for you. By default unless you are sending pictures it goes back to work in 2G even though it's a 3G phone. It's not the answer.

DM: So it's your observation that even though there is no blatant admission that the technology of cellphones has some biological risk to it that internally the cellphone carriers are developing technologies that address that and they are not telling the public.

AP: They address it, I don't know whether that's because they think it's going to be – they address it because they have got a much more efficient way of encoding the information. It also happens to be pseudorandom which is very similar to the old Litowitz technology. I would have hoped that they would have actually that was one of the reasons they are doing it but they are not saying so.

I think at the moment, it's just a gut feeling, what we are seeing there is no doubt, we are seeing an increase in temporal and frontal lobe brain tumors. It's being hidden because for some reason right around the world brain tumors in total are actually decreasing slightly. My personal feeling is it's because we're passing the peak from atomic bomb testing fallout – atmospheric atomic bomb testing fallout that brain tumors are actually falling slightly overall.

There was a paper earlier this year by (indiscernible 57:51) that looked at UK, very few cancer registries list what region of the brain the tumor is in but anyway they produced the paper that looked in English data up to 2007 and showed a 1-1/2 fold increase in frontal and temporal lobe tumors which are statistically significant. They went on to dismiss it for some extraordinary reason.

Looking at the few places I have managed to get data on temporal and frontal lobe tumors in other countries it does look as if those are on the significant rise because of just the way you hold your cellphone. What they did in Interphone is produce two studies on the way you hold your cellphone and where the brain tumors are. They weren't meant to do that (indiscernible 58:36) combine all the information. They split into two groups. One of them says yes it's where the radiation plume is and the other one said no it wasn't.

But actually I think where the radiation plume is misses the point. Actually having that high level of radiation near your head stimulates things in your head. Also, 2G phones,

GSM phone puts these low level magnetic field pulses for the battery current out as you're talking. Every 217 times a second it puts a pulse out which is actually hundred of milliGauss right through your head.

Now because we know that that's associated with an increase in childhood leukemia that may be a critical factor. Believe it or not despite – I don't know, we must have done 40 cellphone studies on people at least now, epidemiological studies – not one of them has taken that into account. There are some good technical papers showing just how high these fields are but not one of the epidemiological studies have taken it into account. It's something I'm raising at an EC meeting in November because I think it's a real problem.

Because in the cephalo study which came out in August – this was an EC study which looked at children's use of phones and it came out saying, we don't think we can find anything. However, slightly worrying – no, they didn't say slightly worrying however this is the abstract.

[----- 1:00:00 -----]

We did find an association with how long since they first made their phone call, since they first had a phone. They didn't find it with how much you used it or how many calls you made or how long you were on the calls but they did find it with how long you've had the phone. This goes along with (indiscernible 1:00:17) work 10 year plus. They had a phone for 10 years. That's when the rate goes up.

But when you look in the table of the cephalo studies on children there is a table 5, all of the things – so 3, 4, 5 fold increases if they have had the phone for more than about seven or eight years. It's really concerning stuff. It seems like you may not need a lot of exposure to trigger than initial derangement of the cell which then goes into a tumor.

One of the things, the Economist recently ran a piece on 2011 saying there is no enough energy to break a covalent bond. So what? Most cancer it's not due to covalent bond breaking.

We're now into epigenetics. We're now into subtle effects. We haven't got a clue what causes most cancers and what the mechanisms are but increasingly it looks like epigenetic effects which are gene switches which occur – they can just occur by stress. They don't need any external field coming in. If you're stressed, you'll get epigenetic changes. These are changes in your production of neurotransmitters and hormones and other things in your body to help you cope with the life that you're leading.

There are some interesting studies on that and one of the really key ones was women who were in the third trimester of pregnancy when 9/11 occurred. They were in New York and actually experienced – they are not in the building but experienced real trauma from it. A high percentage of their children are born with high cortisol levels and when they have looked at it, the reason is they have had these epigenetic switches switched

on in utero which are now with them even though they are now 10-11 years old they still got high cortisol levels.

Cancer is a subtle thing. It's a whole life thing. We need a healthy lifestyle. We need a healthy diet. We need the minerals and vitamins. And a lot of people's diet haven't got them. We need good sleep. It's often diverted by headline statements saying it doesn't got enough thing to damage you.

DM: I like to address the mechanism or at least your thought in the mechanism because you addressed the justification that the cellphone industry uses to state that their cellphones are safe were primarily based on the fact that it doesn't really emit high amounts of ionizing radiation similar to an x-ray. We know that's clear. It's a different mechanism.

You addressed the fact that this other technology would be partially mitigated against that because it was a random set of frequencies that were being generated. So is it the way that impacts biologically is it because its modulating signal is at a certain frequency that is at a rate that interferes with the normal biological signals and it's that disruption of the biological signals that causes this confusion and potential increase in the rate of cancer.

AP: We believe that is certainly part of the equation and probably the worst part of the equation. The problem comes is where VHF radio, TV, cellphones fit in the electromagnetic spectrum was the cosmic quiet spot.

We are now allowed under these guidelines to expose ourselves to 10 to the 18th. That's a billion, billion, billion fold more energy in that part of the electromagnetic spectrum than our ancestors were exposed to a hundred years ago. We have no idea what that's doing to us but it is a phenomenal change in the electromagnetic environment in populated areas of the Earth. We just don't know.

In my opinion it's good to reduce our exposure where we can and have places where – particularly where we sleep that minimally exposed. Don't have your cellphone in your bedroom if you insist on having a cellphone. Certainly don't put it under your pillow. A lot of youngsters put it under their pillow so if they get text messages in the night and they can feel it vibrate.

DM: They do address the issue you said don't put it under your bed. Obviously if you are engaging in a conversation there is an issue with this radiation exposure but can you address the issue of it just being on and next to you. How much of an exposure that is.

AP: Even if it's on standby it will talk to your (indiscernible 1:05:06) base station every few minutes. It varies. The networks vary. They are trying to cut it down. The 3G and 4G, LTE networks have cut it down even more. They don't talk as much again.

Of course if you put it on your – like some youngsters do on their bed then a pillow and then their head on the pillow, the poor little cellphone can't get any signal out so it turns itself up several million fold so it can get its signal to the base station. It's just a daft thing to do. The cellphone wants to be ideally in your window so it can get the signal out but certainly it doesn't want to be – you don't want to be lying on it where it's really going to be struggling to get its little signal out to base station.

DM: That's certainly good words of wisdom. Any parent watching this as I doubt many parents would be making that mistake but the children would not be aware that there would be an issue. They won't have any understanding or wisdom to appreciate that so they would easily put it on their pillow. It's a simple thing to avoid.

AP: On another one, a lot of young people, an amazing number of young people think when they are out jogging and so unwilling tuck into their bra. I'm serious. It is actually quite covered. I couldn't believe it when I first heard it but there are nice little small cellphones now. They have got no way to put it on their body and they just tuck it in and it just sits there nicely. It is odd.

DM: I don't know but it's possible that exercise could and increasing your metabolic rate might actually increase the risk of that although it might actually protect somebody but my guess is it would probably increase your risk because your metabolic rate is increased.

AP: There are some interesting work done some years ago by John Holt. He was president of the Radiologist Association in Australia who treated tumors with radiation, with x-rays and gamma rays primarily x-rays. To kill cancer cells as opposed to healthy cells, the cancer cells need to be in mitosis. They need to be dividing. That's when you kill them.

What he found was a five minute exposure to an early cellphone or equivalent. He started off with an equivalent and then tried cellphones which did the same. Five minute exposure near the breast to a cellphone could turn – it wasn't just breast tumors. He did other tumors as well as other solid tumors – turned a 5% active tumor into a 95% active tumor for about an hour. So if he did that first then his radiotherapy was actually much more effective and he could use lower power and get good results from it. It's something you don't want to do.

We're coming back to ionizing radiation, breaking cellular bonds which cause cancer, most of them don't. What happens is x-ray or gamma ray comes in and it breaks a covalent bond. That cell normally dies. It might get repaired. It might get wrongly repaired in which case it might become cancerous but the majority of them die, get killed off by the fact that they are not repairable.

Most of the ionizing science now is in bystander effects. You get one cancer cell or two cancer cells and you separate them from good cells. The good cells become cancerous. We don't know how it does it but they think it's radiofrequency stroke ultraviolet.

But the cells have got ways of communicating and it's well documented in very solid science. That can be transgenerational. It isn't even just in one generation but this bystander effect and there is nothing about breaking covalent bonds. Cancer cells can contaminate other cells even if you separate them with a (indiscernible 1:09:00) window. There is a lot to learn yet about cancer. And healthy lifestyle and exercise and just trying to have a life is really quite important to our well being as you keep promoting.

DM: You have been doing this yourself for 23 years now. I wonder if you could tell our audience a little about the resources you compiled together in your website and any other materials you have that they might access to become better informed on this area.

AP: The websites got something (indiscernible 1:09:34). The Power Watch website is the best place to look. It actually is a bit out of date in some places because we haven't got the resources to maintain at the level we would like. But there is an article library. You have to register with the site to get access to it but it's free. You just have to register and put your email in. And then there is a thing called the article library. That is kept pretty well up-to-date.

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There is a whole (indiscernible 1:10:00) of articles on cancer, on EMF, on all aspects of it. Home wiring, what you should do for wiring if you're worried in the home, cordless phones, Wi-Fi. There is a whole – I think there must be about 50 articles in there which are all free and people can download and read. They are the best source. There are some headline stuff on the website you can get top level stuff. If you are actually interested the articles are much more informative. And most of them have got references in if you want to follow up further.

DM: Terrific. Any other recommendations you have or comments you would like to make?

AP: Your website is (indiscernible 1:10:37). I don't think so. Laptops is one of things we're going to talk about wasn't it?

DM: Let's discuss laptop computers, notebooks or even the iPads. I'm sort of a gadget geek. It is my impression that the iPad sort of represents this whole genre of tablet computing is really going to be the next generation of the way that we interact with the technological environment. It's just an ideal way to consume information electronically. It's just so much easier and more elegant and convenient that I think within the next five years the majority of our interactions are going to be with tablet iPad-like devices.

AP: iPads yes, maybe. There are some quite interesting stuff at the moment on iPads making people feel a bit nauseous with the slide scrolling at variable speed scrolling as you move it. It's even on the Apple website. There is some quite interesting discussion. People say I have been using it for now, I get up and feel giddy. I want to fall over. Well don't use it. No. I couldn't do that. It's too good. It's great.

I haven't actually measured with any degree of detail the fields from iPads but they are more wirelessly connected. You can't wire connect them.

DM: That's not an option. I don't think you can.

AP: I think it's Wi-Fi or 3G and that's it. I just avoid them I'm afraid. But a laptop needs earthing. If you ran it off its batteries it's alright but if you plug it into a mains adaptor, it will access quite high electric fields on it. It actually needs earthing. I would always suggest it's on a laptop tray so it keeps the heat off your waist. It's alright on a table but it's not a good idea to have it actually on your lap.

As I say if you're running it on Wi-Fi, it's equivalent to about a phone call these days with a modern phone. What you get all the time you're on Wi-Fi on your laptop. It's like being on the phone particularly if you got the laptop on your lap. It does strike me as very wise.

DM: The strategy that I use because I typically I'm on mine quite a bit. If I'm not in my home environment then it's usually with some type of laptop. What I have used is some radiant barrier which is essentially aluminum foil which is a reflective barrier for at least electrical fields certainly not magnetic and heat too. How valuable do you think that is as a way to protect yourself against some of the damage?

AP: You mean underneath the laptop?

DM: Underneath the laptop right.

AP: Exactly. So you put it on some sort of tray. You can get nice quite comfy traded trays, put aluminum foil on top of them, put the laptop on and that can protect you considerably from it. It won't protect the top of your body from the Wi-Fi because the Wi-Fi antennas are actually around the screen. Your head is actually fairly close to those.

DM: Interesting. So your impression or your actual measurements is that when you are connected wirelessly that the exposure is somewhat similar to that of talking on a cellphone.

AP: A modern cellphone. The old cellphones, going back 10 years, actually at a higher power but these modern ones...

DM: But typically the way that most people interact with the cellphone is they hold it to their head and obviously people aren't doing that on a laptop. It is at least two to three feet away. So because of the distance, is that minimized or there are still exposures at a relatively high level?

AP: It's still quite a high level. The way I look at signals is in signal strength not in power. Power is related to heating and we don't think it's a heating. The work that's being done for sensitive people show that they react at about 0.05 volts per meter. People in towns having sleeping problem it's quite common if it's above 0.1 volts per meter coming in from outside or their Wi-Fi router about they have sleep problems or headaches or whatever.

Next to a Wi-Fi laptop just sitting next to it using it, you're typically exposed to one and a half to two volts per meter all the time you are on. It's not frighteningly dangerous but it's certainly in the area of biological activity, certainly over it for sensitive people and therefore I wouldn't do it if I needed to check emails if I was on an airport or something because you are going to be so exposed to other (indiscernible 1:06:07). But I wouldn't use it as a regular way of doing it. I would always want to turn the Wi-Fi off and use a cable.

DM: That's good information because it's such a complex issues. I wasn't separating out the Wi-Fi from the electromagnetic from the battery. This information is actually changed the way that I'm going to interact with my own computer. The way I'm going to do that is obviously to turn off the Wi-Fi signal. And it's easy to do on most notebooks. It's a simple toggle switch that you turn it off. If it's off then you're just exposed to the electrical or magnetic components of the battery (indiscernible 1:16:51). And if you're not plugged in it's almost a non-issue. That's what I'm going to do at this point and then just connect once an hour for a minute or so and update your system and then turn it off.

AP: Obviously if it's in your building you need to watch where your router is.

DM: Sure.

AP: That also puts out (indiscernible 1:17:11). I mean next to the battery it's typically 6 volts per meter.

DM: How does that go out? Could you give us an estimate of whether 10 feet, 100 feet? What the rate of decline?

AP: It's quite quick. A typical modern router if you've not got a building. If you just put one in a field you typically got a 200 meter radius where you can log on to it without any problem and get good bandwidth. In a house, the room it's in and maybe the next room if it's a thin wall will have quite high levels of signal in the (indiscernible 1:17:45) a volt per meter or half a volt per meter. But otherwise it falls off quite quickly. Again, we recommend that it gets turned off when you're not actually using it.

There have been some proposals to have a new standard. You can actually get into the wireless router with a computer and turn off the beacon signal. It says who it is. It's got a unique number that it broadcasts. I forget the acronym for it. It's saying, I'm router

52161 and I'm here. So that when you turn your laptop on it immediately knows and they just talk. But it's doing that all the time ten times a second.

You can get into the router and you can turn that off. What that means you tell the router what your laptop is and the router then only powers up when it gets a call from your laptop saying I want some information which also makes your system much more secure because other people can't then log on to your router. The better quality routers allow that facility but it's never implemented and I have never seen it really recommended on a wide scale but it indispensable.

DM: That is massively important.

AP: Yeah. I think so.

DM: You don't recall what the actual name of it is so someone can implement this. That's a really useful strategy.

AP: No. It's the beacon signal. I have to send it to you.

DM: Yeah, if you could send it to me that would be great because that's a great recommendation.

AP: It's only the better routers that often you can get in and do it but it is a facility. You can do it on a better quality ones. You get in and you can turn it off so that it will only answer your laptop when it hears your laptop or other people so you can train it to more than one but it basically isn't sitting there like a lighthouse giving out its signal all the time.

The industry in the UK one of the big telecom suppliers supply home (indiscernible 1:19:50) devices which is a router cum cordless phone unit. You can turn that off but they turn it back on every two weeks because they have actually implemented a free Wi-Fi system through the UK.

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By getting these things in everybody's houses and saying if you don't turn it off you can have Wi-Fi wherever you like for free. They have got five million of these out around the UK. They are fighting to have them – they don't want it turned off because if it gets turned off then it wouldn't (indiscernible 1:20:20) free Wi-Fi network.

DM: I am just so grateful that people like yourself and organizations that you represent are helping identify these risks and provide us with some simple and practical recommendations to protect ourselves. It's new technology. We just don't know the dangers of these things until at some point it's too late. It's just very difficult to treat an illness once you have it. It's so much easier to prevent it.

So if we can limit our exposures most effectively with these simple strategies like turning off the beacon signal. That's a great simple approach and then of course limiting our use of cellphones and the cordless phones. It's great information. I really appreciate what you've done and compiled. I would encourage everyone to go to your website which is PowerWatch.com.

AP: PowerWatch.org.uk.

DM: I'm sorry PowerWatch.org.uk

AP: Power Watch is actually owned by an American power supply company.

DM: We don't want to send people there. That's for sure. Again, thank you for all your work. I really appreciate it. I really appreciate your spending your time with us today and helping us educate about this very important issue.

AP: I have enjoyed the interview. Thank you.