“Electro smog” at home

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In the days when there were no electrical currents, when the air was not buzzing from electricity, then it was easier, to be human. Then it was also not needed, that people strained themselves so much, to get to the spirit. Then there were no telegraph wires all around, there were no telephone cables and so on. But now people have such equipment all around. They induce constantly currents in us. This makes our physical body in such a way that the soul cannot enter. Therefore it is needed to apply a much stronger capacity, in order to be human.

Rudolf Steiner 1923

Original German text:

In der Zeit, als es kein elektrischen Ströme gab, nicht die Luft durch schwirrt war von Elektrizität, da war es leichter, Mensch zu sein. Da war es auch nicht nötig, dass sich die Leute so anstrengten, um zum Geist zu kommen. Da gab es ringsum keine Telegraphendrähte, gab es keine Telefonleitungen und so weiter. Der Mensch hat aber heute lauter solche Apparate vor sich und um sich. Das induziert fortwährend Strömungen in uns. Das alles macht dem Leib so, dass der Seele gar nicht hereinkommt. Daher ist es nötig, heute viel stärkere Kapazität aufzubringen, um überhaupt Mensch zu sein.

Rudolf Steiner 1923
Information about reducing “electro smog” at home.

In our modern world it happens frequently that people suffer from mayor and minor health problems without knowing the reason why. Things like allergies, headaches, concentration problems, hyperactivity, sleeplessness, nausea, autism, heart rhythm failures, degenerative diseases, cancer and so on.

Often it is a combination of factors, like food habits, stressful life, indoor climate (humidity, temperature, fungus, air born toxins) . What is often neglected, but is getting of an increasing influence, is the so called electro-climate where we live in. There are numerous cases where after a renovation of the electrical installation problems related to health and well-being decreased or even disappeared.
We are living in a world of a boundless growth of electrical devices and wireless communication technology, which does not have to be a problem, but it is coming to a point where the health effects are increasingly getting obvious. This brings the necessity in reviewing how to deal with all the electrical comforts of our modern life.

It is almost impossible to avoid being influenced by “electro smog”, but we can try to reduce it as much as possible. The main importance is to create a healthy sleeping environment. After all it is in your sleep where the body regenerates and the mind is able to work out the influences of the previous day. Unfortunately nine out of ten people in our modern world sleep under tension of “electro smog” being surrounded in a bed with all kinds of electrical devices and wireless communication.
It is possible to reduce the amount of “electro smog” substantially. In order to understand how here follows an explanation what “electro smog” actually is.

The following forms of “electrosmog” can be differentiated

- low frequent electric radiation
- low frequent magnetic radiation
- High frequent electromagnetic radiation.
- Static electricity
- Static magnetism
- “Dirty electricity”
low frequent electric radiation

Where ever there is a voltage on a cable or appliance from our 230 V AC power supply, even when there is no current flowing there will be a 50 HZ electric field, unless the installation is properly shielded. Our body which contains a lot of salty water and nerves (all good conductors) will very easily pick up and propagate such an electric field.

Looking around a modern bed, where you sleep isolated from the earth by your mattress, but surrounded with electrical equipment and cables (also inside the walls), it is logical that your body will pick up this field. The 50 Hz frequency means that your
body has to deal with tensions that change 50 times per second. In this surrounding a human body can impossibly fully relax and go through the necessary regeneration process. It happens rather often that when it is time to wake up the body still feels very tired, instead of freshly energized to start a new day.

With an active voltage tester you can easily test when a body is sleeping in such an electric field. In many cases the screwdriver lights up, when it touches the body. The actual measuring of electrical fields is rather complex and requires a profound understanding of LF electric fields and professional equipment.
Solutions

- Distance, a distance from 50 cm to 1 meter from any electrical unshielded cable, wire or appliance is mostly enough, 2 meter is always good.
- Sometimes turning a 2 pin wall plug 180 degrees can be very helpful.
- Switching off the power fully, this means switching of the live wire and the neutral of a circuit (the electric field from other circuits can be propagated over the neutral to the switched off circuit).
- Using shielded installation cable and shielded appliances, all connected to a proper earthing installation.
- In case a building contains much construction steel or large metal parts, make sure that these parts are properly grounded, especially when the electrical installation is in the vicinity of these parts.
- In case of switches close to the bed only use low voltage DC power, and use relays or home automation components to do the actual power switching.
• Use of Power demand switches.
• In some cases there is the need of conducting and earthed paints, plasters or nets.

These are some measures that can be taken, however every situation is different. When renovation work is requires it needs expert knowledge to implement, and it should always be professionally checked after implementation. In some circumstances switching a circuit power free or using shielding materials might have a worsening effect.
Low frequent magnetic radiation

Whenever there is a current flowing through a cable there will be a low frequent magnetic field. In contrary to the low frequent electric field this kind of radiation can be different in intensity over time, because depending of the load it will be fluctuating in time.

Sources of LF magnetic fields are power transformers, big and small. Especially the small ones are part of our daily lives. Think about all the chargers or build in power supplies of our equipment. Another important source can be the overhead High Tension lines (Also underground lines in some situations).

This type of "electro smog" has been researched a lot. There are many different
points of view of which standards are safe. Changing magnetic fields also induce currents in our body. It is also known to be a possible cause of different kinds off cancer (especially leukemia). Low frequent magnetic fields above 300 nT (Nano Tesla) are declared as possible carcinogenic by the WHO.

Solutions:
- Distance, the problem here is that a safe distance is variable, and only long term measurements can give some information. Roughly can be said that under normal indoor living circumstances a distance from two meters to cables, chargers and other appliances is safe. This is not always possible; therefore it is advisable to at least keep these distances at your sleeping zone to make it radiation free. The distance to outdoors HT lines or transformer stations has to be further.
• Contrary polarized magnetic field can level themselves out. So therefor it is important to make sure that live wire and neutral are close to each other and contain exactly the same amount of current (best is twisted or coaxial). This requires professionally made electrical installations, where these aspects are considered. In outdoor ring-lines it is important not to close the ring to keep the balance between currents. Especially high magnetic fields can occur when the earth is used as neutral.

• A more high tech solution is the active compensation of magnetic fields.

• Shielding with specific metals with a high magnetic permeability is also possible, but can be rather costly.
High frequent electromagnetic radiation

Above a frequency of approx. 30,000 Hz electric and magnetic fields exist together and are therefore considered as an electromagnetic field. These fields can propagate over a large distance that is why they are used for wireless communication. There are different types of modulation, which makes it a too complex subject to discuss in depth in this document. In our modern world we are more and more surrounded with wireless communication, cell phones, Wi-Fi, DECT and so on, and there will be a lot more to come. There is a lot of
discussion about the effects on the human body and there have been numerous researches. So far the outcome is either frightening or inconclusive. Forgetting about the precautionary principle, the telecom industry brings almost daily new gadgets on the market, which besides some attractive features are also capable of increasing the amount of “electro smog” in our lives.

Other appliances that generate high frequent electromagnetic waves are the microwave oven (even the best and newest models do leak radiation), but also appliances containing power electronics like: modern light dimmers or fan regulators, CFL lights and some LED lights. Although they are relatively powerless it is advisable to keep them at a distance of minimally two meters from your sleeping area.
The safe thing to do is to reduce them in our lives. Shielding against outside influences (cell phone towers, your neighbor’s Wi-Fi and/or DECT telephone etc.) is also possible but requires professional guidance. What can be done inside your home is mainly organizational, like:

- Use your wired land-line instead of cell phones or DECT phones. Most providers offer the possibility to redirect your cell phone to your land line.
- Use only wired computer networks. They are often even faster. Special notice should be made to switch off your Wi-Fi or blue tooth facilities on your laptop when not using them, after all why should you be radiated even when you are not using it (most laptop automatically switch on these features at start up).
Static electric radiation.

This form of “electro smog” often appears where materials get statically charged, and where the charge finds no way out to discharge. Mostly this is the case when synthetic materials rub against natural materials in an electrical isolated environment. Or even when moving dry air touches chargeable surfaces. For instance the dolls in a baby bed, made from artificial materials, since the mattress is made from isolating material, the electrical charge does not find its way back to earth, and the child is often charged with several thousands of Volts static electricity. There are many babies crying unnecessarily, which can be avoided by giving the child a woolen or cotton doll instead of nylon or acrylic. Another important source of static electricity are the old tube television sets and computer
monitors. They do not belong near your bed. Even when switched off the electricity might remain for several hours.

The air humidity is of importance in reducing static electricity. In our humid climate here in South India static electric radiation is not a big problem, since materials can discharge through the humid air. The situation will change when air conditioners or dehumidifiers create a dryer indoor climate.

Special care should be taken with surface finishing like paints; synthetic paints and varnishes are often able to build up an electric charge easily.

Solution against static electricity:
• Choose natural materials, some synthetic materials are also usable, but to make sure it is advisable to use natural materials.
• Treat surfaces with open (diffuse) and/or natural paints or oils.
• In case of renovation applying a natural oil
or wax over the surface might be helpful, a technical solution is applying conductive paints, and make a proper connection to the electrical grounding

- Connect old model television sets and computer monitors to a proper electrical grounding, better is replacing them with flat screen models. When buying a monitor make sure it is designed according TCO guidelines, this gives a reasonable good guarantee.

- Make sure the air humidity does not go below 50 to 60 % relative humidity.
Static magnetic radiation

This form of “electro smog” is the result of the magnetizing of metal. This can happen when steel comes under influence of an external magnetic field, like in sound speakers, electro motors, chargers etc. When steel gets magnetized it is difficult to demagnetize it. Very often it happens that factory made steel products are already magnetized when they leave the factory because of electro motors used during the production process.

It is known that magnetic fields can increase cell growth, therefor it is often used as a therapeutic tool, which is fine when correctly used. But it can also increase the growth of unwanted cells and therefor increases the growths of eventual fungus or bacteria’s, but also cancer cells. It is advised to sleep in an environment free from unnatural magnetic fields. The human body has evolved in the natural geomagnetic field. This field has an
important part in our regeneration what we do during our sleep. Any deformation of this field has an unwanted effect on this process.

A magnetic field is easy to detect by moving a compass over a metal containing bed or mattress, when the compass points into different directions you know that the bed is magnetized.

There is little that can be done against a static magnetic field. Demagnetizing and shielding are difficult and very expensive solutions. In case of a bed the solution is simple, buy a wooden bed, (without a spring mattress). In case of for instance magnetized construction steel the only solution is keeping distance. Magnetic fields are mostly not noticeable any more after a distance of 20 to 60 cm.
Dirty electricity

Net pollution, also called dirty electricity is an unwanted effect that many electrical devices create, it deforms our electrical power. Ideally spoken the power we use looks like a perfect sine shaped wave form of 50 Hz. However with the use of devices containing fast switching electronics this sine wave gets deformed. When we try to describe this wave form mathematically it shows that this new wave forms contains more sine shaped waves but of a frequencies which are a multitude higher then the original 50 Hz, We call these frequencies, higher harmonic frequencies. The electricity companies do not like this phenomenon, because they have to generate this power, and the meter doesn’t register it. For the user it is absolutely useless, in the
contrary it might damage other equipment, but more important it has an impact on our health very similar as that of low frequent magnetic fields. Recent epidemiological research indicates that this “Dirty electricity” might have even much more health impact that we have thought until recent.

This net pollution can be easily avoided when the electronics industry would spend a few rupees more in filtering out this pollution from the equipment they sell. In our house these polluters are mainly the CFL, LED light bulbs, fan regulators, Compact chargers and mainly every device which needs to alternate the incoming power to make it usable. And especially also power inverters (avoid the cheap ones and go for UPS and power inverters which guarantee a sine wave deviation of less then 3%, preferably even better).

Another source is the increasing wireless high frequent waves. Every unshielded electrical wire works as a kind of antenna, this means
that the transmitted high frequent electro magnetic waves super impose their frequencies on top of the 50 Hz power, and so deforming the sine wave. This means that apart from choosing our equipment consciously, the use of shielded cables are also here advisable. In case we are connected to the public grid the “Dirty electricity” enters our buildings polluted by the neighbors. This can be reduced by the use of proper filters, which filter out the higher harmonic currents entering our house.
Summary

Generally it can be said that there is a lot known, and a lot more unknown, about “electro smog”. With some simple measures (technically and organizationally) approximately 90% of the “electro smog in our living environment can be reduced, the rest needs some more effort. One of the first things one should consider when building or renovating a building is to integrate an electrical installation which produces none or very low levels of “electro smog”. Next is being well informed and use electrical appliances and transmitters consciously, and inform yourself how devices are protected against unwanted emitting radiation before you buy them.

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