ELECTROMAGNETIC BIOCOMPATIBILITY AT WORKPLACE : PROTECTION PRINCIPLES, ASSESSMENT AND TESTS. RESULTS OF AN EMF PROTECTIVE COMPENSATION TECHNOLOGY* IN HUMANS AND IN ANIMALS

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p. 213 Summary - Part 1 (G. J. Hyland)

The existing safety guidelines governing the exposure of the public to multi-frequency electromagnetic fields of the kind associated with mobile telephony and computer screens (VDU) only protect against adverse intensity effects of microwave and ELF-VLF fields. Even if more stringent limits were to be imposed on the intensity, the ability of living (but not dead) systems to respond to aspects of a field other than intensity - specifically properties allied to its wave nature - makes this fundamental principle of intensity limit inadequate. The way of guaranteeing any protection against non-intensity aspects - e.g. non-thermal microwave and ELF effects - is to redirect attention away from attempts to regulate the field towards devising ways in which the resilience of the living organism under irradiation can be increased, so that an adequate degree of biocompatibility with an aggressing electromagnetic field can be maintained, thereby permitting the emitting device to be used with a greater degree of safety than is possible at present.

p. 216 Conclusion (G. J. Hyland)

It must be concluded that it is really only possible to protect - by way of safety guidelines and devices employing some kind of screening - against effects which are in some way dependent on field intensity, although only in the case of effects not allied to the aliveness of the organism can such protection actually be guaranteed; for, as has been argued at some length elsewhere [4], the intensity threshold required to achieve the switch-on of a certain non-thermal effect in a living organism depends on the state of the organism at the time of irradiation: it is thus not a uniquely defined quantity. Accordingly, in such cases, and a fortiori in the case of effects not dependent on intensity at all - such as resonant responses to both MW and ELF fields - a radically new, and more comprehensive approach to protection is mandated, if the undoubted benefits of contemporary telecommunication and computer technology are to be enjoyed with a higher degree of safety than is possible at present. Given the virtual certainty that, having experienced these benefits, society will never renounce its dependence on this technology, the development of such a new approach to protection is a matter of the highest priority. The nature of the protection required, in conformity with the considerations of the implications of aliveness, is encapsulated in the new concept of 'electromagnetic biocompatibility'.

The Tecno AO EM technology must be considered to be in the vanguard of a new generation of bioprotection that conforms to this electromagnetic biocompatibility principle - its efficacy being intimately allied to the very 'aliveness' of the human organism whose well-being it helps to maintain in an ingenious and novel way.

p. 218 Summary - Part 2

The practical applications of this electromagnetic biocompatibility concept have been experimented through several university research programmes in animals and in humans - (I) in immunology, (II) neuroendocrinology, (III) embryogenesis, (IV) haematology, (V) in human immunology, (VI) ophtalmology, (VII) neurologie, (VIII) neuropsychology, (IX) psychophysiology, (X) clinical study - using a magnetic oscillator(*) which compensates the harmfull effects of the field emitted by actual computer screens and cellular phones. The assessment of the protection given by the compensating emission shows that the EMF of actual VDUs and mobile phones are harmfull for the health of users and that it is possible to

make them electromagnetically biocompatible by the use of specific EM compensation technology (* named Tecno AO).

p.219 Introduction to animal experiments (B.-J. Youbicier-Simo)

In 1989, Dr BJ Youbicier-Simo who is specialist in Neuro-immuno-endocrinology at the University of Montpellier (France), conceived an avian model, with the aim of investigating the fonctional interrelationships between the immune and neuroendocrine systems, as well as the involvement of both systems in the regulation of stress. Especially, Dr Youbicier-Simo studied the ability of juvenile chickens (intact, immunodeficient or immunodeficient and supplied with immunoenhancing endogenous compounds) to respond hormonally and immunologically to antigen challenge. The endpoints were hormone levels (ACTH, corticosterone, melatonin), pineal enzymatic activities (NAT, HIOMT) and antibody titers (IgM, IgG). This research was funded during four years by the pharmaceutical industry and was achieved in collaboration with Madeleine Bastide, who is Professor Emeritus and head of the Laboratory of Immunology at the Faculty of Pharmacy, University of Montpellier (France). A Ph.D. dissertation was completed (1) and four publications issued from this work (2, 3, 4, 5). The chicken model was chosen for the study of stress because the avian embryo is easily accessible and can be easily immunodeprived at an earlierstage of development (3 days of age).

Since 1993, the same model has been extensively used to investigate the potential for Electromagnetic radiation given off by actual communication devices such as video display units and cellular telephones, to induce biological stress in vivo. The idea was to address the issue of the safety of the electromagnetic fields (EMFs) generated by the incriminated devices for human beings in real use conditions. Fertilized chicken eggs were chronically exposed to the radiation during embryonic development. Then embryonic mortality, as well as hormonal and immune parameters were assessed in the surviving brood. The data obtained with Video display units showed that chronic exposure was toxic for embryos and was associated with hormonal and immune disturbances in juvenile chickens (6, 7) Trials with operating cellphones indicated a very high mortality rate among exposed embryos (60% vs 14% for the sham-exposures)(8). When an actual GSM cellphone signal was split into its carrier (microwaves) and modulating (low frequency: ELF) components - by means of copper gauze immune to microwaves but transparent to low frequencies -, embryonic mortality was even worsened (76%), as compared to what observed with full cellphone signal (60%).To date, in vivo studies are rather scant that have been carried out using actual VDU devices or cellphones. Most studies are with field generators with selection of specific frequencies and intensities. Thus the full spectrum of commercially available devices cannot be assessed for their potential biological hazards.

During this 6 year study, endeavours were made to protect exposed organisms from the deleterious effects of electromagnetic radiation. This was achieved by simultaneous exposure to an hyperweak magnetic compensatory signal, intended to make an initially stressing EM radiation biocompatible for the exposed living organisms (7, 9). This compensatory emission is provided by a device, that is an autonomous magnetic oscillator (8-12Hertz ; 100-150fT) termed Tecno AO technology, internationally patented as an electromagneto-bioprotective technology.

p.240 Conclusion of the clinical studies on stress symptoms at VDU work places (D. Clements-Croome)

The study shows a significant reduction in average symptoms (between 27% and 44% with an average of 36%) for those staff with a live Tecno AO antenna. These results confirm that exposure to low frequency magnetic fields in offices can account for at least a third of the environmental health symptoms experienced by staff.
It indicates that the official attitude of the NRPB and the HSE which states that ELF fields can have no harmful effect on the body, needs revision. More importantly it does indicate that there is a practical solution to the problem.

FINAL CONCLUSION

The assessment of the protective effect given by the compensating emission shows that the EMF of actual VDUs and cellular telephones are harmfull for the health of users and that it is possible to make them electromagnetically biocompatible by the use of the above tested specific EM compensation technology.