

**ELF and VLF
Electromagnetic
Field Effects**

ELF and VLF Electromagnetic Field Effects

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PREFACE

Recent emphasis upon the importance of the physical environment has made science and the public even more cognizant of the many components of the biosphere. While much attention has been given to ionizing electromagnetic stimuli which causes blatant and unalterable changes in biological systems, relatively little research has been concerned with those electromagnetic signals whose frequencies overlap with time-varying processes in living organisms. Extremely low frequency (ELF) electromagnetic fields can occur as waves between about 1 Hz to 100 Hz or as short pulses within this range of very low frequency (VLF) and higher frequency sources. The natural occurrence of ELF signals is associated with weather changes, solar disturbances and geophysical-ionospheric perturbations. Man-made sources have also been reported.

Certain physical properties of ELF signals make them excellent candidates for biologically important stimuli. Unlike many other weather components, ELF signals have the capacity to penetrate structures which house living organisms. ELF wave configurations allow long distance propagational capacities without appreciable attenuation of intensity, thus making them antecedent stimuli to approaching weather changes. Most importantly, ELF signals exhibit the frequencies and wave forms of bio-electrical events that occur within the brain and body. Thus resonance interactions between animal and nature become attractive possibilities.

Following a short introduction, this book includes information on the physical parameters of ELF-VLF electromagnetic fields as well as their penetrability and shielding properties. Correlational and experimental data are presented which strongly indicate that ELF fields have significant effects on human activities. Difficulties and methodological formats encountered with measuring detection of

ELF fields by non-human animals are presented in conjunction with the behavioural-biological effects of maintained exposure. In this manner the distinction between detectability versus the effect of ELF signals are recognized. Care is given to differentiate the biological changes possible at natural ELF field intensities from those applied during experimental settings. Results from animal experiments are also presented to demonstrate some of the significant physiological and biochemical changes associated with ELF magnetic field exposures. Speculation on the fundamental role of ELF magnetic fields in the phylogeny of life forms is presented in the chapter concerned with abiogenesis. The conclusion integrates the chapters and points out the applicability of experimentally collected data to naturally occurring phenomena and suggests general approaches for future research.

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Michael A. Persinger

23 August, 1974

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