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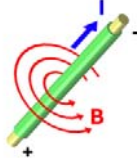
- > Private practice for Osteopathy and Holistic Kinesiology in Vienna
- > Lecturer for Holistic Kinesiology in Vienna, Tokyo, St. Petersburg, Barcelona and at the "Universidad Europea de Madrid" (Spain)
- > Co-founder and CEO of the "Austrian Association for Holistic Kinesiology"
- > Co-founder and CEO of the "Vienna School of Osteopathy"
- > Honorary Secretary of the "World Osteopathic Health Organisation (WOHO)"

What is it made of?

- > **Heat**
 (Infrared radiations - Schwartz et al 1990, Chien et al 1991)
- > **Light**
 (Biophotons – Fritz Popp)
- > **Electromagnetic field**
- > and maybe more

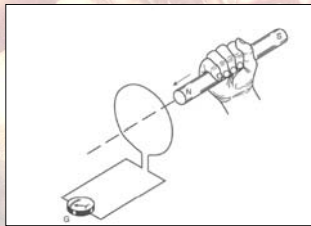
Electromagnetism

- > A changing magnetic field produces an electric field. Similarly, a changing electric field generates a magnetic field. Because of this interdependence of the electric and magnetic fields, it makes sense to consider them as a single coherent entity - the electromagnetic field.
- > Discovered in 1820 by Hans Christian Ørsted



Faraday's law of induction

- > Moving a magnet near a wire causes a current to flow through the wire (Faraday 1831)

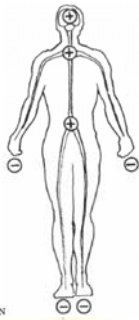


ELECTROMAGNETISM WITHIN THE BODY

Direct Current System

Robert O. Becker

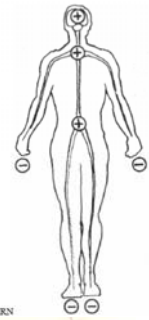
- > Direct Current (DC) system of internal communication located in the perineural cells around the nerves
- > Integrates body processes and controls the activity of body cells
- > More primitive than the digital AC system of nerve impulse conduction
- > **"current of injury"**: DC flow from injured tissue as a reporting system, guides formation of collagen after tissue injury => Important role in growth and healing



Becker, Robert O.: *The body electric*, New York, 1985

Direct Current System

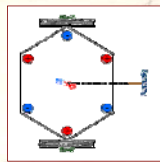
- ➔ If it is possible to sense electromagnetic fields, we should be able to sense the "current of injury" from our patients' injured or dysfunctional tissues.



Becker, Robert O.: *The body electric*, New York, 1985

Piezoelectric effects

- > Dry bone exhibits some piezoelectric properties due to the apatite crystals, and the piezoelectric effect is generally thought to act as a biological force sensor
- > sustained application of electrical potential can stimulate either resorption or growth (depending on the polarity) of bone in-vivo.
- > Not just present in bones, but also in other tissues: "virtually all of the tissues in the body create electrical fields when they are compressed or stretched." (Oschman, 1981)



Crystalline structures in various tissues

- ➔ Whenever we stretch or compress tissues in the body, we change electrical potentials, which might be conducive to healing.

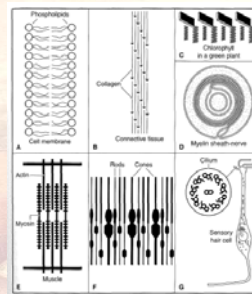
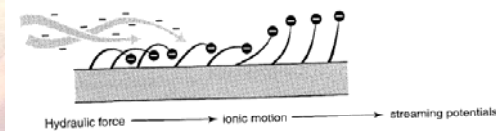


Fig. 3.4 Crystalline arrangements in various tissues. Crystalline arrangements are the rule and not the exception in living systems. A: Array of phospholipid molecules forms cell membranes. B: Collagen arrays form connective tissue. C: Arrays of charged molecules in the cell. D: The myelin sheath of nerves. E: Two thin filaments of membranes such as shown in A. (After Fawcett 1974, Fig. 11.27, p. 332, with permission from Chapman in Hall.) F: The contractile array in muscle, composed of actin and myosin molecules organized around each other. G: The array of sensory endings in the retina. H: Arrays of microtubules, microfilaments, and other fibrous components of the cytoskeleton occur in nerves and other kinds of cells. Here are the sites of sensory organs such as those responsible for detecting odors and sound.

Oschman, James.: *Energy Medicine*, London, 2000

Streaming potentials

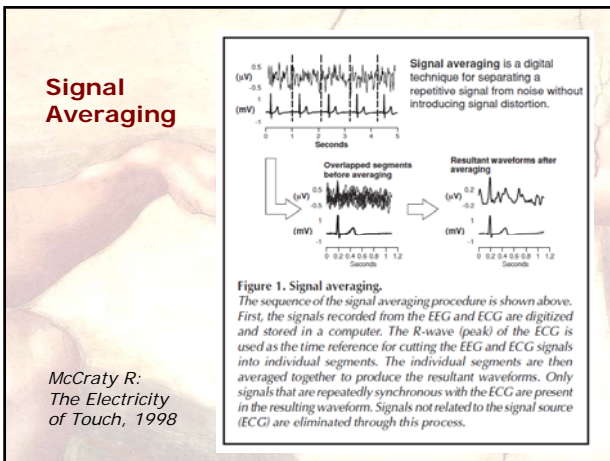
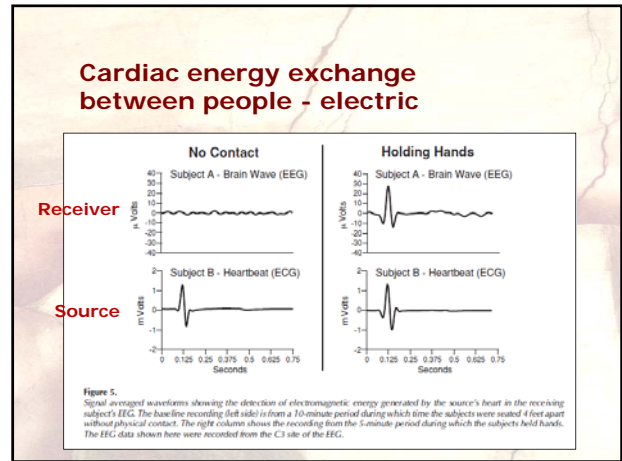
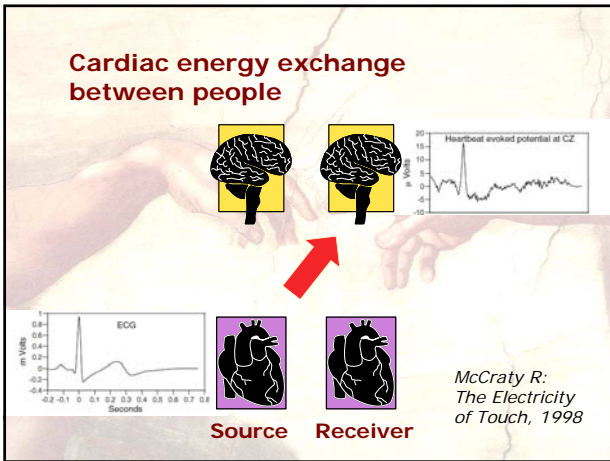
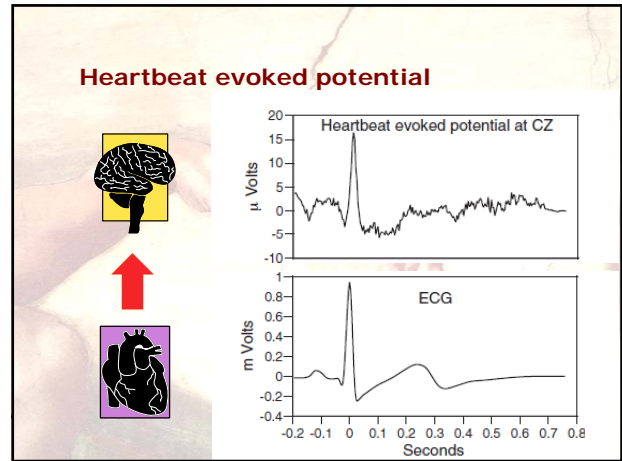


Charge is built up by electrostatic interactions between the flow of a fluid containing charged ions and electrically charged surfaces (blood flow, propulsion of extracellular fluid through the matrix as a result of tissue deformation)

- ➔ Whenever we change the circulation of fluids we change electrical potentials, which might be conducive to healing.

- > Perhaps an electrician would tell us that the **heart** is a dynamo, the **brain** is a storage battery, and the nerves are the wires that conduct the electricity to the stomach and bowels where it atomizes the food.

> A. T. Still: *Osteopathy – Research and Practice*, 1910



Signal below threshold? Stochastic resonance

- Stochastic resonance (also known as SR) is observed when noise added to a system **improves the systems performance** in some fashion. More technically, SR occurs if the signal-to-noise ratio of a nonlinear system or device increases for moderate values of noise intensity. It often occurs in systems with a sensory threshold and when the input signal to the system is "sub-threshold".
- Nonlinear stochastic resonance** is a mechanism by which weak, coherent electromagnetic fields, such as those generated by the heart of an individual in a caring state, may be detected and amplified by biological tissue, and potentially produce measurable effects in living systems.