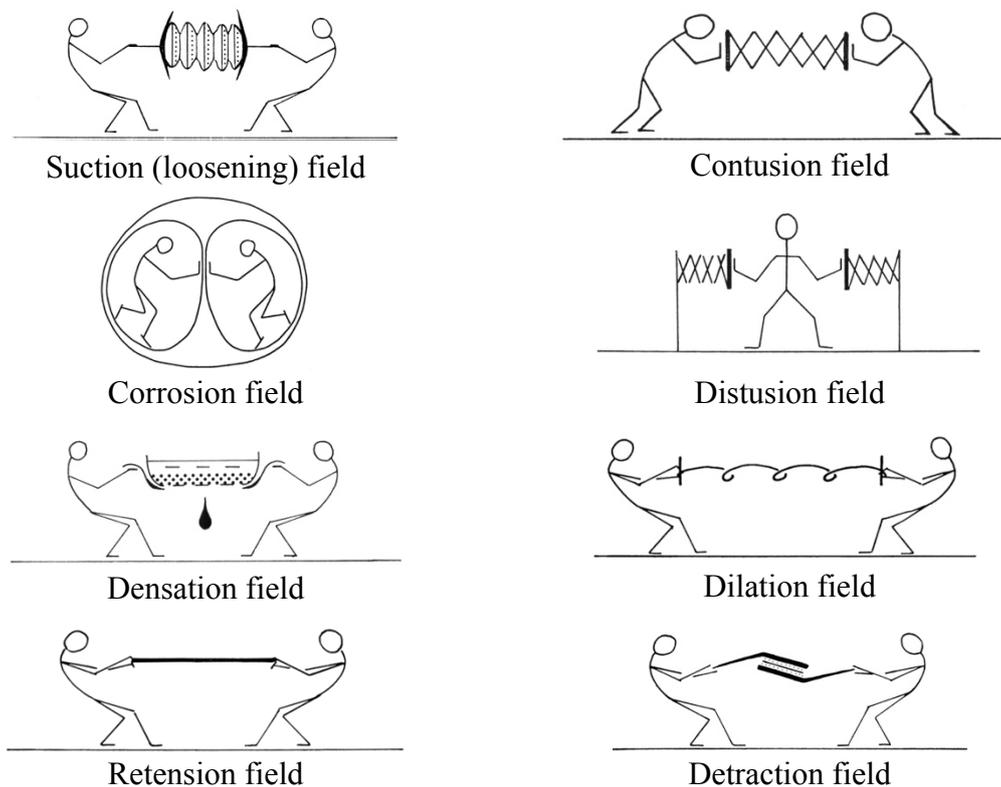


Fluid movements in Blechschmidt's metabolic fields

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Metabolism and movement are hallmarks of life so the concept of metabolic movements must be incorporated into any description of living tissue. Erich Blechschmidt (1904-1992) defined a metabolic field as a region or ensemble of cells with similar shape and similar metabolism containing spatially ordered metabolic movements – such fields usually do not have sharp boundaries. A metabolic field arises at a particular place and time under unique biodynamic circumstances; some fields arise in a temporal sequence, often as a counterbalancing reaction to a previous field, in the sense of Le Châtelier's principle. This workshop concerns the movement of water and metabolites along gradients in the various metabolic fields that Blechschmidt described from his studies of the human embryo. The presentation starts with the concept that the tissues of the body can be classified as limiting and inner. The following preliminary fields are considered: (i) metabolic field between limiting and inner tissue, (ii) metabolic field of a thick epithelium, (iii) metabolic field of a thin epithelium, (iv) metabolic fields of wedge (cuneiform) epithelia. Using Blechschmidt's symbolic representations, fluid movements will be discussed for the following fields, in limiting and inner tissue:



Metabolic fields will be considered throughout life, as well as under certain pathological circumstances. The work of others who independently reached similar conclusions will be addressed: Eben J. Carey (1889-1947) and his studies on muscle and bone formation; János ('Hans') Selye (1907-1982) and generation of tissues; Gavril A. Ilizarov (1921-1992) and distraction osteogenesis; as well as contemporary work in biomedical tissue engineering. Some so-called morphogenetic fields listed in the *terminologica embryologica* will be discussed in the context of metabolic fields.