

# Teaching Working Strategy in Embriology

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You begin with anatomy, and you end with  
anatomy, a knowledge of anatomy is all you  
want or need . . .

—Philosophy of Osteopathy

A.T. Still





*"Find it,  
Fix it,  
and  
leave it  
alone."*



DR. A. T. STILL  
FOUNDER OF OSTEOPATHY

Museum of Osteopathic Medicine (SM), Kirksville, MO [1995.18.01]

# An Aphorism by Dr. Still

Tucker EE. Reminiscences of A.T. Still. 1877.  
Located at: Still National Osteopathic  
Museum, Kirksville, Missouri.



Find It

Diagnosis through Palpation



# Palpation of Living Anatomy

## Basic Criteria of Osteopathic Diagnosis



Normal Anatomy  
is based on  
An Ontogeny

Ontogenetic Anatomy



Quite often, the study of embryology is only limited to a list of the embryonic development phases, essentially with narrative features, focusing merely on the temporal aspects and sequences of the different stages of organs and apparatus development.

Limiting the attention on cell modifications, the growth of the embryo in his totality as well as the differentiation of cells and tissues in different areas are neglected.



# Ontogenetic Anatomy



## Biodynamic Embryology



Over the years, we have developed and improved a teaching method about Embryology based on Blechschmidt's Biodynamic and Biokinetic embryological model.

In order to give a facilitated methodology for the students which could improve their assessments in the diagnostic field and the osteopathic corrective techniques.



Biodynamic Embryology  
is based on developmental movements



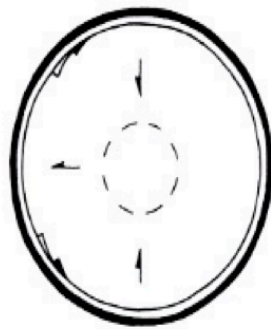
Professor E. Blechschmidt  
1900 -1985

E. Blechschmidt  
named the spatially  
ordered movements  
Metabolic Field

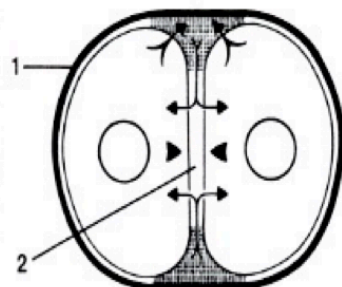


a Biodynamic Metabolic Field is a field of force based on a locally ordered metabolism. Metabolic fields are those morphologically definable regions, at all different levels of spatial resolution, which contain spatially ordered metabolic movements.

Biodynamic metabolic fields can be used to describe cells and cell ensembles (e.g., zones of loose tissue, zones of dense tissue) or whole areas of differentiation such as the lung, the liver, or the thyroid gland.



Human conceptus within its capsule (zona pellucida, black line). Arrows schematize the pathway of an intracellular circulation of material movements whereby the cell boundary is coupled to the cell nucleus and vice versa.



Commencement of subdivision (fission) of conceptus into two daughter cells (blastomeres). Arrows represent metabolic movements. Stipple: secretion products of metabolism. Black line: capsule (zona pellucida).

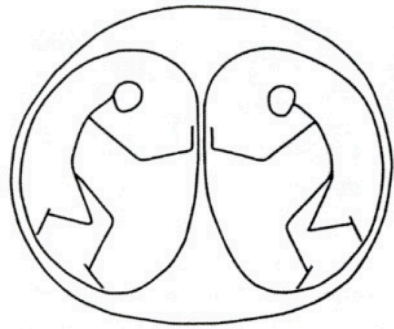


Since Metabolic fields are regions, this means that the development of tissues and organs depends initially on position of the cells.

Feature called "Topogenesis"

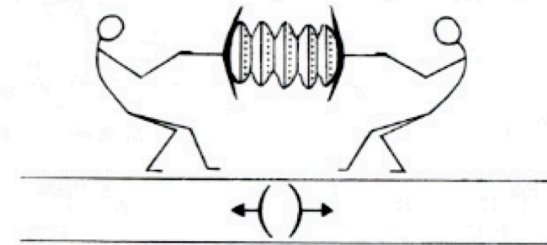
Topogenesis gives rise first to Morphogenesis (the form), then to Tectogenesis (the internal structure)



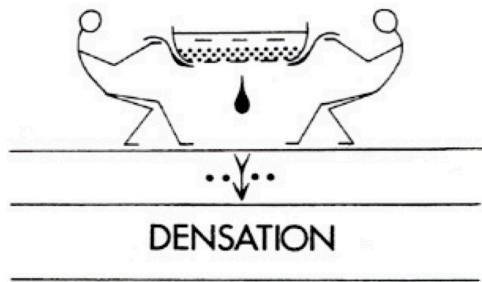


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CORROSION

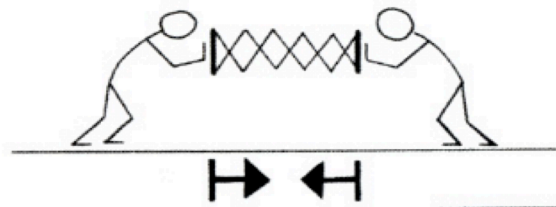
# Metabolic Fields



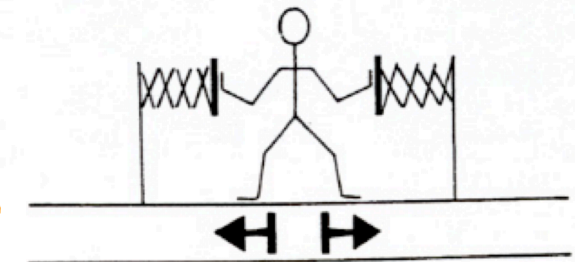
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SUCTION



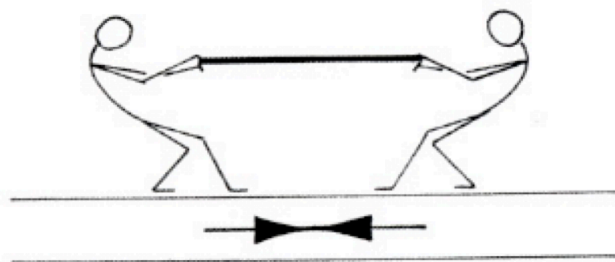
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DENSATION



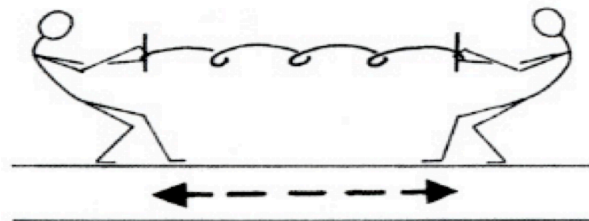
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CONTUSION



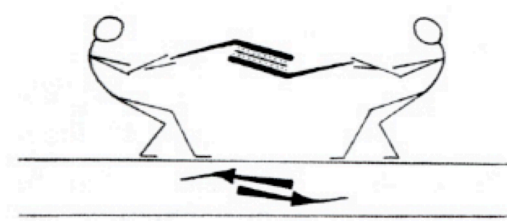
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DISTUSION



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RETENSION

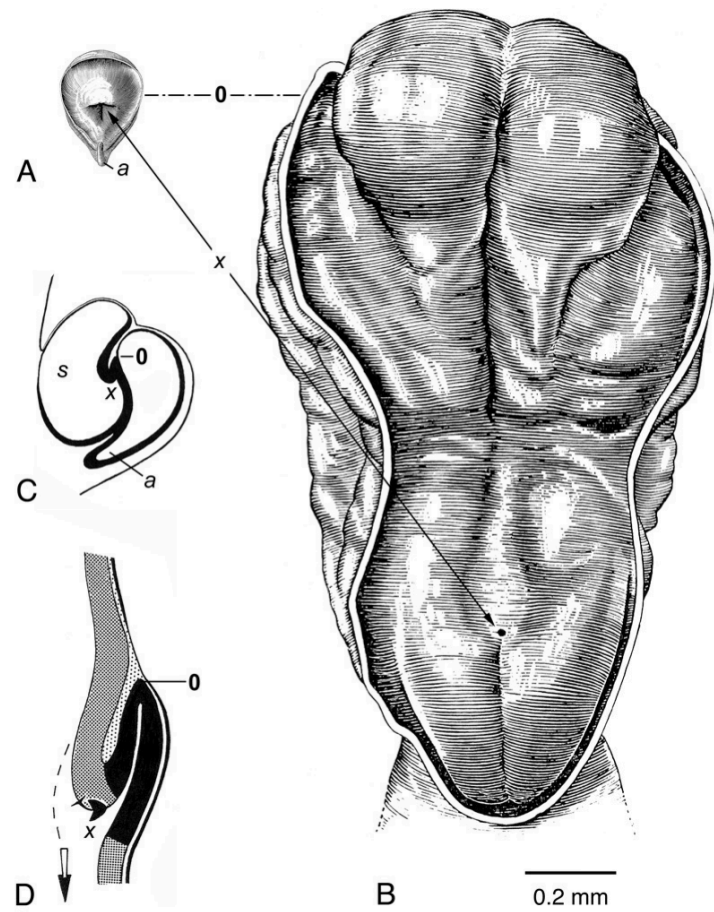


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DILATION

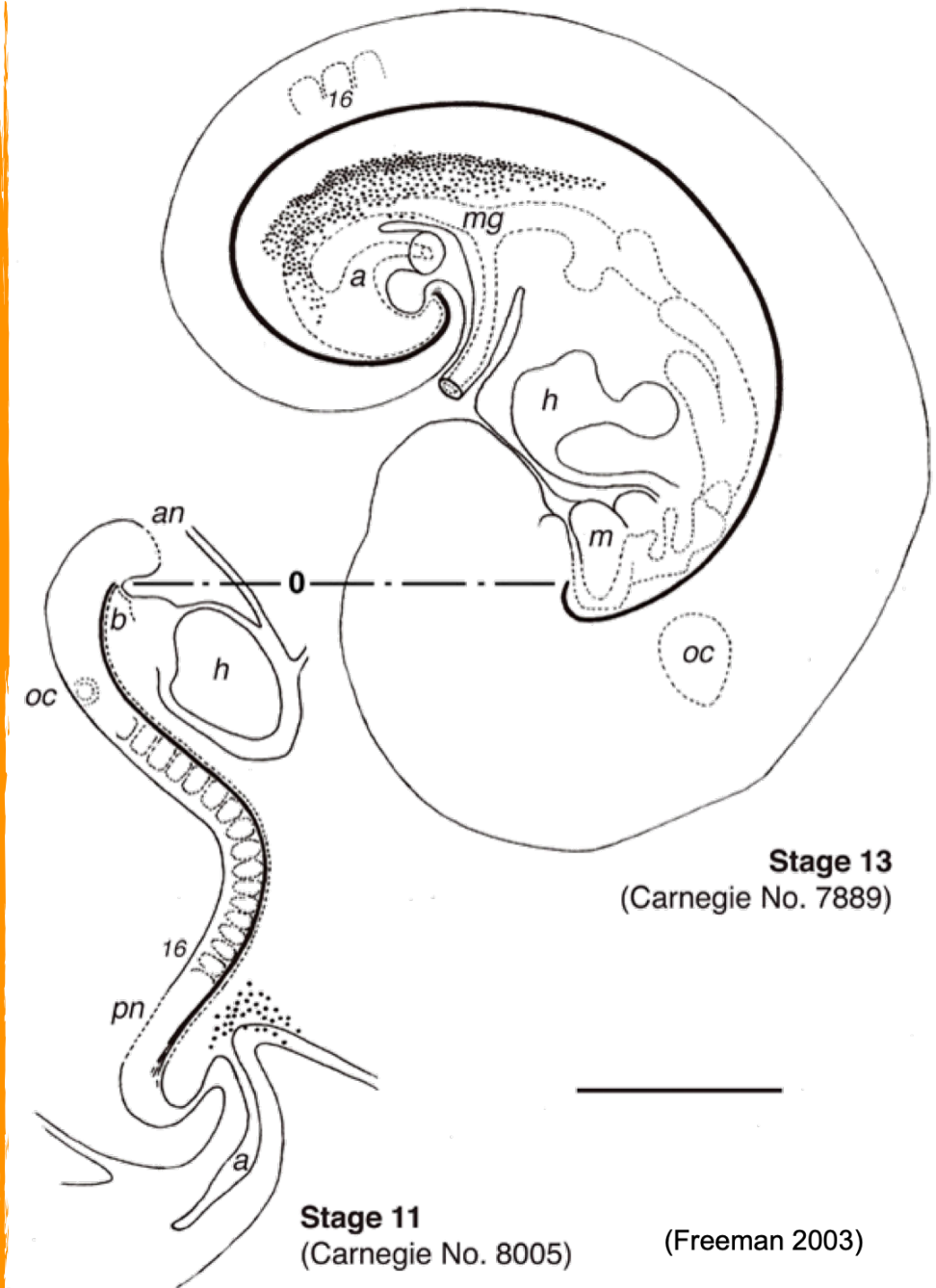


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DETRACTION

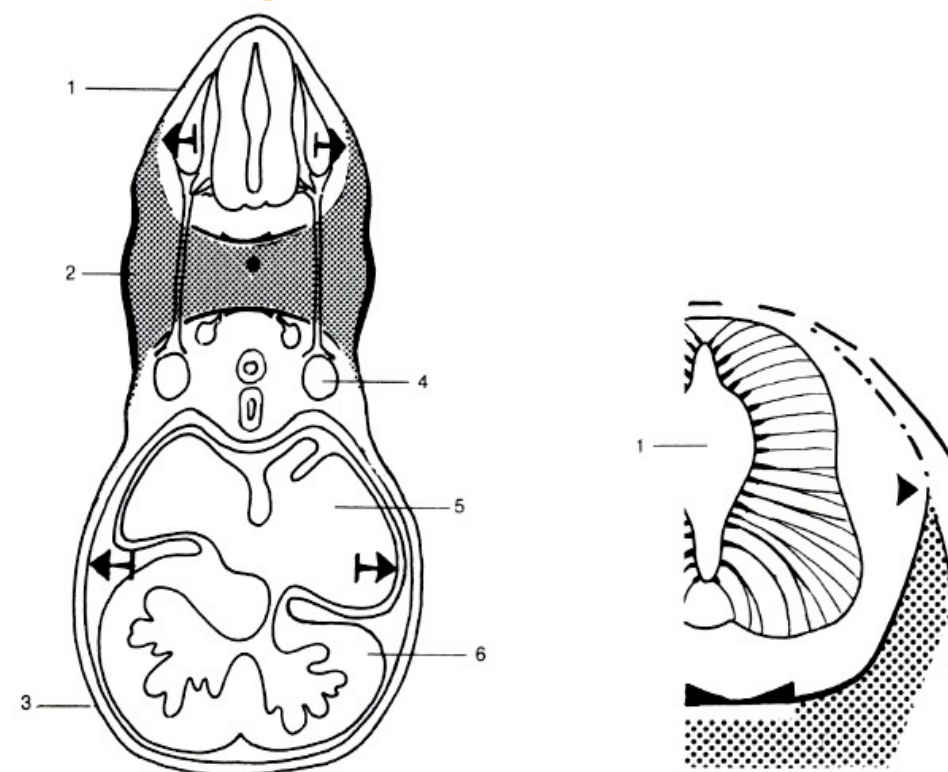
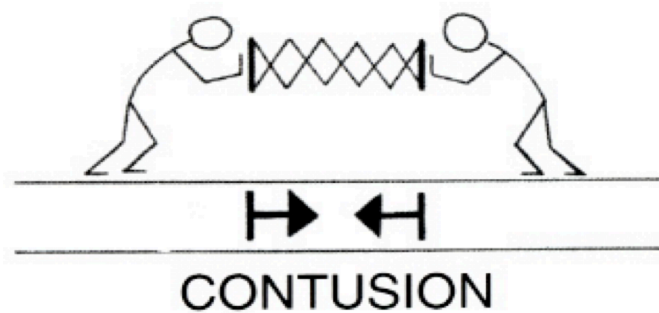
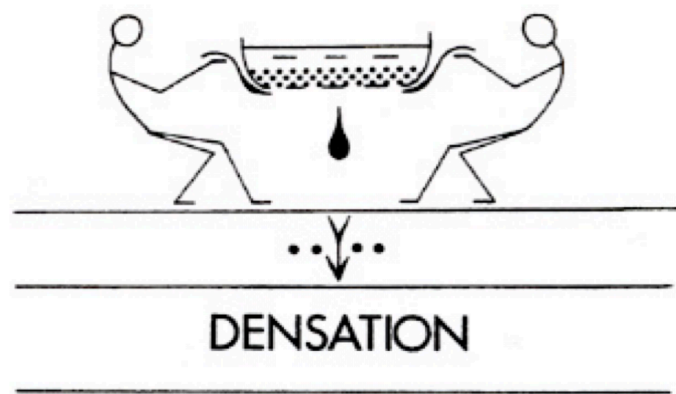




The Notochord is a Null Point



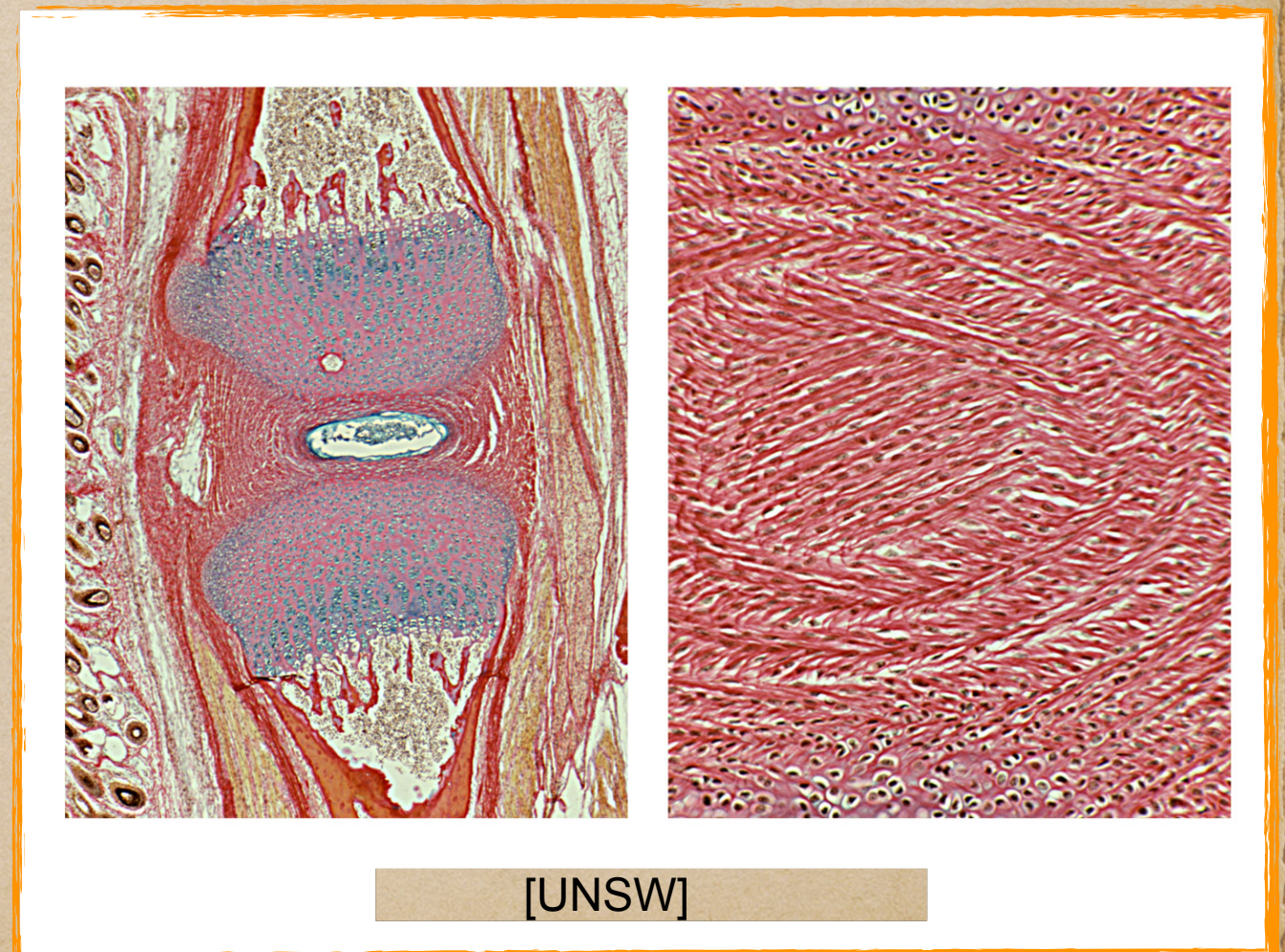
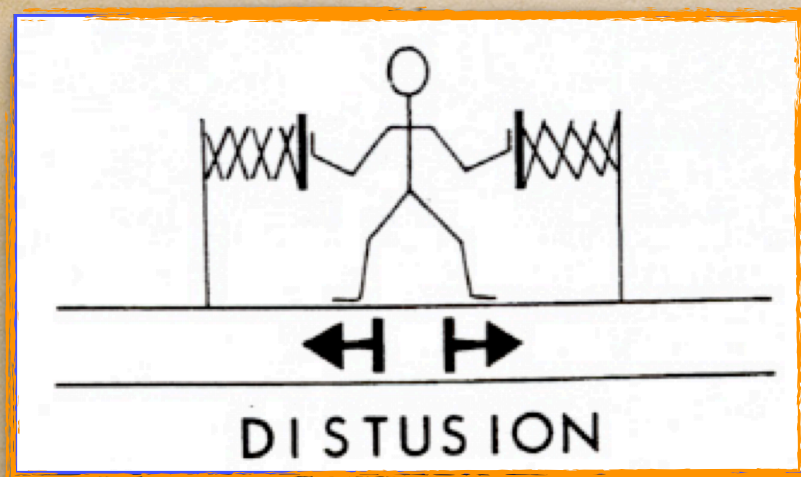
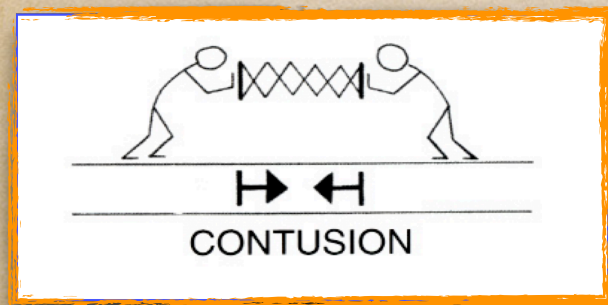
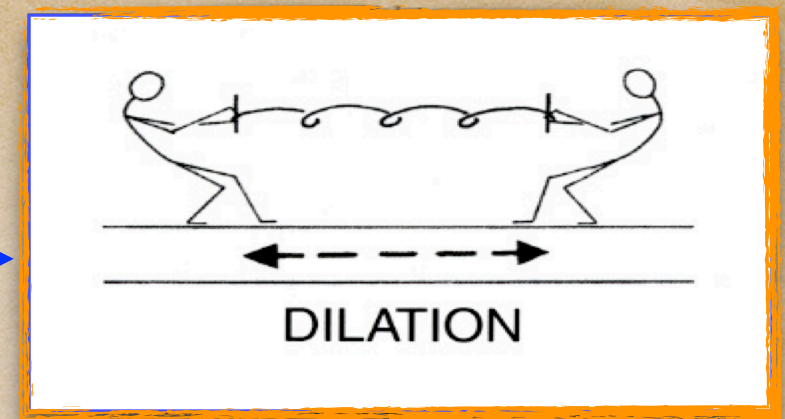
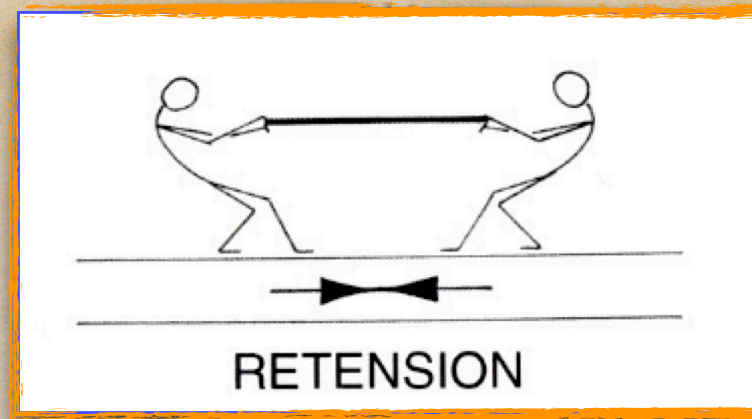
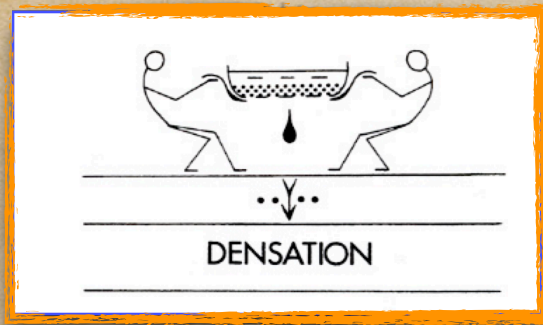




Cross-section of human embryo 8.1 mm long (viewed from inferior aspect) showing thick and thin regions of body wall. Diverging arrows with cross-tails: growth expansion. Stipple: anlage of movement apparatus. 1) thin skin over rapidly growing neural tube, 2) ectodermal ring (thick skin in region of restricted surface growth), 3) thin skin over rapidly growing heart, 4) vein (superior cardinal vein), 5) right atrium of heart, 6) right ventricle.

Vertebral canal and spinal cord of 11 mm long human embryo. Dot-dash line: thin part of dura over eccentrically growing spinal cord. Converging arrows: restraining function of dense meninx (dura mater), also perichondrium of cartilage. Arrowhead: fluid pressure of intercellular substance in endomeninx (arachnoidea); this fluid pressure has led to the formation of a contusion field in the vicinity of the vertebral column. Cartilage stippled. 1) spinal canal.







## 4 Visceral or Pharyngeal Archs

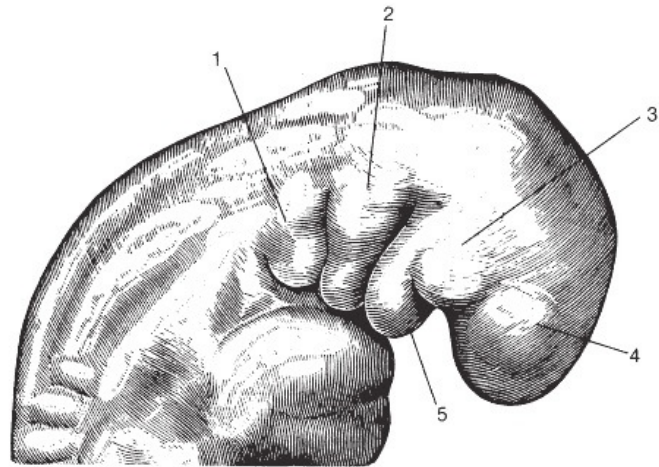
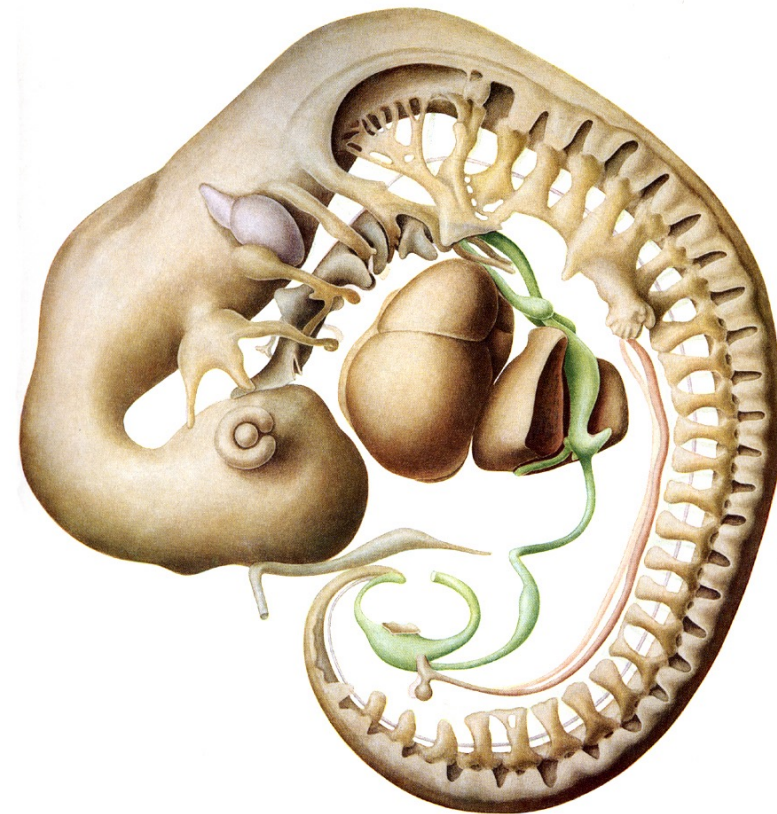
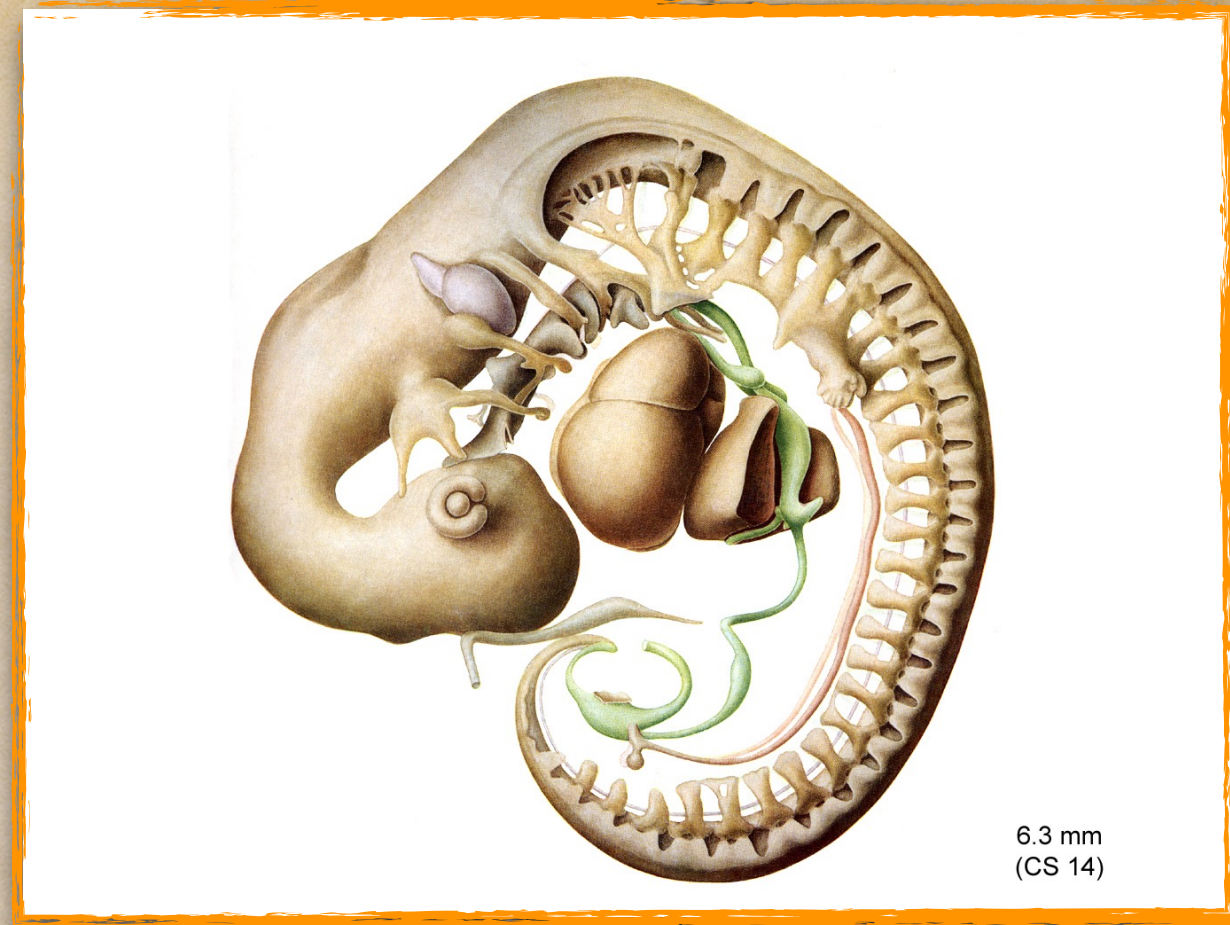
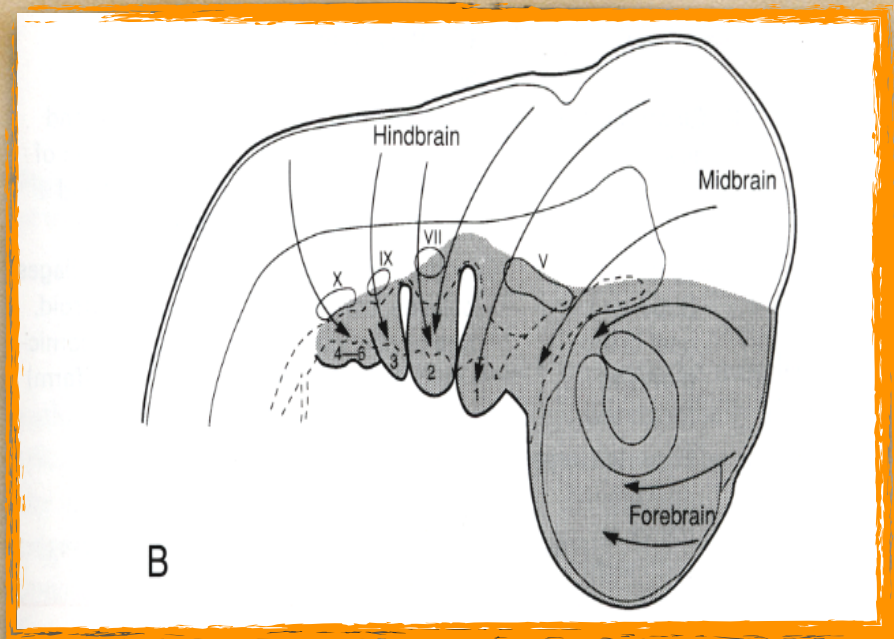


Fig. 2.37. Human embryo 3.4 mm long, 27th day showing flexion folds of head-neck region. 1) 3rd visceral (laryngeal) arch, 2) 2nd visceral (hyoid) arch, 3) upper jaw (maxillary) swelling, 4) eye anlage, 5) mandibular arch (1st visceral arch).



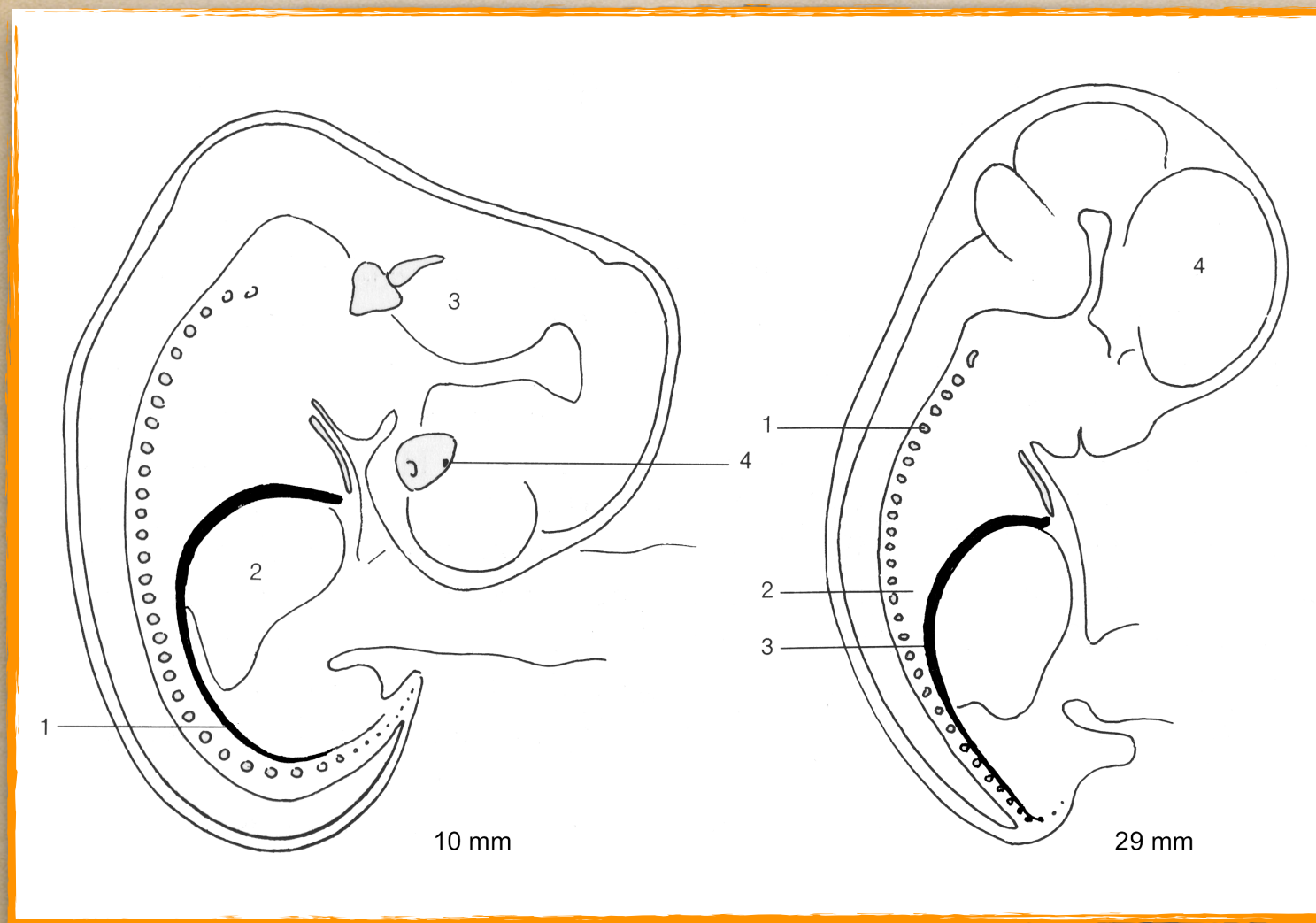
6.3 mm  
(CS 14)







# Descensus



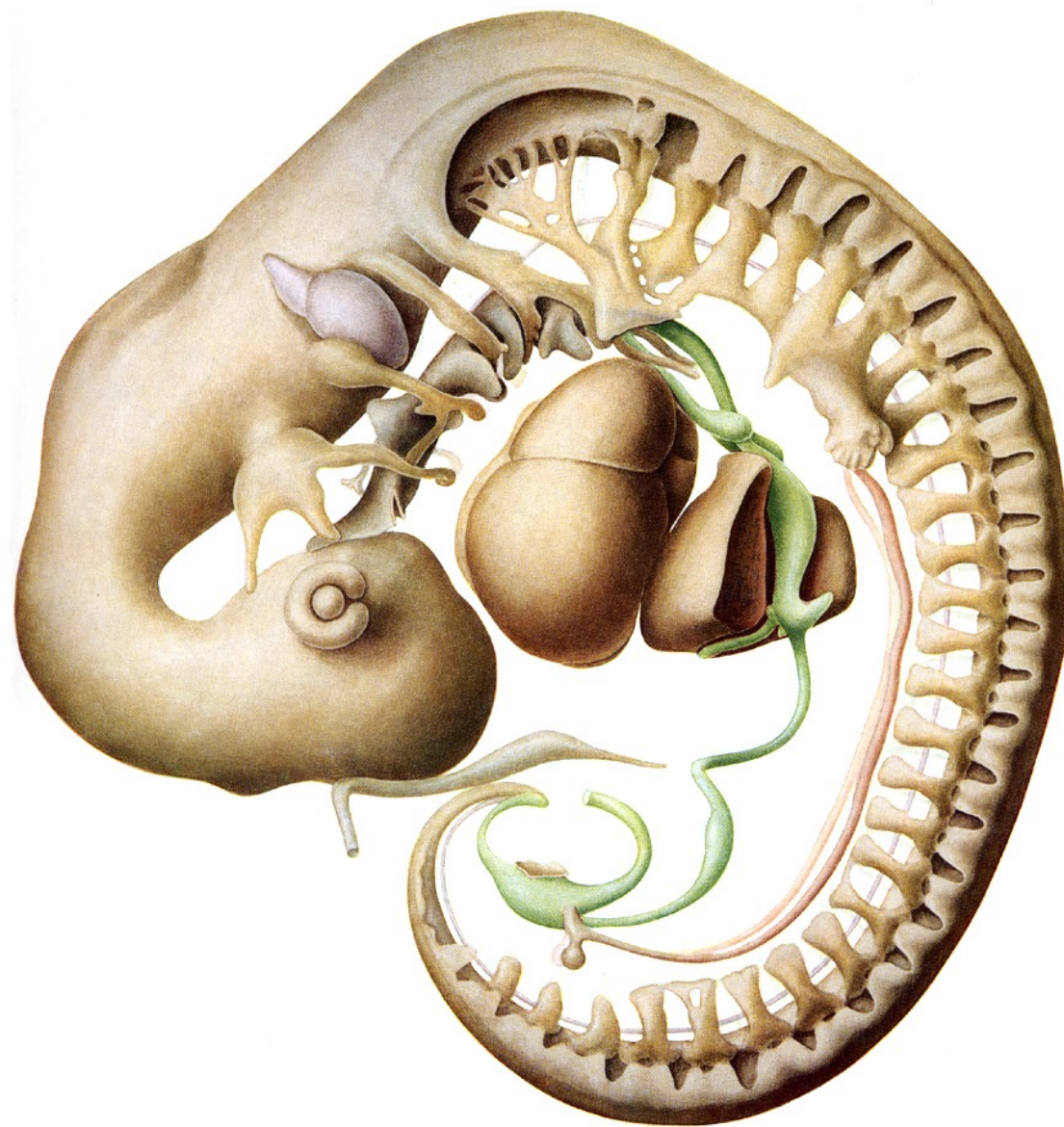
“Heart-Liver Angle”





the transverse septum





6.3 mm  
(CS 14)

Foregut ~ Midgut ~ Hindgut

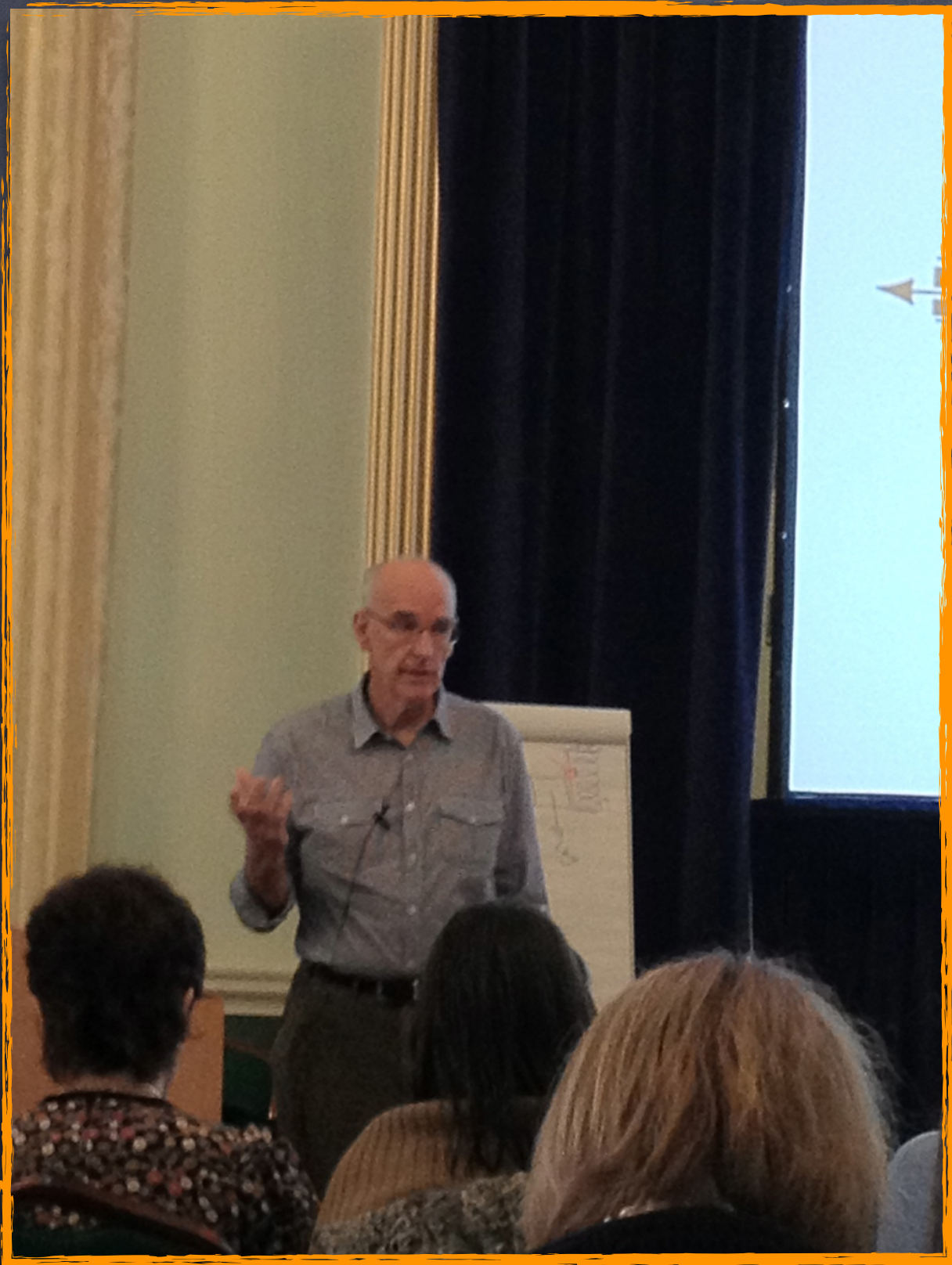




Midgut

Superior  
Mesenteric  
Plexus





Professor Brian Freeman Ph.D. Anatomy  
UNSW - Australia



heartfelt thanks !!!



# Grazie per l'Attenzione



Pescara Italia