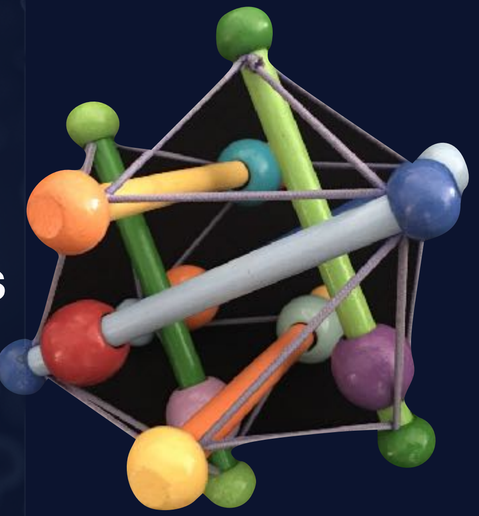
Fasciategrity

7th "Open Forum for Osteopathic Education" Conference
24th & 25th September 2020
TEACHING THE WORKING PRINCIPLES OF OSTEOPATHY

Fasciategrity-Reasoning, Applying and Integrating fascia science and living tensegrity in support of Osteopathic principles.

Note: This presentation will contain Cadaver images

Thanks to the donors, families and friends



biotensegrity@instagram.com

John Sharkey
Clinical Anatomist

British Association of Clinical Anatomists Anatomical Society

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"Fascia ..... By its action we live, and by its failure we shrink, or swell, and die."

(A.T. Still 1899)

Still, AT. 1899 Philosophy of Osteopathy, Academy of Osteopathy, Kirksville, MO

Associate Editor
Fascia Science and Clinical Applications

With Dr Gunthor von hangens- FNPP

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"If disease is so highly attenuated, so ethereal, and penetrable in quality, and multiple in atoms; and a breath of air two quarts or more taken into the lungs fully charged with contagion, how many thousand air cells could be impregnated by one single breath?...- Nourishment from the vitality found in the human fascia, which comes nearer to the surface in lungs than any part of the system." Still, 1899 page 168-9

Article | Full-text available

Fascia Focused Manual Therapy Interventions-proposed treatment for Post-COVID Syndrome

January 2021 · Integrative Journal of Medical Sciences 8 · Follow journal

DOI: 10.15342/ijms.2021.339

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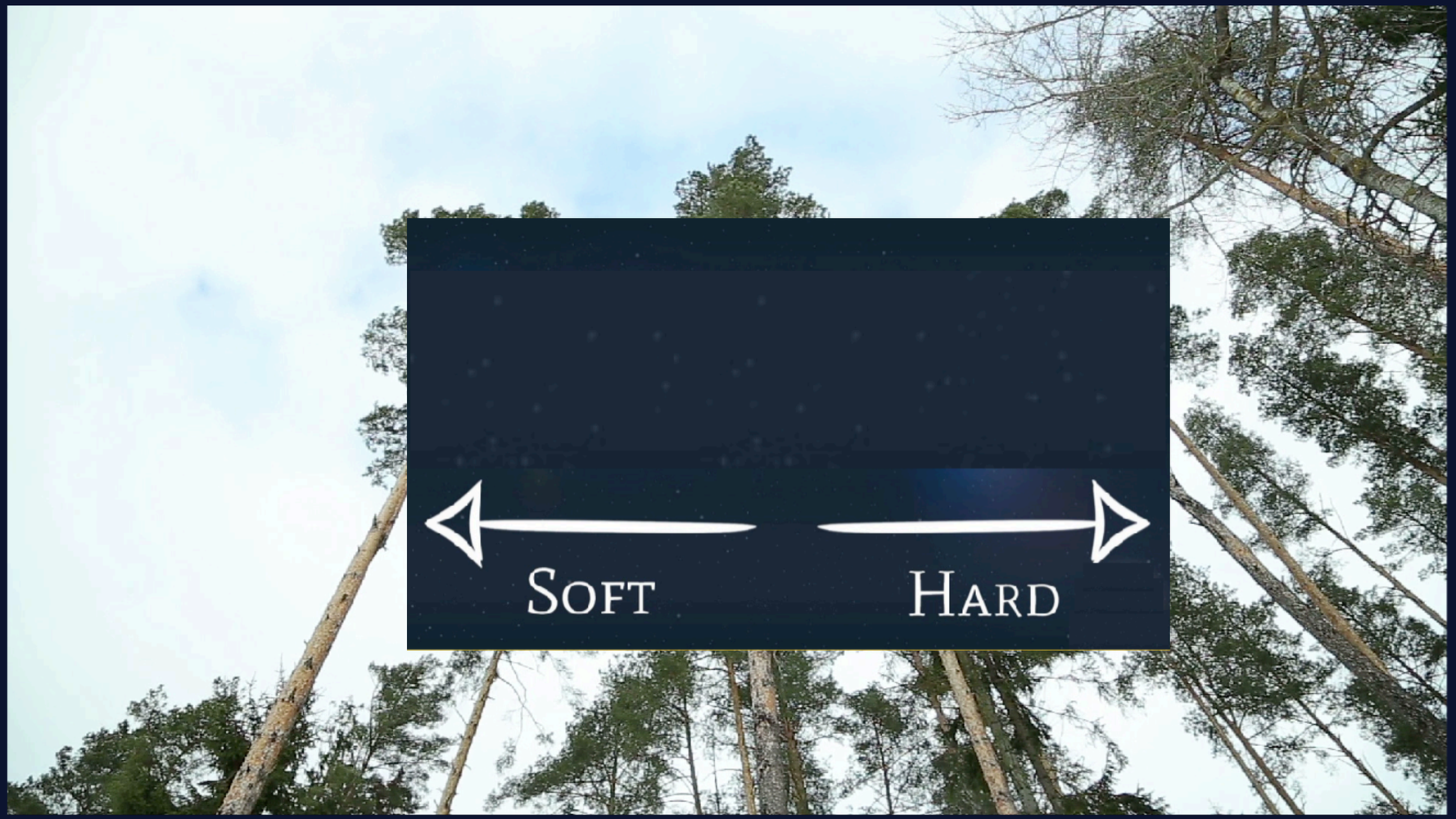
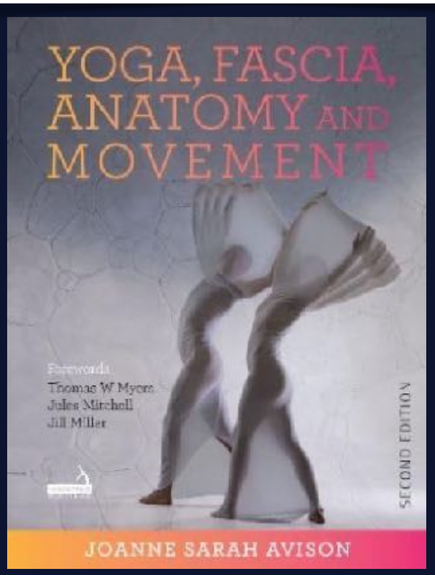
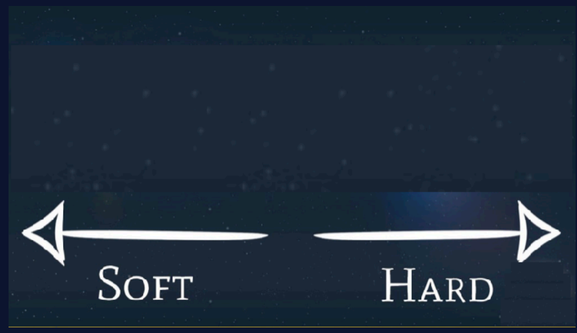
John Sharkey

Fasciategrity= Fascia Science and Science of Living Tensegrity. Combined







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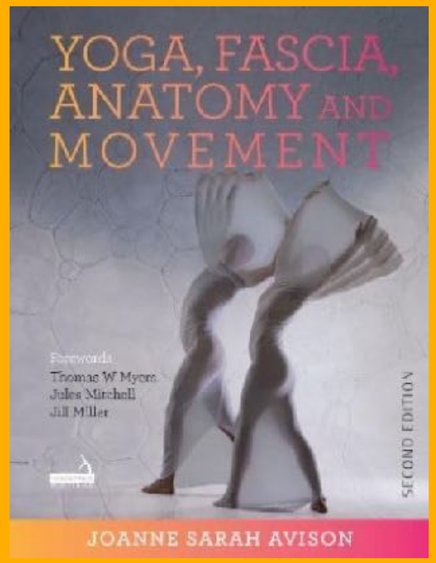

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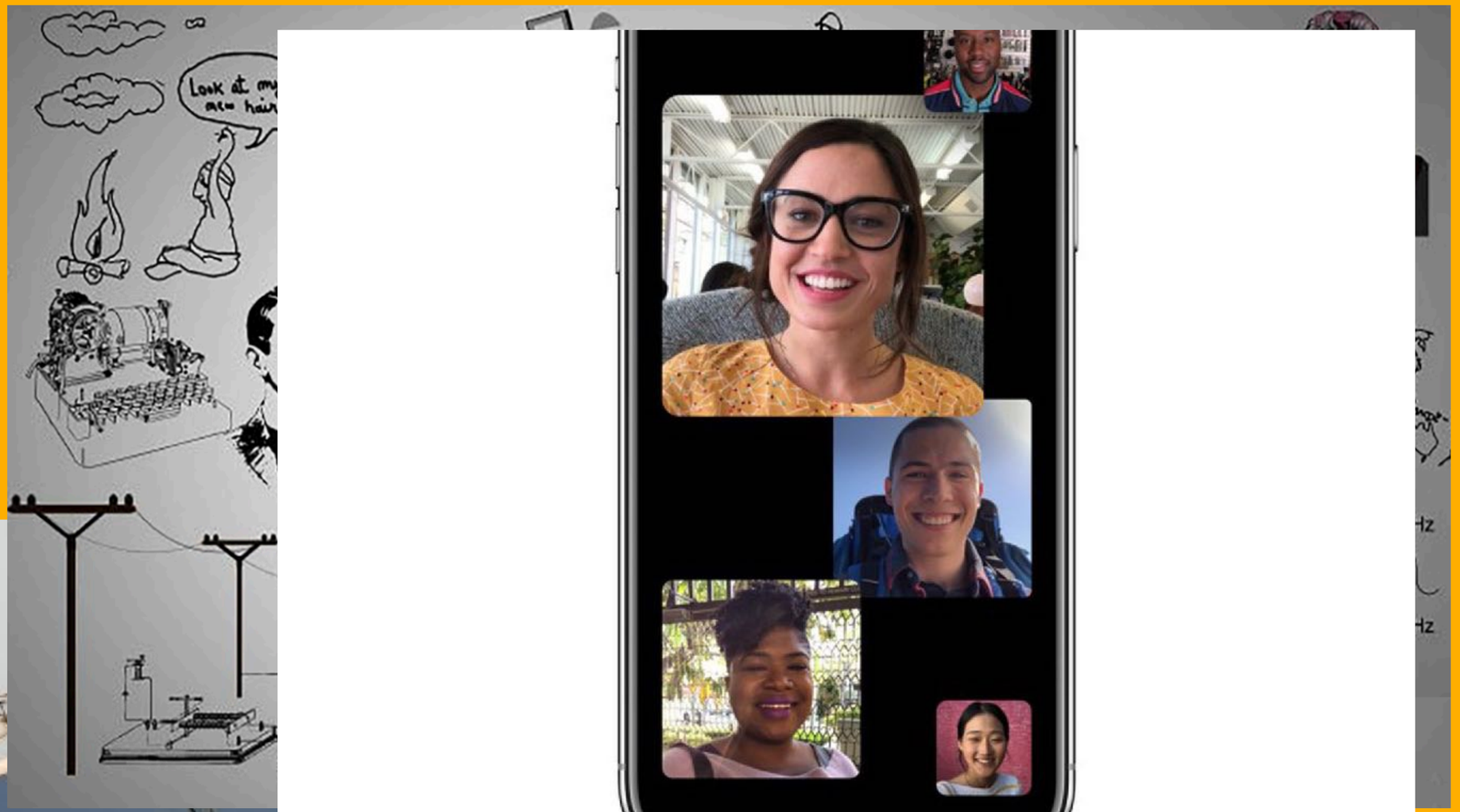

TODAY WE ARE STILL TEACHING 13TH CENTURY ANATOMY

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Origins-

Insertions-

Levers-

Joints-

Body Parts-

One muscle, one movement-

Linear forces— Lines—Train Tracks- Point-to-Point Postulations. We are non-linear !!!

"None of these concepts reflect the reality and continuity of our form"

I suggest we need "anatomy for the 21st Century".

"We are putting Stainless Steel, Ceramics, Cement, Super glue,
Screws, Plates and Plastics into human bodies.
I believe we can do better".

Sharkey, J

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Osteopathy is based upon the concepts of body structure and health maintenance (not disease).

Dr. Still promoted four foundational pillars:

(1) The human body functions as one biological unit

(2) The body can heal itself

(3) Structure and function are interrelated

(4) Abnormal pressure in one part of the body produces abnormal pressures and strains in other parts of the body.

Reference
Still AT 1899. Philosophy of Osteopathy. Kirksville MO

What is Fascia ?

What is Fascia ?

Wikipedia

Fascia A fascia (/ˈfæʃ(i)ə/; plural fasciae /ˈfæʃii/; adjective fascial; from Latin: "band") is a band or sheet of connective tissue, primarily collagen, beneath the skin that attaches, stabilizes, encloses, and separates muscles and other internal organs.[1] Fascia is classified by layer, as superficial fascia, deep fascia, and visceral or parietal fascia, or by its function and anatomical location.

What is tensegrity ?

What is Fasciategrity and how can such a model inform and impact osteopathy?

Reasoning-Applying-Integrating

The word ‘Fascia’ is first mentioned in 1615 when describing the Thoracolumbar Fascia (Fasciam) - *“more like a membrane than a tendon” (Crooke).*

1694 **Cowper demonstrates muscles of the forearm are enclosed by a *‘fascia lata’ and describes the thigh and anatomical leg as invested in ‘fascia membranosa’.***

“Defining fascia is ‘conceptual’

and partially a ‘technical’ issue”. **Sharkey, j.**

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FEDERATIVE COMMITTEE ON ANATOMICAL TERMINOLOGY (1998):

DEFINED FASCIA AS:

“SHEATHS, SHEETS OR OTHER DISSECTIBLE

CONNECTIVE TISSUE AGGREGATIONS”.

Including:

“INVESTMENTS OF VISCERA AND DISSECTIBLE STRUCTURES RELATED TO THEM.

I draw your attention to :
Fascia: “sheathes, permeates, divides and sub-divides every portion of all animal bodies; surrounding and penetrating every muscle and all its fibers - every artery, and every fiber” Still, 1899 page 163

My favourite attempt is the following by Haller (1754)

"Cellular spaces hardly ever contain fat and are moistened by a watery vapour, that is somewhat gelatinous and oily, exhaled out by the arteries and received again into the veins. And when the vapour is, by inflammation, too glutinous, or, from any cause, absent or abolished, the contiguous membranes or plates are cemented into one, with loss of their motion".

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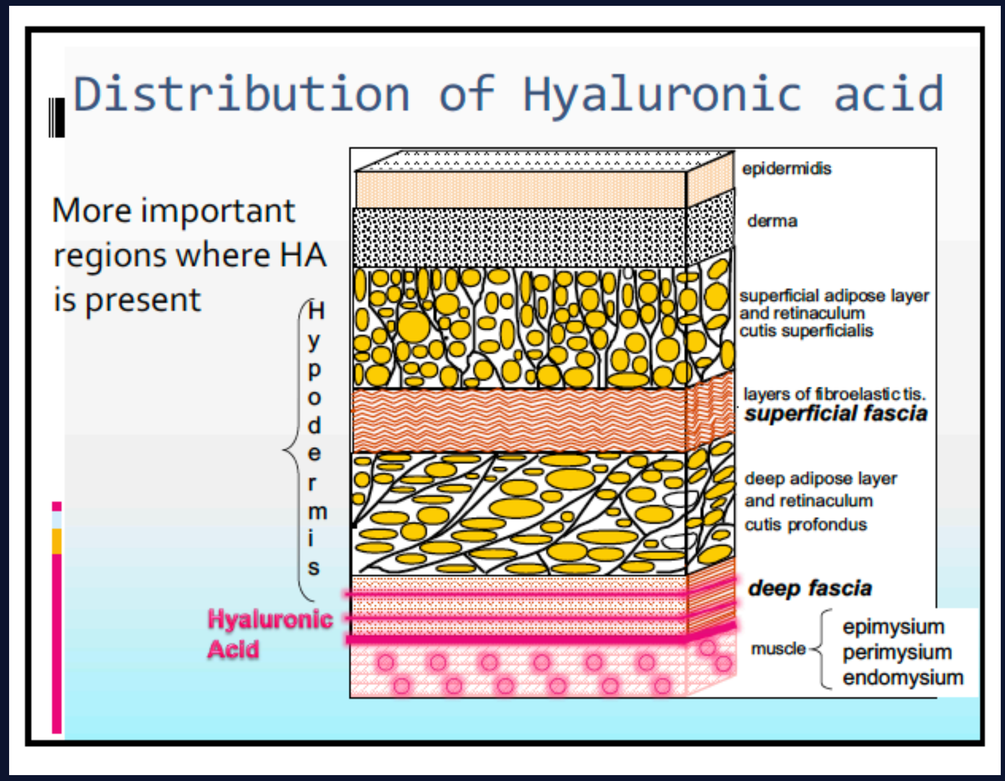
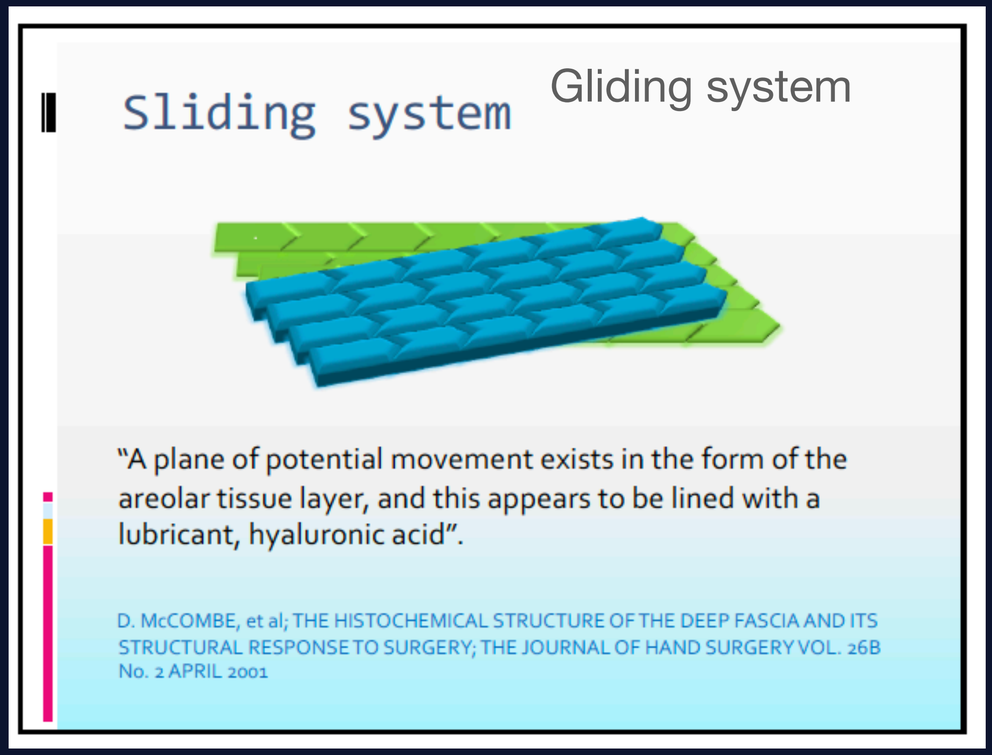
Dr. Albert Haller's Physiology: Being a Course of Lectures Upon The Visceral Anatomy and Vital Oeconomy of Human Bodies.(2vols.) Hardcover – January 1, 1754
by A. HALLER (Author)





What is Fascia ?

Video with kind permission of Dr J.C.Guimberteau and Endovivo Productions

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FNPP

Comment > J Bodyw Mov Ther. 2019 Jan;23(1):6-8. doi: 10.1016/j.jbmt.2018.11.006. Epub 2018 Nov 30.

Regarding: Update on fascial nomenclature-an additional proposal by John Sharkey MSc, Clinical Anatomist

John Sharkey [1]

Affiliations + expand

PMID: 30691764 DOI: 10.1016/j.jbmt.2018.11.006

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Fascia.....How Hard Can its Be ?

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Dissect

Origin

LATIN
dis- apart

LATIN
secare to cut

LATIN
dissecare

LATIN
dissect- cut up

dissect
late 16th century

late 16th century: from Latin *dissect-* 'cut up', from the verb *dissecare*, from *dis-* 'apart' + *secare* 'to cut'.

johnsharkeyevents.com

biotensegrity@instagram

“In Dissection I find only continuity”, sharkey, j.

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Image: Sharkey, J 2019

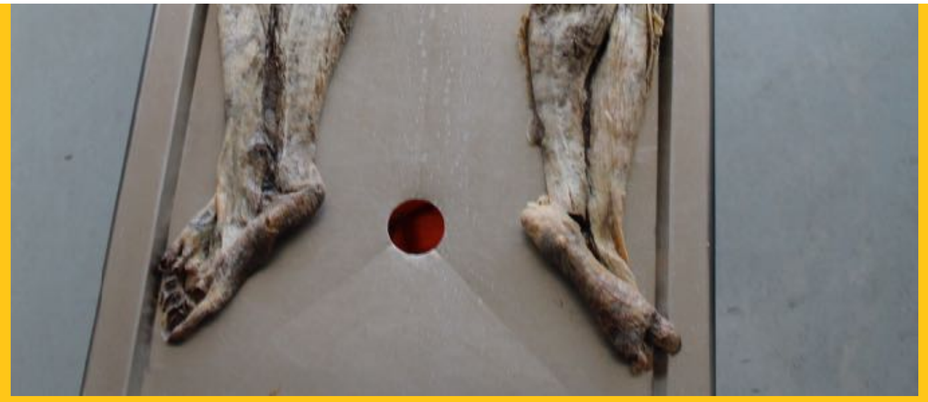
Article | Full-text available

Tensegrity Informed Observations in Human Cadaveric Studies - A Clinical Anatomists Perspective

October 2020 · Integrative Journal of Medical Sciences 7 · Follow journal

DOI: 10.15342/ijms.7.260

John Sharkey



Fascia Superficialis. Image: Sharkey, J 2010

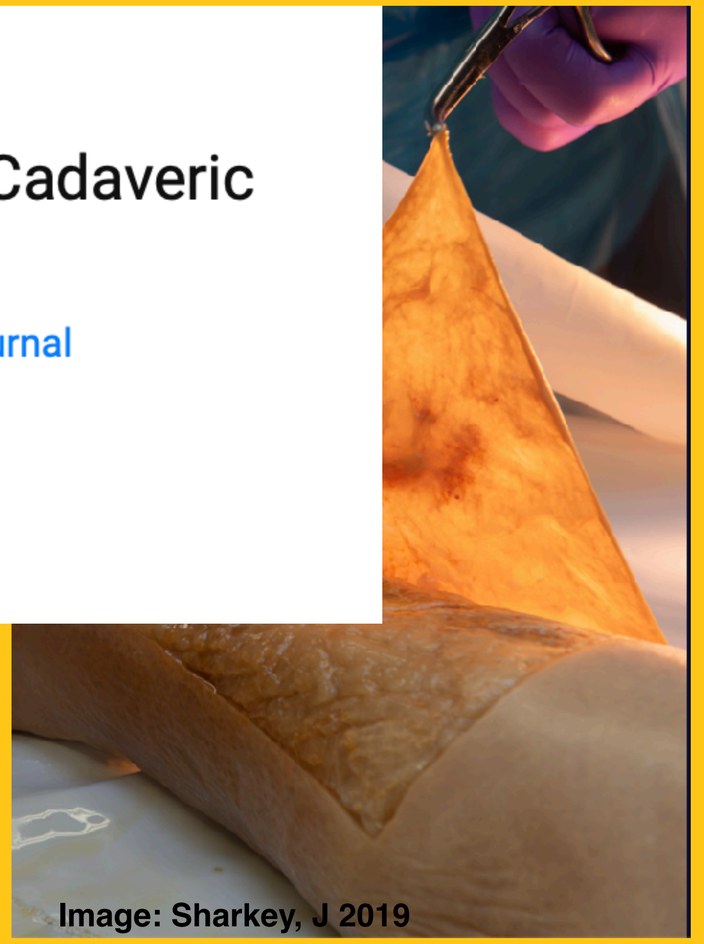


Image: Sharkey, J 2019

Defining Fascia

"From a 'Living tensegrity' or Biotensegrity point of view fascia should include liquid, Lymph and blood, and the more solid fascia -bone"

"Fascia is a liquid crystal"

Comment > J Bodyw Mov Ther. 2019 Jan;23(1):6-8. doi: 10.1016/j.jbmt.2018.11.006. Epub 2018 Nov 30.

Regarding: Update on fascial nomenclature–an additional proposal by John Sharkey MSc, Clinical Anatomist

John Sharkey [1]

Affiliations + expand

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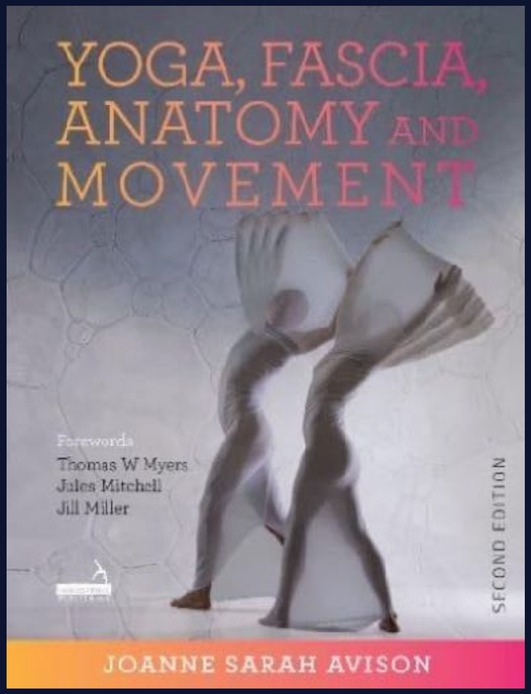

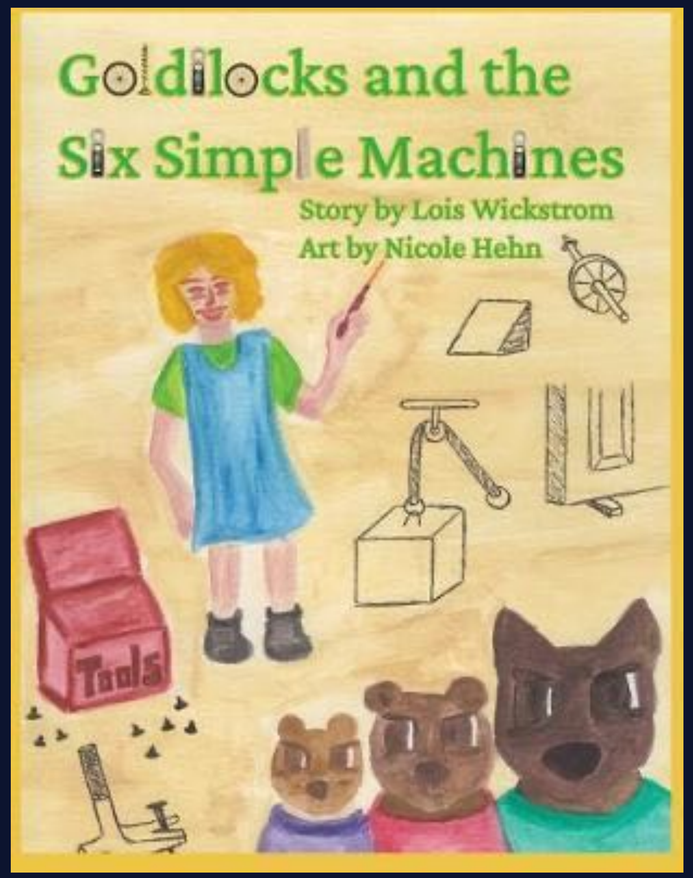

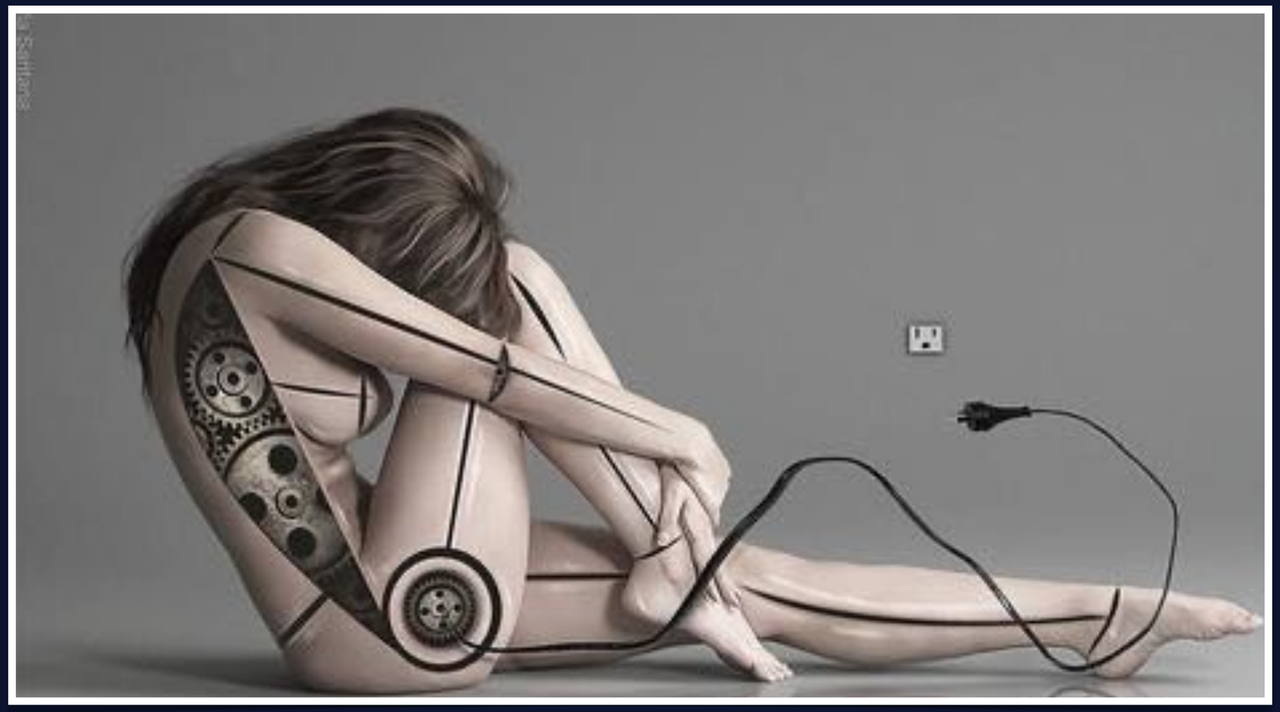

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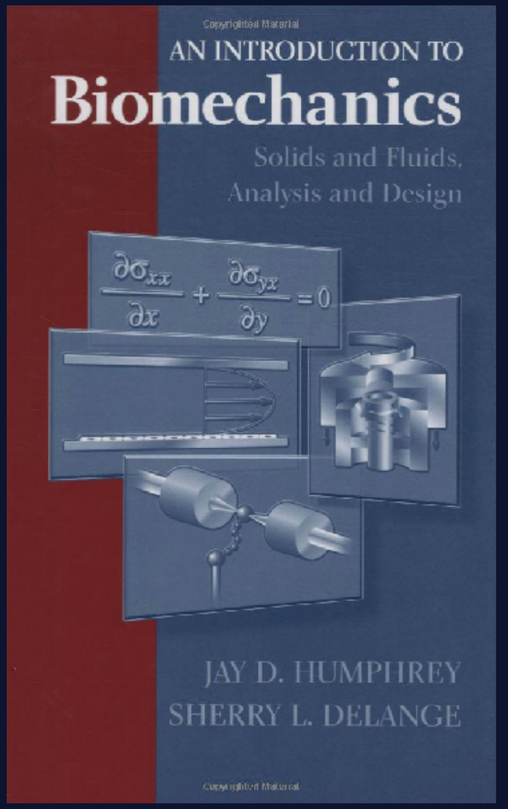

What is the current view of the human body?

Human as machine.

Made of parts.

Bio= Living Mechanics= Mechanical

Biomechanics

Archimedes of Syracuse (287 BC) was a Greek mathematician, physicist, engineer, inventor, and astronomer.

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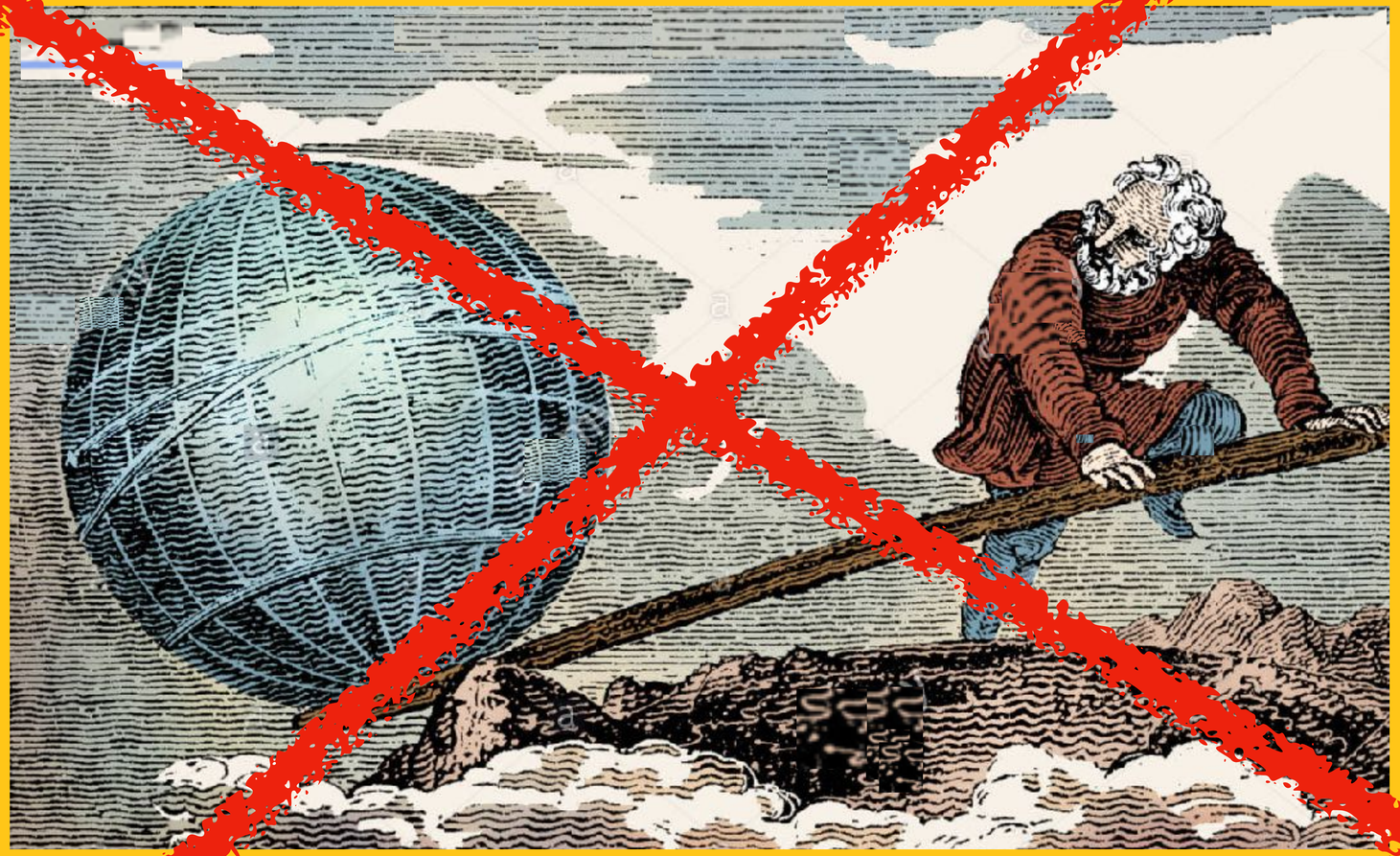
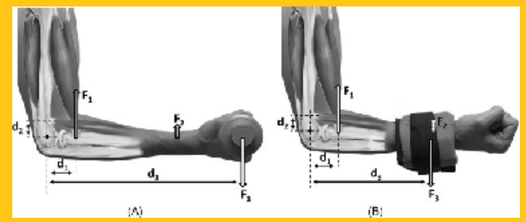
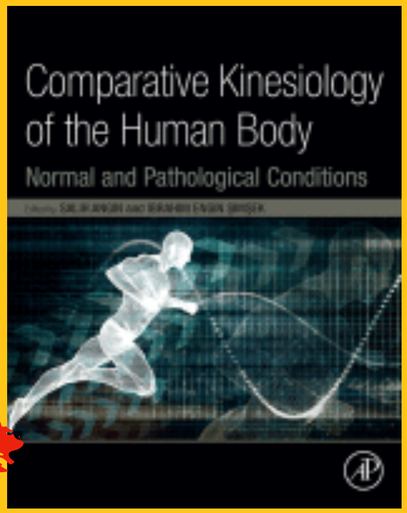
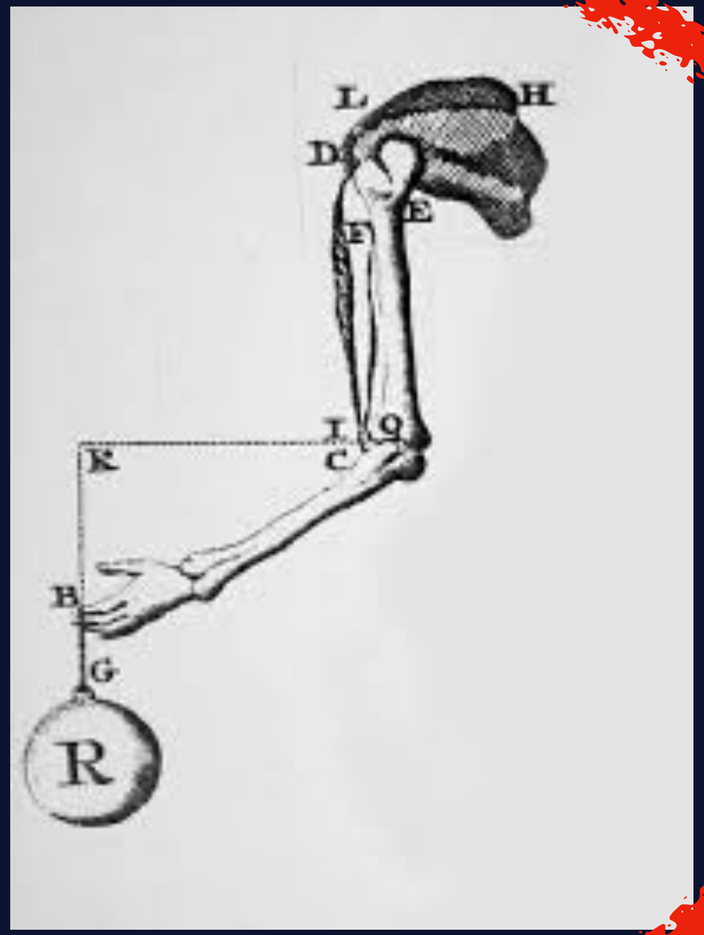
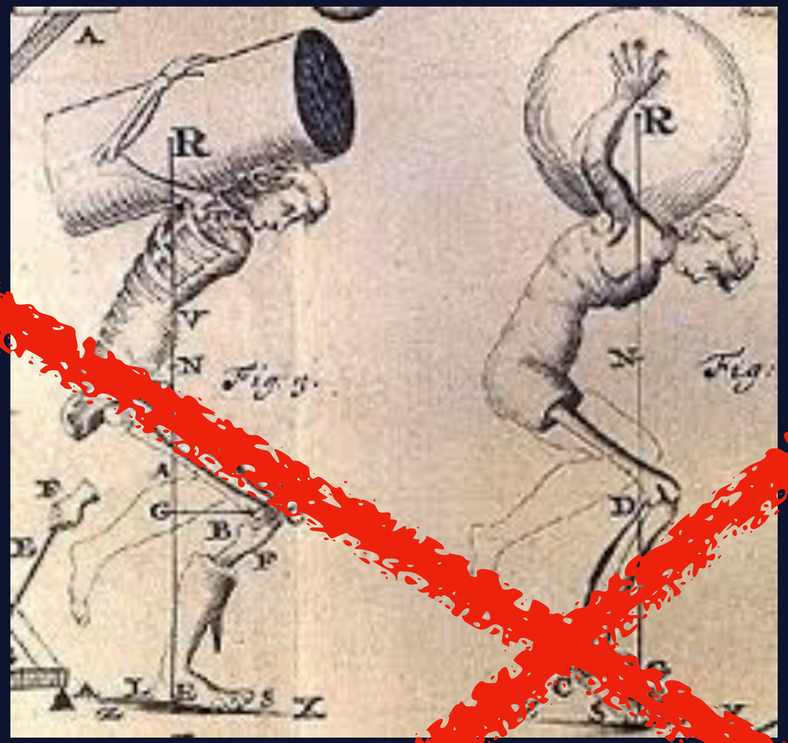




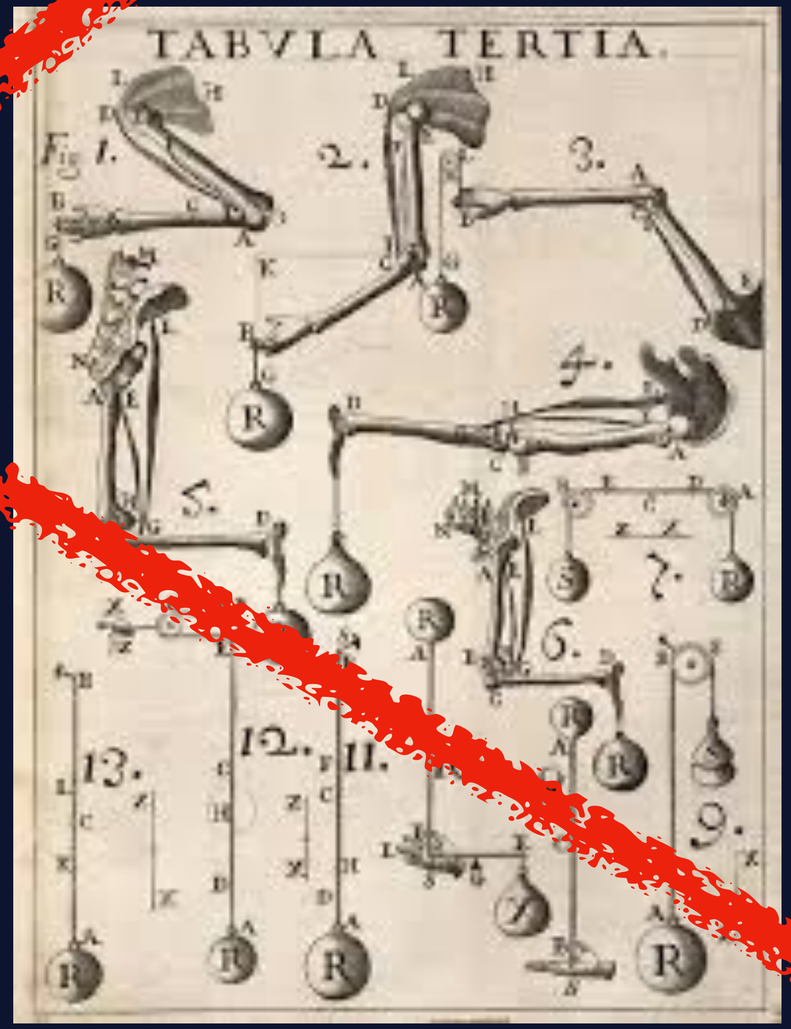


Two-Bar Open Kinetic System





Giovanni Borelli -1608-1679



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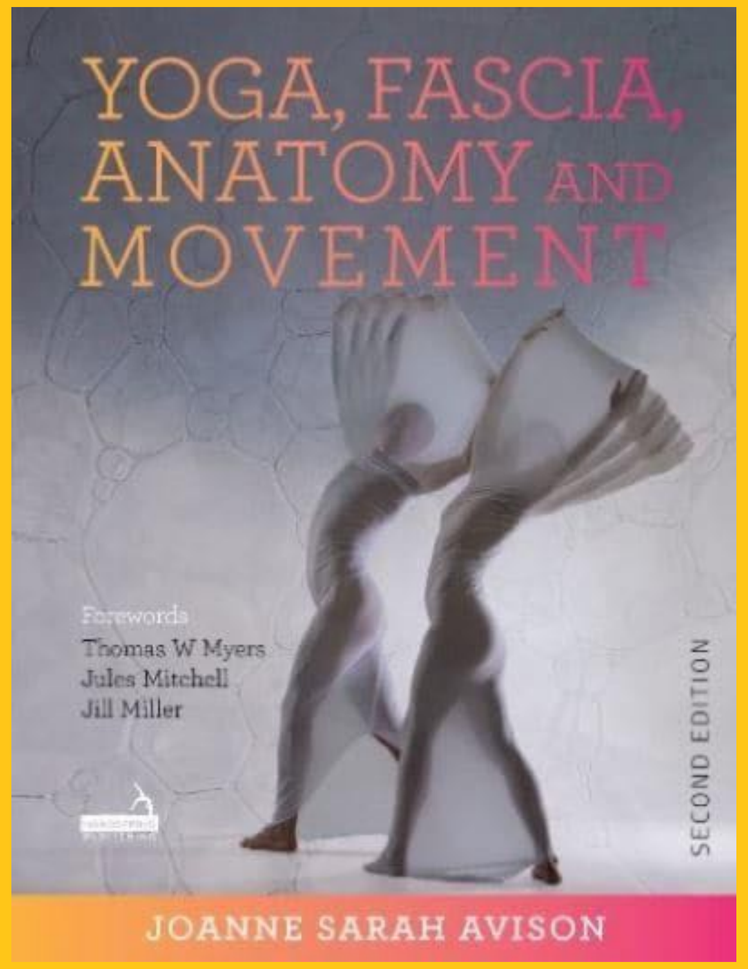

We have viewed 'human as machine and parts' from the time of René Descartes: 1596-1650

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"In the 1940's Bartelink was commissioned by the German Air Defense to study the internal tissues forces that pilots ejecting from the new military jets airplanes were subjected to with sometimes very deadly consequences. During the course of his work, Bartelink proposed that the back muscles are the predominant structure that would control the trunk during simple tasks such as weight lifting. This idea was received with unabridged enthusiasm, and even to this day, many believe that this is the revealed biomechanics' gospel. That this concept survived for so long against the contradictions it generated is a testimony to the unique ability of the art of medicine to keep an attractive idea alive in spite of a ruthless experimental annihilation".

Looking beyond the horizon – The physics of anatomy and function (Private Email to js)

Serge Gracovetsky, Ph.D.
Concordia University, Montréal, Québec, Canada

Serge Gracovestky Ph.D. (Montreal Canada) commenting on Bartelink's hypothesis of "Inter-abdominal pressure".

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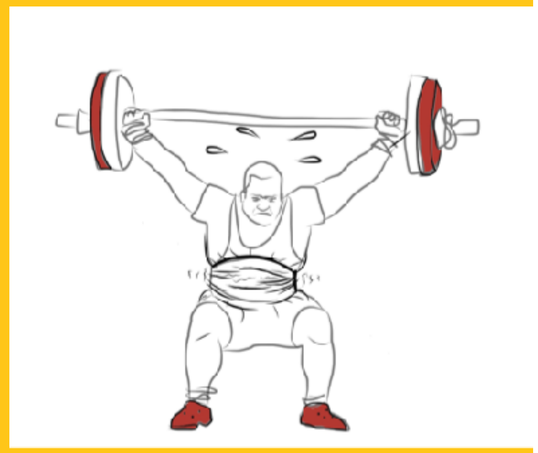

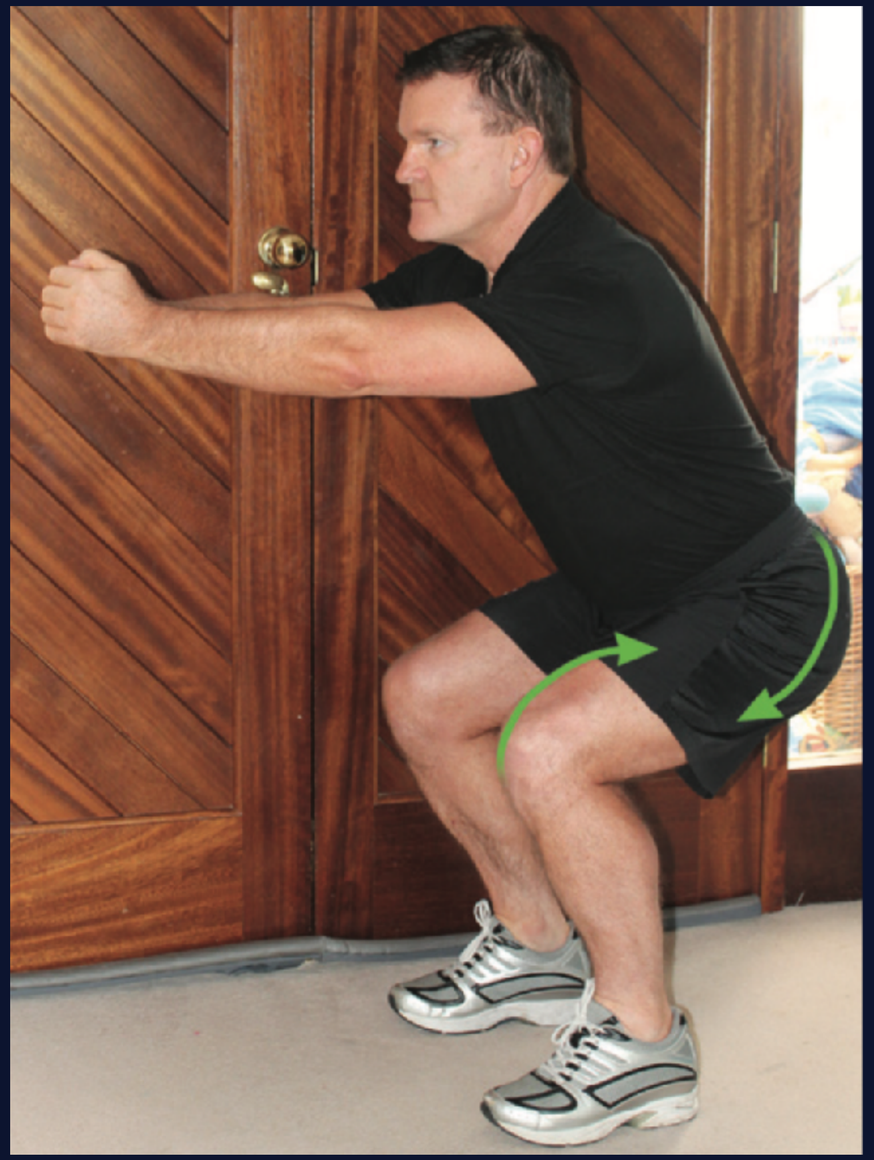

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Reference

Looking beyond the horizon – The physics of anatomy and function

Serge Gracovetsky, Ph.D.
Concordia University, Montréal, Québec, Canada

biotensegrity@instagram.com

There is no break in continuity-The anatomist creates layers

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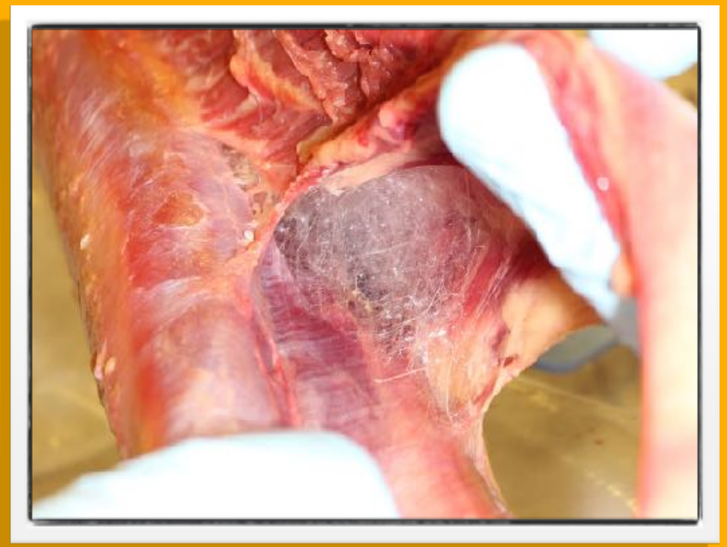


"Fascia, the Dark Matter of our Inner Universe"

Image: Sharkey, J. 2010

Reference

Fascia The Universal Singularity Of Biotensegrity The Dark Matter Of Our Inner Cosmos

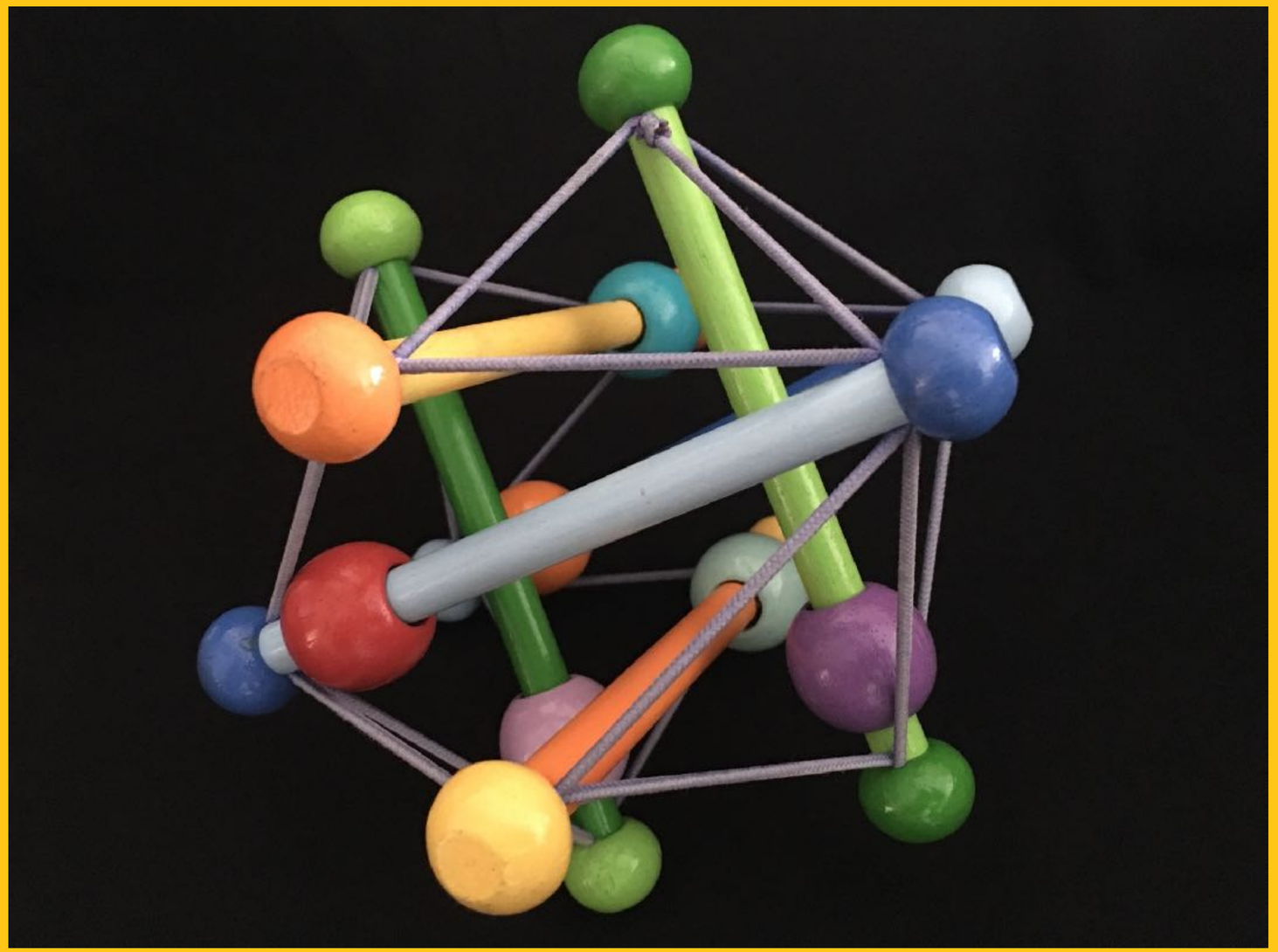
March 2021

DOI: 10.19070/2572-7451-2100033

John Sharkey

Reference

Oschman, James. Energy Medicine



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INTRODUCING TENSEGRITY AND BIOTENSEGRITY (LEVIN)

SHARKEY, J 2021

WWW.JOHNSHARKEYEVENTS.COM

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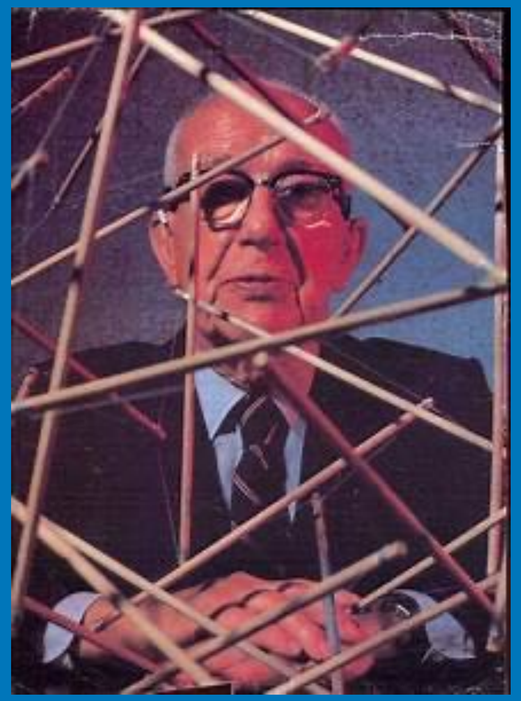
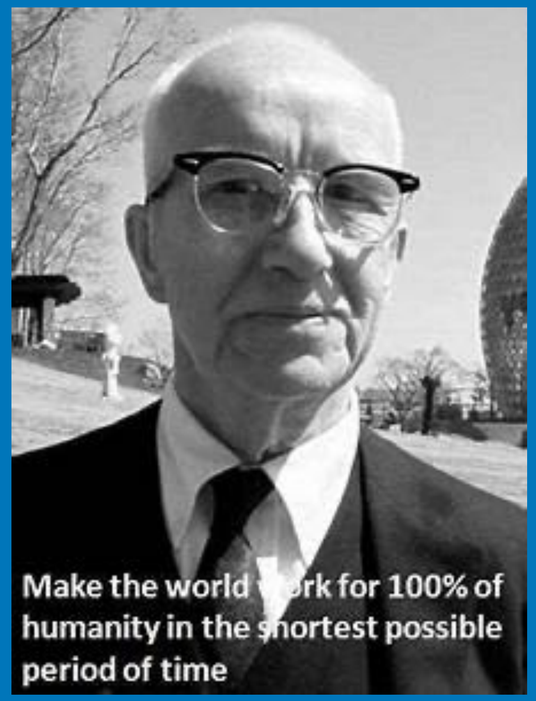
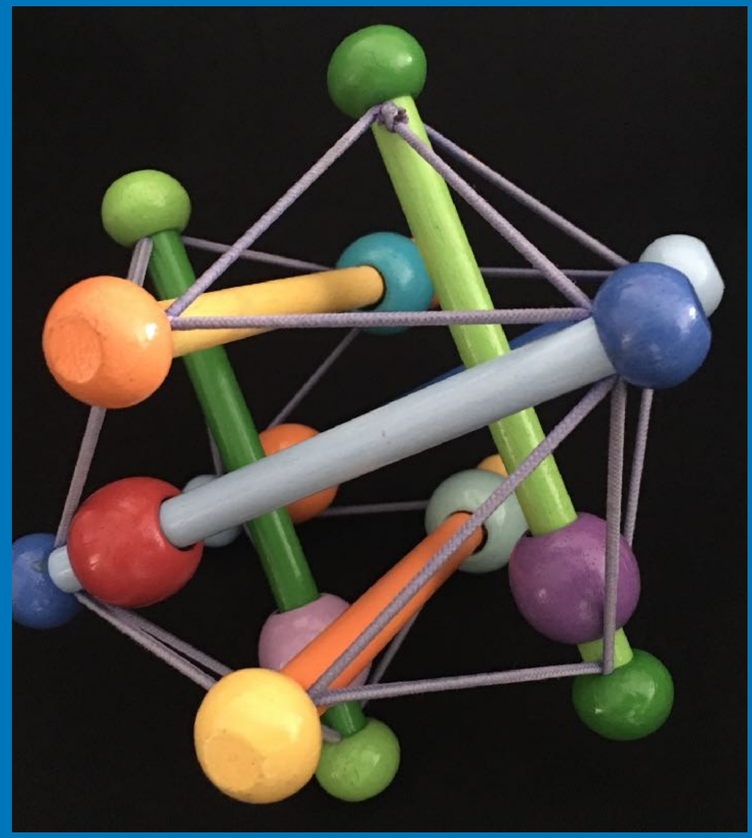
Tensegrity

1895-1983







Richard Buckminster Fuller was an American architect, systems theorist, author, designer, inventor and futurist.

"tensional integrity"

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- Floating Compression

Kenneth Duane Snelson

1927-2016

Donald Ingber, MD,PhD
Harvard University Professor and Director, Wyss Institute

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Ingber, D. E. 1993. Cellular Tensegrity: Defining New Rules of Biology Design That Govern The Cytoskeleton, J. Cell sci., Vol. 104, pp 613-627

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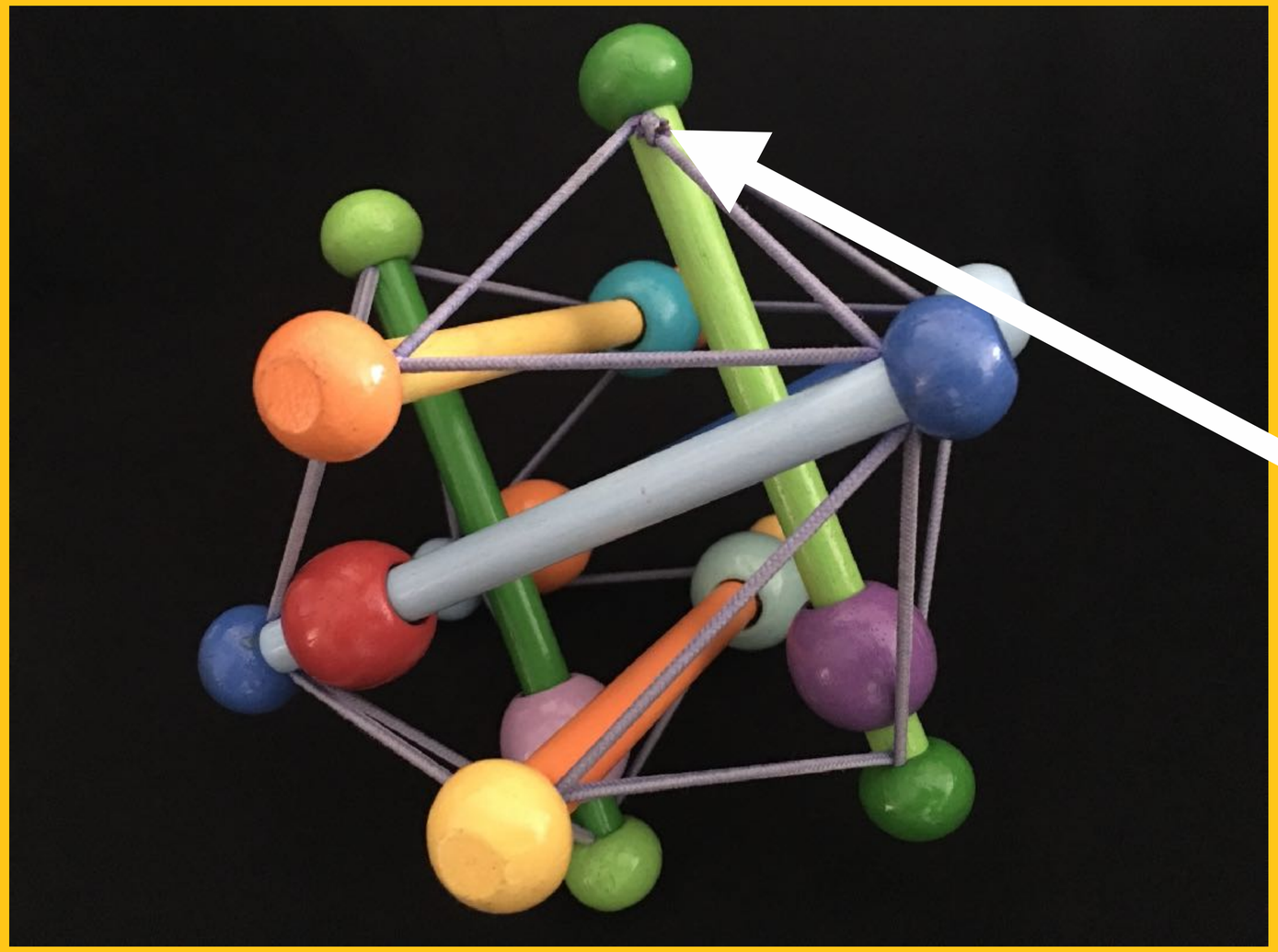
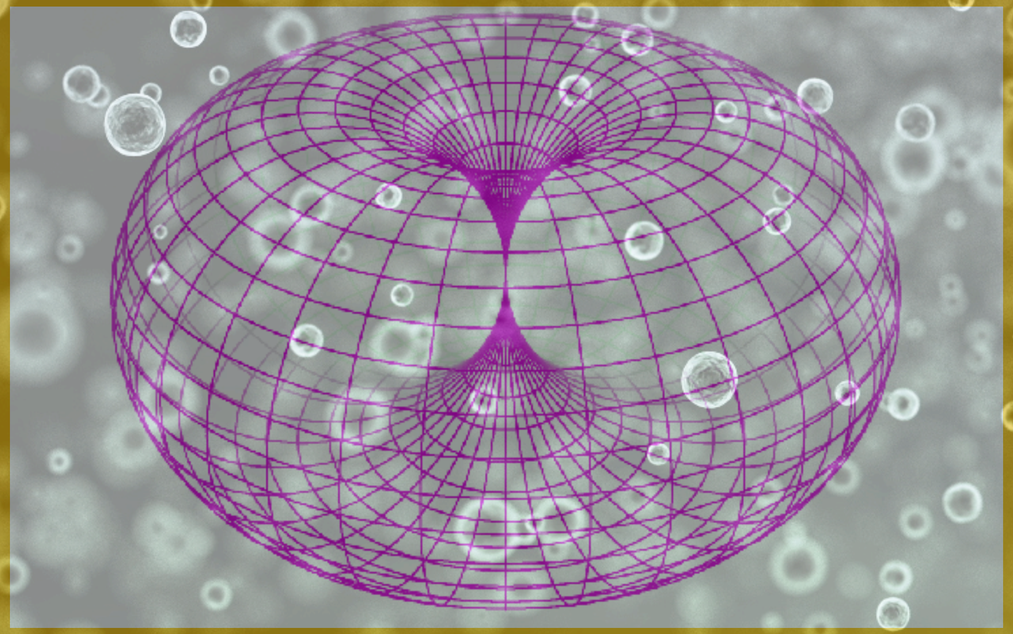


Knot

I find this quote fascinating…….Fascia "gives all muscles help to glide over and around all adjacent muscles and ligaments" Still, 1899 page 164

Tensegrity



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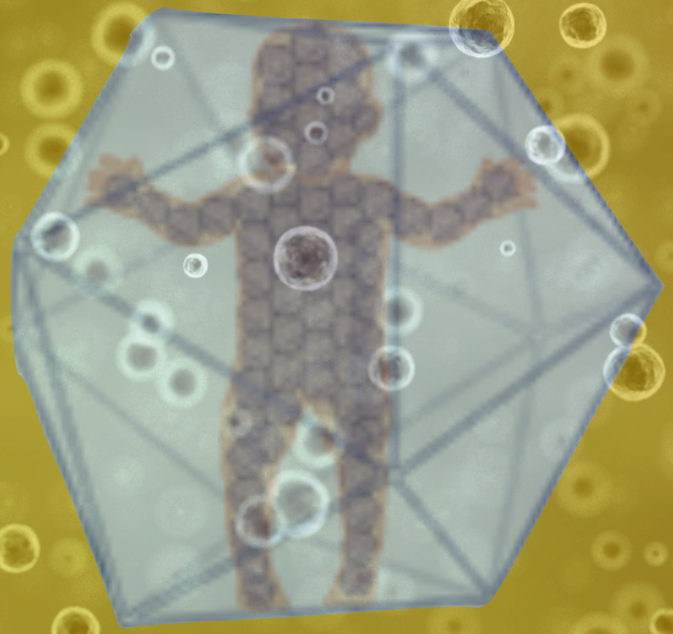
To fully appreciate the Living Tensegrity concept we must first grasp that Living structures grow themselves.

We are self-stressed, self-contained, self-assembled, self-organized, self-generating, self-organising, self-emerging.

You grew yourself independently of gravity



Fasciategrity

Anatomy for the 21st Century

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The Stopak-Harris theory of collagen arrangement by fibroblast traction states that ligament, tendons and skeletal muscles are formed as mechanical effects of traction forces exerted by cells at the sites of attachment to the skeleton (that would be origins and insertions).

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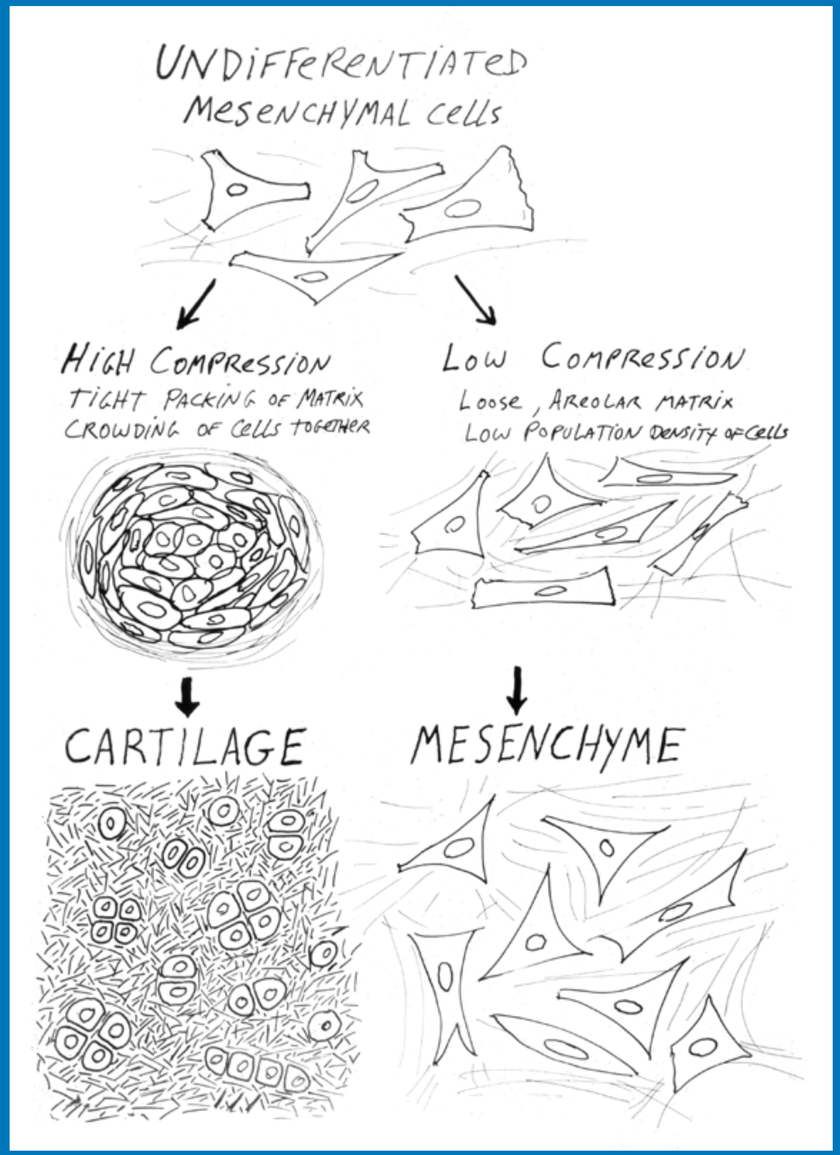

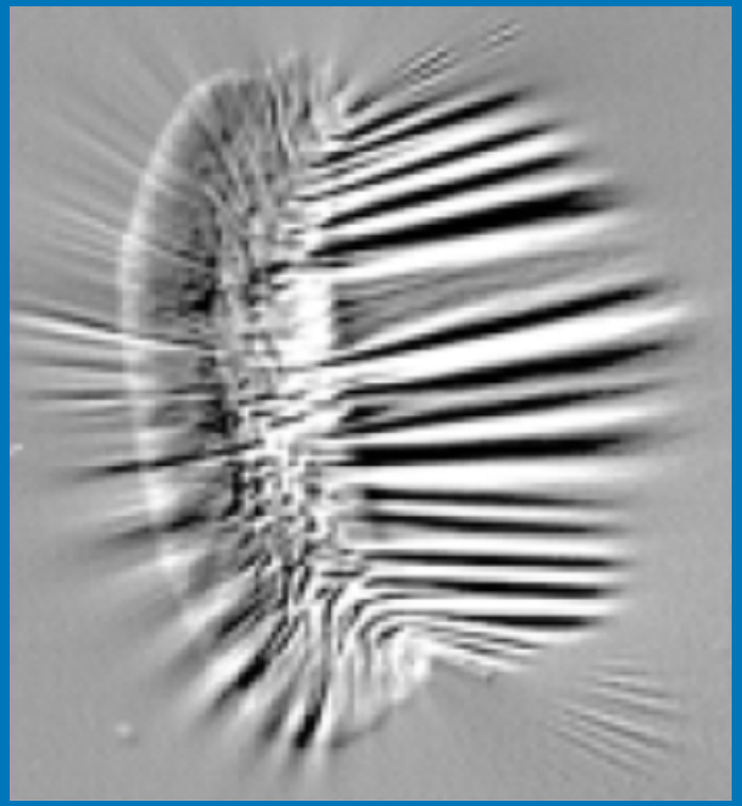

A cell produces wrinkles on a silicone membrane. (Reproduced with permission from Fig. 1 in Beningo and Wang, Trends Cell Biol 12: 79, 2002).

Expanding (Tension) /Contracting (Compression)

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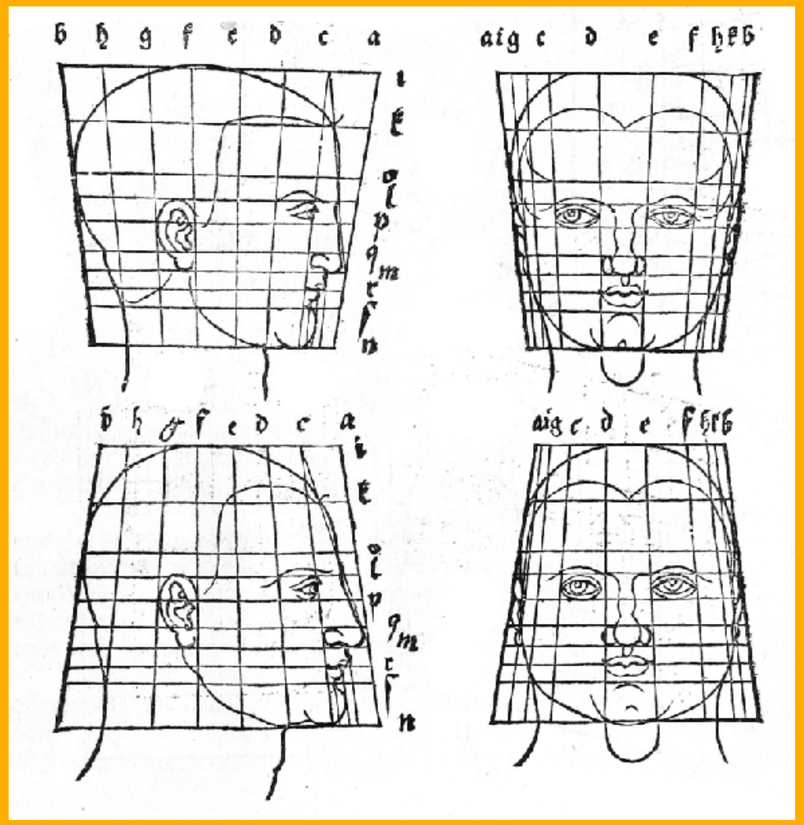

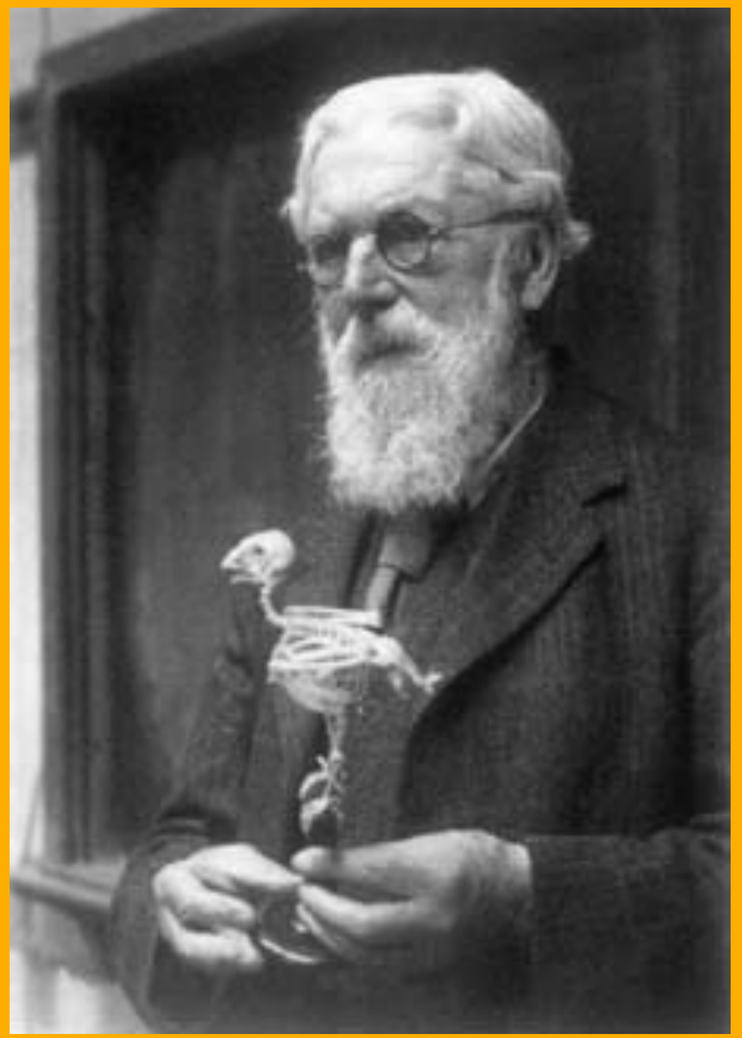

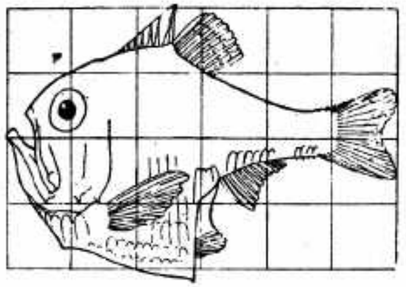

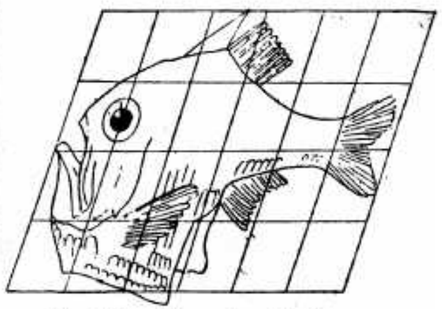

Fig. 517. *Argyropelecus Olfersi.* Fig. 518. *Sternoptyx diaphana.*

D'Arcy Wentworth Thompson (1860–1948)
Pioneer of mathematical study of growth and form.

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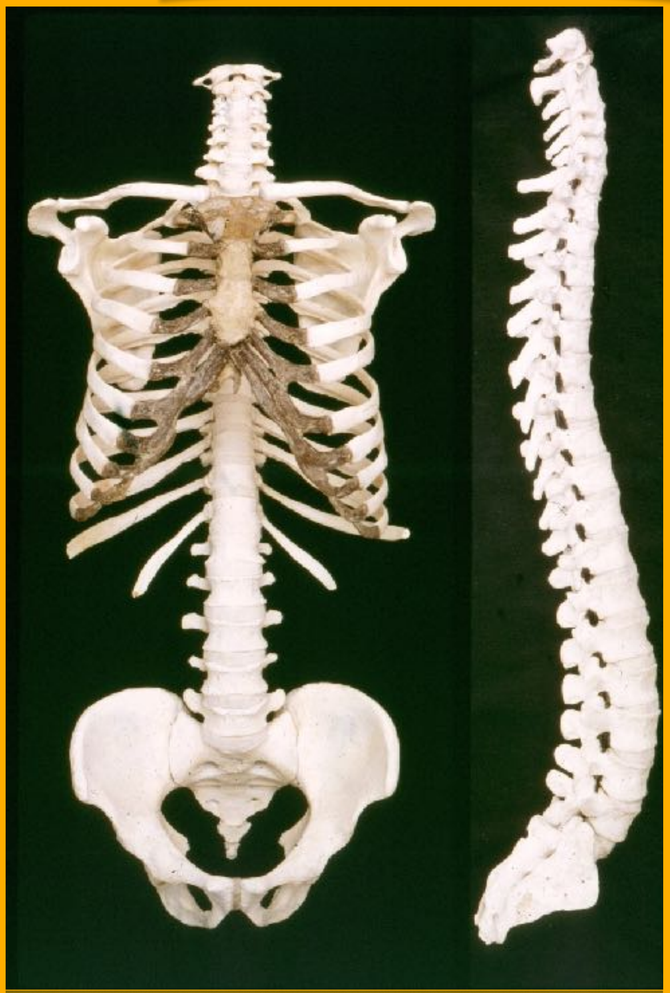

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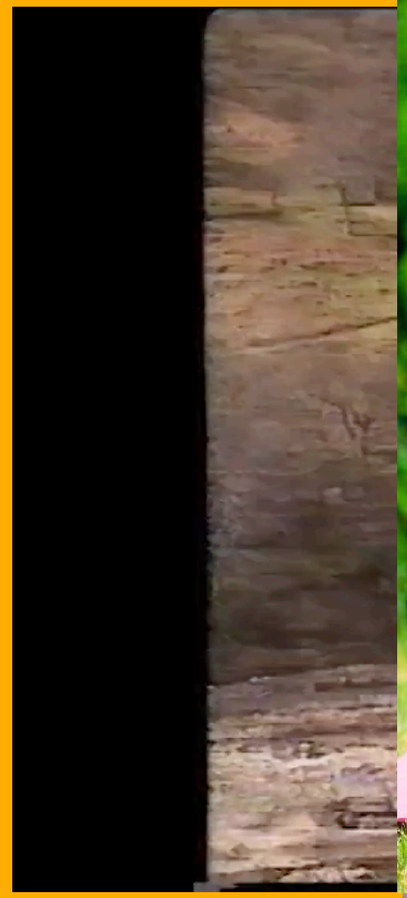

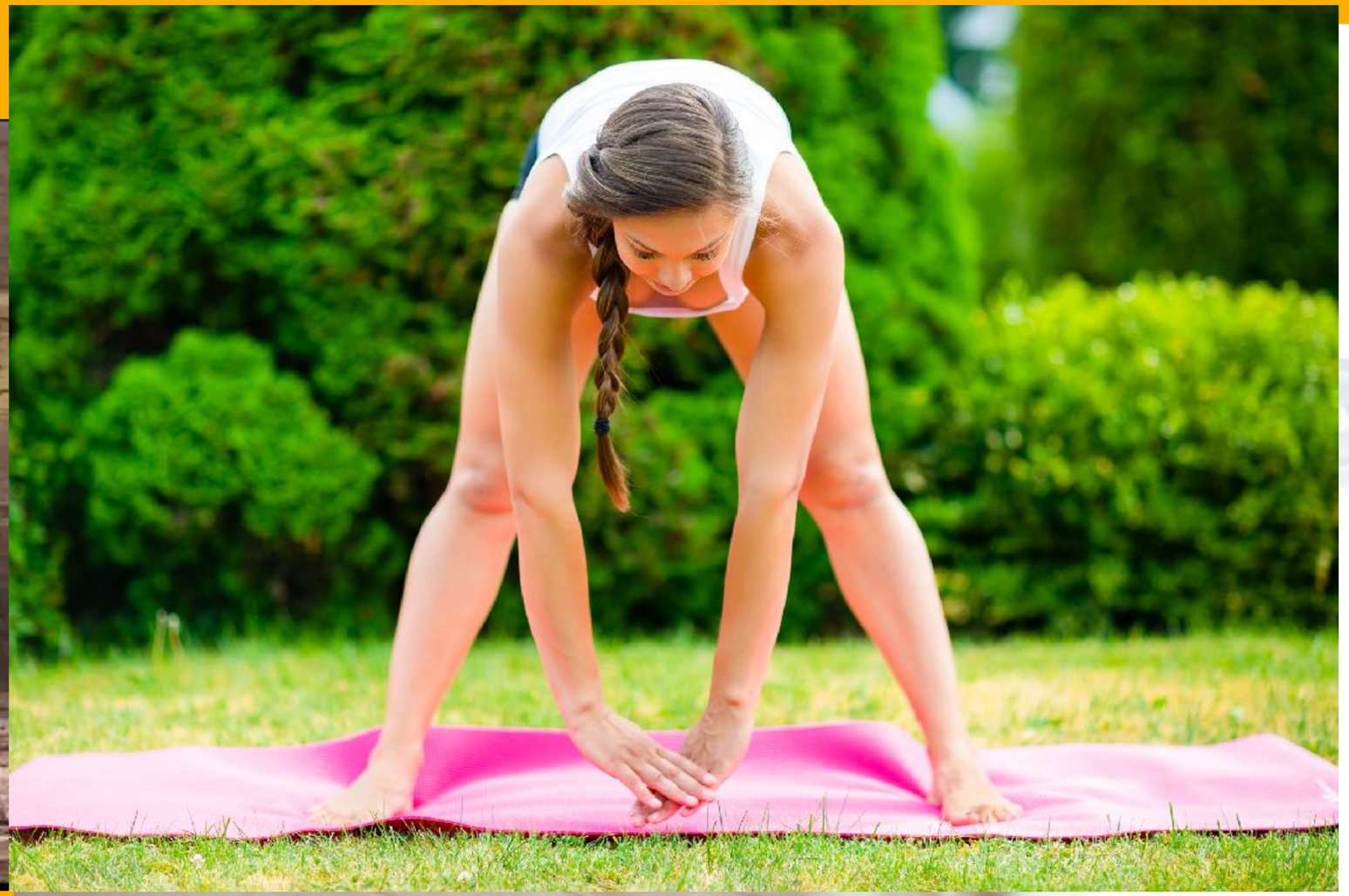

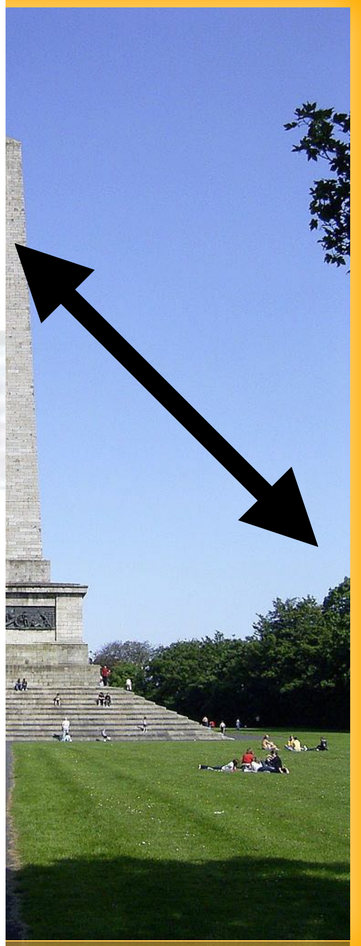

What is the function of cartilage tissue?

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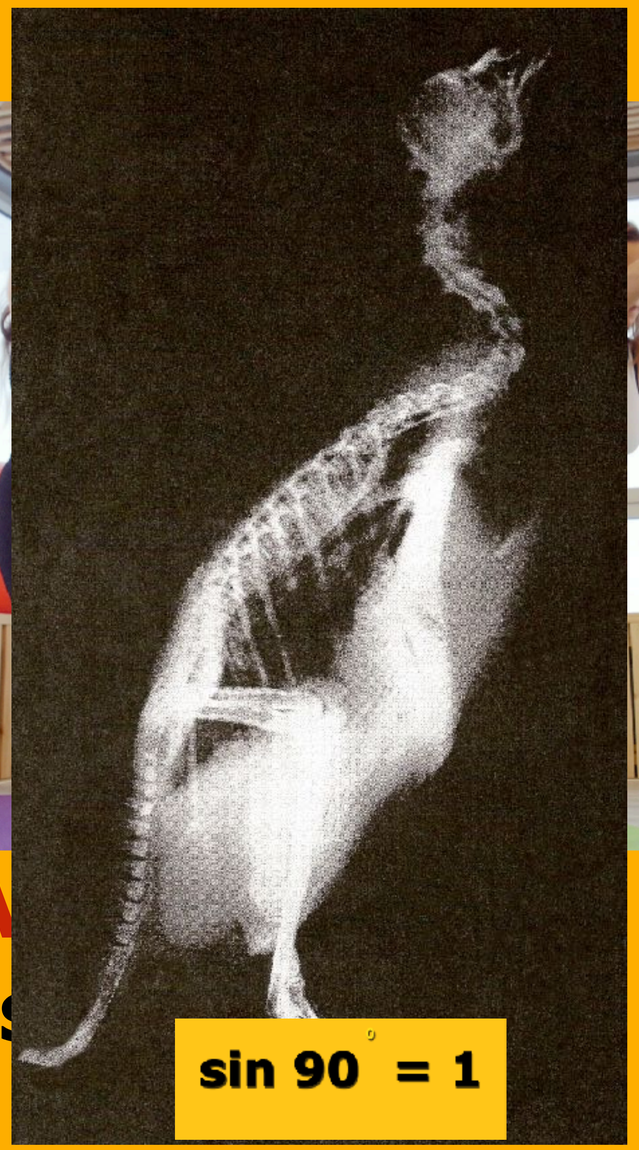

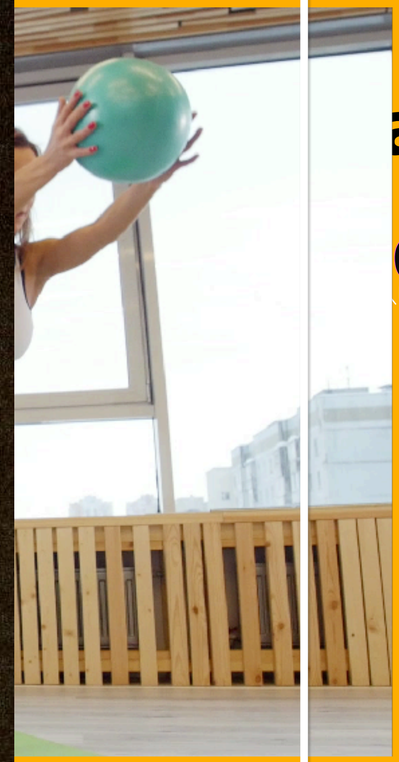

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Approaches

Vertical

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X-ray of a live **penguin** -

An example of an apparently upright animal.

Note the marked flexion at the hips and knees as well as the S-shaped curve of the neck.

The mass is in free Fall!

Words, Pedagogy and Fasciategrity

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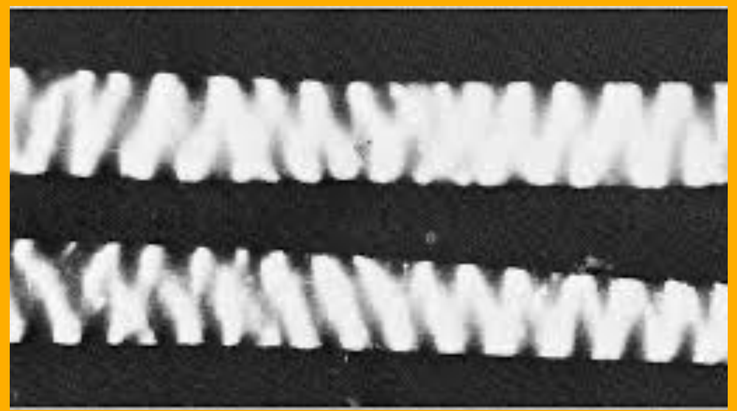

Biophysical and Chemical Properties of Collagen: Biomedical Applications

CHAPTER 4

Collagen assemblies

John A M Ramshaw and Veronica Glattauer

Published November 2019 • Copyright © IOP Publishing Ltd 2020
Pages 4-1 to 4-17

Reconfigurability of prismatic architected materials

Three prototypes of the 3D prismatic architected materials were constructed using cardboard for the rigid faces and double-sided tape for flexible hinges. Depending on the space-filling assembly of polyhedra used as a template, the resulting architected material has different deformation modes or is completely rigid.

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John A. Paulson
School of Engineering
and Applied Sciences

WYSS INSTITUTE

Harvard University
Graduate School of Design

HOBERMAN

-0:58

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Tuning Pegs-Harmonic Resonance-Fascia

Sharkey, J. 2021. Site Specific Fascia Tuning Pegs and Places of Perilous Passage.
International Journal of Anatomy and Research, Int J Anat Res 2020,
Vol 8(4.2):7823-28. ISSN 2321-4287 DOI: https://dx.doi.org/10.16965/ijar.2020.237

Fascia and Mechanotransduction

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Connective tissue: a body-wide signaling network?

Helene M Langevin [1]

Affiliations + expand

PMID: 16483726 DOI: 10.1016/j.mehy.2005.12.032

Reference

Sharkey J. Re: Transmission of muscle force to fascia during exercise [Thomas Findley, M.D, Ph.D, Hans Chaudhry, Ph.D, Sunil Dhar, Ph.D. Journal of Bodywork & Movement Therapies (2015) 19, 119-123]. J Bodyw Mov Ther. 2015 Jul;19(3):391. doi: 10.1016/j.jbmt.2015.03.001.

Fascia as a body-wide communication system

December 2012

DOI: 10.1016/B978-0-7020-3425-1.00049-0

: by Robert Schleip

In book: Fascia: The Tensional Network of the Human Body

James L. Oschman

Fascia, Mechanotransduction and Fascia Tuning Pegs

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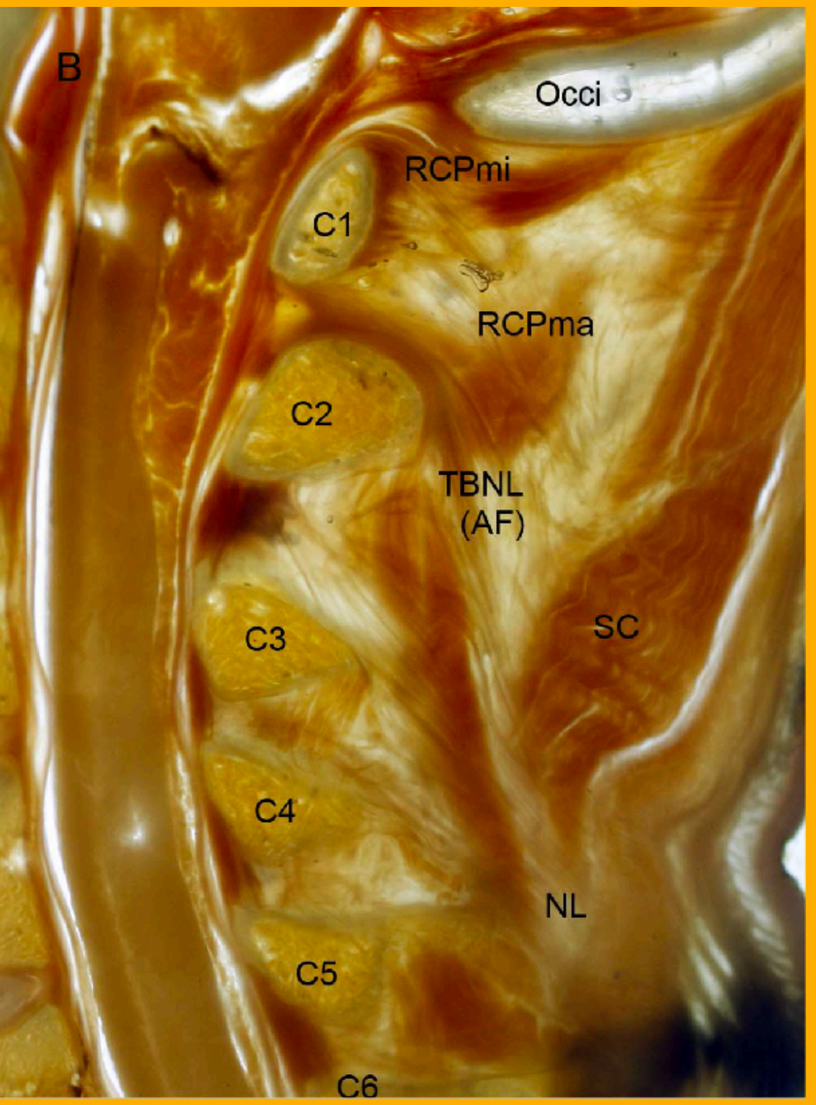


Reference:

Definition of the To Be Named Ligament and Vertebrodural Ligament and Their Possible Effects on the Circulation of CSF

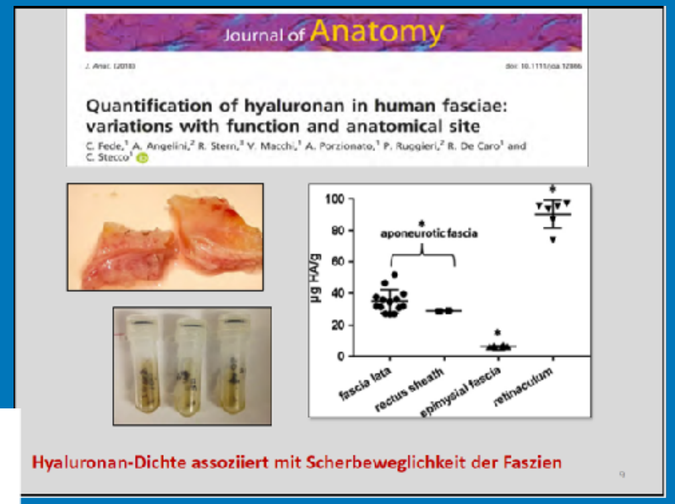
Article | Full-text available | August 2014 · PLoS ONE

Nan Zheng · Xiao-Ying Yuan · Yun-Fei Li · [...] · John J Sharkey

Source

250 Reads · 22 Citations

Small World Networks



Hyaluronan-Dichte assoziiert mit Scherbeweglichkeit der Faszien

Article Full-text available

FASCIA AS A SENSORY ORGAN: Clinical Applications

June 2017

Project: Fascia research

Robert Schleip

Conference Paper Full-text available

Active fascia contractility: an in vivo mechanographic investigation

January 2007

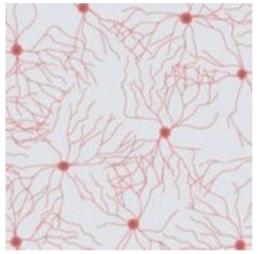
Conference: Fascia Research

Robert Schleip · Adjo Zorn · Frank Lehmann-Horn · Werner Klingler

Pain Nerve Endings: "Bare" No More

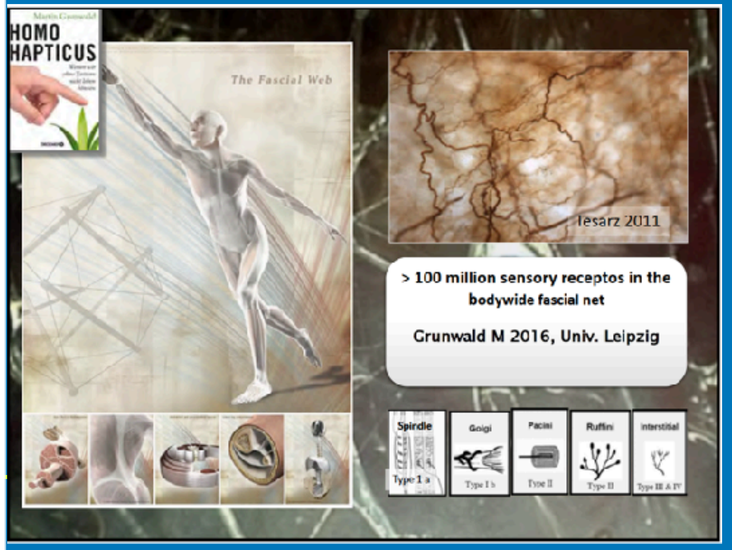
Nociceptive Schwann cells in the skin are an active player in pain sensation

by Stephani Sutherland on 14 Oct 2019



For the past century, dogma has held that unmyelinated nociceptive sensory neurons have "bare" or "free" nerve endings that extend into the epidermis where they detect harmful stimuli directly, unencumbered by end-organ cells. But a new study in mice led by Patrik Ernfors, Karolinska Institute, Stockholm, Sweden, shows that nociceptive nerve endings are ensheathed by a novel type of glial cell, which the authors call nociceptive Schwann cells.

The Schwann cells form a mesh-like sensory organ at the border between the epidermis and dermis, where they wrap around nerve endings. But even more surprising is the finding that the cells participated in detecting mechanical and thermal nociceptive stimuli. The study has far-reaching implications for pain physiology, and perhaps for the treatment of chronic neuropathic pain.



Professor of Anatomy Dr Vladimir Chereminskiy from von Hagen's Plastinarium and Clinical Anatomist John Sharkey
Dept of Human Anatomy and Human Identification, University of Dundee
fascia plastinated specimens

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THANK YOU

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