
This article was written for the
International Feldenkrais® Federation Newsletter
May 2013

A year of living with biotensegrity

By Maureen McHugh
April 2013

A year ago a new energy came into my life: the emerging field of biotensegrity.

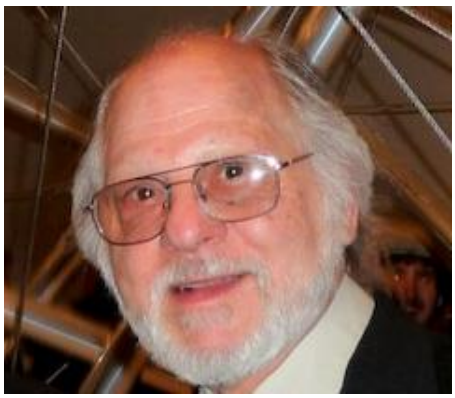
I met this newcomer because March 31, 2012 was full of cancellations. It was Saturday, a regular work day for me; and usually it's busy. But on Friday morning, March 30, when I looked at my calendar for the next day, I saw: cancellation, cancellation, cancellation. "Ouch!" I thought, and "Odd."

Then I looked in my email inbox and saw an unopened invitation to a Saturday afternoon event. I hadn't opened it because – what's the point? – I never get to go. The email said Stephen M. Levin, MD would be speaking about biotensegrity. There was also an attached flyer. I opened it and read:

> *"Conventional biomechanical theory would have us believe that our bodies are built like machines. Dr. Levin's biotensegrity theory offers a new paradigm – a new way to view and understand our own bodies, as well as all biological life."*

"Cool!" I thought. "It sounds interesting. And if it's not – so what? I get to go to a lecture on Saturday afternoon!"

I drove 45 minutes from my northern Virginia office to Bethesda, MD and arrived, sorry, fifteen minutes late. I entered an elegant old estate house that has been converted into meeting space. In a room on the ground floor I found 20 people sitting on folding chairs. Dr. Levin had already begun. He had a laptop and projection screen and was showing his own DVD and pausing it to make comments. From the copy I bought after the talk, the title is: "Biotensegrity and Dynamic Anatomy."



I settled into a chair, and into listening. I realized quickly that here was, in fact, a new way of seeing things.

Dr. Levin is a man of indefinite age, with a white beard, an accent that still recalls his boyhood in New York City, and a soul on fire. Dr. Levin explained that he was an orthopedic surgeon by training and had been concerned all his professional life with the mechanics of the spine. A

basic question for him has been: “How does the human being maintain its uprightness?” The answer from his training was a building block model: “One bone sits on top of the other.” But this didn’t fit with his experience. He was a specialist in the knee and knew from his own surgeries that the thigh bone does not touch the bones of the lower leg; there is a gap between them. He also knew that the bones are also not held in place by fluid. There is fluid in the joint but only a small amount, just enough for lubrication. Nor are they held in place by air: when he put a needle into the joint, he never got a push back because – the joint is not under pressure. So, how then, does one bone stay above the other?

Continuing in his DVD, Levin related how an Italian mathematician, Borelli, in 1680 described the body as an assembly of levers -- the bones -- manipulated by the force of the muscles. This is the model still in use today. Levin describes, though, joint by joint, how the lever model doesn’t work. The key weakness is that the math doesn’t work. The muscles around specific joints aren’t big enough for the job they are imagined to be doing, they aren’t arranged in the proper orientation, and they don’t have enough energy to support the actions that are attributed to them.

After going through the math, Levin moved on to a point that is easier to grasp intuitively: the building block model only works when the structure is upright. The Washington Monument, for instance, is a fantastic structure – right side up. But if it starts to tip, it falls; of course. But, more than that, it tears itself apart. How could this paradigm accommodate the human ability to do gymnastics? Or break dancing? This is Levin’s favorite example. As a young man, he wrestled, and maybe that is why he likes all the amazing shape shifting of today’s young guys.

xxxx

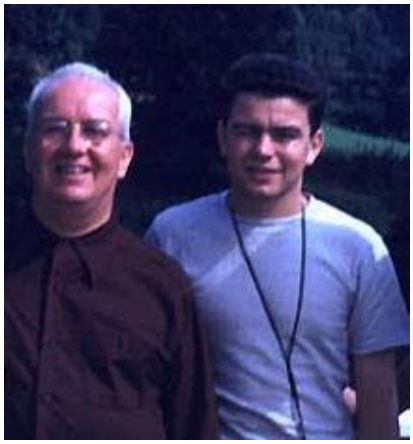
Looking beyond the human being, how does the building block model – more formally known as axial loaded compression – fit with other living creatures?

Dr. Levin lives in northern Virginia. In the mid 1970’s, when he was getting started as a surgeon and when his questions were in full flower, the thought arose that he might learn something from the evolutionary record. Conveniently, the Natural History Museum is in nearby Washington, DC. So, he began making visits.

On March 24 this year Dr. Levin invited those interested in biotensegrity to join him for a Sunday morning visit to the Natural History Museum. Four of us took him up on the offer. Entering the building, one comes quickly into the Dinosaur Hall. The display is stunning. The first impression is of the head of the dinosaur. It is huge. My guess is that it is 15 feet off the ground and also 15 feet forward of the body. The tail is

also long, and in life did not rest placidly on the ground but was raised in the air, counterbalancing the head, and was swung from side to side like a whip. The torso seems small in comparison to head, and the feet are tiny. Even the bare bones express ferocity. The question naturally arises: "In what way is this like the Washington Monument?"

Levin struggled with questions like these until one fateful day in 1974 when the Hirshhorn Museum and Sculpture Garden had just opened. After his customary visit to the Natural History Museum, he walked across the Mall to the Hirshhorn. In an outside courtyard he saw Kenneth Snelson's sculpture "The Needle." From a base 12 feet square a tower soars skyward. It has rigid elements, metal poles, that don't touch each other, but instead are suspended in wires under tension. As the sculpture reaches its peak, the poles take the shape of a six-pointed star (*right)*. This view was for Levin an epiphany: he understood in one moment that ***that*** is biology. The bones are ***suspended*** in soft tissue, and the soft tissue is under balanced tension.

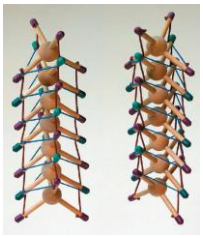


Whether he knew the word or not, Levin was looking at his first tensegrity. The word is a contraction of tension + integrity. It was coined in the summer of 1949 at North Carolina's Black Mountain College. There Buckminster Fuller (*right)*, about 50, was a professor of design, and Kenneth Snelson (*far right)*, 21, an art student. They were working, together and singly, on structures that demonstrated "discontinuous compression and continuous tension." There is argument about who originated what, but credit for the term usually goes to Fuller. After that summer Fuller went on to other projects, while Snelson maintained his focus on tensegrity sculpture.

Levin took "tensegrity" to its next step by adding the prefix "bio". He asserts that these structures are amazing architecture and design, and not only that. They are also biology.

Xxxx

Levin's Saturday presentation continued into more domains, including how the structure of bridges is related to the structure of cells. A lot was new to me, and a lot only half understood, but enough to make me feel that my head was, pleasantly, exploding with new vistas.

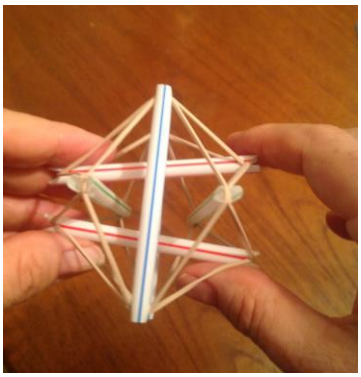


At the break I got to meet the other attendees. We were all movement people: a couple more Feldenkraisers, including Steve Shafarman and some of his FlexAware teachers; a clutch of Alexander Technique teachers; several dancers; a chiropractor; an acupuncturist; our organizer Susan Lowell, who is a t'ai chi teacher, and several of her students. We were all people with hands on experience, and questions. It was an exciting mix. Along with the explanations, Levin had brought a collection of tensegrity toys, such as color-coded, tensegrity models of the spine, and, during the break, we could touch them, as long as we did so nicely. I found them hugely attractive and wanted my own.

When the afternoon's presentation was over, I floated home, looking forward to watching my new DVD and also eager for the group's next get together, scheduled for early May.

xxxxxx

At a second meeting in May, we met in a restaurant, shared a meal and got better acquainted. We were about 15. To our happy surprise, Dr. Levin also joined in and brought a house guest, Graham Scarr, an osteopath and a long-term biotensegrity devotee, visiting from England. During the after-lunch conversation one of the members of the group asked him: "Dr. Scarr, how do you apply biotensegrity to your work with patients?" Graham lowered his head to think a moment and then replied in a voice soft with conviction: "I can't do it any other way."



In June we met for the third time. By now we had chosen a name: the DC Biotensegrity Interest Group. And we moved from talk to action. Carol Boggs, a group member and Alexander Technique teacher, led us in making a biotensegrity model. It was an arts and crafts project *(right)*. She did the preparation and brought us each a small plastic bag with all the materials – notched soda straws and two sizes of rubber bands. In about 15 minutes, under her expert guidance, twelve of us transformed this scattering of materials into – what shall I call it? – a living being!

xxxx

And this is a big part of what I want to say today. Biotensegrity is a fascinating new field. It is full of physics and math, art and argument, and interconnection among levels of biology. But it can remain, like so many things, in the head. And that would shortchange the experience.

The best way to deepen your understanding of biotensegrity is to make a model. When you get your hands around it, then you know that you are feeling something new. And, also, you know how to begin to share it with the people around you.

As soon as I made that first model, I started sharing it with my clients. This was a little hard on the soda-straws-and-rubber-bands-assembly because it is delicate. After several weeks it fell

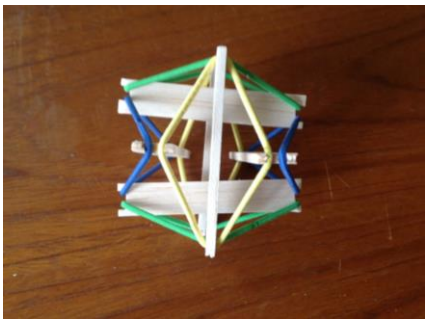
apart. No problem; I rebuilt it. And also I ordered online (from Tom Flemons) a bigger and stronger one. I gave them to my clients to hold. I talked with them about biotensegrity. I said it was a new field, full of possibilities. We looked for connections with the lesson. There were many moments of insight. One in particular stands out: client Jane (*right)* said, while holding the Flemons model, "Maureen, it is just my imagination or does every part move when one part moves?"

The feeling in your hands that the model gives is a big resource for us as Feldenkrais Practitioners. We say in words: everything is connected. We demonstrate it in actions. But our clients, commonly, are also seeing other practitioners, many of whom say something very different: that the body is a collection of pieces, operating locally. The tensegrity model is something the client can hold in her hands. She can feel the unity and, as Jane said, feel how each part influences every other part.

On March 10 I gave an Advanced Training on "Biotensegrity and the Feldenkrais Method" for the Mid Atlantic region. We made the same soda straw models and explored related ATMs. In the weeks before the Training, I looked for someone with whom I could practice teaching model building. Chrish Kresge was willing. I went to her home, and we spent an hour together talking about biotensegrity and making the model. We discovered it's easier with two pairs of hands! Here is what Chrish had to say afterwards:

> *"I LOVED it when the form sprung to life in my hands – very, very cool. I felt and understood, with my own hands, how an efficient structure is completely interdependent on all of its parts and how an aberration in one part has to influence the rest of the structure. It is critical to understand this concept in order to work with a human being and help them feel themselves as an organization of interrelated and cooperating parts."*

I am hoping that others -- perhaps you, dear reader -- will also become interested in biotensegrity and will share the path of making models. To this end I have created four videos on YouTube. They are short, how-to video slide shows, about 5 minutes each. I learned, as I already said, from Carol how to make a model with soda straws. But, then, on my own, I figured out how to do the same thing with balsa wood (*right)*. Is it only because it is mine that I find it beautiful???



Two of the videos are about soda straw models, and two about balsa wood. In each pair, one is how to build the model from a kit and the other how to collect the components for the kit. You can find them in YouTube by searching for "soda straw tensegrity model" or "balsa wood tensegrity model". Alternatively, here are the links.

How to build the soda straw tensegrity model. http://www.youtube.com/watch?v=sVC0WwoSsLI
How to assemble the kit for the soda straw model. http://www.youtube.com/watch?v=78EMAtxS00E

How to build the balsa wood tensegrity model. http://www.youtube.com/watch?v=3Noz5vzhXAY
How to assemble the kit for the balsa wood model. http://www.youtube.com/watch?v=mKgd3M3-UW8

References:

Website for
Stephen M. Levin. http://www.biotensegrity.com/
Kenneth Snelson. http://www.kennethsnelson.net/
Tom Flemons. http://www.intensiondesigns.com/
Graham Scarr. http://www.tensegrityinbiology.co.uk/
DC Biotensegrity Interest Group. http://dcbig.wordpress.com/