

To the Editor:

I'm delighted to have the rare opportunity to respond to not just one, but two "Letters to the Editor" printed in your October 16, 1985 issue.

Betty Kay and Roy Skogstrom both wrote about subjects that are not only areas that I have professionally researched, studied, and practiced for a number of years, but are also often misunderstood by a great number of Healthcare Professionals that haven't yet had the opportunity to experience "hands on" training in Craniosacral Therapy or Somato-Emotional Release.

To give some background on how I came to the conclusion that cranial bone movement does indeed occur, and that the sutures are living membranes that expand and contract to a very specific rhythm, let me tell of my first "hands on" observation.

In 1970 my curiosity was piqued by an observation I made during a surgical procedure in which I was scrubbed as first assistant. The patient in question was one of mine who was suffering from the dystrophic loss of skin with severe pain both involving the soles of the feet. I had treated this patient conservatively for systemic echinococcus infection with abscesses in liver and brain. Treatment had begun in hospital about eighteen months prior. The admitting problem was hemetemesis. The diagnosis of echinococcus was made during the initial hospitalization - subsequently all symptoms cleared for about six months. The skin of the bottoms of the feet began to turn black and slough off. The pain was such that he became unable to ambulate. I was unable to discover the cause of his problem. I sent this man (age 56) to seven other rather well-known Medical Centers around the Eastern half of the United States. No acceptable diagnosis came from any of them, and the problem continued, was worsening and became debilitating.

At the suggestion of a Neurosurgeon who had moved into our area we performed a cervical myelogram. This study revealed a calcified plaque located on the external surface of the Dural Tube posteriorly at the level of C3-4 vertebrae. The plaque appeared to be attached to the Dura Mater and confined to the Epidural Space. We felt that this might be causing a dystrophic effect on the bottoms of the feet, and in order to ease the suspense I will tell you that shortly after excision of this plaque the patient's feet did indeed normalize. Within a few weeks he

To the Editor:

I'm delighted to have the rare opportunity to respond to not just one, but two "Letters to the Editor" printed in your October 16, 1985 issue.

Betty Kay and Roy Skogstrom both wrote about subjects that are not only areas that I have professionally researched, studied, and practiced for a number of years, but are also often misunderstood by a great number of Healthcare Professionals that haven't yet had the opportunity to experience "hands on" training in Craniosacral Therapy or Somato-Emotional Release.

To give some background on how I came to the conclusion that cranial bone movement does indeed occur, and that the sutures are living membranes that expand and contract to a very specific rhythm, let me tell of my first "hands on" observation.

In 1970 my curiosity was piqued by an observation I made during a surgical procedure in which I was scrubbed as first assistant. The patient in question was one of mine who was suffering from the dystrophic loss of skin with severe pain both involving the soles of the feet. I had treated this patient conservatively for systemic echinococcus infection with abscesses in liver and brain. Treatment had begun in hospital about eighteen months prior. The admitting problem was hemetemesis. The diagnosis of echinococcus was made during the initial hospitalization - subsequently all symptoms cleared for about six months. The skin of the bottoms of the feet began to turn black and slough off. The pain was such that he became unable to ambulate. I was unable to discover the cause of his problem. I sent this man (age 56) to seven other rather well-known Medical Centers around the Eastern half of the United States. No acceptable diagnosis came from any of them, and the problem continued, was worsening and became debilitating.

At the suggestion of a Neurosurgeon who had moved into our area we performed a cervical myelogram. This study revealed a calcified plaque located on the external surface of the Dural Tube posteriorly at the level of C3-4 vertebrae. The plaque appeared to be attached to the Dura Mater and confined to the Epidural Space. We felt that this might be causing a dystrophic effect on the bottoms of the feet, and in order to ease the suspense I will tell you that shortly after excision of this plaque the patient's feet did indeed normalize. Within a few weeks he

was ambulatory without difficulty.

I was assisting the Neurosurgeon during the removal of the plaque. The anesthetized patient was in the sitting position. After removal of the spinous process and part of the posterior arches of the 3rd and 4th cervical vertebrae, the plaque located on the external surface of the Dural Membrane, was exposed. It was about 1 centimeter in diameter and roughly circular in shape. It was rather ferrally adhered to the dural membrane and was perhaps 1 to 2 millimeters in thickness. The surface of the plaque was rough and uneven.

As first assistant my responsibility was to hold the dural membrane still while the neurosurgeon removed the plaque without interrupting the integrity of the dura mater. I could not hold the membrane still; it rhythmically protruded and retracted through the operative site at a rate of about 8 cycles per minute. There was no stopping this movement. The movement of the Dural membrane did not coincide with the breathing of the patient nor did it coincide with the cardiac rhythm. No one in the operating room had any idea about what we were looking at. This experience piqued my curiosity.

To make a long story short, the question remained with me for a year or so without answer.

I had heard little about Cranial Osteopathy while in school. The subspecialty was (as general consensus) to be a cultist bit of quackery which was an embarrassment to an otherwise scientifically oriented profession. I agreed with this sentiment. However, as I learned later, Cranial Osteopathy had not died because there were dedicated doctors who had salvaged patients with its use, often after the patient's traditional medical practitioners had given up.

An advertisement for a Cranial Osteopathy Seminar made something click in my head. My observation of the rhythmical movement of the dural membrane seemed to be tied to the unexplained results claimed by these "strange" osteopathic physicians who "manipulated" skull bones and "cured" hopeless cases.

I attended the seminar. I wanted to deny, but my hands seemed to feel the movement of individual bones of the Cranium, one in relation to another. The question was, could I trust my hands and the perceptions they imparted when I knew that the human

adult skull is a fused, solid, boney encasement for the human brain? The answer turned out to be yes. I could believe my hands and yes the anatomy books were wrong.

At the Cranial Seminar I learned a few techniques which I took back to my practice. The first three patients I tried the techniques on were adults with long standing and incapacitating head pain problems. All three were "cured" by these techniques in a very short time and I could not deny that the bones of the "fused" cranial vault seemed to be moving individually as I applied my light forces to key areas of the patient's skull.

Ultimately, after three years of using the techniques and additional study on anatomy and physiology of the skull, its contents, the vertebral column, its canal, its contents and the fluids within the Dural Membrane, I acquired some reputation in the use of Cranial Osteopathic Techniques. My clinical results were good, and I had some degree of respect as a scientist because I had taught Biochemistry as a Fellow in Osteopathic Medical School.

The Michigan State University - College of Osteopathic Medicine created a Department of Biomechanics which was to be research oriented and investigate the validity of all types of manual medicine, acupuncture and electrotherapies. Included was Cranial Osteopathy. This forum of diagnosis and treatment was to be scientifically documented or debunked once and for all. Because my background in Biochemistry and Physics was solid and because I seemed to have not only an enviable track record in successful Cranial Manipulation, but also a working knowledge of other peripheral stimulation therapies (including acupuncture), I was invited to join this new department as a clinician/researcher. We began with 22 Ph.D.'s and 5 clinicians that were certified specialists in manual medicine.

As we evolved, it became clear that I would work in Cranial Osteopathy, Acupuncture and Electrotherapies fields, specializing in chronic pain and brain dysfunctioning children.

For seven and one half years at M.S.U., I worked with Fred Becker, Ph.D. in Anatomy. He told me I was crazy to believe that cranial bones could move in the adult human. I finally succeeded in getting Fred to feel the movement with his own hands. After

that, we worked very closely in the study of the anatomy of the skull, the meningeal membranes, the brain and the cerebrospinal fluid system.

Dr. Ernest Retzlaff, Ph.D. in Physiology specializing in Neurohistology and Neurophysiology, also worked very closely with me at M.S.U. We found that the sutures of adult humans were not "fused" if we looked at fresh specimens taken from living humans. The same neurosurgeon with whom I was scrubbed when I first observed the movement of the Dura Mater sent us several quick frozen specimens taken from patients age 9 through 54 years at the time of surgery. These specimens when stained properly did not even look like they came from the same species as did the specimens studied from embalmed cadavers. The fresh specimens showed generous vascular and nerve plexuses with end organs within the sutures. Sharpey's fibers penetrated the bone margins. The sutures were filled with collagen and elastic fibers. There was very little calcium deposit between the bone edges. The suture would definitely accommodate small amounts of motion between bones. Dr. Retzlaff has presented his work at the national meeting of the American Anatomists on several occasions since 1976. Although controversial, the facts are irrefutable and the concepts of vascularized, unevited, moveable cranial sutures has been accepted by many anatomists, histologists and neurophysiologists at this writing. In addition to the work on sutural architecture Dr. Retzlaff and I also collaborated with Richard Roppell, PhD in Biophysics to investigate movement of cranial bones in primates other than humans. We rejected experimentation with human subjects at that time for two reasons., First, non-invasive measurements of Cranial diameters and circumference had already been done by Fryman of the cranial vault and Baker of the maxillar. Both of these investigators showed continual rhythmical movement between cranial bones in living humans. However the work was not taken seriously; which brings me to the second reason we decided not to pursue this course. Non-invasive measurements made by Fryman were rejected by the critics on the basis that the soft tissues of the scalp were interposed between the measuring devices and the bones of the cranium. The suggestion was that the soft tissue was changing its dimension rather than the bone moving. Bakers measurements across the maxillary arch in the mouth were somehow dismissed as relatively unimportant and disconnected from the cranial vault. Summary dismissal does not always require solid rationale.

We decided to study cranial bone activity with live, anesthetized monkeys using pentathol . I then made scalp incisions over the mid-parietal bone region symmetrically on each side. When the bone of the skull was exposed we mounted antennae bases directly on each of the two parietal bones. We then placed 12" antennae in the bases so that any movement of the parietal bone was exaggerated by the length of the antennae which was mounted to the bone with a resin cement. Dr. Roffell then broadcast a radio signal between the two antennae. As the distances between the two antennae reflected movement of the two parietal bones independent of each other the frequency of the broadcast was recorded by polygraph along with the respiratory activity and electrocardiograph tracing. There was a lot of suspenseful breath-holding as we began to record our tracings. Lo and behold - there it was a rhythmical change of distances between our two antennae measurable at about 20 cycles per minute. This rhythmical change in radio broadcast frequency was different and independent from the monkey's breathing activity as seen on the polygraph and certainly much slower than the cardiac rate. There was nothing interposed between the monkey's parietal bones and radio broadcast except the metal of the antennae bases and masts. There it was; measurable cranial bone motion. Two monkey parietal bones moving independent from one another with no living or biological tissue between the bone and the measuring devices. I was excited but managed to restrain myself enough to place very light inhibiting pressure on the monkeys sacral apex and coccyx. I held it in an anterior direction. As I did this, we discovered that I could inhibit and if desired, completely stop the parietal bone movement. There it was; a connection between the skull and the sacro-coccygeal complex which was capable of functionally influencing the "Craniosacral System". This influence could be via the hydraulic system enclosed within the dural membrane and/or via the direct dural connections between the cranium and the tail end of the dural membrane. As the situation evolved, it was clear that both fluid hydraulics and membrane tensions powerfully influence the activity of the system. We repeated the experiment on three different monkeys and received consistent confirmation each time. Drs. Retzloff and Roffell continued this line of investigation. I directed my efforts toward working with human subjects and patients.

My first research endeavor with human subjects involved the development of a standardized

Craniosacral evaluation protocol. I developed a 19 parameter examination which involved evaluation of physiological motion/restriction to motion of the Occiput, the Temporal Bones, Flexion, Extension, Side-Bending, Torsion, Vertical Strain, Lateral Strain and Compression of the Sphenobasilar Synchodrosis and the base of the Cranial Vault. We also evaluated the sacrum for flexion, extension and torsion. Once the examination protocol was developed I did a double blind study of 50 examinations of nursery school children with 3 other examiners. A 96% agreement was achieved with a graduate student whom I had trained in the examination techniques. An 86% agreement was achieved with another physician who attended the same initial Cranial Osteopathy seminar in 1972. That had been the first exposure to Cranial Osteopathic Techniques for both of us. A 76% agreement was achieved between myself and another osteopathic physician who had been involved in cranial work since about 1960. These results in a strictly monitored double-blind study indicated that we were definitely perceiving motions in the skulls of the examinees which were not figments of our imagination. (Ref 5)

Next I examined 203 school children while blind to their school performance, behavior and classification. It was clearly seen that those children with higher incidence of multiple and severe craniosacral system dysfunctions as illustrated by the standardized craniosacral examination used above were the same children with brain dysfunctions in school. This research achieved a probability of 0.000 in the Learning Disability Category, 0.000 in Behavioral problems (Hyperactivity) category and 0.002 in the motor-speech problem category. Once again if cranial bones do not move it is most difficult to account for this examination's ability to predict brain dysfunction. (ref-9)

Subsequently, I opened a craniosacral clinic for brain dysfunctioning children at the University. The results were very positive and led to the training of the staff at a local school for handicapped children. The results with reading problems, motor coordination, hyperkinesis, strabismus and spastic paralysis were exceptionally encouraging. The staff of the school learned well. The University instituted the Craniosacral Therapy course under my direction in the curriculum available to M.D. students, D.O. students and graduate students in Psychology, Special Education,

Psychotherapy and Occupational Therapy.

I soon received an additional research grant to investigate the possibility of the efficacious use of Craniosacral Therapy in Autism. Our work for three years at a county center for autistic children led me to the hypothesis that autism was perhaps etiologically related to a loss of compliance of the meningeal membrane system. I tested this hypothesis by performing blind craniosacral examinations on 63 children who had been rated by Dr. Bernard Rimland's scale for autism. Dr. Rimland is a Psychologist and is the Director of the Institute of Child Behavior Research in San Diego. I rated the examinees in terms of palpably perceived membrane restriction as well as doing the standardized craniosacral examination. There was a very high correlation between my perception of membrane restriction and high scores of Dr. Rimland's scale for autism.

During my research we performed craniosacral therapy on 1/2 of the autistic children in the center once weekly for six months of each year. We observed improvement in self abusive behavior, reduction of self-stimulation, changes in social interaction and expression of love to other persons rather than constant occupation with inanimate objects. I continue to treat many brain dysfunction problems.

Concurrently while working with brain dysfunctioning children I began a research project with Zvi Karni D.Sc., and PhD in Biological Engineering and Biophysics. Dr. Karni held the position as Visiting Professor in our department for three years. His tenure was at Technion Institute in Haifai Israel where he was Chairman of Biological Engineering. Dr. Karni began work with me as a total skeptic in order to shut me up and prove I was wrong. As it turned out he became one of our strongest supporters. Dr. Karni measured electrical potential changes in millivolts on the lower extremities on over 100 patients while I did craniosacral examinations and treatment. He polygraphed all of the data as I audiorecorded my comments in time synchronized tape. We discovered that there were changes in electropotential in the lower extremities far more subtle in amplitude than the EMG changes, which accompany the effect of Craniosacral Therapy. The electrical patterns were characteristic of palpable specific changes in Craniosacral function. Cardiac changes did not correlate to craniosacral system change. Breathing activity did correlate, but only when specific

craniosacral techniques were applied. The strain gauge measurements of circumferential changes of the upper and lower extremities correlated exactly with the perceived craniosacral rythmn. (ref-11)

This work was duplicated later in Israel by Dr. Karni and his colleague Joseph Mizrahi. This also was done while I was working in Israel as a Visiting Professor at the Technion Institute in Haifa and at the Loewentstein Institute for Neuropathology in Ra'-anana, Israel.

As I became more deeply involved in the Craniosacral System and its diagnosis and treatment, it became apparent to me that cranial bones move at the pleasure of and in order to accommodate changing tensions on the membrane (dura mater) boundary of the hydraulic system which is the driving force of the Craniosacral System. I began to do special dissections on fresh human and baboon cadavers which were sent to us for tissue study before embalming. I avoided calvarium cuts and instead reviewed brain tissue through parietal windows which were cut so as to avoid the attachment areas of the Falxes and Tentorium.

Study of the Dural Tissue soon indicated that fiber orientation varied from skull to skull. We hypothesized that fiber orientation was a form of adaptive modeling which developed to accomodate individual tension patterns, and which could be used to diagnose abnormal tension patterns in the Craniosacral System which exited before death. I collaborrated with Yoram Lanir, PhD in Biological Engineering and world class expert in the Biomechanical properties of connective tissue. Dr. Lanir also came to M.S.U. from the Technion Institute in Haifa Israel. Our initial work was quite promissing.

Quite honestly, I believe that study of Dural Membrane and its fiber orientation patterns could offer a great deal of information about brain dysfunction. The difficult part is that one must do fresh specimen autopsy dissection and correlate with brain function during the subject's life time. This is a life's work for the researcher and it is not the life's work I would choose for myself. It is at this juncture that I decided to return to my profession as a physician.

In answer to Mr. Skogstrom's comments on my "Energy Cyst" article, I'm afriad that the blame (or credit) is a result of observation and theorizing by myself,

Dr. Karni, Dr. Retzlaff, and finally Dr. Elmer Green, Director of the Menninger Foundation, who ultimately suggested the name. None of us see any conflict with existing laws of Physics. Energy goes in and becomes entrapped by an impermeable wall fashioned by the body or is discharged and dissipated immediately. When this energy is trapped it may be thought as a cystic focus, and its release generates measurable heat. This phenomenon has been measured and documented with dynamic Thermographic Techniques and with skin galvanometers placed over the area of release.

If Mr. Skogstrom has some more specific questions, I would be happy to address them.

One final thought comes to mind. As Physical Therapists and "hands on" clinicians - we must learn to trust that the perceptions received through our hands are valid, accurate and reliable. Shut down the left side of your brain for a while, and let your creative right side take over. If your experiences begin to emulate mine, you will find yourself progressing very rapidly in your clinical work, and that your patient/client sensitivity will increase measurably.

Thank you for the opportunity of answering these questions.

Sincerely,

John E. Upledger, D.O., F.A.A.O.

PUBLICATIONS

1. Retzlaff, Ernest W., Roppel, Richard M., and Upledger, John E. "Craniosacral Mechanisms." JAOA, 76:288/123 (December, 1976).
2. Roppel, Richard M., and Upledger, John E. "Bioelectric Phenomena in relation to Neural Function." JAOA, 76:290/129 (December 1976).
3. Upledger, John E. "Integration of Acupuncture and Manipulation." Osteo. Med., Vol.2, No. 7 (July, 1977).
4. Upledger, John E. "Osteopathic Medicine and Traditional Chinese Medicine." The D.O., page 96 (July 1977).
5. Upledger, John E. "The Reproducibility of Craniosacral Examination Findings: A Statistical Analysis." JAOA, 76:890/67 (August, 1977); also reproduced in 1977 A.A.O. Yearbook.
6. Retzlaff, Ernest W. Mitchell, Fred L., Jr. and Upledger, John E. Sutureal Collagenous Bundles and Their Innervation in Saimiri Sciureus. Anat. Rec., 187:692 (1977).
7. Retzlaff, Ernest W., Mitchell, Fred L., Jr., Upledger, John E., and Biggert, Thomas. "Nerve Fiber and Endings in Cranial Sutures." JAOA 77.
8. Upledger, John E. "Correspondencies Between Chapman's Reflexes and Acupuncture Points." Accepted for publication - JAOA.
9. Upledger, John E. "Craniosacral Findings in Grade School Children." JAOA, 77:760/69 (June 1978).
10. Upledger, John E. and Karni, Zvi. "Bioelectric and Strain Gauge Recordings During Transcutaneous Acupuncture Treatment." JAOA, 77: 479/108.
11. Upledger, John E. and Karni, Zvi. Mechano Electric Patterns During Craniosacral Manipulation." JAOA, 78:782/49 July 1979.
12. Upledger, John E. "Diagnosis and Treatment of Temporo-parietal Suture Head Pain." Osteo. Med./. Vol. 3 (July, 1978).
13. Upledger, John E. The Non-Pharmacologic Management of Autogetic Headache." Scheduled for publication - Osteo. Annals (Dec.1978).
14. Upledger, John E. "The Goal of Therapy." The D.O. (Dec. 1978).
15. Upledger, John E. "Holism, Osteopathy and Biomechanics." Michigan Osteopathic Journal (Nov. 1979); also guest editor of this issue.

16. Retzlaff, Ernest W., Upledger, John E., Vredevoogd, Jon D. "A Proposed Mechanism for Drugless Pain Control." Michigan Osteopathic Journal (November 1979).
17. McConnell, David, G., Upledger, John E., et al. "Low Agreement of Findings in Neuromusculoskeletal Examination." JAQA, Vol. 79, No. 7 (March 1980).
18. Dinnar, Uri, Upledger, John E., et al. "Classification of Diagnostic Tests Used With Osteopathic Manipulation." JAQA, Vol. 79, No. 7 (March 1980)
19. Upledger, John E. "Scoliosis: A New Contributing Factor to Consider." Post Graduate Medicine (November 1980)
20. Henderson, Kathryn, Brookes, Anne Raynesford, Alice, Upledger, John E. "Trace Mineral Hair Analysis in Autistic Children." JAQA, Vol 80, No. 4 (December 1980)
21. Dinnar, Uri, et al. "Description of Fifty Diagnostic Tests Used with Osteopathic Manipulation." JAQA, Vol. 81, No. 5 (January 1982)
22. Upledger, John E. "Childhood Behavioral Problems" The Journal of Applied Nutrition, Vol. 34 No. 2 (Fall 1982)
23. Upledger, John E. "Craniosacral Function in Brain Dysfunction" Osteopathic Annals" Vol. 11, No. 7 - July 1983.
24. Upledger, John E. "A Thermographic View of Autism" Osteopathic Annals Vol. 11 No. 8 - August 1983.

BOOKS

"Craniosacral Therapy" Upledger, John E., Vredevoogd, Jon D., - Eastland press, Chicago, Illinois (January 1983)

"Craniosacral Therapy, Vol.II (Beyond the Dura)", Upledger, John E., Eastland Press, Seattle, Washington (In press).