Decompression and Mobilization: Down But Not Out of the Gymnasium

Edward J. Thomas

As we struggle to fashion a 21st Century physical education curriculum, we are wise to occasionally search the past and reconsider discarded ideas. The Gravity Guiding System of Decompression and Mobilization was put to bed in the mid-1980s, and there are no doubt a few rusty inversion boots and dusty gravity guidance machines stored away in the bowels of our equipment rooms. Those of us who were around in the early 1980s may recall at least some of the controversy surrounding their use and abuse.

To understand the theory behind the Gravity Guiding System, we should begin with its developer, Robert M. Martin, Sr., M.D. He was born shortly after the turn of the century and began gymnastics training at the age of five. As a young man he worked with Bernarr McFadden and taught at Turner halls in Philadelphia and Kansas City. (see photo 1) Martin eventually studied physical education and received degrees in chiropractic, osteopathy, and medicine. He has specialized in orthopedics since 1949, and two decades ago he crystallized his knowledge of physical education and medicine into an exercise system designed to help prevent and correct disorders caused by the debilitating effect of gravity.

Martin's ideas resemble those of Galen, Hippocrates, Mercurialis, Tissot, and numerous other ancient physicians who believed rational movement could heal and prevent infirmity. He challenged the notion that gravity is a villain, and humankind is doomed to be ultimately compressed and distorted by its unidirectional force and relentless pressure upon us. Shifting the blame away from nature, Martin (1979)

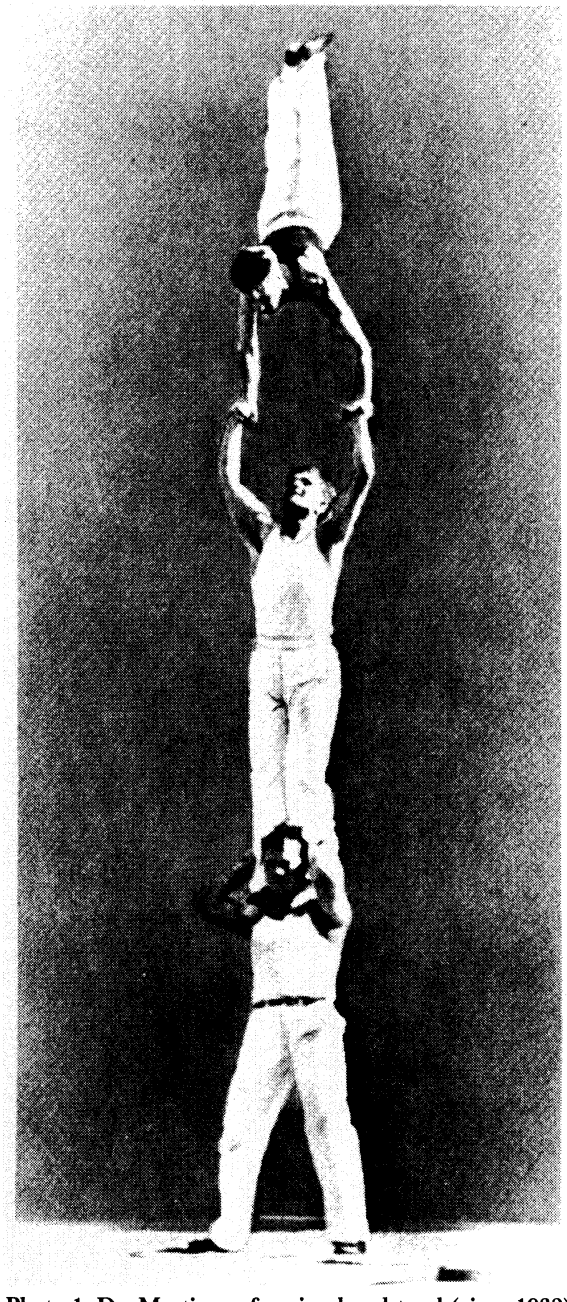

Photo 1. Dr. Martin performing handstand (circa 1932)

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theorized we contribute to our own deterioration by choosing to limit our motion and fix our postures:

> Gravity applies its constant, relentless force to the pliable, moldable, moveable structures of the body, much like a potter manipulates and molds clay. The resulting shape depends on how the force is allowed to apply. In both cases, to produce a shape and form of beauty, intelligent application of force is required. (p. 12)

Posture can be simply defined as any position in which the body resides, and it assumes a fluid dimension as the body constantly shifts in adaptation to gravity. Within the unlimited postures we can assume, Martin (1979) suggested there are six basic human postural categories to consider.

GROUP I—Common Postures

Effects: Produce body compression and shortening of stature.

Used: In work, play, rest, etc.

1. The ERECT POSTURE (Fig. 1)
   (The posture of Dominance)
   a. Sitting
   b. Standing
2. The HORIZONTAL POSTURE (Fig. 2)
   (The posture of Neutrality)
   a. Lying (On side, back, or front)
3. The FLEXED POSTURE (Fig. 3)
   (The posture of Accessibility)
   a. Bending forward

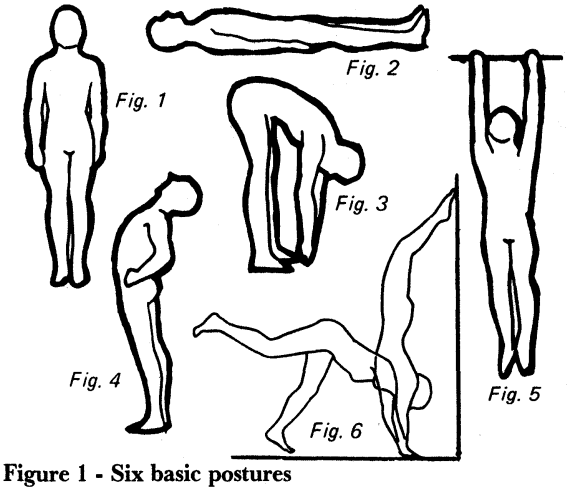

Figure 1 - Six basic postures

GROUP II—Uncommon Postures

Effects: Produce body decompression and elongation of stature.

Used: To counter and correct adverse effects of gravity produced by the common postures.

4. The EXTENDED POSTURE (Fig. 4)
   (The posture of Bending Backwards)
5. The BRACHIATED POSTURE (Fig. 5)
   (The posture of hanging by the limbs—upper or lower)
6. The INVERTED POSTURE (Fig. 6)
   (The Upside-down posture)
   a. Standing on the hands
   b. Standing on the forearms
   c. Hanging by the lower limbs (pp. 31-32)

Martin realized we neglect the uncommon postures, so he designed numerous devices and exercises to facilitate them. He then tested his theories and equipment for over 15 years in his medical practice before inversion boots and tables were mass produced in the mid-1970s. They swept the nation and, in 1983, Gravity Guidance Incorporated was one of the fastest growing small companies in America. By 1986, public doubt forced the company to limit sales to only the medical community. A few years later, Gravity Guidance, Inc. went completely out of business. The Gravity Guidance equipment is no longer available.

Was Martin off base, or did we physical educators miss a rare opportunity to regain some of our lost ground as teachers of rational and restorative exercise? The inversion table is an adjustable bed which allows users to move from a horizontal to inverted posture by simply moving their arms. (see figures 2 & 3) The boots are used to invert suspended from a horizontal bar. On the surface oscillation and inversion appears to be therapeutic or preventive gymnastics, and there remains considerable historical and laboratory support for the inversion concept.

Ancient Greek physicians used an inversion device and, in the Middle Ages, the "Scamnum

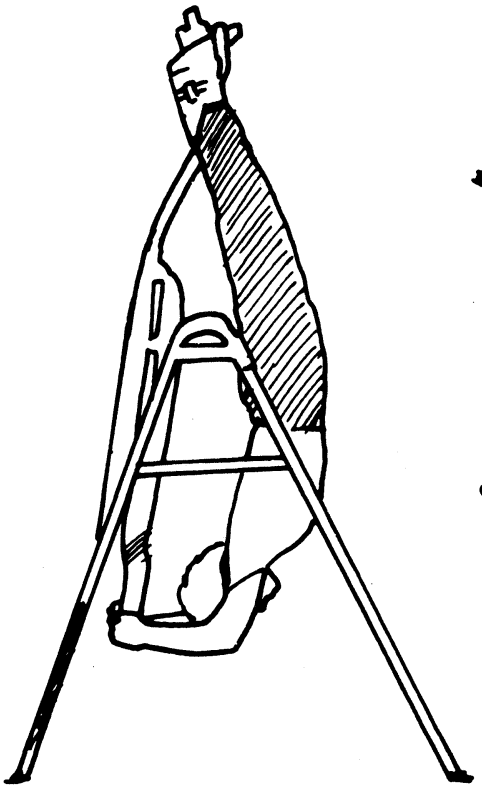

Figure 2 - Inverted extension

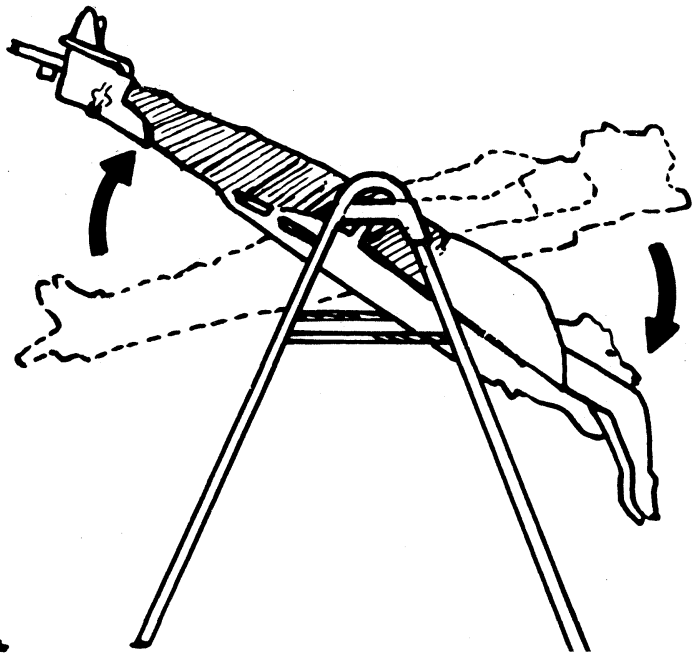

Figure 3 - Oscillation

Hippocrates," a ladder-shaped bed suspended by ropes and pulleys was used to facilitate inverted traction (see figure 4). Succussion (shaking the spine) was used to treat a variety of orthopedic problems including scoliosis (Burton, 1990; De Vries, 1985; Krakauer, 1986). The patient was tied to the bed, hoisted into the inverted position and dropped a short distance to create a quick tractive jolt.

In the late 1800s, the great strongman C. A. Sampson (1895) recommended and used an inversion device called the Roman column which bears a striking resemblance to the modern Roman chair used today for abdominal exercise (pp. 221-233) (see figure 5).

There was a spurt of scientific research concerning oscillation and inversion in the early to mid-1980s. Much of it was positive, but the lay press exaggerated the risk of increased arterial blood pressure and cerebrovascular damage. These concerns were eventually rejected, and DeVries (1985) further clarified the issue by stating:

> Considerable valid research data on the use of inversion devices to relieve low back pain have been published in the medical literature. Unfortunately, the information has been distorted and sensationalized in the lay press, giving rise to confusion. (p. 24)

Like all forms of exercise, inversion is not recommended for everyone. Martin (1985) listed the following contraindications:

- History of uncompensated congestive heart failure
- Severe vascular disease
- History of space-occupying brain lesions
- Arterial hypertension (uncontrolled)
- Severe myopia with tendency for retinal tears
- Carotid artery stenosis
- Osteopathia: e.g., cancer and tuberculosis of the bone
- Detached retina
- Glaucoma
- Vulnerable areas of stress from recent surgery

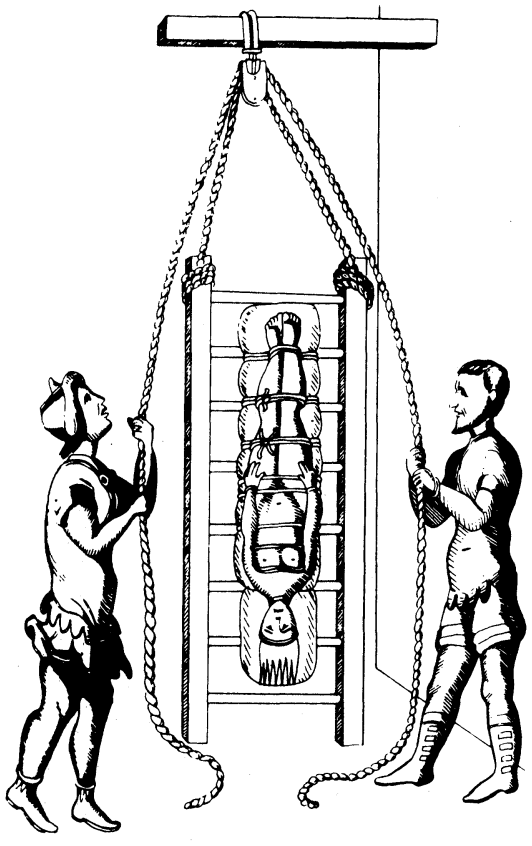

Figure 4 - Scamnum Hippocrates

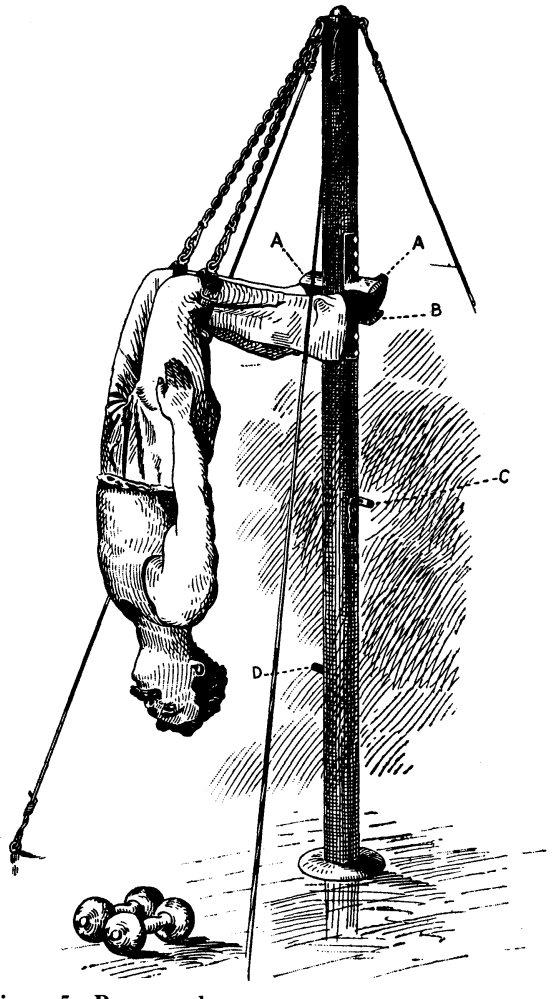

Figure 5 - Roman column

- Hiatus hernia (large)
- Ventral hernia
- Extreme obesity
- Pregnancy (p. 34)

DeVries (1985) suggested medical clearance and stressed the importance of competent supervision for users of inversion equipment. He concluded that "with proper precaution, full inversion using an oscillating inversion device probably presents no risk to normotensive healthy persons" (p. 27).

Nosse (1978) and Sheffield (1964) were among those who reported positive results from inverted traction; and B. D. Lockhardt (personal communication, January 20, 1986), past president of the American Association for Health, Physical Education, Recreation, and Dance, wrote Martin a letter praising his work:

> If the AAHPERD embraces the concepts you teach and modifies its fitness assessment tests accordingly, every child in physical education classes throughout America will be positively affected by your ideas. I am hopeful that we will make these adjustments as soon as possible and start on a steady and sensible program of preventing back pain long before it starts.

Chronic compression of the intervertebral disks, particularly in the lumber region, is often cited as a primary contributor to the back pain that afflicts scores of Americans annually. One might assume a good night's rest would compensate for daily compression of the disks, but Nachemson (1966) found the horizontal position unable to significantly relieve intervertebral pressure. Grieco (1986) suggested alternating

compression and decompression of the vertebrae, and the Martin (1975) system of oscillation and inversion achieved this vital *milking* effect. The Gravity Guiding System promises to:

- Relieve pain and muscle spasms in common back problems.
- Provide maximum amount of traction in minimum time.
- Allow rhythmic and soothing oscillation to relax muscles.
- Improve circulation.
- Decompress or unload the intervertebral discs by painless vertical suspension.
- Provide maximum mobility of the spine without strain to the spinal cord.
- Stretch the paraspinal and vertebral muscles and ligaments.
- Strengthen ligaments and soft tissue.
- Provide free inverted suspension, enabling full range of motion for maximum restoration of joint function. (Gravity Guidance, Inc., 1983 p. 10)

DeVries (1985) made a compelling argument for serious consideration of the Gravity Guidance concept. Why then did the Martin system fail? Have we physical educators lost our understanding of fundamental exercise? Maybe so. It has been almost a century since sports and games displaced the German, Swedish, and American hybrid systems that emphasized education *of* the physical. The Kraus-Weber test of the early 1950s suggested American youth were seriously deficient in muscular strength and flexibility, but Kraus (1965) later noted that physical educators had recommended increased participation in youth sports as the primary solution. He wrote:

> Sports were not and are not the answer. The answer was and is basic exercise programs geared to the correction of muscular deficiencies and development of good hearts and lungs. (p. 49)

Through the years there have been voices in the wilderness like Drew (1929), Lippitt (1923), Lovett (1922), Rathbone (1954), and others who promoted restorative, preventive, and corrective gymnastics, but sports dominated American culture and the physical education curriculum by the 1950s. Kraus (1965) later wrote:

> At the time I simply did not realize that many physical educators had such an ingrained dislike of exercise. I found this out in 1957, when I attended a meeting with a number of physical educators. It was a very friendly session. After a few minutes we got down to the main problem. I asked, "Why are you against exercise?"
>
> "We can't use exercises," one physical educator said.
>
> "Why not?" I asked.
>
> He smiled. "Very simple," he said, "Twenty-five years ago we gave exercises to school children. And as far as I'm concerned, that's enough. We were looked down on as the boobs of the school system. We had no status at all. So we changed our emphasis. Now who are we? Well, we're not the boobs we used to be. We're respected members of the academic community. We're educators, physical educators if you wish. We're not 'exercise teachers' any more. We're educators, coaches, and administrators. You want to know the truth? Exercise is finished! It's passé. It's out of date. You want us to turn back the clock. Well, I'm telling you doctor, we don't care what your findings show, we're not going back to the old days. We've worked hard to get where we are, and we're going to stay there." (p. 49-50)

In 1955, *Sports Illustrated* published an article titled *The Report that Shocked the President.* The Kraus-Weber study was reviewed with attention to controversies that surrounded the general validity of the test and its results. The Amateur Athletic Union was applauded for its youth fitness efforts, a case was made for extended gym time in schools, and the general attitude toward formal exercise surfaced in the following remarks:

> The mere mention of formal exercise is enough to bring a shudder to the average American spine, weak as it is alleged to be at present, but formal exercise must be resorted to where there is no room or time for freer play. Exercise may not be popular, but it certainly can be made more palatable by teaching it with imagination and belief. (p. 32)

Attached to the *Sports Illustrated* article was a section called "A Hotbox Special." Numerous well-known Americans were asked:

> President Eisenhower, at an extraordinary luncheon, recently expressed his concern about the lack of participation in sports by American youth. How would you remedy this? (p. 32)

Roy Campanella (baseball player), James Bennett (Director, U.S. Bureau of Prisons), Hopalong Cassidy (cowboy), J. Edgar Hoover (Director, FBI), Ed Sullivan and Arthur Godfrey (entertainers), and 35 others agreed the solution was more sports. By the time the *Sports Illustrated* article appeared in 1955, the problem of muscular balance, as Kraus stated it, had shifted to lack of youth sports participation.

Kraus (1965) studied medicine in Vienna during the early 1930s. Like Martin, his professional training was complimented by personal and practical insights into the old European systems of physical culture. He also mastered judo, acrobatics, fencing, boxing, skiing, and mountain climbing. Kraus moved to the United States in 1938 and was soon surprised at the extraordinary number of patients who came to him in search of relief from idiopathic back pain which he eventually linked to under-exercise (hypokinesis) and over-irritation. He believed hypokinetic disease and nervous tension contributed to at least back pain, stiff neck, headache, emotional instability, duodenal ulcers, diabetes, and heart disease (p. 8).

In search of the elusive sources of America's massive backache, Kraus (1965) joined forces with a team of experts at New York University in the mid-1940s. Suspecting that muscular imbalance might be a contributing factor, Kraus developed a test using six simple postures designed to test the muscular efficiency of the lower back and abdominal regional (pp. 9-11). Patients who scored poorly were given exercise prescriptions which often proved effective in helping to relieve their back pain. It then followed that the test might be used to predict backache. More than 5,000 American children between the ages of 6 and 19 were tested, and 57.9% failed one or more of the postures. In contrast, almost 3,000 Italian and Australian children were tested and only 8.7% failed (p. 41). The test proved too easy for Japanese children and educators to take seriously.

The Kraus-Weber emphasis on hypokinesia (a quantitative deficiency) overshadowed but did not completely obscure the troubling and complex qualitative problem of clumsy and unnatural body movements caused by a general impairment of motor function. Kraus (1965) also noted the following:

> Look at people you know are tense. How do they move their bodies? Certainly not smoothly. Their body movements are not fluid or rhythmic but jerky and stiff. They freeze themselves into a position, whether they are sitting in a chair, standing, or driving a car. They force their muscles into a steady alert reaction. Their muscles, already under tension, are forced to become even more tense. The muscles of the neck, shoulder girdle, and back are particularly tense, and they become the prime target areas for even more tension. (p 63)

When education *of* the physical gathered new momentum in the late 1960s and early 70s, we physical educators were faced with applying the very skills we had long been taught to ignore. Shultz (1979), for example, noted the relatively recent popularity of static stretching:

> Indeed, flexibility itself, for years the overlooked sibling of strength, endurance, and speed, has come to be appreciated for its own virtues as an aid to overall physical perform-

ance and as a protection against muscle soreness and injury. (p. 109)

Only a few decades ago, weight training was often ignored, deplored, and pushed to the periphery of the curriculum, only to be dragged back to our attention by an increased public interest and acceptance. Our present inability to even physically transform ourselves has been implied in our own literature. Brandon and Evans (1988) suggested physical educators in general may be unfit, and Whitley, Sage, and Butler (1988) have called for us to improve as role models. Could many of us actually be waddling and hobbling through our careers as the mobility of American youth spirals away from perfection? How then will they transcend our ignorance?

Lindsey and Corbin (1989) recently added to the growing list of questionable or dangerous postures which includes, for example, the squat. Outside the borders of our nation, millions if not billions of people comfortably rest, sleep, work, defecate, copulate, and sometimes even give birth from the squat posture. Have our bodies grown so rigid and our lower backs so immobile that we simply can no longer squat as we naturally should? Has normal been mistaken for natural? Should we actually be saying squats are hard on the knees of people like us who can no longer do them? This is certainly not a criticism of the Lindsey-Corbin analysis. The postures they have listed are probably contraindicated for many if not most Americans, but it is troubling to consider what that implies about our movement dilemma in general.

Many of us received our training from a sport-oriented generation of physical educators, and it is certainly possible that we may still be clinging to some of their misconceptions. This is not meant in disrespect. We owe whatever we have attained to our teachers, but for society to grow and cultivate itself, the pupil must learn what the teacher does not know. Our elders were taught by a generation that rejected restorative exercise for sports and games, and the physical educators of the 1920s and 30s were simply responding to and surviving in an educational climate that had rejected the structure of the European gymnastics systems of the early 1900s.

We are today concerned with the epidemic hypokinesia, rigidity, and awkwardness of our youth, and we are now challenged to teach them what we do not know. Cultural survival depends increasingly on a rational and harmonious relationship with and better understanding of nature. Martin's message is uniquely suited for our time, and we are wise to again consider the complicated notions he eloquently translated into simple and compelling language:

Examples of the consequences of not living compatibly with gravity and Newtonian Law are found everywhere. One needs only to look at his neighbor and his drooping, shortening, sagging stature: bulged mid-section, and unsightly posterior to see the devastating effect of gravity, illustrating how important it is to live compatibly with this major environmen-

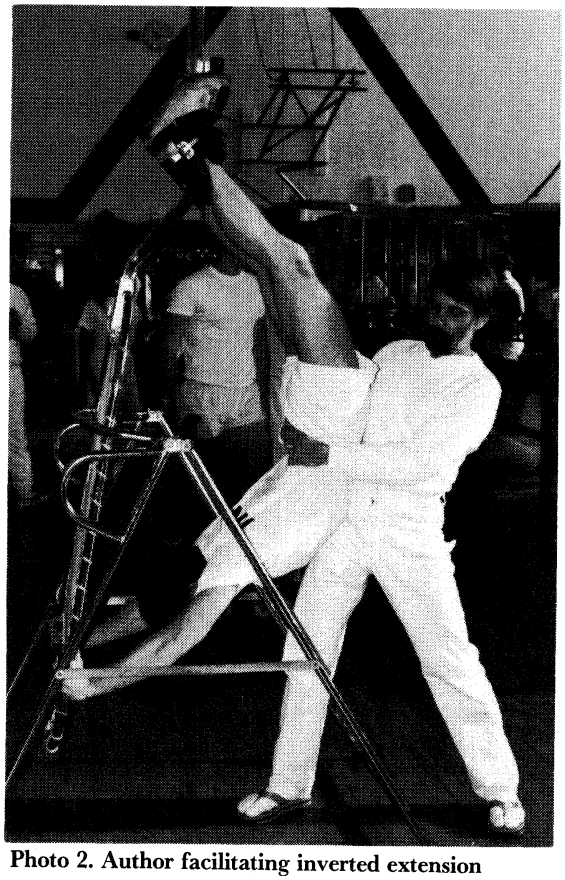

Photo 2. Author facilitating inverted extension

tal influence. Too many of us are models of molding tissue living without concern for gravity's guiding power—a power we must learn to respect and use positively. (Martin, 1979, p. 12)

The Gravity Guiding System and restorative arts in general may be on the canvas but certainly not out for the count. Physical education is an evolving profession, and cultural needs will provide directional and philosophical paradigm shifts. With a courageous vision for the future, we can certainly bring to life the perennial wisdom that has surfaced enough throughout history to warrant our confidence.

Movement, as such, may replace by its effect any remedy, but all the remedies in the world cannot take the place of movement.
(Tissot-XVIII Century)

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