

The ALEXANDRIAN

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Towards a Physiology of the Alexander Technique

by Chris Stevens

From its earliest days the Alexander Technique has been of fascination to physiologists. Theories of how it worked were put forward particularly after the publication of Rudolf Magnus's book "Körperstellung" in 1924.

Experimental work, however, did not begin until after the Second World War when two teachers, Dr. W. Barlow in England and Professor F. P. Jones in America, working independently, experimented in different ways.

Dr. Barlow used photographic methods for measuring posture and to measure muscle activity he used electromyographs.

Professor Jones chose to measure movements, mainly using multiple image photography and latterly a force platform.

The effects presented by both are clear-cut. Dr. Barlow, by measuring static posture, showed that his patients became taller and broader, tended to undo twists and lateral curvatures and reduce muscle activity to normal levels in previously overactive muscles.

Professor Jones' studies showed that a course of lessons changed movement patterns, using less force and taking less time to complete. Fuller accounts of Dr. Barlow's and Professor Jones' work are to be found in their books "The Alexander Principle" and "Body Awareness in Action," respectively. References to their papers are listed in their books.

My own research so far has been concerned with bringing up to date our understanding of the key physiological mechanisms (dealt with in part two) and to exploring the new technologies now available for making measurements that are both more comprehensive and more accurate.

The photographs and charts give some idea of the technology now available. I chose to repeat Professor Jones' experiments for the movement pattern from sit to stand but in addition simultaneously measured muscle activity in the right upper trapezius, sternocleidomastoid, erector spinae and rectus abdominus muscles as well as the acceleration on the head and the force on the feet on a polygraph.

Instead of using multiple image photography, I chose a newer idea of light emitting diodes. Two of the diodes were placed on the Frankfurt plane (roughly a line from the ear hole to the bottom of the eye socket), one on the acromion process (shoulder) and one on the highest point of the pelvis. The diodes were switched on and off 50 times a second electronically.

This pulse rate is duplicated on the polygraph record. In order to know what is happening at a particular instant, once a second the lights do not come on. If you look carefully at the photographs you can see a gap in the light traces. There is an identical gap in the pulses recorded on the polygraph record. By counting backwards or forwards from the gap we can see where different parts of the body were, at any instant, and what the muscle activity, head acceleration and force at the feet were at that instant. We can also estimate the time taken for the movement.

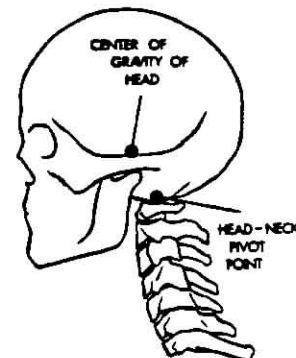
Looking at the charts you can see how the movement developed, first when unguided and then guided. The differences are both

Skeletal Appreciations Inspired by Alexander

by Deborah Caplan, M.A., R.P.T.

My first appreciation of Alexander's work was a practical one as I applied it to dancing, an early interest of mine. Some years later, after becoming an Alexander teacher, I chose a course of study which required gaining technical knowledge of the body's structure. As I sat in my anatomy classes, I found myself delighting in the harmonious "match" existing between human structure and Alexander's instructions for improved use of that structure. Let me take you on a skeletal journey to explore this harmonious match.

The Elegantly "Unbalanced" Head



Following Alexander's lead, I am going to start our journey at the top by exploring how the anatomical components of head-neck balance relate to his first and most important, instruction: *to release the neck to let the head balance forward and up.*

One of the principles of efficient use of the body (and therefore of musculoskeletal well-being) taught by Alexander is that the spine should lengthen during activity rather than compress. As he used his mirrors for self-observation, Alexander perceived that the way the head is habitually carried on top of the neck determines in large part whether the spine will be able to lengthen. He also perceived that the road to efficient head balance and spinal lengthening must be one of non-interference with the head-balancing mechanism inherent in our structure. Let me explain:

If you were to balance a human skull on two fingers the same way it balances on top of the neck, you would see that it immediately rotates forward. This tells us that the head has more weight in front of the head-neck pivot point than in back. It is, therefore, *not* in a state of equilibrium on top of the neck. It is this very lack of skeletal equilibrium that facilitates spinal lengthening if we allow the balancing system to function properly. If the head were positioned squarely on top of the neck, its total weight would act as a compression force on the spine; however, the head's tendency to rotate forward means that it can cause a beneficial lengthening (tractive) force on the neck and total spine. Since the strong muscles in back of the neck counter-balance the weight of the head, unnecessary shortening of these muscles prevents the spine from lengthening by pulling the head back and down on the neck. The head can exert a lengthening force on the spine only if the neck muscles are not being habitually shortened.

(continued on p. 4)

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Free-moving Hip Joints

Why have we fallen into the back-abusing habit of using the torso as though it were "hinged" in the middle? One cause may be the fact that our chair-oriented society has removed our legs from their bending function in daily life. We see children automatically bending with their legs, not the waist, until they reach the age when they are required to join the social scene by sitting in chairs.

Alexander realized that in order to use the entire torso as a functional unit, we need to learn to use our hip joints freely. He again tapped into the structural beauty of the human skeleton with his instruction to *let the legs release away from the torso*. The legs connect with the torso by means of free-moving, ball-and-socket joints. As we go about our daily activities, allowing the legs to release away from the torso will encourage us to make full use of these free-moving joints.

The Floating Shoulder Girdle

To conclude our journey, I now want to explore another part of the skeletal structure—a part that allows a diversity of activity unique to human beings.

Stand up for a moment and make several large circles with one of your arms around your body. Notice that you can make large circles in front and to the side, and that you can reach up overhead and quite far in back. All this wonderful mobility is possible due to the ball-and-socket design of your shoulder joints, and to the fact that your shoulders are flexible.

Visualize, for a moment, your two collar bones in front and two shoulder blades in back as forming a "yoke-like" structure. The shoulder girdle, as this structure is called, is designed to float freely on the rib cage. It is from this shoulder girdle that the arms are hung.

Since we, as human beings, do not need our arms to bear weight, our skeletal structure has evolved to allow more arm motion than would be possible if the shoulder girdle were less mobile. This is a mixed blessing because we have gained mobility at the expense of stability: we can use our arms for a lot of skilled activities, but we can also fall into postural habits which cause the shoulder girdle to be incorrectly balanced. Hence the frequently heard, but completely ineffective, admonition to "pull your shoulders back," which just increases muscle tension without correcting shoulder balance.

Much more productive and harmonious with the body's structure is Alexander's instruction to *release the shoulders out to the sides*. This frees the shoulder musculature so that the shoulder girdle can balance correctly, and also frees the spine so that it can lengthen up between the shoulder blades.

Alexander's instruction to release the neck muscles allows, when necessary, a corrective forward rotation of the head to occur. This, in turn, will bring about spinal lengthening and allow the *up* part of his instruction to take place.

The Waist Is A Mythical Creature

Let us now continue our journey and explore one of Nature's most capable inventions—the human spine and all its surrounding structures. The torso, as this entire invention is called, is a structural triumph providing both flexibility and strength. However, the torso can only serve us properly when it is used in a well-integrated way. All too often we misuse the flexibility of the torso by continually bending from the waist as though it were a hinge. Like the unicorn, the waist is a mythical creature, and we give too much credence to this mythical creature by visualizing the torso as being divided into upper and lower halves.

The concept of a divided torso, and the "use" this engenders, is not only bad for the back, it goes against the structure of the body. Even though the spine is flexible, it has no hinges and should be thought of as one functional unit. Alexander's instruction to *let the torso lengthen and widen* benefits us in two ways: it reminds us that the torso is indeed one functional unit, and then guides us into using it as such.

As I apply Alexander's instructions for improved use to myself, and each time I see a young child running, climbing and dancing, I appreciate anew our elegant verticality and Alexander's contribution to our realization and enjoyment of this evolutionary gift.

Deborah Caplan is an Alexander teacher and physical therapist. She studied with F. M. Alexander, is a founding member of ACAT, and was formerly affiliated with New York University Medical Center.

Editorial

by Ron Dennis

This issue marks the third full year of publication of *The Alexandrian: A Periodical of the Alexander Technique*. The first ten issues have included 24 original articles, six book reviews (including three doctoral dissertations), eight reprinted articles, several editorials and a guest editorial, some communications from readers, as well as the important "Frank Pierce Jones Memorial Issue"—all in the spirit of, to quote Professor Raymond A. Dart, "communicating our knowledge about that better [Alexander] usage to others by the human practices of recording, of speaking and also of writing thereupon."

As editor, I would like to express thanks to all the authors, readers, subscribers, technical staff, and others who have made this possible, but especially to the American Center for the Alexander Technique of New York, which has provided the major funding support, an amount approaching \$10,000. This support reflects the commitment of ACAT-NY to providing a *center* of Alexander activity, not only of training and teaching, but also of publishing, communicating, and coordinating. The American Center has maintained its headquarters and its programs for the past 20 years. By necessity rather than choice, it has exemplified the saying of a contemporary of Alexander's, President Calvin Coolidge:

There is no dignity quite so impressive, and no independence quite so important, as living within your means.

Living within our means in the current and projected environment of Manhattan now implies making some choices, one of which has already been made in terms of deciding to share our space with the New York Reiki Center, and others of which are still to be made regarding ongoing programs and policies.

One of the possibilities under consideration is that of sharing publication and editorial responsibilities of *The Alexandrian* with other Alexander organizations. If such an arrangement could be worked out, it would mean not only an easing of the situation here in New York, but also an enriching of the publication through various regional (and even national!) interests and energies. *The Alexandrian* was conceived as a forum for the whole Alexander Technique. I personally feel that this direction can be continued *and strengthened* along the lines suggested, and would like to hear your reactions also.

THE USE OF THE SELF

by F. M. Alexander

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The Kouroi: A Physico-Cultural Analysis of Archaic Greek Sculpture

by Roger Tengwall

Kouros

"Kouros" in Greek means beardless young man and is the name by which we know a group of statues from archaic Greece. The plural is "kouroi." (c. 700 B.C. to c. 480 B.C.) They have been found throughout the Greek Mediterranean and come from the period of greatest Greek expansion. Greek warships dominated the northern Mediterranean, and the Greek phalanx was the most effective fighting force of its time. There is almost no literature from this period so that the Kouroi constitute a stimulus for considerable conjecture.

Rhys Carpenter stated:

"Few of those who consult the well compiled and authoritatively written handbooks on Greek art have any suspicion that the proud edifice of Greek sculptural history is reared on a quagmire of uncertainty, ambiguity and baseless conjecture."

In this context a somatic anthropologist might be indulged to present an hypothesis.

1. Posture

They are strong young men posed for action. This posture can be seen at any track and field meet. It is the posture of jumpers and leapers as they are about to start their run. Left foot forward, erect, legs straight, face and eyes forward, the slight smile of the confident who is in the posture of joy.

Contrast this with the Kritios boy: lordotic, scoliotic, **right** leg forward and bent. He marks the end of this gloriously vital period in Greek culture and the beginning of the decline into the classical age, with its marvelous over-ripe fruits.

2. Symbols and representatives of power

The power that made the triremes effective in battle was men like these who could row. The power that made the phalanx work was men like these who had the strength and coordination to **run** into battle in **step** and in **full armor**.

3. Dancers and leapers

These were not Olympiad athletes but had a role which was integral to the rites of their culture. And this probably included the Eleusian Mysteries. In fact, they were representative of a central figure, the Kouros. Dionysius and Apollo were then united and were Kouroi.

And they danced in full armor, and the dancing was "ekstasis."

From *The Hymn of the Kouretes*:

"Yo, Kouros, most great. I give thee hail, Kronos, Lord of all that is wet and gleaming. Thou art come at the head of thy 'demonae' to 'dichte' for the year. Oh, march and rejoice in the **dance** and song that we make to thee with harps and pipes mingled together and sing as we come to stand at thy well-fenced altar."

This was a ritual hymn, a hymn to the Kouros.

Major References

Harrison, Jane Ellen. *Epigomona and Themis*. New Hyde Park: University Books, 1981.

Her insight into Greek religion—particularly her presentation of "The Hymn of the Kouretes"—provides the basis of this hypothesis.

Richter, Gisela, M.A. *Kouroi*. London: Phaidon, 1960.

The photographs in this beautiful book provide the rest of the data base.

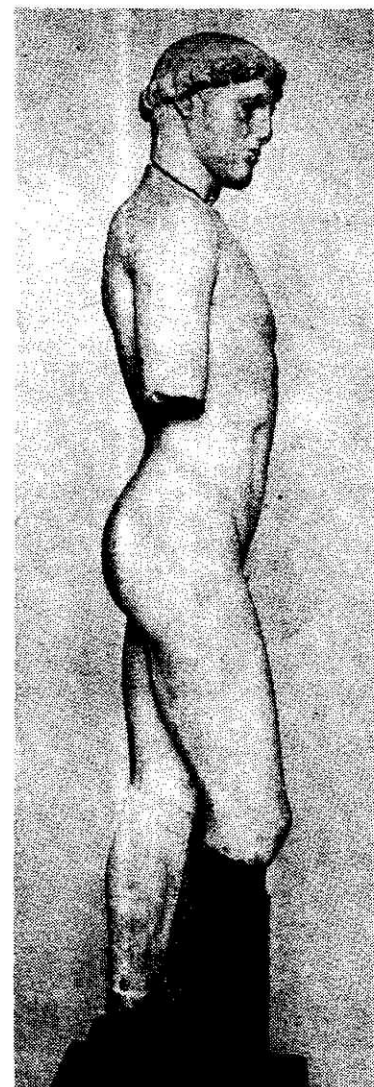
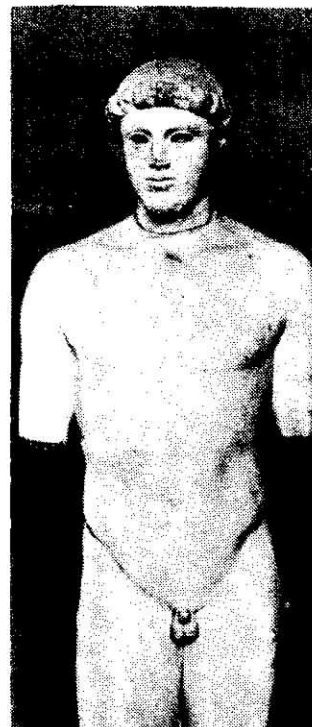
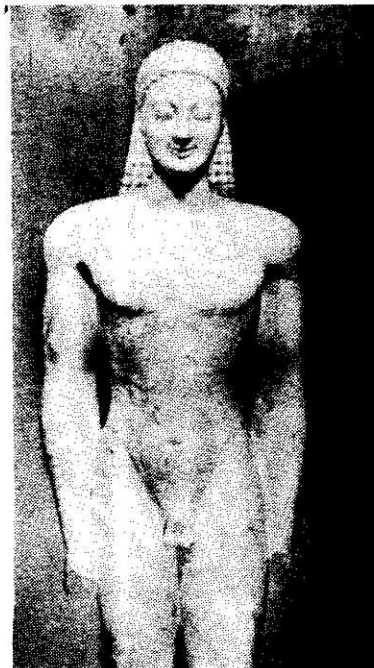
Carpenter, Rhys. *Greek Sculpture*. Chicago: Univ. of Chicago Press, 1960

His disrespect for art historians gave me the courage to proceed.

Tengwall, Roger. "Towards an Etiology of Mal-Posture: a social scientist looks at postural behavior." *Somatics*, Vol. III, No. 3, Fall 1981

McNeil, Wm. H. *The Rise of the West*. Chicago: Univ. of Chicago, 1963.

Roger Tengwall received his Ph.D. from the School of Social Sciences, University of California, Irvine, CA. He has given classes in the Alexander Technique at the University of California and the University of Southern California. He is internationally published in scientific journals on human postural behavior, including Alexander's discoveries. *The Kouroi* was originally published in *Collegium Antropologicum* (Zagreb, Yugoslavia: Vol. 5, 1981). Reprinted by permission of the author.



Kritios Boy

STEVENS

striking and subtle. Incidentally the regular bumps on the muscle traces are due to heart activity.

With the unguided movement, activity is seen in the sternomastoid on the chart, before movement can be detected on the photograph. Simultaneously the feet are pulled up reducing the force recorded on the force plate. The accelerometer shows that the head is beginning to be accelerated upwards slightly. You can see a small upward jump of the head just as movement begins on the photograph.

The next big event comes when he starts to push with his feet to stand up. Notice the upsurge in back muscle activity and the strong acceleration *down* on the head and the big increase of force from the feet. In the guided movement there is no preparatory muscle activity, no jump of the head and no lifting of the feet. When the person pushes off, back muscle activity is 60% of that unguided, downward acceleration on the head is less and the force needed to stand up is reduced by 10%.

The accelerometer on the head is a good test of the teacher. For if the subject was "pulled up" by force, then we would expect an upward acceleration at the beginning. As you can see in fact there is no upward acceleration initially, whereas there *was* one when unguided!

The burst of rectus abdominus activity in the guided movement may be due to the subjects having their centre of gravity further back than they are used to. Close inspection of the photographs show that the diode placements are further back when the subject is standing at the end of the guided movement than they were at the end of the unguided movement. Also they are taller!

There are problems with this photographic technique. As you can see, the start and finish of the movement are blurred. This is inevitable as images tend to be superimposed at low speeds. But what interests me from the Alexander point of view is: Exactly what is happening as we prepare to move and just as we start? To look at these areas we have to go to another generation of technology, solid state cameras, much higher frequency light emitting diodes and a computer to handle all the data. The Swedes luckily have it. Called SELSPOT this advanced system can switch the lights on and off up to 10,000 times a second, and, because it uses semi-conductor cameras rather than conventional film, each pulse is recorded separately. Each position is sent to the computer, which stores it ready for the next one, and then calculates how far apart they are. Knowing the time interval it can then calculate the speed of movement, acceleration and other useful things!

This system lets us look exactly at what is happening with great precision. Again we can correlate this position/movement information with what is happening in the muscles and other measurements.

It can do more than this. We can use it to measure up to 128 points on the body (whereas the conventional photographic method becomes confusing over 8 or 10). With it we can measure spinal curvatures, muscle lengths, the movements of the ribs, the height of the body, its width, the movements at all the joints, and so on—simultaneously. It gives us the opportunity to repeat both Dr. Barlow's and Professor Jones' work with much greater precision and extend them to measure many more parameters.

It is my hope that by this means we will be able to build up a comprehensive model, not only of what the technique does but *how* it does it. In short, we may be on the verge of discovering the mechanisms that give us the marvellous experience we all know.

The next stage of the research, using Selspot, computerised force plates and more E.M.G. channels is planned for 1984. In it we plan to study 10 subjects and 10 controls as well as groups of patients referred by doctors to the project.

As this will require at least 3 months for the experiments and as much time again for the analysis of the results, we are appealing for funds to make the study possible. £2,000 is needed to cover Chris's expenses; can you help, directly by giving money, helping to raise funds, or in other ways?

ANY help, no matter how small, will be appreciated.

To help, please write or telephone: Angela Thompson, 71 Chester Road, Seven Kings, lford, Essex IG3 8PY; telephone 01 599 3346.

Photo 1: Unguided movement

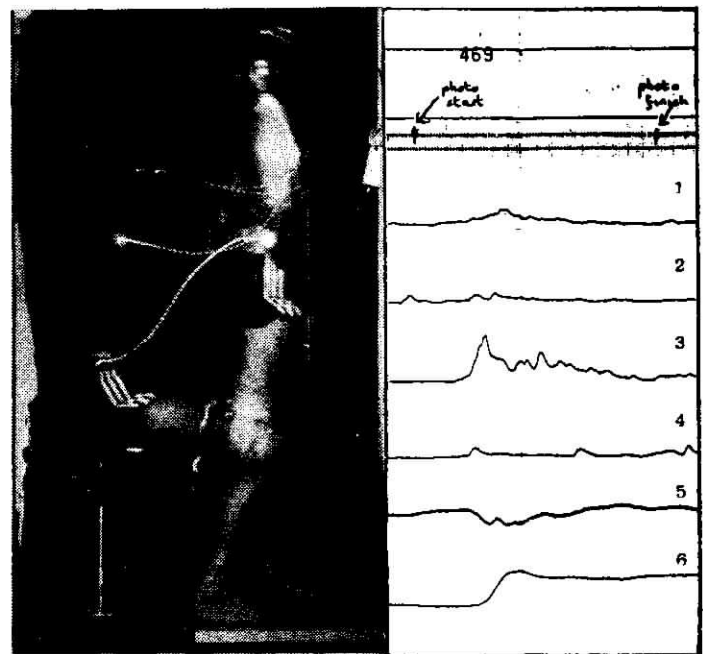
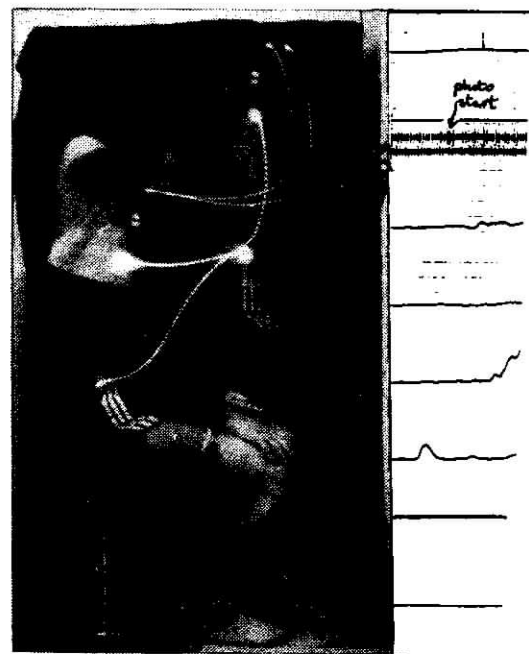


Photo 2: Guided movement



KEY TO BOTH GRAPHS

- | | |
|-------------------------|--------------------------|
| 1. Upper Trapezius | 4. Rectus Abdominus |
| 2. Sterno Cleidomastoid | 5. Accelerometer (head) |
| 3. Erector Spinae | 6. Force Platform (feet) |

Chris Stevens is a member of STAT, and an active Alexander teacher, author, and researcher.