

## SCIENTIFIC EXPLANATIONS OF THE ALEXANDER TECHNIQUE

John Nicholls ©1989

[2006: A cautionary note. This article is now somewhat out of date because of more recent developments in the scientific study of posture and movement. Reflex responses are no longer considered an adequate explanation of human postural behaviour, and the article above, *Modern Neuroscience and the Alexander Technique*, reflects this new trend. However, this 1989 article does still usefully represent how the Alexander world related to scientific knowledge during the 1960s, 70s, and 80s.]

A basic hypothesis can be expressed roughly as follows:

- 1 The human being has naturally evolved mechanisms of posture, poise, or anti-gravity support.
- 2 ) In modern society we see widespread disturbance or misuse of these mechanisms.
- 3 ) The Alexander Technique can help to remove these disturbances or interferences and restore the proper use of the natural mechanisms. In the process it raises the level of conscious awareness of these mechanisms.

The written comments of the following major scientific supporters of the Alexander Technique suggest that they accepted the above hypothesis:

Sir Charles Sherrington (Nobel prize-winner, pioneer of the study of neurophysiology)

Prof. George Coghill (researched the development patterns of movement in small vertebrates)

Prof. Raymond Dart (anatomist, palaeo-anthropologist, and discoverer of Australopithecus, the earliest known species of upright Man, in South Africa)

Prof. Niklaas Tinbergen (Nobel prize-winner, pioneer of ethology, the scientific study of animal behaviour)

(Another important scientific figure supporting the Alexander Techniuqe is Dr.T.D.M. Roberts, author of "The Neurophysiology of Postural Mechanisms" (Butterworth, 1978) I have not included him in the above list, as I do not know how he would view the hypothesis we're considering here.)

As Tinbergen pointed out in his Nobel prize acceptance speech (1973), the Alexander Technique evolved by using simple, empirical observation, similar to the methods of ethology. The scientific explanation of how it works does not directly affect the usefulness of its practical procedures, and Alexander teachers can practice very successfully without detailed knowledge of the scientific underpinnings.

The hypothesis of interference with natural anti-gravity mechanisms seems a good working model for Alexander teachers to use since it has both credible scientific backing, and, as we shall see, accords with a common sense viewpoint. However, believing it or not believing it has no bearing on the practical value of the Technique. At least one leading Alexander teacher, Dr. Wilfred Barlow, has written an account (The Alexander Principle) which implies that he does not believe it. He sees the new use taught by the Alexander Technique as a further development in the evolution of upright posture rather than the removal of interferences with something that has already evolved. Yet the Technique remains as effective in his hands as in the hands of teachers who hold quite different views to his. (To avoid confusion, we should be clear that when Alexander in his books writes of his work as a new step in evolution, the new step he is referring to is a step in consciousness: from subconscious (instinctive guidance and control of use to conscious guidance and control.)

Still, a majority of teachers find the hypothesis outlined here a useful one for explanatory purposes. it particularly helps in communicating the fact that learning the Technique is predominantly an inhibitory process, the unlearning of habits of interference.

Detailed descriptions of these anti-gravity mechanisms have not yet been worked out by anyone. The known postural reflexes, first researched by Magnus, must play some role in them, but the attitudinal (tonic) and righting reflexes described by Magnus do not appear in the normal human after the first few months of infancy in the obvious way they appear in decerebrate animals in a laboratory. Nevertheless, these reflexes are still there in humans as evidenced by their reappearance in some kinds of brain damage.

As with many primitive reflexes, we learn to exercise an inhibitory control over the postural reflexes, to give greater flexibility to our postural behaviour. We also develop a wider range of balance reactions known collectively as equilibrium reactions. Several studies do suggest that while the attitudinal and righting reflexes are not obvious in the adult human, they do continue to influence the distribution of postural muscle tone: Hellebrandt and Co (1962), Ikai (1950), and Pukuda (1961).<sup>1</sup>

Frank Pierce Jones of Tufts University, Boston USA, published a number of papers suggesting that the head and neck righting reflexes played a major role in the Alexander Technique. He believed this would explain the profound effect on the whole body produced by changes in head balance. However a more recent scientific researcher, Dr. Kathleen Ballard (formerly of the Dept. of Physiology, Glasgow University, Scotland, now an Alexander teacher) has drawn our attention also to the importance of reactions triggered from the other end of the body, particularly the positive support reactions. These are exemplified in normal upright balance by pressure of the feet against the ground stimulating the extensor muscles of the legs and back.<sup>2</sup> This would help to explain the sense of springy "upthrust" through the legs, back and neck often experienced by Alexander students.

It must be clearly understood, however, that these sort of reflexes or anti-gravity reactions in human beings only happen if we want them to happen. We can exercise a choice. For instance, pressure of my feet against the ground will only tone my back and leg extensors if I actually wish to support myself. If I am tired and wish to collapse in a heap, that is exactly what will happen. This has obvious implications for the role of conscious direction in the Alexander Technique.

Further scientific research in this area is being done by Chris Stevens, an Alexander teacher and researcher at London University, U.K., and Dr. David Garlick, Dept. of Physiology, University of New South Wales, Australia. Chris Stevens is exploring recent theories of the spine as a compression spring, with an inherent dynamic upthrust, provided its curves are maintained in balance. Dr. Garlick is exploring the hypothesis that in modern society we tend to shift the burden of anti-gravity support of ourselves from the slow-twitch (red) muscle fibres to the fast-twitch (white) muscle fibres. It could then be that the Alexander Technique helps return the burden to the more suitable red fibres.

The present state of scientific knowledge on this subject is best expressed by the chairman of the symposium "Proprioception, Posture and Emotion" organised by Dr. Garlick in 1981. Summing up at the end of the symposium, the chairman said:

"Much is now known at this simple level, and about the brain's wiring diagrams, as a result of such studies. But obviously this is totally inadequate to explain the full complexity of the central nervous mechanisms responsible for posture, locomotion, skilled movement, learning and memory, consciousness and the emotions. It is here, of course, that the holistic, observational approach of the Alexander technique - akin to the methods of ethologists - has much to offer, despite its complete bypassing of details of the underlying neural and muscular mechanisms.

One object of the symposium, I understand, was to examine the extent to which an adequate physiological framework can be put forward to account for the observed results of such a training, re-educative technique. How far have we succeeded in this aim? I must confess to feeling that we have not been able to make a great deal of progress. This is not really surprising, in view of the enormous complexity of the array of mechanisms involved, which even in piecemeal fashion are far from being understood; for example, even the apparently simple act of standing upright."

<sup>1</sup> Further details in M. Kondracki's thesis (pp.41-66) in the library.

<sup>2</sup> Further details in Roberts' "Neurophysiology of Postural Mechanisms," pp. 165-166.

From a common sense point of view, it seems reasonable that we should come into the world equipped with all the necessary mechanisms for upright posture and movement. After all, we have had more than 4 million years (since Australopithecus) to evolve them. This common sense view seems to be borne out by Dr. Roger Tengwall's comments on the flexed hip and knee posture adopted by the human body in zero-gravity. As Tengwall says: "Gravity must stimulate one or more "lengthening reflexes" or anti-gravity reflexes."<sup>3</sup>

Naturally, since we take such a long time to grow and mature, there must be an element of learning to integrate and use these mechanisms - even puppies and kittens do not run and jump with perfect balance at birth.

Basically what we need, and seem to have, is some mechanism that enables us to take our head to its maximum height above whatever part of ourselves we are resting on (feet on the ground, seat-bones on a chair, elbow on a desk etc.) and to do this with no great effort and no restriction of movement, breathing, circulation and digestion (as in Dart's definition of poise). The Alexander Technique simply shows that we interfere with this mechanism by chronic tension, particularly in the neck<sup>4</sup> and back muscles. We can learn to avoid these interferences, and to optimise the use of our anti-gravity apparatus by consciously organising our wish to be upright with greater precision.

<sup>3</sup> See Tengwall's thesis "On Human Postural Behaviours" in the library.

<sup>4</sup> For a resume of scientific work on the importance of sensory information from the neck, see Abrahams' paper "Neck muscle proprioception and motor control in "Proprioception, Posture and Emotion". (Copy of this paper is in the library).