CHAPTER 7

PSYCHOSOMATIC TREATMENTS, MIND-BODY THERAPIES AND BODY WORK

The correct posture alone has the power to open one's consciousness
(Belasik, 1990: 33).

.....posture is body language that depicts the emotions and excessive lordosis is not exempt
(Cailliet, 1995: 103).

7.1 INTRODUCTION: THE MIND-BODY PROBLEM

Following an analysis of ancient, modern, Eastern and Western perspectives on healing, Graham (1990: 90) came to the conclusion that:

> *Ancient, modern, Eastern and Western perspectives on 'life, the universe and everything' appear to be the same - quite literally.*
>
> *They are all holistic, all parts of the universe being seen as inter-related and inseparable, with no distinction between mind and matter; body, soul or spirit.*

As early as 1923, Alexander (1987) came to the conclusion that it is impossible to separate physical and mental operations in our concept of the working of the human organism, preceding the concept of "holism" in biological science introduced by General J.C. Smuts in 1926 (Smuts, 1987) by a few years.

Konrad Lorenz, a Nobel prize laureate, and one of the founders of the science of animal behaviour, also considered the issue of the mind-body problem from

an epistomological point of view (Lorenz, 1988). The outcome of his deliberations on this issue is discussed on the following pages.

Undoubtably there has to be close connections between certain processes taking place within human bodies and the form in which they are experienced. Lorenz (1988: 90) was of the opinion that:

> .....*the isomorphism between what happens physiologically and what happens subjectively can be quite extensive and very reliable.*

To explain this isomorphism Lorenz (1988) suggested three hypotheses which are epistemologically equally legitimate.

1. The first hypothesis is that of **interaction:**

Here the physiological process is the cause of the corresponding experience, which in turn has a retroactive effect on what happens physiologically. A drooping head, for example, symbolises sorrow because it expresses a specific internal nervous situation which is regularly accompanied by the subjective indications of depression.

> ***The one cannot be the cause of the other since, in a certain sense, the one is itself the other, except that it is experienced from the other side*** (emphasis that of Lorenz) (Lorenz, 1988: 92).

2. The second hypothesis is the doctrine of **psycho-physical parallelism:**

Some highly complicated physiological processes are carried out constantly and completely unconsciously. Often qualitatively unmistakable subjective experiences are not correlated with objective and measurable physiological occurrences, despite the fact that transitions from mental processes to a

physiological correlate is a common, demonstrable occurrence. Lorenz (1988) assumed that such definite correlates exist in all instances, in spite of the fact that physiological processes are not demonstrable. To explain this he considered the possibility that some physiological processes are of such delicacy and minimal energy, that they are untraceable.

3. The third approach to the mind-body problem, is that body and mind, physiological and emotional occurrences, are, in reality, in themselves, simply **one and the same**.

This approach (Lorenz, 1988) is the only one tenable for the evolutionary epistomologist; an approach which assumes that body and mind, physiological and mental occurrences are experienced and recognized as we do energy and matter, or energy radiated in the form of waves or particles by means of two independent and incommensurable cognitive capacities.

The above points of view are reflected in the approach that emotional and psychological ways of relating to the world and other people are physically reflected in the body (Graham, 1990; Lorenz, 1988). Likewise, according to Rolf, (1977) man is a unity in response to all that has happened to him, not two separate entities (body and soul), with each entity responding separately to various influences.

The body, and, for the present purpose, the muscles may therefore be a reflection of mental processes and emotions. Muscular imbalances and tensions, for example, can become a shield or armouring, protecting a person both from the emotional discomforts of life as well as from conscious experiences of the deep, inner hurts that have accumulated throughout life (Feldenkrais, 1985; Lowen, 1994; Rolf, 1977). These armourings or regions of tension, by virtue of their pull on the body, lead to postural distortions, rigidity and limitations in movement (Lowen, 1969, 1971, 1975; Painter; 1986). Thus the body's attitudes reflect both mental and emotional attitudes, and the relationship between our bodies and our minds should be approached as a single unified problem. In

Figure 7.1 the reciprocal links between behaviour, moods and emotions, thoughts and image patterns are clearly illustrated (Steyn, 1999). This model will allow for the effect of thoughts and/or emotions on physical behaviour as seen in aberrant postures.

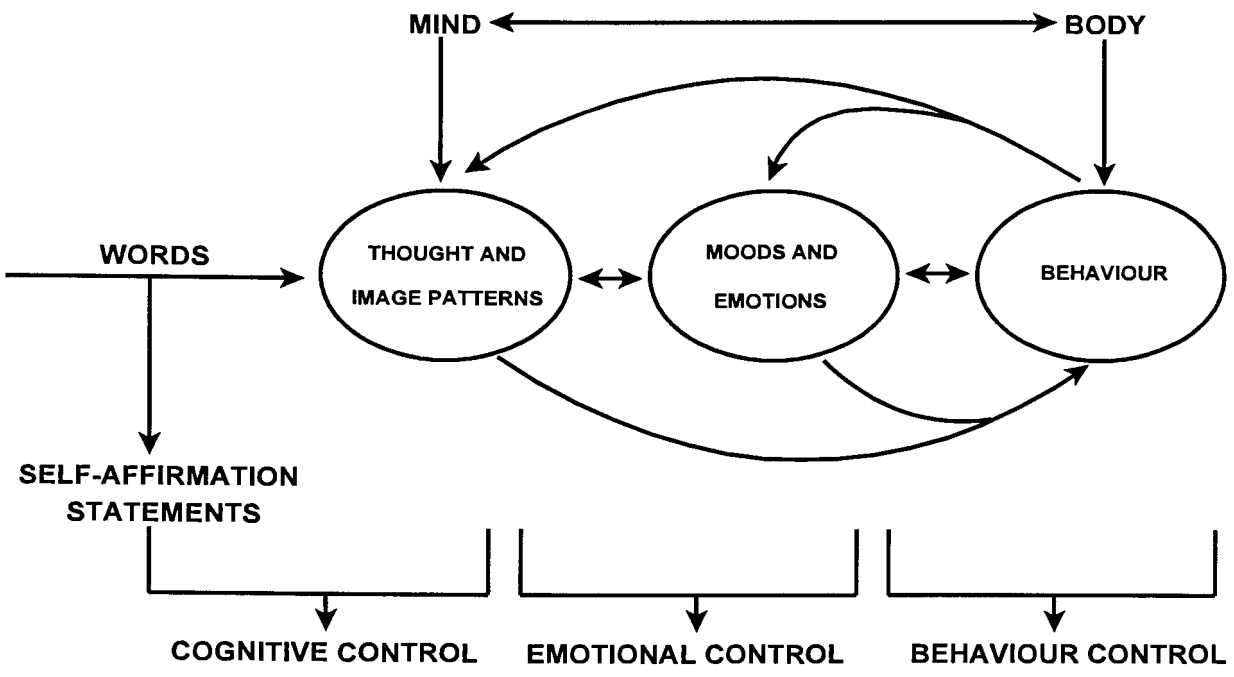

Fig. 7.1 The mind-body link (Steyn, 1999).

The contentions of Alexander (1932; 1987), Feldenkrais (1972; 1985), Hanna (1988), Lowen (1969, 1971, 1975), Painter (1986), Reich (1999) and Rolf (1977), all originators and practitioners of structural integration therapies, led them to implement the mind-body unity concept to develop practical therapies, which they applied to the benefit of their clients and patients. The connecting link between all these therapies, according to Plummer (1982), is posture. Since postural homeostasis is, in fact, one of the central issues in these and some other

physical therapies (see Table 7.1), the relationship of posture to the mind becomes apparent. It is in this connection that the therapies discussed below should be considered.

7.2 CURRENT TECHNIQUES IN BODYWORK

Techniques developed to change posture and other associated aspects such as muscle imbalance, psychological problems may be divided into two groups from the subject's point of view, namely active and passive techniques (Plummer, 1982) (see Table 7.1). Active techniques require the involvement and full participation and cooperation of the subject in order to be effective. The subject must be motivated to improve his posture/use or else the techniques are useless. Passive techniques make the individual dependent on the therapist to some extent, although, according to recent personal information gained from those practising in this field, active participation and involvement of the subject is required (Plummer, 1982).

Techniques come and go, some undergo a rise and fall in popularity, but some withstand the test of time and become classics and remain as effective today as at the time of their inception. Five such techniques are highlighted here; and information about the instigator, development of the particular technique and the effectiveness of each technique is traced and evaluated. The five approaches which will be discussed on the following pages are Reichian Therapy, Bioenergetics, the Alexander Technique, Dart postures, and Rolfing. This will be followed by a brief overview of some active intermittent techniques mainly aimed at the correction of posture, muscle imbalances and neuromuscular coordination.

7.2.1 Reichian Therapy

A brilliant and emotional thinker, Wilhelm Reich (1897-1957) is considered today to be the father of most **body-oriented psychological therapies** (Hoff, 1978).

Because of this statement it was considered feasible to give a short overview of the relevant background of this enigmatic and complex person. His writings are extremely difficult to come by, therefore most of what follows is what has been obtained from secondary sources.

Table 7.1 *A classification of techniques for restoring postural homeostasis (Adapted from Dart, 1947; Norris, 1995; Pilates & Miller, 1998; Plummer, 1982; Putkisto, 1998; Schrecker, 1971)*

ACTIVE		**PASSIVE**	
Requires active participation, therapist-independent once learned		**Subject is passive, therapist-dependent**	
Continuous	**Intermittent**	**Peripheral**	**Central**
Alexander Technique	1. Anti-gravity exercises: yoga, t'ai chi ch'uan. 2. Sensory awareness: Dart postures, Feldenkrais technique, Bioenergetics, Reichian Therapy. 3. Muscle lengthening (stretching) exercises, Method Putkisto, orthotherapy, corrective gymnastics/exercises, kung fu, karate. 4. Deep muscle strengthening (Pilates).	Rolfing, shiatsu, acupuncture-acupressure, polarisation, trigger point therapy, neural point therapy, neural therapies, psychoperistaltic massage, connective tissue massage.	Chiropractic and other spinal manipulation methods.

7.2.1.1 The history of Wilhelm Reich

Wilhelm Reich was born on 24 March, 1897 in rural Austria. After graduating from the University of Vienna's medical school he became Sigmund Freud's assistant and contributed significantly to the development of psychoanalysis. During the 1930s he severed ties with Freud and started expounding controversial theories, as well as pioneering work in trying to relate neurosis to its physiological basis, in Oslo. Reich believed that a person's neurotic

responses were indicated in his entire behaviour, including his characteristic muscular expressions and posture, which he termed "muscular armouring", and his character analysis was directed towards identifying and eliminating this. In 1939 he moved to the United States of America where he lectured and did research in New York City, discovered orgone energy and died in a Pennsylvania penitentiary in 1957, misunderstood and misinterpreted. Reich stated before his death that the world of his day was not ready for his work. He was dismissed as fanciful and pathetic by the scientific community of his time, but nevertheless attracted a number of enthusiastic supporters and his influence has proved to be considerable and largely underestimated (Boadella, 1985; Graham, 1990; Katchmer, 1993; Mann & Hoffman, 1990; Wilson, 1982).

7.2.1.2 Reich's theories and methods

Freud's ideas and methods were germinal to the development of Reich's mind and thoughts and had a profound influence on him throughout his life, although he deviated from Freud's movement early in his career and followed pathways in direct conflict with those of the psychoanalytic society. Reich's career started as a psychoanalyst and he enthusiastically contributed much to the development and expansion of this therapy. He soon began to evolve his own controversial techniques which were contrary to psychoanalysis as approved by the international organisations of the day, and he eventually severed ties with them (Boadella, 1985; Graham, 1990; Katchmer, 1993; Mann & Hoffman, 1990; Wilson, 1982).

7.2.1.2.1 Reich's character analysis

Originally Reich's reputation was built on the fact that he was a skilful psychotherapist with a method of attacking neurosis that was more positive, direct and a great deal quicker than psychoanalysis. This was called "character analysis" and was in contrast to symptom analysis of psychoanalytic treatments. According to Reich, neurosis was due to deep-seated inhibitions or resistances.

For the therapist to break down the resistances, he needed the patient's full cooperation and had to overcome the initial mistrust of patient towards therapist. The therapist/analyst's job was not to establish a polite, cooperative relationship with the patient, but to prod his tender spots and encourage him to express suffering and rage. Attacking the patient's character defences inevitably led to anger. The patient was made to consider him/herself and view him/herself as he/she was in a totally objective way. This was the first step at breaking down the resistance. The resistance is never straightforward, but exists in layer upon layer, and are memory traces of unpleasant past experience, namely emotional scars. The function of this armour is to protect against further hurt. The effect, however is that of keeping out pleasure while the person cowers inside the armour (Boadella, 1985; Graham, 1990; Katchmer, 1993; Mann & Hoffman, 1990; Wilson, 1982).

Following the character analysis theory came the full evolvement of the concept of "muscular armour" and *"vegetotherapy"*. It was Reich's notion that a neurosis is often accompanied by a rigidity in the muscles. For example, a person suppressing a great deal of anger might develop a rigidity of the back and shoulder muscles and poor circulation in the hands and arms (Boadella, 1985; Graham, 1990; Mann & Hoffman, 1990; Wilson, 1982).

In a therapy session the following happened step by step 1) noticing a person's stiff neck, 2) breaking down his resistance through psychotherapy, 3) finding the stiffness in the neck vanished together with the psychological resistance and 4) resulting in psychosomatic symptoms such as mottled skin, head and neck pains, diarrhoea and accelerated heart beat. This lead Reich to wonder: If release of psychological tensions could cause relaxation of the muscular armour, could the reverse also be true? If the muscular armour could somehow be destroyed, would the tension also vanish? His subsequent work proved him correct (Boadella, 1985; Graham, 1990; Mann & Hoffman, 1990; Wilson, 1982).

7.2.1.2.2 Reich's methods (muscular therapy)

Reich developed new clinical methods designed to pinpoint the resistances. He found that the therapist should be seated in a position so as to watch the patient's face in order to recognize resistance in any of its many forms. This was contrary to the habit of the time which was to face the patient's feet and simply listen to his words (Wilson, 1982).

Reich felt the muscles, for example around the jaw and neck, and finding a tight cord in the neck, would press hard until it hurt. He pinched, pressed, kneaded, jabbed and prodded the muscles all over the body with an unerring instinct for every tight and sore muscle. He was adamant that his treatment was quite different from physiological massage or manipulation since it was necessary to understand the role of each tension in the total armouring of the patient. He was guided by the emotional function of the tensions. If this was not grasped, mechanical pressure on muscle groups had only very superficial effects. Reich's technique was revolutionary and highly controversial because, in psychoanalysis, it was regarded as strictly forbidden to touch the patient. Physical and psychological distance was maintained at all times. He went to the opposite extreme (Boadella, 1985; Graham, 1990; Wilson, 1982).

During a therapy session Reich would encourage the patient to breathe deeply, while rolling the eyes around without moving the head. The eyes looked as far as possible to the side, at each wall in turn. Reich insisted that the first step in overcoming nervous tensions was to learn to breathe deeply, using the stomach and solar plexus as well as the chest. This caused many patients to feel vital and alive and experience a oneness with nature akin to a mystical experience (Graham, 1990).

An indispensable prerequisite for a therapist for whatever method he used, according to Reich, was that he must be in touch with his own sensations and emotions and be able to empathise fully with the patient and to feel in his own

body the effect of a certain restriction. During sessions he would go so far as to imitate the patient's tensions in his own body, not only to feel them himself but to serve as mirror for the patient (Boadella, 1985; Wilson, 1982). Similarly Alexander (1932), observed himself and his actions in mirrors and related these to his perceptions and feelings (section 7.2.4).

Reich used a high degree of patience in making his patient aware of what he had noticed about his bodily tensions. The patient was led to experience and express what had not been discovered. Day after day and week after week he would call the patient's attention to an attitude, a tension, or a facial expression until the patient could sense it and feel what it implied. He was training his patients in self-observation and this played an important part in the cure of repressions (Wilson, 1982).

At the end of a session the patient was instructed to lie on a bed and do a bicycle kick, striking the bed hard with the calves until exhausted.

7.2.1.2.3 Outcomes of Reichian Therapy

After a session with Reich, the patient had a heightened awareness and perception, and all the senses were sharpened. Colours were brighter and objects seen with greater clarity. An increase in energy and vitality was also experienced (Boadella, 1985).

The effectiveness of the treatment came with the infinite patience revealed by Reich in continuing sessions. Patients gradually gave up more and more of their bodily armour, their breathing became much freer and their capacity to surrender to spontaneous and involuntary movements increased greatly. Slowly the various sensations of warmth, prickling in the skin and of shuddering movements in the limbs and trunk would begin to integrate themselves into a convulsive reflex movement of the whole body in which there were a clonic involuntary flexion and extension of the spine. The body as a whole seemed to expand and contract in a pulsatile manner (Boadella, 1985).

Half an hour of Reich's muscular therapy produced a more dramatic effect than six months of usual psychoanalysis (Boadella, 1985; Wilson, 1982). Reichian body work, as practised by his followers, is powerful. It provides quicker, surer access to areas of the unconscious that used to be virtually inaccessible. Profound, convulsive emotional releases, and even repressed memories from the earliest periods of life, emerge spontaneously, without special effort, simply as a byproduct of the continuous softening of the resistances. The free-flowing energy that has been liberated pushes into the remaining blocks, further weakening them, and setting in motion a process of spontaneous dissolution of armouring that ultimately reaches down to the deepest levels of biological functioning (Hoff, 1978).

7.2.1.2.4 Comments on Reichian Therapy

Reich's success (some called it brilliance) as therapist was attributed to his total concentration on his patient, along with his patience or tenacity. He apparently never missed the slightest movement, lightest inflection of the voice or smallest change in facial expression. He stubbornly called the patient's attention to an attitude, a tension or a facial expression until the patient could sense it and feel what it implied. This was part of his cure for repressions (Boadella, 1985; Wilson, 1982). In explaining his attitude to, and his methods of research, Reich, when discussing basic attitudes about correctness of one's own assumptions and combatting one's own beliefs, commented (Quoted by Boadella, 1985: 246):

> *So much for the basic attitudes which are essential to work of this kind. Their leading principle is: Believe nothing, convince oneself with one's own eyes, and never lose sight of a fact that has been observed until it has been thoroughly uncovered.*

The technique of observing the subject was later used to a great extent and very effectively by naturalists and anthropomorphologists such as Nikolas Tinbergen

and Konrad Lorenz, as well as best selling authors in the biological field such as Desmond Morris[1] and Lyall Watson[2].

The therapeutic technique of empathising with the patient is current practice in body work therapies (Barlow, 1990; Gelb, 1981; Graham, 1990; Lawson-Wood & Lawson-Wood, 1977; Painter, 1986). By empathising here is meant the careful scrutiny of the reactions of the patient to stimuli.

> *The concept, "functional identity", which I had to introduce, means nothing more than that the muscular attitudes and character attitudes have the same function in the psychic mechanism: They can replace one another and can be influenced by one another. Basically, they cannot be separated. They are identical in their function* (Reich, 1999: 270-271).

Reich had clearly uncovered the holistic principle of mind-body, a principle which today is widely accepted (Graham, 1990). Reich, (1999: 271) explained it in more detail:

> *If the character armour could be expressed through the muscular armour, and vice versa, then the unity of psychic and somatic functioning had been grasped in principle, and could be influenced in a practical way. From that time on, I was able to make practical use of this unity whenever necessary. If a character inhibition did not respond to psychic influencing, I resorted to the corresponding somatic attitude. Conversely, if I had difficulty in getting at a disturbing somatic attitude, I worked*

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[1] Desmond Morris is well-known for his books on human and animal behaviour, such as *The Naked Ape*, *The Human Zoo, Manwatching, Horsewatching and Dogwatching*.

[2] Lyall Watson looks at life from a biological perspective and has gained popularity by means of books such as *Supernature, The Romeo Error, The Lightning Bird, The Nature of Things*.

> *on the expression in the patient's character and was able to loosen it.*

Reich was thus able to bypass the psychological games of his patients and directly attack the basis of the dysfunction by treating the tenseness of the musculature (Katchmer, 1993). Massage therapists are today very aware of the effectiveness of this approach.

Releasing the body muscular tensions with resulting pulsating movements of the musculature, for which Reich was ridiculed for comparing it to jellyfish, was given credence two decades later when Dart (1946, 1947) used crawling movements in adults to rectify childhood deficiencies. Dart (1946, 1947, 1950) had no problems comparing human and animal movements, and based his theories and therapies on the evolutionary development of the human species. This aspect of Dart's approach to posture was discussed in Chapter 3, section 3.3.2.8, and will be further discussed in section 7.2.5.2 of this chapter.

Bioenergy (from the Greek: life force) is the term adopted in latter years for the somatic aspect of Reich's concept of orgone energy - the cosmic energy present everywhere. Reich showed that physical and psychological help is possible only when this energy flows freely in the body. The overall pattern of defensive body armouring was called character armouring (Reich, 1999; Whitfield, 1979). Character armouring is described by Reich (1999: 7-8) thus:

> *The character structure of modern man, who reproduces a six-thousand-year-old patriarchal authoritarian culture, is typified by characterological armouring against his inner nature and against the social misery which surrounds him. This characterological armouring is the basis of isolation, indigence, craving for authority, fear of responsibility, mystic longing, sexual misery, and neurologically impotent rebelliousness, as well as pathological tolerance. Man has alienated himself from, and has*

> *grown hostile toward, life. This alienation is not of a biological but of a socio-economic origin. It is not found in the stages of human history prior to the development of patriarchy.*

The physicist, Alan Wolf (1987) noted that Reich was probably the first psychologist to realize that muscular contractions and consciousness could lead to malfunctioning and inappropriate tiredness. Wolf (1987: 32) explained the validity of Reich's theories and techniques according to current knowledge:

> *Reich would not have been aware that his concept of bio-energy was a real electrical discharge carried by calcium ions. Calcium mediates the contraction and relaxation of all muscles. We now know that when a muscle contracts, calcium ions bathe the sarcomeres causing the contraction to occur and therefore, the bio-energetic discharge Reich referred to, was the outflow of calcium ions from the regions of the sarcomeres.*

All muscles at rest give off heat at a low and constant rate (resting heat). When a muscle is stimulated to contract, a relatively larger amount of heat is given off (initial heat). When the muscle relaxes again, another bout of heat production takes place (recovery heat) and this is a measure of the electrical processes during the outflow of calcium ions and the recovery of ATP from ADP through the process of oxidation (Wolf, 1987).

Muscle under constant tension produces more heat and warm spots on the body indicate tension in those areas. The hotter muscles tire faster than the surrounding relaxed muscle tissue and need more food input. The tension is fuelled at the expense of energy needed for useful work by other muscles. In this way, by keeping muscle cells hot, consciousness is able to hold body memories as a defensive measure (Wolf, 1987).

Most people carry some muscular armour as a protection against intrusion, be it mental or physical (Wolf, 1987). For example constant noise or verbal abuse

may lead to the middle-ear muscles remaining contracted, with calcium ions causing the contraction in an attempt to lessen the noise. The problem is that once the muscle is trained to protect, it is not easy to unlearn.

Wolf's (1987) theory was that the body's muscular armour is caused by the mind's altering the probability patterns of calcium production and release in the muscles (as with the quantum wave of probability). Once this armouring effect occurred, and once the muscle learned to continually release calcium from the sarcoplasmic reticulum or maintain its presence in the sarcomeres, the conscious mind no longer plays a role. Thus, the nerve impulses originally responsible for causing the inflow of calcium no longer have the effect of control. The muscle is then an **isolated pocket of consciousness,** unable to respond to the nerve command to relax. The calcium ions simply do not leave. Sometimes it is necessary to relax the muscle by means of repetitive slow and/or rapid passive lengthening, or sometimes in stubborn cases by procedures such as deep massage (Loots, J.M. - personal communication). If these concepts are correct, body armour can, for example, be altered by thought (Wolf, 1987). To the author`s mind, the manipulation of the tripartite movement system, as Reich attempted, could precipitate the following cycle: Mind/thought/brain causes muscle relaxation by means of motor pathways. The same effect can also be obtained in some instances by working with the muscle itself or repositioning a particular body part. The subsequent decrease in muscle tension will then alter the sensory input via the sensory pathways to the brain, which could influence the brain in the same way as the brain had influenced the muscle. A relaxed muscle could thus result in a relaxed mind.

Another of Reich's incredible discoveries, was that of the segmental arrangement of armouring. He realised that, in general, individual muscle blocks do not correspond to an individual muscle or nerve pathway but fall into a segmental arrangement. The segments function transversely, at right angles to the natural longitudinal flow of biological energy. They are like the rings of an earthworm: when the worm is pinched, its rings constrict, choking off and disrupting the natural sinuous flow of longitudinal energy streamings. Like the segmental

arrangement of the spine, autonomic ganglia and intestines, they represent the worm in man (Hoff, 1978).

Reich identified seven major segments of armouring: The ocular (around the eyes), the oral (around the mouth and jaws), the cervical (the neck, throat and shoulders), the thoracic (the upper chest including the arms), the diaphragmatic (around the diaphragm and organs under it), the abdominal (including the large abdominal muscles, lower back muscles and rectum) and the pelvic (including the legs). Each segment is a ring of tension encircling the body and including the underlying internal organs. The relative independence of these segments is shown by the fact that any emotional or bioenergetic activity in one part of a segment will tend to influence its other parts, while the adjacent segments will remain relatively unaffected. If armouring is released in one segment, the adjacent segments will often show signs of increased armouring as a defensive reaction to the pressure of the released energy. Thus it is preferable to start releasing from the head (the topmost segment) and gradually proceed downward. Each step of loosening the armour almost inevitably means the patient will feel some anxiety at the new sensations of physical and emotional freedom that are emerging. For this reason, Reich felt, the armouring had to be broken down slowly, over a series of sessions, typically taking place over several months (Hoff, 1978; Mann & Hoffman, 1990).

7.2.2 Alexander Lowen and the concept of bioenergetics

Alexander Lowen, a pupil of Reich from 1940 to 1953, developed Bioenergetic Analysis as a systematic methodology for dealing with the relationship between somatic functioning and psychological trauma. He established the Institute of Bioenergetic Analysis in the United States of America in 1956 and since then it has been developed throughout Europe and elsewhere (Graham, 1990; Lowen, 1994; Whitfield, 1979). He was also a prolific writer on the subject with titles such as: *Physical Dynamics of Character Structure* (1958) which was later reprinted as *The Language of the Body, Love and Orgasm,* (1965), *The Betrayal*

of the Body (1967), and *Bioenergetics* (1975) (dates of publication given here are the original, and not those of the copies used in the present study).

The aim of bioenergetics is the healthy integration of the body and mind through breathing, relaxing character structures and grounding (Graham, 1990).

> *Bioenergetics is a therapeutic technique to help a person get back together with his body and to help him enjoy to the fullest degree possible the life of the body* (Lowen, 1994: 43).

The emphasis on the body includes the basic functions of breathing, moving, feeling and self-expression:

> *A person who doesn't breathe deeply reduces the life of his body. If he doesn't move freely, he restricts the life of his body. If he doesn't feel fully, he narrows the life of his body. And if his self-expression is constricted, he limits the life of his body* (Lowen, 1994: 43).

> *The goal of bioenergetics is to help people regain their primary nature, which is the condition of being free, the state of being graceful and the quality of being beautiful. Freedom, grace and beauty are the natural attributes of every animal organism. Freedom is the absence of inner restraint to the flow of feeling, grace is the expression of this flow in movement, while beauty is a manifestation of the inner harmony such a flow engenders. They denote a healthy body and also, therefore, a healthy mind* (Lowen, 1994: 43-44).

> *Bioenergetics is an adventure in self-discovery. It differs from similar explorations into the nature of the self by attempting to understand the human personality in terms of the human body* (Lowen, 1994: 44).

> *My position is that the energetic processes of the body determine what goes on in the mind just as they determine what goes on in the body* (Lowen, 1994: 44).

7.2.2.1 Lowen's methods

Lowen was both trained and treated by Reich, whom he held in the highest regard, and his methods were an outflow of this association. Some of his methods and views resemble those of Reich closely, while others seem like a natural progression of some aspects of the Reichian methods (Lowen, 1994).

7.2.2.1.1 The concept of practical empathy

Empathy of the therapist with a patient/client by duplicating his body expression was an aspect of therapy with which Lowen was in complete agreement with Reich. Like Reich, Lowen (1994) suggested that the therapist "feels" the patient's emotion at a certain point by mimicking his expression to experience what the attitude signifies. For example, lifting the brows and raising the shoulders in the same way as the patient, causes the therapist to perceive that he/she has adopted an expression of fear.

7.2.2.1.2 The basis of bioenergetics

One aspect on which Lowen (1994) levelled criticism against Reich, was the question of what should be done after cessation of therapy. Lowen (1994) maintained that Reich never considered this question. Lowen (1994) himself found the solution in his "bioenergetic" exercises, developed to promote the effects of his therapy sessions. These exercises were prescribed to be followed as a regular routine at home.

Lowen (1994) was impressed with Eastern methods and the fact that they recognized the importance of some programme of bodily exercise as being

essential to spiritual development. He found a similarity between Reichian Therapy and yoga, both systems placing the main emphasis on the importance of breathing. The difference between the two schools of thought was in their direction. In Yoga the direction is inward, toward spiritual development, whereas in Reichian Therapy it is outward, towards creativity and joy. Lowen (1969, 1971, 1975, 1994) considered bioenergetics to be a reconciliation between the two views, an integration of both Eastern and Western attitude. Some of the principles of his physical exercises - grounding, the fundamental stress position and character structure - are next discussed in sections 7.2.2.1.2.1 and 7.2.2.1.2.2.

7.2.2.1.2.1 Grounding

Grounding is a concept unique to bioenergetics. Lowen developed this concept slowly over the years as he perceived that all patients lacked a sense of having their feet planted firmly on the ground and consequently being out of touch with reality. Grounding means getting a person down to solid ground, establishing adequate contact with the ground, making a feeling and energetic contact and, according to bioenergetics, is the opposite of being hung up. Lowen developed a basic exercise to help people to become more grounded. He called it the arch or the bow and referred to it as the *fundamental stress position*. Later on he used the various ways in which this position is executed by different individuals to identify personality types and to prove the intimate relationship between the body and the personality (Lowen, 1969, 1994).

7.2.2.1.2.2 The fundamental stress position

A person pushes his knuckles into the small of his back and leans backwards as far as possible. The knees are fully flexed, the feet flat on the ground, the line from the heels to the back of the head forms a perfect arc, the head and trunk are centred, the breathing is abdominal and relaxed and the person is comfortable. A line superimposed on the profile of the whole body should form

an arc. The correct position has the centre point of the shoulders directly above the centre point of the feet and the line joining these points is almost a perfect arc passing through the central point of the hip joint (see Figure 7.2). The use of this position was based on the principle that the body functions like a bow in many activities where it arcs backward to gain impetus for a forward thrust such as seen when a tennis player serves a ball, or a woodcutter swings an axe. After using this exercise therapeutically for decades, Lowen (1994) discovered that it is also a basic position used during Tai Chi Chuan exercises (Lowen, 1969, 1994).

When the body functions like a bow, its lower end is anchored to the ground through the feet, while the upper end is stabilized by the muscles of the back of the neck which hold the head firm. To Lowen (1969) this signified that an individual is moored to reality at both ends of his body, below through his contact with the ground and above through his ego.

Lowen (1994) stressed that the positions were not exercises, and if done mechanically would lead nowhere. If used to gain feeling in the body, they are simple and effective. No time limits were involved.

7.2.2.1.2.3 The bow and character structure

Various body disturbances prevent people from being able to form the perfect arc. They are listed below with their associated personality types.

1) Overall body rigidity

The line joining the shoulder midpoint and the foot midpoint is a straight line. The legs are inflexible, the ankles cannot be fully flexed, tension in the lower back prevents arcing and the pelvis is slightly retracted. Overall body rigidity is associated with an inflexible personality/body type.

Fig. 7.2 The fundamental stress position (Lowen, 1994).

2) Hyperflexibility

In this case the body bends too much, denoting weakness in the back muscles. The lower back does not support the body, thus support comes from the abdominal muscles which are overcontracted and the pelvis is pushed too far forward. A hyperflexible body is associated with too pliable a personality type.

3) Break in the bow line

This happens due to a severe retraction of the pelvis. If the pelvis is pushed forward, the knees straighten and can only be bent by pulling the buttocks back. There is marked tension in the lower back and along the back of the legs.

When viewing the body in the bow position from the front, a splitting of the body segments is sometimes clear. The major parts of the body, the head and neck, the trunk, and the legs, simply do not line up. The head and neck are angled off to the right or left. The trunk is angled off in the opposite direction and the legs are also angled opposite to the trunk. These angulations represent a fragmentation of the integrity of the personality typical of a schizoid personality.

7.2.2.2 Physical characteristics and character structure

Character structure is important for the understanding of various character types. No person is a single type - the majority of people have all types present, each manifest under a given set of conditions. One or two may predominate but nobody is likely to be altogether free of them (Proto, 1989; Whitfield, 1979). Lowen (1969, 1971, 1994) identified major character structures in bioenergetics, each with its identifiable physical and emotional component.

7.2.2.2.1 The rigid character

Stiffening produces rigidity, both physically and emotionally, and this group is marked by the inflexibility of the ego structure. The rigid structure is characterized by the muscular pattern of protecting (holding back against exposing) the heart against further heartbreak. He has a need to be in control of his emotions. During unfavourable conditions, the rigid character tenses further but maintains contact, contrary to the oral character who withdraws from reality. Because of the rigidity, motility is decreased and the individual has feelings of lifelessness but not of inner emptiness. This character shows a total body rigidity. The back is rigid and unbending, the neck tight and the head held erect. The pelvis is retracted and held tightly (Lowen, 1971; Whitfield, 1979).

The front of the body is hard, as if armoured. Lowen (1971) conjectured that, although the erectness of man exposes his vulnerable belly area, there is no

need for armouring as the freeing of the forelimbs for aggression in the human animal balanced the scales. Dynamically, the tension in the front is produced by pulling back the shoulders and pelvis, thus stretching and contracting the front muscles at the same time. The front and back of the body is thus encased in a rigid sheath and armoured. This armour binds anxiety and a change in character structure may be accomplished by a release of muscle tension. Armouring begins with surface muscles, in contrast with the spasticities associated with oral and masochistic structures. In time the individual may become more rigid, less flexible and the deeper muscles become affected. Loss of elasticity also leads to brittleness.

7.2.2.2.2 The oral character

The oral character is characterized by the muscular pattern of holding on against the dread of abandonment and isolation (Lowen, 1971; Whitfield, 1979).

The oral character tires rapidly when engaged in a continuous physical activity and many of these individuals feel they lack energy. This is only partly due to muscle fatigue as they frequently suffer from low blood pressure and low basal metabolism (Lowen, 1971; Whitfield, 1979).

The chest is generally deflated with a depressed sternum in some. The legs feel weak and tire rapidly during tension and coordination is inadequate. There is a tendency of locking the knees during standing to compensate for the weakness. The feet are weak, often with collapsed arches. The body mass rests on the heels, the spine supports the body since the legs are too weak, the buttocks and pelvis are held forward, the shoulders pulled back and the head thrust forward. The oral character tends to have a sway back. This person seems "disjointed" and the muscular system is underdeveloped compared to the skeletal system (Lowen, 1971; Whitfield, 1979).

Headaches are a common complaint in this character type, probably due to the tensions in the head and neck. They have a strong ring of tension about the

shoulder girdle and at the root of the neck. The scapula is tightly bound to the thorax, the pectoral muscles overdeveloped in the man and in the woman the breasts tend to be large. The longitudinal muscles of the back are very tense, especially between the shoulder blades, at the level of the diaphragmatic crusa and at the insertion into the sacrum. The muscles of the pelvic girdle are tightly contracted. Muscle tension at the front of the body seems absent due to the deflated conditions of the chest and abdomen but the *rectus abdominis* muscle is usually spastic (Lowen, 1971; Whitfield, 1979).

This character type has a marked lack of aggression which Lowen saw reflected in the weak back, usually in the lumbar region, which might also be the cause of the tiredness (Lowen, 1971; Whitfield, 1979).

The need for acceptance and affection is great in the oral character and he does not armour himself either physically or mentally. A high degree of spiritual development, low motor function and lack of muscular development characterize this character type (Lowen, 1971; Whitfield, 1979).

7.2.2.2.3 The masochistic character

The masochistic character is characterized by a muscular pattern of holding in against asserting his rights and needs (Lowen, 1971; Whitfield, 1979).

This person has a muscle-bound condition in his arms and the rest of the body, as well as over-development of the muscles in the thigh. The hamstrings are tense and the arches of the feet are tightly contracted. This limits the contact with the ground and movement (Lowen, 1971, 1994; Whitfield,1979).

Severe muscle tensions are present in the shoulder girdle and the neck is thick and muscular without much rigidity (bull neck). The severe spasticity which shortens the neck is located in the deep seated muscles. Facial movements are limited and the facial expression of the masochistic character type is one of

innocence or naivete. This may take the form of wide-eyed innocence, good natured smiling or an expression of grinning stupidity (Lowen, 1971; Whitfield, 1979).

In the lower half of the body there is a tendency to pull in the belly and raise the pelvic floor (Lowen, 1971; Whitfield,1979).

The muscles overdevelop to hold back negative impulses and to control natural ones. These people have feelings of inner tension and anxiety, but no inner emptiness. Although independent, they have a strong need for approval. There is little aggression. They have overdeveloped musculature but reduced spirituality (Lowen, 1971; Whitfield,1979).

To overcome the severe muscular contractions, movements involving stretch and elongation are required (Lowen, 1971).

7.2.2.2.4 The schizoid character

The schizoid character is characterized by muscular patterns of holding the body together against the dread of falling apart. His behaviour is that of being out of touch with his body (Lowen, 1969, 1971, 1975, 1994; Whitfield, 1979).

The head of the schizoid character never seems to be firmly attached to the neck. It is held at a slight angle and the person's attitude is one of detachment. The head is out of line with the rest of the body. There is a deep tension at the base of the skull and the head is contracted. The scalp across the head is tight; the facial expression gaunt and mask-like and cold with lack of expression in the eyes and thinned lips. The neck muscles have isolated tensions but no generalized rigidity (Lowen, 1969, 1971, 1975, 1994; Whitfield, 1979).

The arms have power but their movements seem mechanical and separate from the stiff, non-participating body. The muscle tensions in the shoulder segment

are deep and based upon the immobility of the scapula (Lowen, 1969, 1971, 1975, 1994; Whitfield, 1979).

The spasticity deep at the base of the skull is reflected in a corresponding block in the small of the back at the junction of pelvis and spine. There is no freedom in the hip joint but a severe immobility of the pelvis. The muscles of the thighs and legs may be flabby or overdeveloped and show a lack of contact with the rest of the body. The metatarsal arch of the foot is weak, the foot is contracted and there is lack of contact with the ground. The joints are stiff, the ankle joint is especially inflexible (frozen). There is an inability to bend the knees fully when the feet are on the ground, and there is a general tendency to stand with locked knees and rigid legs (Lowen, 1969, 1971, 1975, 1994; Whitfield, 1979).

The schizoid character has a specific breathing pattern: the expansion of the chest cavity is accompanied by a contraction of the abdominal cavity. Apparently the diaphragm contracts, inhibiting the downward movement of the lungs. Breathing thus takes place only in the upper part of the chest. The belly is sucked in during inspiration, then pushed out during expiration. Normally, in the average person, the chest and belly tend to make the same movement and there is unity in the respiratory movement (Lowen, 1969, 1971, 1975, 1994; Whitfield, 1979).

An immediate result of the immobility of the diaphragm, is a division of the body into an upper and lower half due to the constriction of the body about the waist. There is thus a lack of unity in the body structure. The various body segments are functionally split off from each other. This, however, is a quantitative phenomenon and the schizoid character shows the splitting only as a tendency. This character structure is willing to make a sincere effort to overcome problems (Lowen, 1969, 1971, 1975, 1994; Whitfield, 1979).

7.2.2.2.5 The psychopathic character

This type of character denies its feelings. It emphasizes control and power, subverting the body striving for pleasure in favour of its 'ego image'. There is a marked displacement of energy towards the head. The upper half of the body is overdeveloped (Katchmer, 1993).

7.2.2.3 Bioenergetics in perspective

Bioenergetics gives a way of rapidly and dynamically analysing character without the use of words. The analysis can be checked or corroborated by the client. Through contact with the body the client can recognize his problem, find a way through to the integration of his body and his mind and thus move to a wholeness of self-understanding and awareness. He may relinquish his physical posture and his dread and find a new way beyond fear to pleasure (Whitfield, 1979). The principle of bioenergetics is a flow of energy that unites head, heart, genitals and feet in one uninterrupted movement. There is a feeling of rightness about it, for the person feels connected, unified and whole (Lowen, 1994).

Lowen (1994) developed a system of whole person therapy that identifies the person with his body, seeing that body as a functional system including the mind and the spirit. The system is an energy system seeking balance. Bioenergetics aims at removing blocks both in the musculature and in the psychic character to increase the energy and realistically and pleasurably discharge it so as to maximize the person's growth, self-expression and consciousness (Katchmer, 1993).

> *The underlying principle of bioenergetics is the simultaneous duality and unity of the human personality. Man is a creative thinker and a feeling animal - and he is just a man or a woman. He is a rational mind and a nonrational body - and he is just a living organism. He must live on all levels at once, and that is no easy task* (Lowen, 1994: 343).

7.2.3 Rolfing (Structural Integration)

Ida Pauline Rolf was born in New York in 1896. She received a Ph.D. in biological chemistry from the College of Physicians and Surgeons of Columbia University and worked at the Rockefeller Institute until the late 1920's. In the 1930's she developed the structural integration technique which was to become known as "Rolfing". According to her biographer and co-worker, Rosemary Feitis (1990), Rolf was much intrigued and influenced by Yoga and incorporated many of these teachings into her ideas. She did, however, also have a thorough knowledge of homeopathy and osteopathy and kept abreast of any new ideas of the time. Hill (1979) and Graham (1990) both alleged that Rolf drew heavily on the work of Reich and Feldenkrais. Consequently Rolfing is not simply a physical massage, but an increasingly deepening technique of freeing the body and also the mind and emotions, from their previous conditioning (Hill, 1979). According to Feitis (1990) Rolf had a gift of understanding basic principles, new and ancient, and the unique capacity to take them a step further, so that they evolved to a place of usefulness for her own day and age. Although Rolfing was developed in the 1930s in the United States, much of its fame was only achieved in the 1960s with the rise of the humanistic growth movement in California. The Rolf Institute in the United States of America draws students from across the world, including South Africa. Fritz Perls, father of the Gestalt therapy, as it is known today, was a frequent visitor to the Institute (Feitis, 1990).

7.2.3.1 Purpose of Rolfing

The aim of Rolfing is to relieve painful conditions, improve general functioning and to contribute to psychological well-being (Rolf, 1977).

> *(Structure)·····is a road map for a way of seeing which has led to the technique called Structural Integration. The system, like its name, underscores the need for patterned order in the human body. It is a physical method for producing better*

> *human functioning by aligning units of the body. Invariably, in matter, appropriate order is more economical of energy than disorder. Therefore, as man becomes more aware of himself as a more patterned structure, he feels himself revitalized. He no longer wastes his vital capital. Comprehensive recognition of human structure includes not only the physical person but also, eventually, the psychological personality - behaviour, attitudes, capacities* (Rolf, 1977: 29).

7.2.3.2 Theory behind the Rolfing technique

Body segments, gravity and fascia are the three areas concentrated on by Rolfers. In this respect Rolf (1977: 30) observed that:

> *Symmetrical, balanced pattern in a man's segmented aggregates of material units allows his lesser field to be reinforced by the greater field (gravitational) of the earth.*

and:

> *Balance reveals the flow of gravitational energy through the body. Asymmetry and randomness betray lack of support by the gravitational field.*

Rolfing is a technique for reordering the body, to bring its major segments - head, shoulders, thorax, pelvis and legs - toward a vertical alignment by means of deep massage and manipulation of body structures (Pierce, 1978). Generally speaking, the Rolfing technique lengthens the body, approaching an ideal in which the left and right sides of the body are more equal in balance, and in which the pelvis approaches horizontal, permitting the mass of the trunk to fall directly over the pelvis; the head rides above the spine, the spinal curves are shallow, and the legs connect vertically to support the bottom of the pelvis (see section 3.4).

> *The vastly greater energy field of the earth's gravitational field can reinforce the smaller organic unit or destroy it, depending on the reciprocal interaction of the two in space.* ***Symmetrical, balanced pattern in a man's segmental aggregate of material units allows his lesser field to be reinforced by the greater field of the earth*** (Rolf, 1977: 30).

Due to man's erect, bipedal stance, his centre of gravity is high, giving him a state of high potential energy. The key to this efficient and graceful relationship to the field of gravity, is a body in which the mass transmission remains close to a vertical central axis. If the body is viewed as a stack of partially independent mass segments, the least energy will be expended in rotational movement when the blocks are stacked directly above one another. This stacking will also result in the highest possible centre of gravity, since the spinal curves will be shallow and the body consequently longer (Pierce, 1978; Rolf, 1977).

When the body's blocks (segments) are shifted in various directions out from the vertical axis and not stacked directly on top of one another, both skeleton and musculature are forced into an inefficient weight-bearing function. Skeletal muscles contract and relax to maintain posture and bring about movement. When they consistently take on the weight-bearing function of bone, their fascial envelopes tend to take on the hard and inelastic quality of bone. Tightness spreads through the fascial network, the body locks up and the joints lose their freedom (Pierce, 1978; Rolf, 1977, 1990). This situation is discussed in the example below.

If the bones of the lower leg are twisted outward and the bone of the thigh is twisted inward (a common appearance), the knee is likely to be unstable and troublesome. The movement of the leg, and thus the whole body, will lack the grace which comes from movement that is appropriate to the structure. Such a movement is not integrated and is labelled "disjointed". There might also be an imbalance between the voluntary musculature of the surface and the deeper,

smaller, slower and more reflexive muscles such as those around the spinal column. Inability to lengthen the spine due to tightened fascia, will tend to diminish the use of the deeper muscles, resulting in a jerky style of movement which is neurologically imbalanced toward cerebral or voluntary control at the expense of the reflexive centres of the spinal cord (Rolf, 1977).

The state of balance or imbalance of the body (the relationship to the field of gravity) is reflected in the emotions, as the emotions are intimately involved with muscle tone. Being in balance is being prepared. Chronic muscle tension causes a permanent shortening of fascial structures leading to an incapability of lengthening. This influences both the way a person moves, as well as the way he feels. The effect is that the range of emotions becomes restricted so that one particular kind of emotion characterizes his response to a wide range of stimuli. The response is influenced by the past which caused reactions followed by imbalances. The programming marks a loss in the ability to respond with full appropriateness to a present situation (Pierce, 1978).

7.2.3.3 Rolfing: The technique

This therapy is essentially a method of very deep massage in which the therapist manipulates the client's body in order to return it to a desired postural and structural position. In so doing imbalances resulting from the armouring process are released and emotional and psychic blockages are discharged. It is not simply a physical massage but a technique for freeing the body, mind and emotions from their conditioning. Energies locked up in physical armour and defence mechanisms are released, prompting insight into the fears and inhibitions which initially provoked these responses (Pierce, 1978).

Rolfing involves loosening and lengthening of specific muscles and fascia of the body, repositioning of muscle fibres and returning them to their natural position (Pierce, 1978).

Loosening of the muscles and fascia leads to a repositioning of the muscle fibres and a migration back to their natural position. As a result, by manipulation of the fascia, the whole body can be radically altered. Granted a freedom of response, the body will naturally revert to its optimum function. Bony malalignments will, when the muscles and fascia have been freed, also resume as far as possible their normal relationships. Rolfing aims to rebuild the body rather than to just superficially alter it (Pierce, 1978).

The lengthening and centring of the body along its vertical axis, along with an increased engagement of the deep musculature, bring about a quieting, a flexible sense of self-possession that tends to replace earlier, restructured responses. This is clearly seen in the carriage of the body (Pierce, 1978).

A course of Rolfing therapy usually entails ten weekly sessions, the first seven of which attempt to remove ingrained stress patterns, postures and habitual responses. The initial session focuses on freeing the thoracic muscles to improve breathing, while at the same time unlocking the hips and loosening the outer fascial layers of the body. The second session concentrates on the feet and ankles. The psychological importance of the feet is to ground the patient and bring him in touch with reality and gravity. The focus of subsequent sessions is on the integration of newly loosened muscles into new patterns of movement by manipulating the layers of fascia in the appropriate directions (Graham, 1990; Hill, 1979; Rolf, 1977).

Rolfing proceeds from the surface of the body towards deeper levels and from the relief of specific local areas of contraction to the reorganization of the relationships between major segments of the body (Pierce, 1978).

7.2.4 The Alexander Technique

> *It is essential that the peoples of civilization should comprehend the value of their inheritance, that outcome of the long process*

> *of evolution which will enable them to govern the uses of their own physical mechanisms. By and through consciousness and the application of a reasoning intelligence, man may rise above the powers of all disease and physical disabilities. This triumph is not to be won in sleep, in trance, in submission, in paralysis, or in anaesthesia, but in a clear, open-eyed, reasoning, deliberate consciousness by mankind, the transcendent inheritance of a conscious mind* (Alexander, quoted by Brennan, 1992: 43).

Frederick Matthias Alexander was born in Tasmania in 1869. He trained as an actor in Melbourne, Australia, and due to problems with his own voice developed a method/therapy to rectify his problem. This later became known as the Alexander technique. He used his method therapeutically from 1894 in Australia and New Zealand and moved to London in 1904. From 1914 he divided his time between London and New York. He wrote four books on his technique; *Man's Supreme Inheritance* in 1910, *Constructive Conscious Control* in 1924, *The Use of the Self* in 1931 and *The Universal Constant in Living* in 1941. He also opened a school for children in 1924, and later a training centre for therapists (which he called teachers). Until his death in 1955 he continued actively to teach, train students, supervise the work of his assistants and develop the technique further. Although not a trained scientist or academic, his research and application of his work adhered to the highest scientific standards and was credited and used by the greatest and most distinguished scientists and philosophers of his time. Examples of these are Raymond Dart, John Dewey, the behavioural physiologist George Coghill, the authors Aldous Huxley and Bernard Shaw, and two Nobel prize laureates, namely Sir Charles Sherrington and Nikolaas Tinbergen. The Alexander Technique generated a large amount of literature and comment (Alexander, 1932, 1941, 1987, 1996; Barker, 1981; Barlow, 1946, 1955, 1956, 1959, 1978, 1990; Bowden, 1965; Brennan, 1992; Dart, 1970; Drake, 1991; Gelb, 1981; Jones, 1965, 1979; Jones & O'Connell, 1958; Jones *et al.*, 1959; Jones *et al.*, 1964; Macdonald, 1998; Robinson &

Fisher, 1998; Sherrington, 1946; Stevens, Bojsen Møller & Soames, 1989). Few therapists/teachers have elicited so much comment, needed a court case to verify his technique, and was used by such prominent personalities (listed above) as Alexander did. Proof of the success of the technique lies in the fact that it is more popular today than in Alexander's own time and teachers, students and training centres are found all over the world (Barlow, 1978, 1990; Graham, 1990; Macdonald, 1998; Stevens, 1979).

7.2.4.1 Theory behind the Alexander Technique

In each of his four books Alexander mainly addressed a central theme. These will give a good background of the development and the nature of Alexander's theories. Each central theme will first be addressed below, followed by a general discussion of his approach.

7.2.4.1.1 Alexander's writings

7.2.4.1.1.1 Man's Supreme Inheritance

In 1910 Alexander published his first book *Man's Supreme Inheritance* (Alexander, 1996), in which he contended that human beings cannot progress satisfactorily in civilization if they remain dependant on instinctive (subconscious) guidance and control. The reason for this state of affairs is that in modern civilization changes have occurred too rapidly for man to adapt, and that in these circumstances instinctive control came to survive its usefulness. Many new instincts were developed in man's quick attempts to meet the new demands of civilization - these proved to be unreliable. This degree of unreliability increased with time.

Sherrington (1946: 89) addressed this issue by observing that a chair unsuited to a child can quickly induce special and bad habits of sitting and of breathing, and also that:

> *·····verbal instruction as to how correct wrong habits of movement and posture is very difficult. The scantiness of our sensory perception of how we do them makes it so.*

According to Alexander (1996) an observant minority early in this century became aware of a gradual, but a most serious deterioration, in the human condition - a deterioration which they perceived to be only physical - a problem which they tried to set right by means of physical exercises. Compared to the unified exercises later proposed by Dart (1946; 1947; 1970), Feldenkrais (1972; 1985) and Hanna, (1988), these physical exercises were construed on mechanistic premises, and by doing so did not take man's inherent holistic way of functioning into account, and nor did they take into account what Alexander (1996) advocated in this book - **the unreliability of sensory appreciation.**

In order to combat misuse of the body Alexander (1996) advocated the use of conscious control in order to eradicate the habits of misuse. Man's ability to pass from subconscious to conscious control is, according to Alexander, "our supreme inheritance". Before conscious control could become a reality, it is necessary to beware of the differences between impulsive reactions and reasoned conceptions. This is why Alexander emphasized the importance of pausing before acting (Alexander, 1932, 1996; Gelb, 1981).

By means of the study on himself Alexander (1932, 1996) came to the conclusion that correction of misuse involved the development of a number of abilities. These were 1) the conscious inhibition of habitual interference with the upright posture, 2) the free control of the motivating factors responsible for the physical misuse of the body, as well as the conscious control of the body into an efficient posture and working state and 3) the maintenance of improved functioning in all activities, especially in unfamiliar circumstances. These abilities are only acquired by means of years of intensive introspection and study of the self as Alexander (1932) did, or by partaking in bodywork programmes as set out in Table 7.1 (Barlow, 1990; Cohen-Nehemia, 1983; Dart, 1947; Feldenkrais,

1972; Gelb, 1981; Hanna, 1988; Pang & Hock, 1984; Pierce, 1978; Plummer, 1982; Putkisto, 1997; Robinson & Fisher, 1998).

Habits involve the deterioration of the muscular sense that makes it difficult to distinguish between appropriate and inappropriate effort. Alexander (1996) early realised early that mind and body form a unity and therefore a habit could never be considered as simply being mental or physical, but should be recognised as a unified response of the whole of the individual.

7.2.4.1.1.2 Constructive Conscious Control of the Individual

In his second book Alexander (1987) considered man's sensory appreciation in relation to his evolutionary development, learning and learning to do. He reiterated man's inability to adapt to rapid changes in modern civilization, and that, as a whole modern man lacked the grace and *poise* of our ancestors. He observed, like Sherrington (1946) and Dart (1947) that modern man often displayed poor body use and inability to efficiently change his posture. The only way in which this could be achieved was by increasing sensory awareness. Feldenkrais (1972, 1985) also emphasised the importance of sensory awareness, but his methods of achieving this differed somewhat.

In this book Alexander (1987: 5) explained the terms "end-gaining" and "the means whereby", terms which he introduced in his previous publication:

> *The "end gaining" principle involves a direct procedure on the part of the person endeavouring to gain the desired "end." This direct procedure is associated with dependance on subconscious guidance and control, leading in cases where a condition of mal-co-ordination is present, to an unsatisfactory use of the mechanisms and to an increase in the defects and peculiarities already existing.*

> *The "means-whereby" principle on the other hand, involves a reasoning consideration of the causes and conditions present, and an indirect instead of a direct procedure on the part of the person endeavouring to gain the desired "end." This indirect procedure is that psycho-physical activity, associated with constructive conscious guidance and control and with the consequent satisfactory use of the mechanisms, which establishes the conditions essential to the increasing development of potentialities. Under these conditions defects, peculiarities, and misuse are not likely to be present within the organism.*

Alexander also argued about a crucial issue in the training of individuals, which is that an individual's conception of an idea or an instruction depends on his standard of sensory appreciation. This in the past led - and still does today - to the incorrect assumption that having asked someone to do something, he will be able to do it properly.

Alexander (1987: 181) addressed the issue of happiness arising from the ability to correctly interpret bodily sensations, and used the child as an example:

> *For the psycho-physical processes which precede and accompany the child's desire to acquire a knowledge of the mechanical working of inanimate machinery are the same as those which are called into activity in connexion with the acquisition of the knowledge of the satisfactory use of its own mechanisms. It should be obvious to concerned that in any process of growth of the child or adult, experience in employing the mechanics of the psycho-physical organism should precede all other mechanical experience, and that any experiences gained later in the sphere of inanimate mechanical experimentation would thus be materially increased in value.*

One can recall the expression of interest, happiness, and satisfaction exhibited by the child when one has enabled him to understand for the first time that his unduly stiffened neck with perhaps the head too far pulled back - is really not the fault of his neck at all, but due to the fact that he is trying to do with the muscles of his neck what should be done by other mechanisms.

7.2.4.1.1.3 The Use of the Self

This book has a detailed description of the development of Alexander's technique. During his ten-year study on himself Alexander made some important observations about human behaviour:

- *"Use affects Functioning"* (Barlow, 1990) became one of the underlying principles of the Alexander Technique. Alexander (1932) reiterated his belief in the unity of the human organism, and that if the individual understands the means whereby the use of his mechanisms can be directed in practice as a concerted activity, the principle of unity will work for the good. The reverse side to the picture, however, is that it is the nature of unity **that any change in a part means a change in the whole.** This means that if the concerted use of the tripartite mechanisms of an individual is faulty, any attempt to eradicate this defect by means otherwise than to change and improve this faulty concerted use is bound to throw out the balance somewhere else. This is, according to the present author's opinion one of the key issues which should be addressed by sport coaches and biokineticists working with individuals with known faulty technique(s), posture and poor execution of activities of daily living.

- One of Alexander's major discoveries, was that interference with the free *poise* of the head is followed by interference with the efficient working

of the rest of the body. The dominance of the head in the hierarchy of the body he called the **Primary Control** (Alexander, 1932; Barlow, 1990; Gelb, 1981). This also refers to the relationship between the head, the neck and the back and is the first factor to deal with when unravelling the misuse of a body. The whole issue of primary control will be discussed in detail in section 7.2.5.2.1.

7.2.4.1.1.4 The Universal Constant in Living

The manner of use exerts a "constant" influence over general functioning and reaction. The fact that muscles are constantly used for this, affects our health. He argued that individuals can control and coordinate use of his musculature to the best of his advantage (Alexander, 1941).

Reacting to the "Report of the Physical Education Committee of the British Medical Association", he again pointed out the fallacies and limitations of physical exercise (Alexander, 1941). Here it should be emphasised, however, that Alexander only had issue with the prescription of exercises aimed at the correction of the then perceived physical deficiencies in civilized man and the correction of misuse. Rolf (1977) felt equally strongly about what she termed man's willful ignorance of his own processes which kept mankind in the dark. Much of her criticism was aimed at what was taught in physical education. The assumption in most physical education departments, she felt, was that endless "doing" - callisthenics, acrobatics, gymnastics, violent sports - built good bodies. Orthodox physical-fitness methods, according to Rolf (1977), often fail to take into account that differences in the structures of young people are vitally significant and should be a central determinant in any physical education programme - a programme that failed to differentiate fails, and therefore failed to give effective help.

If correctly designed, however, exercise may be useful in the correction of habitual misuse of the body, while simultaneously serving other purposes such

as muscle strengthening and increase in stamina. These exercises will be discussed in sections 7.3.8.2 and 7.3.8.4. One of these - Pilates' Contrology (Pilates & Miller, 1998) - is now prescribed in conjunction with the Alexander Technique (Robinson & Fisher, 1998).

7.2.4.1.2 Discussion of Alexander's principles

Related to bioenergetic therapies, the Alexander Technique was developed for the improvement of postural and muscular activity. It does not separate mind and body and Alexander observed that every activity, whether physical, mental or spiritual is translated into muscular tension which becomes habitual and distorts thinking, feeling and doing. The technique develops an individual's self-awareness as to how certain activities are performed. It is concerned not with what is being done, but how it is accomplished, and as such demands the same kind of self-awareness as oriental disciplines like Zen, Yoga and Tai Chi Chuan (Graham, 1990).

Alexander maintained that malposture, which he preferred to call *"misuse of the self"*, was the end result of much deeper wrong processes, involving the whole person. He found that people live in almost complete ignorance of the way that they use their bodies. Most people distort the form and impair the working of the whole organism, by bad coordination, muscular overtension and misuse of the parts of the body in their relationship to one another.

7.2.4.1.2.1 The pattern of misuse

Alexander (1932) observed that a general pattern of misuse is found in everybody: Consistently, the muscles of the neck are overcontracted, causing loss of the free *poise* of the head on top of the spine. This leads to overcontraction of some muscles of the trunk and lack of proper tone in the other supporting muscles of the body, resulting in exaggeration of the natural curves of the spine, harmful pressure on the individual vertebrae and on the

joints, coupled with overwork and wrong relationship of the limbs to the trunk. The wrong general principle on which the body is being used, is that of contracting every part of it into the nearest joint, beginning with the contraction of the head towards the trunk. Jull and Janda's (1987) patterns of muscle imbalance are to a large extent comparable to those described by Alexander.

7.2.4.1.2.2 Inhibition

Alexander realised the strength of habit and that little could be changed by *"doing"*. He thus formulated a method of non-doing or inhibition.

The way a person uses his body is the end result of inner patterns found in the nervous system. The moment to control or change the habitual use is the instant when a stimulus to activity reaches the consciousness. Usually, when a stimulus comes, a person reacts to it according to habitual patterns that have been developed from his earliest years, without giving it a thought. Once he recognises his habitual responses, he can inhibit the immediate response and choose another one. Eventually old, wrong inner patterns are replaced by new ones resulting in a coordinated, trouble-free working body (Alexander, 1941; Barlow, 1978).

> *Alexander taught that there is one main field of work for each of us - work on ourselves to gain more light on our unconscious habits - work to use more constantly the one place of freedom we have, the moment of the impact on us of a stimulus, so that we increase the number of moments when we choose our reaction, instead of being driven by habit to react as we have always done in the past. For this we must be there - present and aware, at the crucial moment, to inhibit before we react* (Barlow, 1978: 25).

7.2.4.1.3 Alexander's methods

The mainspring of Alexander's life's work, was the development of consciousness and awareness in the individual.

> *Alexander used to say, "Everyone must do the* ***real*** *work for them-selves. The teacher can show the way, but cannot get inside the pupil's brain and control his reactions for him. Each person must apply it for himself"* (Barlow, 1978: 23).

The uniqueness of the Alexander method lies in the fact that it does not treat, but teaches instead. The method of teaching relies on verbal instructions only to a limited extent. The main component of an Alexander lesson, is the instructions given by the touch and pressure of the hands of the teacher on the pupil. The pupil allows himself to be consciously guided by the hands of the teacher to experience the sensation of good use of the body and good posture. Only individual classes are given, the teacher concentrating entirely on a single pupil at a time. The method does not include exercises or massage - it is a very gentle method.

A course of 10 to 30 Alexander lessons is usually recommended. During a lesson, the teacher guides a part of the pupil's body in a specific direction while the pupil is asked to think in that direction, while inhibiting his habitual responses. This allows the teacher to detect tensions in the pupil's body when he is ready to perform an action, to make him aware of the tensions and to give him the experience of performing an act effortlessly, smoothly and tension-free. Eventually the patient/pupil becomes willing to let go of deep-seated and unconscious tension patterns. This tension release is often accompanied by an emotional release and the premise of the Alexander Technique is that a balanced body leads to a balanced mind. The Alexander principle is psychophysical and it stresses the mental and emotional benefits that follow a course of lessons (Barlow, 1990).

During Alexander lessons the pupil/patient is made aware of a way in which the body can be used efficiently. It is then up to the pupil/patient to use the knowledge and training in his daily tasks.

7.2.4.1.4 Consequences of lessons in the Alexander Technique

The subject becomes aware of tensions in joints when executing certain tasks and is able to inhibit (stop) the tension-causing message, thus freeing the joint. The task can be completed in a smooth manner without unnecessary energy expenditure (Barlow, 1990; Brennan, 1992; Drake, 1991; Macdonald, 1998).

The *"becoming aware"* on a physical level can be transposed to the psychological level where the first step in handling a problem is to be made aware of it (habits of the mind are as stubborn as habits of the physical body). This however does not solve the problem, but the subsequent inhibition of habitual reactions may well eliminate it eventually (Barlow, 1990; McCullough, 1995).

Having learnt to "inhibit" harmful habits and uses of the body, a person stops interfering with himself and allows his full potential to develop (Barlow, 1990; Brennan, 1992; Drake, 1991; Macdonald, 1998).

The effect of a lesson is to experience lightness and ease within the body as well as a sense of being generally more in touch with the body. Calmness and clarity of thought are benefits of an Alexander lesson (Barlow, 1990; Brennan, 1992; Drake, 1991; Macdonald, 1998).

As is the case with other body-mind therapies, suppressed emotions such as sadness and anger may emerge. However, it is generally the positive emotions, such as happiness, joy, contentment, freedom that have been repressed which are released by an Alexander lesson (Brennan, 1992).

An Alexander lesson may be a Western way of achieving the Eastern ideal of movement. When writing about Iron Shirt Chi Kung I, Goss (1986: 221) stated:

> *In order for full movement potential to be possible, the body must spontaneously return to its "center" of relaxed alignment after movement. This is the relaxed "idling" position that is most unblocked and energetically economical, and out of which movement flows.*

This is also what Alexander (1932, 1987) was striving for.

7.2.5 Raymond Dart and the attainment of *poise*

7.2.5.1 Raymond Dart - a brief biography

Raymond Arthur Dart (1893-1985) was an Australian by birth, where he obtained his MD degree in 1917. From Australia he went to the University College, London, England. He then moved to South Africa where he contributed largely to the building up of the young Medical School at the University of the Witwatersrand in Johannesburg. There he filled the Chair of Anatomy for no less than 36 years up to his retirement in 1958. Concurrently with this, for 18 of those years, he also took on the Deanship of the Faculty of Medicine (Tobias, 1982).

It was, however, chiefly as a physical- and paleo-anthropologist that Dart achieved a secured place among the great scientists of this century. He was to make one of the most seminal offerings to our understanding of the origins of man. This started when Dart published the first account of the skull of a fossil child - the first of the small-brained hominids to be found (Tobias, 1982).

In 1943 he was introduced to the Alexander technique (Dart, 1970), and the writings of Alexander, which greatly influenced his thoughts when he wrote his

papers on *poise* and the double spiral arrangement of the skeletal musculature (Tobias, 1982).

Dart felt that in a society where malposture is endemic, *poise* can be regained through careful study of oneself (Dart, 1946; 1947; 1970). He developed a series of posture improving exercises (postures), using as basis his considerable knowledge of neurophysiology, phylogeny and ontogeny (Dart, 1946, 1947, 1970).

Since Dart was greatly influenced by Alexander one finds a great similarity in their basic theories. Dart differed from Alexander, in one respect, in that he formulated a series of postures based on paleo-anthropological evidence and the motor development of the infant and child, in order to teach the individual the balanced state, while Alexander preferred to teach the pupil correct alignment and use of his/her body by using his hands and voice.

Proponents of the Alexander Technique make use of Dart's postures to a large extent (Brennan, 1992; Drake, 1991; Macdonald, 1998). The basic concepts developed by Dart (1946, 1947, 1970) are discussed in the next section.

7.2.5.2 Dart's basic concepts

- Malposture is pandemic in urbanised and industrialised communities (Dart, 1947).

- *Poise* is a state of balance, something which can be attained by means of careful education of the body (Dart, 1947).

- In the attainment of *poise*, Dart (1947) echoed the sentiments of Alexander (1996) and Feldenkrais (1972) that consciousness should be allowed to play its proper part. For this, the individual should have an interest in his acts (Dart, 1947). Dart (1947: 79) blamed a lot of our bodily ills on:

> *·····the attitude of neglecting or despising the body, as though it were beneath contempt, or of hating and even maltreating it, as though it were vile and foreign to its indwelling spirit.*

From a psychological point of view Reich (1975: 374) summed up man's lack of consciousness about himself as follows:

> *To dissociate himself from the animal kingdom, the human animal denied and finally ceased to perceive the senses of his organs; in this process he became biologically rigid.*

- The head is the prime mover and the position of the head in relation to the neck and the rest of the body, plays a predominant part (Dart, 1946; 1947 1951, 1970). He thus also saw the position of the head as the primary control; an approach which probably stemmed from his intimate knowledge of the work of Alexander (1932), Coghill (1929), Magnus (1926a,b), as well as his intimate knowledge of the development of the nervous system in the head, neck and shoulder area (Dart, 1946). This explains his firm belief that in every action the head should be the prime mover:

  > *But directly or indirectly every sort of bodily movement and skill illustrates the same principle: if the head containing the balancing organs is not the prime mover, if it is incorrectly placed and maintained for equilibrated execution of the movements planned, the movements will be unbalanced and in brief, caricatures of what those movements should be* (Dart, 1946: 11).

- The body is suspended in an upright position, from the base of the skull by two sheets of spirally arranged muscles (Dart, 1946, 1947, 1951). Marking the spirals on the surface of the body, they would run latero-

medially upwards from each anterior iliac spine across the front of the body and around the back of the neck to the mastoid processes (see Figure 3.9). Bodily rotation, resulting from synergy and antagony of flexors and extensors, is the fundamental character of all voluntary movement. Asymmetry results from fixed postural twists due to imbalances in the tensions of the flexors and extensors. The solution to this problem is twofold; firstly factors producing asymmetry should be inhibited and secondly the body should be derotated (Dart, 1946, 1947).

7.2.5.3 Dart's postures to attain *poise*

Dart (1946, 1947, 1970) developed a series of exercises in which the individual is taken through the various phylogenetic and ontogenetic steps man has taken in order to come upright. These exercises require the individual to assume a series of postures, starting with the infantile supine and primary crawling postures. Each posture should be adopted and studied for an extended period. These postures serve as an educational process in the study of body mechanics, with the aim that of the attainment of *poise*. The postures follow man's evolutionary history, and are also found in the development of the supine newborn and further development to the upright stance. A given posture should be maintained and studied for 15-20 minutes. The postures and the order in which they are to be executed by the individual are discussed in the following paragraphs:

- The infantile supine posture

The subject reclines in a supine position on a carpeted floor, head on books (60-90 millimetres thick), feet on the floor, knees bent without muscular strain, elbows on floor and hands resting on the junction of thorax and abdomen.

This is the basic, safe, rest position which induces a gradual relaxation of the *sacrospinalis* and all the extensor musculature of the body as well as a

temporary release from their inevitable state of torsional strain. An example is an untwisting between the scapulae and occiput. At the same time seven areas of the body are trained to share the body weight in an equilibrated way. These areas are: Occiput, scapulae, hip bones and feet and the supine body on a resistant base, allow exteroceptive sensual discrimination to be experienced. Long term persistence of the procedure produces widespread effects in derotating (refer to Chapter 3, section 3.3.2.8), and improving the equilibrium of the body, as well as bringing the head into a more appropriate relationship to the neck (Dart, 1946, 1947, 1970).

Feldenkrais (1985) elaborated on this exercise by including lifting of the head. This makes sense in ontogenetic terms, where lifting of the head is the first movement to follow the supine position of the infant. The purpose of the exercise is to educate the extensor muscles of the neck in inhibition. In correct control, contraction of the anterior neck muscles would reflectively reduce contraction in the dorsal neck muscles (inhibition) - muscles that in muscle imbalance, for example, oppose the lifting of the head. In faulty control the front muscles have to use force in order to bring the head into the desired position, while the dorsal neck muscles, which continue to contract, are stretched. The neck extensors (back) are voluntary muscles and their habitually maintained contraction goes beyond the inhibitory control. Maintaining the head raised for 30 seconds reduces the contraction of the extensors and enables them to lengthen, while the work done by the flexors decreases and the weight of the head is borne by the cervical vertebrae. This exercise brings about an awareness of the actions being performed, and the ability to command only the one for which there is motivation, thus a monomotivated act. Awareness of habitual acts which are parasitic and unwanted also takes place.

Hanna (1988) used the same exercise but added arching and flattening of the back. The abdominal muscle contracts as the lower back is flattened. The emotions of fear and apprehension also cause the abdominal muscle to contract and this exercise teaches the rudiments of controlling the withdrawal reflex.

❑ The primary crawling posture

The subject rests on the forehead, elbows and knees for 15-20 minutes subsequent to the rotational and relaxing influences effected by the previous supine posture.

This prone posture is the reverse of the previous position and is also devoid of fear being the crawling variety of the foetal posture. It approximates the primary mammalian posture, and has the direct effect of evoking the ancestral postural mass-reflexes of the body (Dart, 1946, 1947, 1970).

Dart (1946, 1947, 1970) placed great value on the crawling posture. In this posture correlational movements of the head and eyes are cultivated. These are important for maintaining equilibrium in the upright position. At the same time the extended head is freed from torsional and gravitational forces. He was, however, not unique in his use of crawling. Schrecker (1971) also appreciated the role of crawling in childhood development, and as an exercise in restoring a good posture. The prone position allows the trunk muscles to relax and the spine to extend so that the intervertebral discs expand and become more pliable. The exercise is recommended for symmetrical deformities of the spine. It achieves mobility of the spine and straightens the upper back. The exercise is also beneficial in correcting the position of the pelvis (Christaldi & Mueller, 1963).

Barker (1985: 78) made some interesting comments pertaining to the above, which may probably be construed as sexist:

> *The last fifty years have seen the disappearance of two activities, which did so much to maintain good posture in women, namely praying and scrubbing. Praying was an excellent exercise for the lower back and the buttocks, particularly if the arms were unsupported. Scrubbing the floors exercised the whole of the back, but particularly the upper back.*

❑ The prone posture (forehead-dorsum of hand-dorsum of foot)

From the supine position the subject turns over into the fully prone position with the arms down the sides, back of each hand and foot on the floor, book beneath the sternum and forehead resting on the floor.

This is the first and safest ancestral position for a terrestrial vertebrate. The subject can thus fearlessly, at a later date, execute synchronous movements of the upper and lower limbs or roll over slowly.

A similar postural exercise was devised by Denniston (1938) for the re-education and reconditioning of the neuromuscular pathways: The subject lies prone with the arms extended to the side in line with the shoulders and lifted from the floor. Thus he learns the feeling of contractions in the middle *trapezei* and *rhomboidei* for the replacement of his forward shoulders. She asserted that the mind is reflected in posture and feeling the correct posture is necessary for the improvement of posture. Placing of the subject's hand on a tight muscle and feeling it softening is also beneficial.

The forehead resting on the floor gives the frontal or forehead portions of the trigeminal nerves a chance of establishing mutual understandings with the vestibular (balancing) nerves (Dart, 1970).

This posture can also follow the primary crawling posture: as the supporting capacity of the elbows and knees improves, the distances may be increased until the body subsides with completely extended limbs into the completely prone position (Dart, 1946).

❑ The amphibian posture

From another angle, the prone posture produces the primary crawling posture by limb flexion. Further flexion produces the heel-haunch posture, the ventigrade

or amphibian posture. Frog position. This posture provides exercises for levering the limbs upon the joints of the shoulders and hips, the spinal column and the joints of the ankle and wrist (Dart, 1947).

Dart (1946) considered the crawling posture as being a primary posture from where could be proceeded to the initial pronograde posture, or reverted to the ancestral ventigrade posture.

❑ The initial pronograde posture (forehead-palm-sole posture)

This is a foetal crouch on dorsi-flexed toes. Recoiling from this position onto the soles of the feet while knuckles support the body anteriorly, brings the body to the squatting posture in an equilibrated way. From the squatting position developed the erect position and mastering the squatting position is today still a prerequisite for a poised erect posture. Dart (1946) called this a natural evolution.

❑ The primate primate pronograde posture

The initial pronograde posture may evoke the desire to take the body mass principally upon the hypothenar eminences and medial borders of the hands, and the outer ball and lateral borders of the feet (Dart, 1947). Since the hands tend to assume a grasping attitude in this posture, this natural tendency could be exploited to strengthen this function by using objects such as pieces of hosepipe to form hand grips (Dart, 1947). The natural tendency to supinate the feet in this posture, could also be exploited to promote proper foot mechanics to the individual with abnormal pronation (flatfoot).

❑ The anthropoid pronograde posture

The primate pronograde posture may evolve naturally into the chimpanzoid posture, a posture in which the body mass is transferred from the hypothenar

eminences and medial borders of the hands on to the ends of the fifth and fourth metacarpal knuckles (Dart, 1947).

Mass bearing upon metacarpal knuckles is an essential exercise for the development of flexibility, and digital skills necessary in all arts and crafts, where finger flexibility and digital skill is of utmost importance (Dart, 1947).

❑ The humanoid orthograde posture

With time, the repetition of the humanoid ontogeny, it becomes possible for the dorsum of the wrist, the proximal and distal rows of phalangeal knuckles, and eventually the finger tips to take up in succession their mass bearing functions and the body mass to be transferred from the hands to the feet.

Intermediary to full uprightness is the crouched, semi-erect or humanoid orthograde posture, still found in the Kalahari Bushman - a posture which can broadly be compared to Howorth's (1946) dynamic posture (Chapter 2, section 2.1.2). The human child elevates himself from the ground with the aid of any handy structure into this posture, not for the purpose of tree-climbing, but to rock and balance himself upon his lower limbs, and of eventually fully extending his upper limbs as equilibrating organs (Dart, 1947). Those involved in the Alexander principle refers to this as the posture of maximum mechanical advantage (Barlow, 1990) (Chapter 2, section 2.1.2).

These exercises portray postural ontogeny and although seemingly simple, experiencing each of these phases demonstrates their complexity.

When executing the postures advocated by Dart (1946, 1947, 1970) maintaining regular breathing throughout the exercises is important. The postures take the body systematically through the stages of phylogeny and cause the experience thereof and the use of joints in weight bearing for which they were developed and have subsequently fallen into misuse or uselessness, such as the knuckles

and scapulae. The postures also assist in derotation of the skeletal muscles which surround the body in a double spiral arrangement (Chapter 3, section 3.3.2.8).

The Mitzvah Exercise (Cohen-Nehemia & Clinch, 1982), which will be described in Chapter 8 (section 8.5.2.1.2), also follows a developmental pattern, but is reminiscent of ontogeny. The lowered head and rounded back mimic the foetal position with the primary rounded curve of the spine in evidence. The spine then flattens (infant sitting position) before taking on the secondary curve of the adult upright position.

The rationale behind these types of exercises and positions is that experiencing the heritage strengthens correct development.

7.2.6 The Feldenkrais Method

Moshe Feldenkrais was a Russian-born Israeli, who received his D.Sc in physics at the Sorbonne. He became an internationally known physicist and engineer. He worked on atomic research in France, and during the second World War moved to England. He was an expert in judo and soccer. An old injury, which incapacitated him, left him with little hope to ever walk normally again. Feldenkrais then applied his extensive knowledge of anatomy, physiology, psychology, physics and martial arts to restore his own normal functioning. He then became a teacher of his method, and also wrote books such as *Awareness through Movement* (1972) and *The Potent Self* (1985) (The Feldenkrais Guild, U.K., ND). From his writings Plummer (1982) concluded that Feldenkrais could have developed his ideas from Reich, while Graham (1990) was of the opinion that the Feldenkrais exercises were in many ways similar to *Curative Eurythmy,* exercises developed by Rudolph Steiner, the originator of Anthroposophic Medicine for the treatment of energy imbalance. The Feldenkrais technique is difficult to follow, requires great concentration and may be time consuming (Plummer, 1982). Exercises, called *Somatics*, which were developed from

Feldenkrais' method by Hanna (1988) are, however, easy to follow and to implement and may be used by biokineticists and sport coaches alike.

7.2.6.1 Theory behind the Feldenkrais Method

There are great similarities in the theories underlying the Feldenkrais Method and those of Alexander and Dart (Alexander, 1932, 1987; Barlow, 1990; Dart, 1946, 1947; Macdonald, 1998), Lowen (1994) and Rolf (1977). The similarity in approach to Alexander, makes one wonder if Feldenkrais was not extensively aware of, and influenced by the writings and methods of Alexander. In fact a hands on approach, similar in some ways to that of Alexander (Barlow, 1990; Gelb, 1981) also forms part of the Feldenkrais Method (Rywerant, 1983).

Feldenkrais (1985) was deeply convinced of the existence of deep-seated patterns of emotionally evoked postures, as was Cailliet (1995), and the importance of improving the individual's self-image in order to bring about physical improvement and spontaneity in movement (Feldenkrais, 1972, 1985).

In accordance with Reich (Boadella, 1985; Mann & Hoffman, 1990) and Lowen (1969, 1971, 1975, 1994), Feldenkrais (1985) was of the opinion that repeated emotional upheavals in young children cause the child to adopt attitudes that ensure safety. This then leads to contraction of the flexor muscles, inhibiting extensor tone, the typical startle pattern described by Jones *et al.* (1964). An analogy of this is the reaction of animals, when they are frightened they react by violent contraction of all flexor muscles, thus inhibiting the extensor musculature, a reaction which prevents forward locomotion. In the newborn a similar reaction is elicited by the fear of falling. The attitude of a child exposed to repeated emotional stresses is that of flexion and the concurrent relaxation of the extensors. The physical outcome of all this is a posture in which there is flexing at the hips and spine with a forward head posture (Cailliet, 1995).

More than a thousand lessons were developed at the Feldenkrais Institute (Feldenkrais, 1972). These lessons were made up of movement exercises which

involve the whole body and its essential activities. These lessons were designed in such a way that a certain number of goals could be met. These are listed below:

- Feldenkrais' exercises were designed to improve physical ability. Feldenkrais (1972) believed in making exercise easy and pleasant, in order for these activities to become part of man's habitual life, and to serve him for the rest of his life.

- Ability and will-power can be counterproductive. There are basically two ways to obtain an objective. If the individual relies too much on will power the ability to strain will be developed, with the individual gradually becoming accustomed to the application of excessive amounts of effort and energy to execute tasks which normally require much less effort. Alexander was also aware of the problem and advocated the use of minimal amount of energy for even the simplest of tasks (Gelb, 1981). Feldenkrais, being a physicist, realised that force not converted into useful movement does not simply disappear, but is dissipated into damage done to bodily structures (Feldenkrais, 1972).

- In order to learn, the individual needs time, attention and discrimination. In order to discriminate the individual must be able to sense. According to Feldenkrais (1972) in order to learn effectively the individual must sharpen his powers of sensing. Feldenkrais (1972, 1985) probably obtained this idea from his experience in Martial arts, in which the ability to distinguish even the slightest touch, is emphasized - in this respect Feldenkrais (1972) was mainly concerned with the use of undue muscular force, something which may prevent improvement.

- The individual should be able to feel the difference between one action and another, and without this ability there can be no learning (Feldenkrais, 1972). One of the main aims of exercises used in the Feldenkrais Method is to reduce the effort involved in the execution of

any movement. More delicate tripatite control is possible only through the increase of sensitivity; through a greater ability to sense differences (Feldenkrais, 1972).

- Like Alexander (1932), Feldenkrais (1972, 1985) became acutely aware of the difficulty of breaking faulty habits of posture and movement. This is so even after the problem has clearly been recognized. Practical experience by the author has shown that verbally instructing individuals to "sit upright" led to all sorts of different "upright" postures and the invariable use of excess muscular force. Apart from the use of heightened sensory awareness, Feldenkrais (1972) was of the opinion that some conscious effort also has to be made by the individual until the adjusted position/movement/effort ceases to feel abnormal and becomes a new habit. Alexander (1932) discovered that in order to bring about adjustment in posture, for example, the directions required for these adjustments should be mentally rehearsed many times before doing it physically for the first time. This then should be rehearsed many times before the new "means whereby" is used in real life situations. Alexander (1932) felt that this is an example of what John Dewey has called "thinking in activity".

- Feldenkrais (1972, 1985) designed his exercises in such a way that postural adjustments may be made, while the exercise is in progress. In this way the individual learns to act while he thinks and to think while he acts. As suggested by Alexander (1932) the thinking should revolve around the "means whereby".

- Feldenkrais (1985) was of the opinion that in the systems of teaching generally accepted today, emphasis is placed on achieving a certain aim at any price, without any regard for the amount of disorganised and diffused effort that has gone into it. To Feldenkrais (1985) the key to good action is the absence of the sensation of effort, no matter what the actual expenditure of energy is. All inefficient action is accompanied by

this sensation; it is therefore a sign of incompetence. The outcome is the wasting of energy associated with excessive muscular effort in the individual's actions. The common idea that one should "try harder" is, according to the author's experience the root cause of problems such as overexertion, and physical breakdown, in many sportsmen.

Externally the sensation of effort can be identified through hardly perceptable breaks in the breathing rhythm, poor performance, halting of breathing, kinks in the curvature of the spine (that usually develop from uneven bending or twisting of the vertebrae, where some are held rigidly in groups with possibly only one or two of these being bent and twisted to their anatomical limits), and unnecessary fixation of joints in space (Feldenkrais, 1985). *Poise* is associated with the absence of resistance; the sensation of resistance being absent with a particular fault in the distribution of contraction in the musculature. The power producing muscles are located around the pelvis, something known to practitioners of martial arts for centuries (Claremon, 1991).

> *The muscles of the limbs only place the bones in such a relationship as to transmit the power moving the body. They direct the transmission of power most of the time, but are not the major source of it. In correct* ***acture***[3]*, no matter what the movement is - standing up, sitting down, pushing or pulling - power is transmitted from the pelvic joints through the spine to the head* (Feldenkrais, 1985: 113).

For the sake of proper posture, muscle contractions along the spine are only synergetic, and just enough to keep the spine in the position for adequate power transmission, and there is no voluntary (and parasitic) contraction of the muscles of the head- and neck-joints unless this is

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[3] Acture: Feldenkrais (1985) emphasised that posture relates to action rather than to the maintenance of any given position. *Acture,* he felt, would perhaps be a better word for it.

the object of the action. The sensation of resistance arises when the limbs, the back, the chest, the shoulders, or any other part of the body is made to do the job of the pelvic and abdominal muscles (Feldenkrais, 1985). Excellent examples of this (Barlow, 1990; Jones, 1979), and which the author has also frequently seen, is the excessive force and parasitic muscle movements used by individuals rising from a chair. Inevitably the pattern is shortening of the neck and back extensor muscles, pushing of the hands on the upper thighs or arms of the chair, and lifting of the shoulders.

- The main feature of posture in all procedures depending on and existing within the scope of voluntary action is **reversibility** (Feldenkrais, 1985). If an act is well-balanced, it can at any given moment be stopped, withheld from continuing or reversed without any preliminary change of attitude and without effort. This approach falls well within Dart's (1947) concept of *poise*, in which a well-balanced body will always keep its balance, whatever the external demands placed on it.

- One of the clearest observable sign of malposture is the holding of the individual's breath. The body image that these individuals form is such that they have to produce a preparatory rearrangement of their throats, chests, and abdomens before they can start to speak or initiate any movement whatsoever. Simple respiratory physiology tells us that upsetting normal ventilation may affect the acid base balance in the blood (Martini, 1992).

7.2.7 Anti-gravity exercises

7.2.7.1 Tai Chi Chuan

T'ai Chi encourages the fulfilment of the entire person, yet also emphasises that this goal should be achieved through moderate, natural ways of living (Liao, 1990: 7).

Tai Chi Chuan develops sensory awareness, and has the effect of bringing about muscle balance or postural homeostasis. It involves continuous but slow movements, which should be performed correctly in order to improve posture (Pang & Hock, 1984; Plummer, 1982). Initially the movements feel "unnatural" and difficult. If the movements are done to "feel natural" it only reinforces muscle-imbalance. This is because habitual muscle imbalance causes proprioceptors to become adapted to incorrect muscle lengths and forces, and thus doing movements correctly in Tai Chi Chuan does not feel natural or easy (Plummer, 1982). The same feelings are experienced during an Alexander lesson - a person feels unbalanced and in danger of falling when he stands aligned and vertical (Barlow, 1990). True verticality is also the goal of structural integration (Rolf, 1977). Feldenkrais incorporated elements of the Alexander Technique into his method, but it differs from it in emphasising body motion rather than body posture (Heggie, 1993). Graham (1990) likened the Feldenkrais Method to a Western form of Tai Chi Chuan. Lowen's bow posture is a common Tai Chi Chuan exercise (Lowen, 1994) (section 7.2.2.1.2.2).

During training emphasis is placed on the correct execution of the movements and the placing of the feet, arms, hands and other body segments (Galant, 1984; Pang & Hock, 1984). The participant is constantly monitored by means of visual feedback or by the teacher. Slow movements and the emphasis on its correct execution lead to the adaptation of proprioceptors and an increase in sensory awareness (Plummer, 1982). Another way by which Tai Chi Chuan increases sensory awareness is by making the individual aware of the mass of each individual body segment (Plummer, 1982), the main effect of Tai Chi Chuan is to develop each muscle in the body as an antigravity muscle, thus developing muscle balance or *poise*.

The mechanism by which Tai Chi Chuan improves postural homeostasis is the same as that described for the Alexander Technique and Joseph Pilates' Contrology (Pilates & Miller, 1998; Robinson & Fisher, 1998), in which weaker muscles hypertrophy and exert a stronger "pull" on their stronger, but shortened

antagonists (Plummer, 1982). This mechanism will be addressed in more detail in section 7.3.8.4.

7.2.7.2 Yoga

Yoga involves the adoption and maintenance of certain antigravity postures. The assumption of yoga is that bodies need to lengthen (Iyengar, 1968). Alexander (1932), Feldenkrais (1972, 1985) and Rolf (1977), for example, were adamant about lengthening of the body. Yoga recognises that increasing orderliness in the physical body somehow fosters order in the psychological personality (Iyengar, 1968). Alexander (1932; 1987) Feldenkrais (1972, 1985) and Rolf (1977) adhered to this principle.

7.2.8 Muscle lengthening and strengthening exercises

7.2.8.1 Introduction

Lowen (1994) devised a range of muscle lengthening exercises which deal mainly with the psychological aspects of the subject. Muscle lengthening or stretching involves the reorganisation of connective tissue. This is exactly what Rolfing (Rolf, 1977), and exercises developed by Pilates (Pilates & Miller, 1998; Robinson & Thomson, 1997) and Marja Putkisto (Putkisto, 1997) aim to achieve. Briedis *et al.* (1978) suggested that tonic postural exercises can be a means of optimizing the process of brain activation, functions of the vegetative system and functional regime of the skeletal muscles including their postural component.

7.2.8.2 Joseph Pilates' Contrology

Recently there has been an upsurge in the interest in the exercises developed by Joseph Pilates (Pilates & Miller, 1998; Robinson & Thomson, 1999). Health professionals, both in conventional and complementary medicine became impressed with the method's amazing success with back problems and spinal

injuries, other conditions such as osteoarthritis, osteoporosis, joint injuries, the relieving of stress and headaches (Robinson & Thomson, 1999). Olympic athletes, international rugby and cricket players are joining ballet dancers in the use of Pilates exercises for physical conditioning (Robinson & Thomson, 1999).

> *Contrology is complete coordination of the body, mind, and spirit. Through Contrology you first purposefully acquire complete control of your own body and then through proper repetition of its exercises you gradually and progressively acquire that natural rhythm and coordination associated with all your subconscious activities. This true rhythm and control is observed both in domestic pets and wild animals - without known exceptions.*
>
> *Contrology develops the body uniformly, corrects wrong postures, restores physical vitality, invigorates the mind, and elevates the mind* (Pilates & Miller, 1998: 9).

Pilates' "Contrology"; unlike other physical regimens, works on the deep architecture of the body by targeting the key postural muscles, so that the individual literally works from the inside out. The exercises are designed to correct misalignments, muscle imbalances and to provide structural support for the body and works well with the Alexander Technique (Robinson & Fisher, 1998).

7.2.8.2.1 Principles of Pilates' Contrology

Modern sedentary lifestyles lead to muscular imbalances in the body (Barker, 1985; Richardson, 1992). An example of this is sitting hunched behind a desk or the steering wheel of a car all day, the muscles around the front of the chest become excessively tight. Add to this the common startle response to stress (Jones *et al.,* 1964), the individual ends up with overworked muscles of the upper shoulders and neck (Robinson & Fisher, 1998). Muscles in the mid-back -

in particular those who stabilize the shoulder blades may become overlengthened, overstretched and weak (Robinson & Fisher, 1998). Sitting for extended periods of time tends to overuse the hip flexors (Mandal; 1984; Robinson & Fisher, 1998). The gluteal- and the abdominal muscles become weak, the hamstrings shorten, the lower back becomes stiff and immobile (Robinson & Fisher, 1998).

Muscle imbalances may be corrected by physical exercises according to Barker (1985), Jull and Janda (1987), Richardson (1992) and Schrecker (1971), for example. Barlow (1990), Robinson and Fisher (1998) and Richardson (1992) were of the opinion that most of these physical exercises do not accommodate for faulty habitual movement patterns. According to them, as well as Gurfinkel and Cordo (1998) Massion *et al.* (1998) and Richardson (1992), muscles work in a coordinated fashion to produce a given posture and movement. If one muscle in a group is too tight or weak, or is used improperly, the muscle group mainly responsible for a specific action cannot function properly - so the body resorts to the use of substitute muscles to do the work (Robinson & Fisher, 1998; Richardson, 1992). The use of muscular substitutes is then the cause of "habitual misuse" of the body (Alexander, 1932; Richardson, 1992), or as Feldenkrais (1985) termed it: "parasitic movements".

The aim of Pilates' Contrology is to release and lengthen the tight muscles, then strengthen the weak ones, and thereafter, teach the body the correct muscle combinations and sound movement patterns (Robinson & Fisher, 1998). This is also the approach advocated by Jull and Janda, (1987), and the other exercises such as Tai chi Chuan and Yoga (see sections 7.2.7.1 & 7.2.7.2).

7.2.8.3 Method Putkisto

Method Putkisto was developed by a Finnish fitness and dance teacher Marja Putkisto (Putkisto, 1997). She studied Pilates' techniques and collaborated with Finnish sports-medical practitioners, physiotherapists and chiropractors in the development of her method.

> *Flexibility is the link to your body's strength and balance. In principle, each muscle should be longer than the bone whose movement it initiates or supports* (Putkisto, 1997: 14).

> *Method Putkisto places an emphasis on opening and lengthening muscles which are too tight and short, unlike conventional exercise which can result in shortening the muscles. This enables you to achieve suppleness, strength, balance, well-being and awareness* (Putkisto, 1997: 12).

As with all the body work techniques discussed above the central approach is to work on the body as well as on the mind - the latter being achieved by increasing the individual's awareness and well-being.

As basis of her method, Putkisto (1997) makes use of deep stretches - a stretch which begins where a normal stretch ends. Deep stretching takes muscle to a new length by working at a deeper level and with different timing and dynamics. A stretch is worked on for a minimum of 2-3 minutes and up to 5 minutes. Passive and active stretching can be carried to the level of deep stretch. The basic aim of these stretches are probably to correct muscle imbalance (Janda, 1993) (see Chapter 5, section 5.9.7 and section 7.2.8.4).

7.2.8.4 Correction of muscle imbalances

Correction of muscle imbalances are based on the following principles according to Jull and Janda (1987) and Norris (1995):

- Shortened muscles are stretched and lengthened muscles are shortened. Lengthened muscles are shortened by exercising them in their shortened position or by splinting them in this position. Slow twitch muscle function is then restored by training with low loads [20-30% of maximal voluntary contraction (MVC)]. Shortened and tight muscles are stretched using appropriate stretching exercises.

- When the above is achieved muscle strengthening can commence.

Richardson (1992)'s approach to the problem of muscle imbalance, on the other hand, is to change the pattern of muscle use through postural correction, an approach which is also advocated by Alexander (1932), Barlow (1990), Dart, (1946, 1947), Feldenkrais (1985), Hanna (1988), Rolf, (1977) and the proponents of Tai Chi Chuan (Pang & Hock, 1984) and Yoga (Iyengar, 1968). The methods proposed by Richardson (1992) are based on the neuroplasticity of the tripartite system and involve treatment methods that can be instigated to break the cycles which perpetuate muscle imbalance. This can be achieved by either increasing tonic input to the antigravity/stability muscles, or by reducing the tonic input to movement muscles. Clinically, Richardson (1992) found the former method to be effective, a finding which is in agreement with what has been found by Dart (1947; 1970) on himself, Feldenkrais (1985), Hanna (1988) and teachers of the Alexander Technique (Barlow, 1990; Brennan, 1992; Macdonald, 1998).

Increasing tonic input to stability synergists requires, according to Richardson (1992), precise treatment techniques, since the other muscles capable of performing similar movements do not require enhanced input/activation. For this reason the stability synergist needs to be separated from the movement synergist and then selectively activated. Richardson (1992) formulated a series of steps to facilitate this process:

- Isolate and activate the stability synergist, a task which requires precise and controlled muscle action. As substitution by the overactive movement synergist poses the most difficult problem, the ability to isolate a stability synergist is a difficult skill for an individual, and requires a finite period of learning. The teaching of this skill depends on an initial emphasis on cognitive processes (Martiniuk, 1979) with specific and accurate verbal descriptions and feedback (Richardson, 1992). Alexander Technique teachers gently direct their pupils into biomechanical balanced positions, thus activating the use of stability

synergists. They also emphasised sensory awareness of the new, and often unusual, position of the body and its parts (Barlow, 1990; Macdonald, 1998). Cohen-Nehemia (1983), Feldenkrais (1972; 1985) and Hanna (1988) recommended specific exercises in order to attain correct function of the stabilizing muscles in the body. Since the protocols of Alexander (Barlow, 1990), Cohen-Nehemia (1983), Dart (1947), Feldenkrais (1972; 1985) and Hanna (1988) all concentrate extensively on the position of the head and neck [the primary control of Alexander (1932), see sections 7.2.4.1.1.3 & 7.2.5.2)], stability synergists are then selectively activated by means of the neck and labyrinthine reactions (sections 6.3 & 6.4) (Loots, J.M. - personal communication).

- Increase the tonic neural patterns to the muscle in order to re-establish slow twitch muscle function. To this end Richardson (1992) suggested specific exercises or electrical stimulation. Specific types of movement and specific types of muscle contraction can be used to enhance the tonic function of the stability muscles.

  Movement should be static, with no sudden or jerky movements (Richardson, 1992). Contractions should initially be isometric and not phasic, at low percentages (20-30% MVC), in order to encourage activation of the tonic (stabilizing) rather than the phasic (movement) motor units. Contractions should be sustained over long periods of time, but in order to avoid fatigue, several repetitions of sustained contraction (approximately 10 seconds) may be more beneficial. This is essential if interference of movement muscles is to be avoided.

  Since they require the holding of body positions with minimum effort, and the movements are slowly executed, exercises like those prescribed by Barlow, (1990), Brennan (1992), Cohen-Nehemia (1983), Dart (1947), Feldenkrais (1972; 1985) and Hanna (1988) are admirably suited for the purpose of training the stability muscles. Holding of body positions and

slow movements are also found in Tai Chi Chuan (Pang & Hock, 1984), Yoga (Iyengar, 1968) and recent versions of Pilates' exercises (Robinson & Fisher, 1998; Robinson & Thomson, 1999). Balanced standing, sitting and movement gradually become more and more prevalent following exposure to the above training regimens, resulting in continual further training of the stability muscles.

Sensory awareness also forms part of Richardson's (1992) programme. Techniques to increase proprioception, such as joint compression, stretching and eccentric muscle contractions may help to maintain activation of tonic muscle fibres.

- The last phase in Richardson (1992)'s programme is progressive interaction of synergists for functional rehabilitation. Although the initial preparation of the muscles through the first two steps form the most essential part of the treatment of muscle imbalance by Richardson, (1992), the stability and movement synergies need to work appropriately for their ultimate functional role. Rehabilitation must therefore proceed to enhance the interaction of both groups through slowly increasing loads and speeds.

The division of the rehabilitation programme into sequential phases by Richardson (1992) is contrary to the approach taken by others such as Alexander (1932), Barlow (1990), Cohen-Nehemia (1983), Dart (1946; 1947), Feldenkrais (1972; 1975), Hanna (1988), Rolf (1977) and Painter (1986), who believed that rehabilitation should always be approached in an integrated manner.

7.2.9 Passive, peripheral techniques

These techniques originated from Rolfing, which is also strong massaging at acupuncture points, and Reichian vegetotherapy. A form of psychoperistaltic

massage has been developed in the United Kingdom. This involves identifying the tight muscles of the Reichian muscular (character) armouring by ways of physical examination following pointers supplied by Lowen's body language. The subject is then massaged (Rolfed) until the specific muscles involved release and relax. The procedure is accompanied by memory flashbacks and emotional release as well as increased intestinal peristaltic reaction (Graham, 1990; Plummer, 1982).

7.3 DISCUSSION

The connecting link between all the mind-body therapies is posture (Plummer, 1982) and its associated muscle balance (see Chapter 5, section 5.6.3.3). In order to compare the above examined therapies, they will be viewed in the context of general techniques for restoring postural balance as found in Table 7.1.

Reich laid the foundations of a somatic psychology and for psychosomatic treatments which address the psyche (mind or soul) by way of the body (Boadella, 1985; Mann & Hoffman, 1990). He recognized that emotional and psychological ways of relating to the world are reflected physically in the body, and vice versa. He used his hands to effect emotional release by pressing on tight muscles. Subsequently many different forms of psychosomatic treatments have evolved from the Reichian tradition with the common aim of relaxing the body and releasing the energy held back by various tensions. One such treatment is that of bioenergetic analysis, developed by Lowen (1994) with the aim of integrating body and mind through, amongst others, relaxing character structures. Related to Bioenergetic therapy is the Alexander Technique for the improvement of postural and muscular activity. Alexander (1932, 1987) observed that every activity, whether physical, mental or spiritual is translated into muscular tension, which becomes habitual and distorts thinking, feeling and doing. Rolf also drew heavily on the work of Reich to create a method of deep

massage whereby the therapist manipulates the subject's body into a desired postural and structural position, at the same time releasing imbalances resulting from the armouring process and discharging emotional and psychic blockages (Graham, 1990).

The therapies reviewed all have the common goal of bringing about postural balance with the added benefit of balancing the mind. The methods used all involve physical interaction between therapist and subject, not simply depending upon verbal instructions, but using manual intervention so that the subject can feel the benefit. Often mirrors are also used. The subject can thus hear and feel the instructions of the therapist as well as seeing the effect and experiencing it emotionally. The many senses involved seem to increase the effectiveness of the treatment (Graham, 1990).

In comparing the Feldenkrais Method with the Alexander Technique, Heggie (1993) noted that the two practices were different ways of getting a similar experience. Whereas in the Feldenkrais Method the student is taken out of the context which produces the habitual action, in the Alexander Technique the teacher works with the student directly in action. The two approaches are actually more complementary than contradictory.

Both Alexander (1932) and Dart (1947) emphasised that the head is the prime mover and the position of the head in relation to the neck and the rest of the body plays a predominant part in posture and movement. This concept is supported by Magnus' (1926a,b) work on local, segmental and general reactions in the mammalian body and Sherrington (1946: 89) who stated:

> *Mr Alexander has done a service to the subject* (the correction of movements by working on proprioceptive reflexes) *by insistently treating each act as involving the whole integrated individual, the whole psycho-physical man. To take a step is an affair, not of this or that limb solely, but of the total*

> *neuromuscular activity of the moment - not least of the head and neck.*

Alexander (1932) formulated much of his technique on the concept of *primary control* which he defined as a control that *depends upon a certain use of the head and neck in relation to the rest of the body* and Barlow (1990), following Alexander and proceeding with his work, also stressed the importance of the head position. Magnus (1926a) used animal studies to show that the primary factors determining reflex posture are the position of the animal's head in space and its relationship to the body.

> *Our concept of posture is based on the principle that all other relations between parts are subordinate to the relation of the head to the trunk* (Jones & O'Connell, 1958: 288).

Jones (1965, 1979), Jones and O'Connell (1958), Jones *et al.* (1959), Jones *et al.* (1964) executed a series of experiments to demonstrate the importance of the head-neck relationship in movement. They found that refraining the head from pulling back and the neck from stiffening on the initiation of a movement, such as from sitting to standing, led to a reflexive straightening of the body against gravity, accompanied by a feeling of lightness and ease of movement. The fixed position of the head is released, the righting (antigravity) response is initiated and the body follows where the head leads. This action then suspends the body and its segments from the head (Dart, 1946 and Chapter3, section 3.4). Feldenkrais (1972) developed a series of exercises to make the individual aware of the dependance of all the muscles of the body on the action of the muscles in the head and neck.

Others, however, found a balanced posture originating from the other end of the body. Cohen-Nehemia (1983), originator of the Mitzvah Exercise (see Chapter 8, section 8.5.2.1.2), contended that man has a built-in defence mechanism which protects muscles by releasing contracted muscles before they adapt to

their contracted state by shortening. This defence mechanism is activated involuntarily by movements involving the pelvis (Cohen-Nehemia, 1983: 6):

> *An upward ripple of movement is triggered from the pelvis causing the spine to lengthen, the back to widen, the chest to expand, and the head to rebalance itself on top of its spinal support.*

Feldenkrais (1985) too, favoured the pelvis as prime mover, maintaining that no correct posture is possible without the pelvis being able to move freely. He explained that, although the first movement was lifting the head off the ground, it needed the chest to be anchored to the pelvis before the head could be lifted:

> *The pelvis supports the whole weight of the body, and in that respect is the most important part of it. The head, in which all of the most precise organs of orientation are located, cannot be properly held without the pelvis supporting the body so that no unnecessary muscular strain exists all along the spine. Without proper pelvic control, adjustment of the head carriage is a laborious and thankless job* (Feldenkrais, 1985: 176).

The supporting role of the pelvis was also pointed out in Chapter 3 (section 3.4). Feldenkrais (1985) also observed that the pelvic muscles are the first to contract in all extensive and rapid movements (Feldenkrais, 1985), which is in agreement with the Tai Chi Chuan concept that inner strength is controlled by the waist (Horwitz & Kimmelman, 1987).

Inhibition is a concept much used in the Alexander technique (Alexander, 1941; Gelb, 1981). Inhibition in this sense is not to be confused with repression, rather it is the choice of selection of a response to a stimulus so that an appropriate activity may follow. It is the fundamental process, conscious or unconscious, by which a person's integrity is maintained while a particular

response is being carried out, or not carried out, as the case may be (Alexander, 1987; Barlow, 1990; Jones, 1979).

Inhibition was used by Feldenkrais (1985) as a method of overcoming inappropriate, residual childhood habits or excesses in behaviour in the growth to maturity. He advocated learning a new response to existing stimuli, the response being inhibition. He explained it in the following way: When learning a new skill, the muscles perform the projected act as well as unnecessary and contradictory movements. This is because before one is able to excite a precise pattern of cells in the wanted order, the neighbouring cells all along the pattern of the cells essential to the movement become active. When proficiency is achieved, only those cells that command the muscles for the desired act send out impulses. All the others are inhibited.

> *One of the most important mechanisms for directing action is inhibition and the associated phenomenon of induction. In order to obtain a monomotivated action, we must learn to inhibit the adjacent parasitic activity due to habit as well as the parasitic activity due to the topology of the cortex of the brain. If we could manipulate the nervous system itself, rearrange its nervous paths, and influence directly the different sources of impulses, we could probably obtain the wanted changes directly. As it is, we can learn to influence the nervous system by acting on its envelope. Mental processes are set going together with body action, and by the alternate switching of our attention from one plane to the other we obtain a unique mental motivation and feel the muscular sensation of such an act. It is through a series of such successive approximations that we can make sure of the correct use of the internal mechanisms of which we have no direct feeling or knowledge* (Feldenkrais, 1985: 133-134).

Once this is mastered, action will become coordinated, and such action seems, and feels effortless, no matter how great the actual work involved may be

(Feldenkrais, 1985; Gelb, 1981). In this respect Feldenkrais (1985: 86) was of the opinion that:

> *This assertion may seem sweeping, but it can be shown to be true in every case. It suffices to watch the skilful performance of masters in their trades or arts to become convinced that the presence of effort is the indication of imperfect action.*

The Mitzvah Exercise (Cohen-Nehemia, 1983), also aims at inhibiting neuromuscular interference patterns in order to obtain a maximum accomplishment. The defence mechanism of the body which releases contracted muscles before they shorten permanently, and which is activated by the Mitzvah exercise, aims to minimize interference patterns.

Combining the psychological with the physiological, Jones (1965) paid much attention to inhibition when he developed a method for changing certain postural behaviour patterns. He found inhibition to be the basic principle in his paradigm for postural change and described inhibition as a positive, not a negative, force. Inhibition is a physiological process which does not need to be conscious to operate, but when brought to the conscious level it establishes an indirect control over antigravity responses as well as facilitating the learning of new habits and unlearning old ones.

Exercises *per se* are not recommended for improvement of faulty posture, as exercising, repeating and stretching strengthen the faulty action (Alexander, 1987; Barlow, 1990; Dart, 1946; Feldenkrais, 1985, Painter, 1986; Plummer, 1982), probably by over emphasizing the action of the movement muscles (Richardson, 1992) (see section 7.2.8.4). Neuromuscular patterns causing tension build-up also strengthen with continuous use (Cohen-Nehemia, 1983). Attempting a sporting activity with a poor posture will affect the performance adversely (Dart, 1946; Gelb, 1981; Jull & Janda, 1987; Watson, 1983, 1995). The tightness and adhesions, which are the consequence of malposture, increase the susceptibility to injuries as well as impairing the efficiency and execution of limb movements

(Pritchard, 1985; Watson, 1983). Exceptions, as far as the use of exercise to correct malposture and poor use are concerned, are those developed by Pilates (Pilates & Miller, 1998; section 7.3.8.2) and Putkisto (1997; section 7.3.8.3) and Jull and Janda (1987) (Chapter 5, section 5.9.7 and section 7.2.8.4) and Schrecker (1971).

Dart (1946, 1947, 1970) was of the opinion that *poise* can be attained by firstly inhibiting the factors promoting asymmetry, and secondly by derotating the twisted body. To this end he devised a series of simple postures, which, if executed regularly, will over a period of time achieve these aims. These postures were discussed in section 7.2.5.3.

CHAPTER 8

AN INVESTIGATION INTO SOME ASPECTS OF POSTURE

The erect posture has NOT been attained by the overwhelming majority of mankind. It is true that human beings approximate more or less the upright stance: It is just this more-or-lessness that conceals from people the fact that their stance and dynamic posture is still inefficient, uneconomical, and wastes a very great deal of vital energy (Lawson-Wood & Lawson-Wood, 1977: 13).

Nearly all the chronic conditions have what may be termed an orthopaedic facet to their solution in the need for correcting the poor posture of the body (Cochrane, 1924: 310).

Can any of us civilized human individuals claim physical and mental perfection? On the contrary such statistics as we possess ·····proclaim the virtual universality of human physical and mental imperfections; despite the hundreds of millions of years that geologists, zoologists and physicists inform us have elapsed in our long evolutionary journey from a pre-molecular state of existence to the manhood that has been deemed worthy of being called sapient (Dart, 1970: 9).

8.1 INTRODUCTION

Dart (1947) and Barlow (1955) both emphasized the fact that faulty posture was a prevalent condition of the human body affecting, for example, between 70 and 95% of children up to the age of 18 years (Barlow, 1990). In 1924 Cochrane drew attention to Swain's (ND) declaration that he saw no more than 20 well-postured individuals among 3000 patients at a sanatorium, and at a training camp for youths and men, Cochrane (1924) found that 75% were physically inefficient. This is in contrast with the findings of Fenton (1973), who found that 9% of children in his study were overcurved when standing, 17% leant forward or backward when standing and at least 5% had a noticeable lateral curvature of the spine.

In this chapter research projects, which were undertaken at the Sport and Training Institute of the University of Pretoria, to determine body posture and deviations thereof in different sectors of the population, will be reported on. The purpose of these studies was to evaluate the posture of some members of the South African male population and to determine the range and area of postural deviations. It was inconceivable to obtain a representative sample of the South African population at the time of the study. Therefore it was decided to investigate firstly the effect of two factors (stressful lifestyle and regular participation in physical activity) on posture in groups of male subjects, and secondly, the consequences of postural rehabilitation on selected small groups. These data could provide an indication as to body use and misuse of sectors in the population, and to facilitate selection by therapists and educators of therapies suitable for improvements in body use.

All of the studies made use of the conventional, non-invasive method of photography for the recording of static posture. In addition to being portable and relatively cost effective, the camera can be depended upon to always give a true representation of the subject (Jones, 1979). For the purpose of simple documentation the operator does not require extensive training (see Chapter 2, section 2.3.4). Photographs provide a reliable data record and a stable surface from which to measure and calculate angles. Barlow (1990) has also shown that valuable information may be obtained about muscle tension and use from the scrutiny of photographs.

8.2 POSTURE OF MIDDLE AGED MALES

8.2.1 Introduction

Malposture is pandemic in modern society (Dart, 1947; Lawson-Wood & Lawson-Wood, 1977; Rolf, 1977; Sherrington, 1946). The extent of this problem is not known in this country at present. Lack of body awareness, modern sedentary

lifestyle, stress, poor use are to be blamed for this unfortunate state of affairs (Alexander, 1987, 1996; Dart, 1947; Feldenkrais, 1985; Richardson, 1992; Rolf, 1977). A group in which all these aspects are most likely to be combined, is that of senior executives. The purpose of this study, therefore, was to determine the incidence of postural defects, and use of musculature during the static act of standing, in a group of middle aged senior executives.

8.2.2 Subjects and methods

The subjects of the study consisted of 43 senior executives from two large companies in the Pretoria area. The ages of the subjects ranged from 31 to 61 years, with a mean age of 44,5 years. The subjects were included in the study because of their excessively sedentary lifestyles.

All data were obtained by the use of photography. The equipment consisted of a Pentax camera mounted on a tripod. In order to minimise image distortion a Takumar zoom lens, set at a focal length of 85 millimetres was used. Images were recorded on black and white film.

The subjects were placed against a plumbline on the wall and photographed from a distance of 4,5 metres. The subjects were instructed to assume a typical stance, the one they usually stood comfortably in, with arms hanging at their sides. The posture was to be the habitual standing posture with no aim towards the ideal. The subjects were then photographed laterally from both sides, and also from the front and from the back.

The photographic prints were analysed according to the pro forma suggested by Barlow (1956, 1990), which was a useful guide in assessing a given subject's postural defects and the associated muscular tensions. Details of this pro forma are found in Table 8.3. This pro forma enables one not only to analyse the subject's posture, but also the relationship and position of the various body parts in relation to each other, and the tension in the body musculature needed for the

the maintenance of this posture. Defects were scored in different body segments by two well-trained observers, whose scores always tallied, on a basis of1, 2 or 3 marks according to the severity of the defect, with 1 denoting a slight-, 2 a moderate- and 3 a severe postural defect using examples from Barlow (1990) and Robinow, Leonard and Anderson (1943) as guidelines. Finally, all the scores were added in order to obtain the total score. The lower the total score, the closer to the attainment of *poise* (Barlow, 1956, 1990; Dart, 1947).

According to the use of their bodies, the quality of subjects' total body posture were assessed according to the categories shown in Table 8.1.

Table 8.1 Classification and scoring of body use (based on Barlow, 1956, 1990).

USE	TOTAL SCORE
Excellent use/*poised*	0-3
Slight postural defects	4-5
Severe postural defects	6-9
Very severe postural defects	10-14
Gross deformity	15 and over

8.2.3 Results

8.2.3.1 Postural defects and their incidence

Of the group of 43 male subjects none had excellent use (*poise*), only 1 subject was classified as having slight defects (score 5), while more than half of the group had severe and very severe defects according to their total scores. The mean total score was 11,8, of which the lowest was 5 and the highest 21 (Table 8.2). The mean score of almost 12, placed the subjects studied in the category of very serious defects (Table 8.2).

Table 8.2 Incidence and severity of postural defects in male senior executives.

POSTURAL DEFECTS	NUMBERS	PERCENTAGE
Excellent use/*poised*	0	0
Slight postural defects	1	2.3
Severe postural defects	10	23.3
Very severe postural defects	25	58.1
Gross deformity	7	16.3

8.2.3.2 Occurrence and mean score of postural defects in the various body segments

Postural defects in the various body segments, their mean score, as well as their occurrence in the sample studied are listed in Table 8.3. Mean scores were calculated according to the formula:

$$\text{Mean score} = \frac{\text{Total score}}{\text{Number of subjects with defects}}$$

This score is therefore an indication of the severity of the postural defect in a segment.

Mean scores were low, ranging from 1,0 to 1,4, while postural faults occurred in all body segments. The highest incidence of postural defects was observed in the back, shoulders and the neck, with kyphosis a problem present in all the subjects studied.

Table 8.3 ***Occurrence and mean score of postural defects in different body segments.***

REGION	FAULTS	% OF CASES	MEAN SCORE
Head	Poked	14	1.2
	Retracted	79	1.1
	Tilted backwards	51	1.0
Shoulders	Raised	77	1.4
	Rotated	9	1.3
	Pulled together	33	1.1
	Dropped	14	1.2
Pelvis	Tilted forwards	42	1.3
Spine	Kyphosis	100	1.3
	Lordosis	70	1.8
	Scoliosis	72	1.4
	Thorax Displacement	47	1.2
Stance	Forward Inclination	81	1.4
	Hyperextended Knees	86	1.1
	Internal Rotation of Knees	12	1.0
	Asymmetry	58	1.2
Tension	General	9	1.3
	Local	84	1.1

None of the subjects appeared to have a comfortable, balanced stance. A tight, "holding on" type of stance was the general posture. Typical examples of standing postures in the sample are shown in Figure 8.1.

In Figure 8.1a & b examples of the postural consequences of scoliosis are shown. In the subject shown in Figure 8.1b, torsional rotation in response to spinal scoliosis is particularly evident. In Figure 8.1c the upright posture is

maintained by means of excessive muscle tension. The subject in Figure 8.1d leans far forward, putting unnecessary strain on his lower calf muscles.

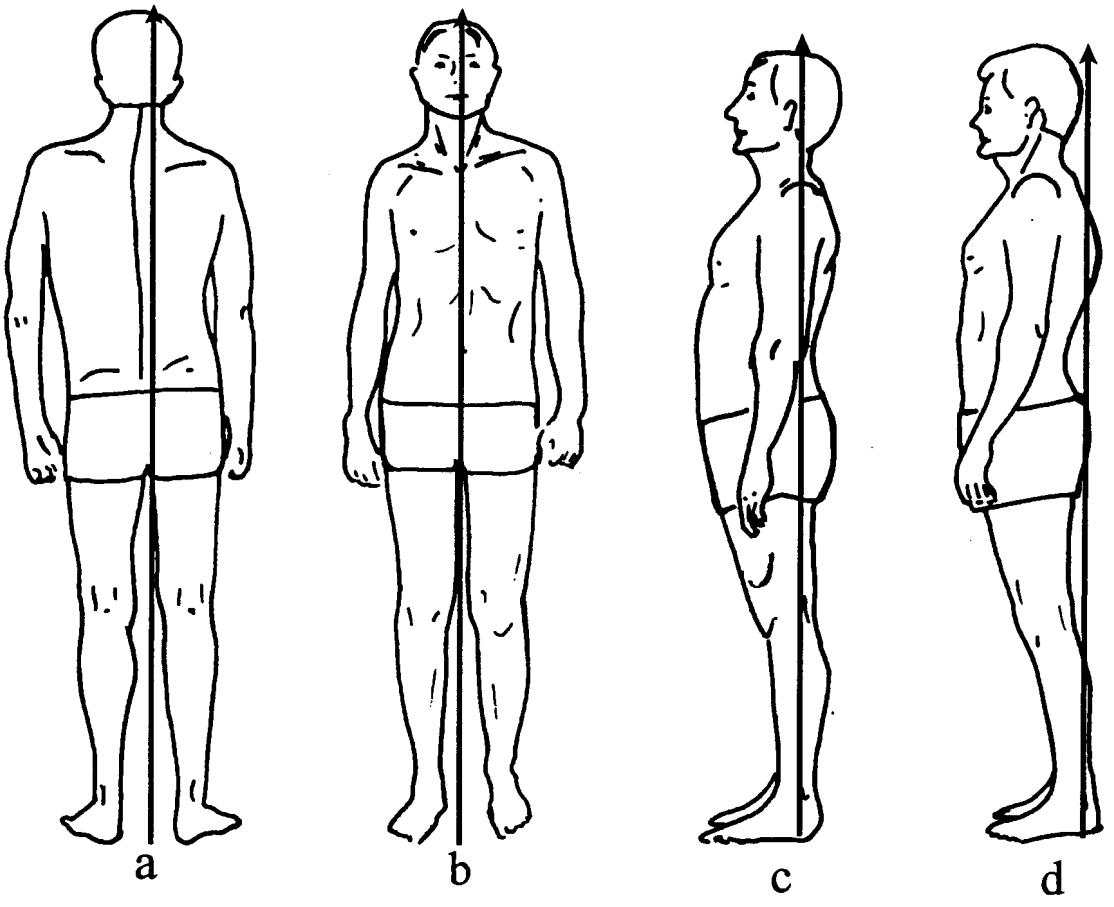

Fig. 8.1 Examples of some of the postures assumed by subjects.

Figure 8.2 shows different ways of carrying the upper quarter in 6 subjects - in all the examples head and neck position are maintained by means of excessive muscle tension, a feature which is evident in the tight shoulder and neck muscles, and which contributed to the high incidence of localized tension (Table 8.3).

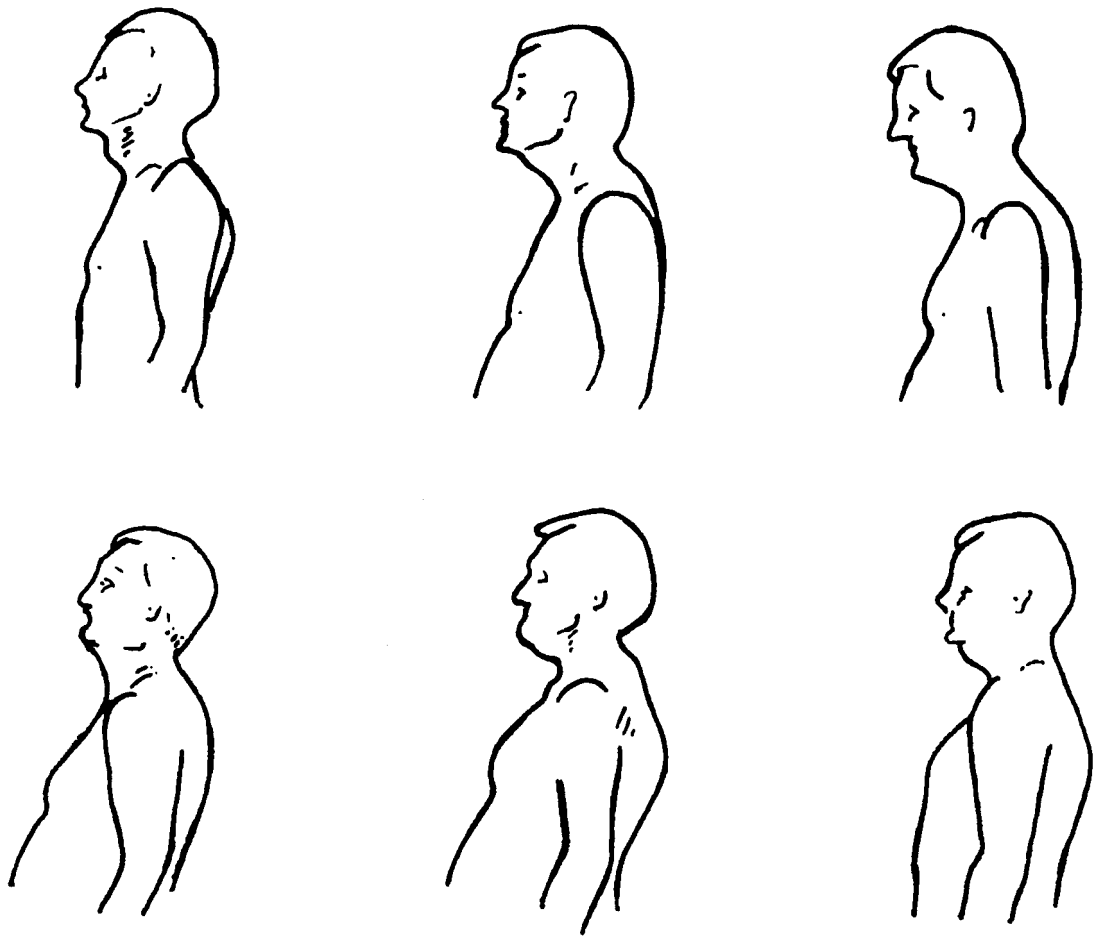

Fig. 8.2 Head and neck position in 6 subjects, showing the variability in which head carriage is being dealt with, in different individuals.

8.2.4 Discussion

The purpose of this section of the study was to investigate the postural consequences of modern Western lifestyle characterized by a sedentary lifestyle (National Institutes of Health, 1997), lack of body awareness, stress and poor use (Alexander, 1987, 1996; Barlow, 1959; 1990; Dart, 1947; Feldenkrais, 1985; Rolf, 1977). The results of this section of the present study support others who were of the opinion that malposture is pandemic (Dart, 1947; Lawson-Wood & Lawson-Wood, 1977; Sherrington, 1946). Apart from the high percentage of subjects with severe and more than severe postural defects (97.7%, Table 8.2)

analysis of Table 8.3 indicates an alarming tendency of more than one postural defect per body segment. Examples of this are the high incidence of head retraction (79%) concurrent with 51% of the heads tilted backward. Kyphosis was found in all of the subjects. This was associated with a 70%, 72% and 42% incidence in lordosis, scoliosis and thoracic displacement, respectively. Scoliosis starts to develop at the age of 6 years, and progresses with advancing age (Farkas, 1941). The high incidence (72%) of scoliosis observed in the subjects of the present study, is about twice as high as the estimated incidence (about 30%) in schoolchildren (Dickson, 1983), thus supporting Farkas' (1941) findings.

Local muscular tension was observed in 84% of the subjects. This tension in different areas of the body can be seen in all of the subjects in Figures 8.1 and 8.2. Prominent here are tension in the neck, shoulder area and upper back (expressed for example in the 79% occurrence of retracted necks and a 100% incidence of kyphosis). With the exception of 1, none of the subjects in the present study were able to maintain body alignment without undue muscular tension. Barlow (1959: 345) was of the opinion that this constitutes an additional stress:

> *Muscular hypertension, then, is the residual tension and postural deformity which remains after stress activity, or after any other activity for that matter, since any activity which leaves residual muscular tension is to that extent a stress activity.*

Comparison of the postural faults in the subjects of the present study with those made by Barlow (1956, 1990) on drama and physical education students (Figure 8.3) presents a bleak picture. In the subjects of the present study the incidence of very severe postural defects and gross deformity are higher than that found by Barlow (1956, 1990).

The observations of the present study indicate that the middle aged, sedentary subjects all have poor postures, and according to the observations of others, it is possible that the faulty postures could be due to misuse of their bodies, and

an inability to deal with physical and emotional stress (Alexander, 1932; Feldenkrais, 1985; Rolf, 1977). The subjects would not be able to perform certain movements adequately or easily, and there is also a possibility that minor pains of the moment might develop into pathologies in the future (Barlow, 1959; Goldthwait *et al.*, 1952).

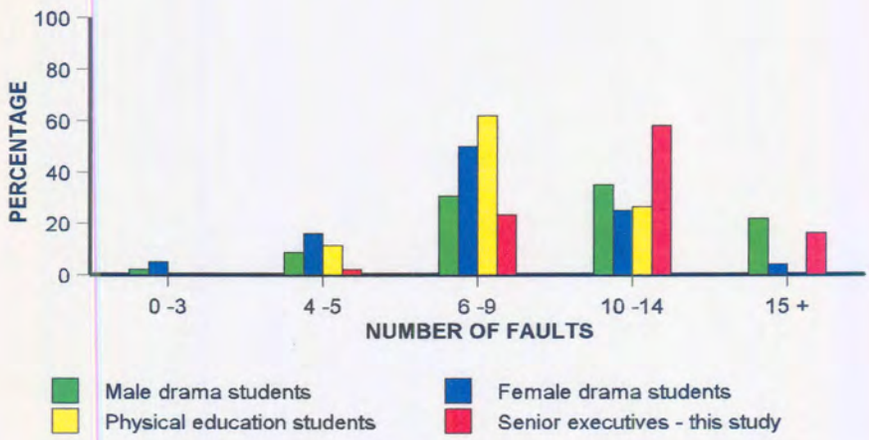

Fig. 8.3 Comparison between the number of postural faults in studies by Barlow (1956, 1990) on two groups of drama students (green and blue bars), physical education students (yellow bars) and the subjects of the present study (red bars).

8.3 BODY ALIGNMENT AND POSTURE OF PRIMARY SCHOOL BOYS

8.3.1 Introduction

Participation in physical activity and sport does not necessarily lead to good posture, according to Alexander (1996), Feldenkrais (1985) and the studies done by Barlow (1956, 1990). To try and resolve this issue, and in order to obtain detailed postural information about South African children, a study was undertaken on healthy primary school boys. These subjects all came from rural areas and actively participated in sport such as athletics (track and field), gymnastics, swimming and tennis.

8.3.2 Subjects

The subject population consisted of 58 male primary school boys who participated actively in sport. The subjects were selected by their schools to attend an annual Vleissentraal Sport Junior coaching clinic at the Institute. None had had back surgery or other major health problems. Their ages varied between 8 and 12 years. Girls who also participated in the clinic were not included in order to avoid the embarrassment of being photographed with a minimal amount of clothing.

8.3.3 Methods

All data were recorded photographically by means of a Pentax camera mounted on a stand. A plumb-line was brought on permanently against the wall and followed through on the floor with a 2 centimetres wide strip. Each subject was instructed to stand comfortably in front of the plumb-line with the floor-line between the feet, and hands placed at the sides. The subject was photographed from the front, the back and each side at a distance of 4,5 metres.

Anthropometric data were collected on the vertex, trochanter, tibial and acromion heights. The five body landmarks were located as follows: the ankle, 1 centimetre in front of the posterior edge of the lateral malleolus; the knee at the lateral epicondyle; the hip at the projection of the greater trochanter; the shoulder at the centre of the head of the humerus and the ear vertically below the external meatus (Woodhull *et al.*, 1985). Each point was marked with a small black dot for consistency of location in the photographs.

Special attention was given to the angles of mass bearing joint centres in posture and deviations thereof. The children were also analyzed according to the pro forma based on that of Barlow (1990) (section 8.2.2) in order to ascertain postural defects.

8.3.4 Results

8.3.4.1 Body alignment

The average heights and positions in front of the ankle of the body landmarks in the individuals of the present study are shown in Table 8.4 and Figure 8.4. The knee, hip, shoulder and ear were usually located forward (anterior) to the ankle joint in typical standing. Averaging across individuals in the present sample, the knee was 40,2 millimetres, the hip is 53,4 millimetres, the shoulder 49,6 millimetres and the ear 50,8 millimetres (±27 millimetres S.D.) in front of the ankle. Some individuals were more variable than others, but the between-subject variations were large compared to variations within subjects (Figure 8.6).

Table 8.4 Mean positions of body landmarks and their standard deviation.

BODY LANDMARK	POSITION IN FRONT OF ANKLE (MM)	STANDARD DEVIATION	BODY HEIGHT (MM)	STANDARD DEVIATION
Knee	40.2	21.4	426.7	69.2
Hip	53.4	25.3	781.3	78.5
Shoulder	49.6	25.4	1203.7	85.2
Ear	50.8	27.2	1451	95.8

8.3.4.2 Posture and postural defects

In Table 8.5 the incidence of the various postural defects is shown. None of the subjects had excellent use and only two had slight postural defects (3,4%). Severe postural defects were detected in about a fifth of the subjects (20,7%), while nearly half of the subjects had a total score which put them in the very severe posture defect category. Gross deformity was found in 28,7% of the subjects.

Table 8.5 Occurrence and intensity of postural defects.

USE	NUMBERS	PERCENTAGE
Excellent use/*poised*	0	0
Slight postural defects	2	3.4
Severe postural defects	12	20.7
Very severe postural defects	28	48.3
Gross deformity	16	27.6

Table 8.6 Occurrence and mean score of postural defects in different body segments.

REGION	FAULTS	% OF CASES	MEAN SCORE
Head	Poked	31	1.2
	Retracted	32.8	1.1
	Tilted backwards	52	1.0
Shoulders	Raised	74.1	1.6
	Rotated	51.7	1.0
	Pulled together	15.5	1.2
	Dropped	17	1.0
Pelvis	Tilted forwards	95	1.3
Spine	Kyphosis	89.7	1.4
	Lordosis	93.1	1.6
	Scoliosis	39.7	1.0
	Thorax Displacement	60.3	1.1
Stance	Forward Inclination	86.2	1.3
	Hyperextended Knees	24.1	1.0
	Internal Rotation of Knees	31	1.1
	Asymmetry	84.5	1.0
Tension	General	55.2	1.3
	Local	87.9	1.4

Postural faults in the various regions of the body are shown in Table 8.6. The greatest number of faults was found in the spine and pelvis, kyphosis being present in 89,7%, lordosis in 93,1% and a forward tilting pelvis in 95,0% of all subjects. Forward inclination was found in 86,2% of the individuals, as previously mentioned (section 8.3.4.1).

Asymmetry in body segments while standing was apparent in an unusually high percentage of the subjects (84,5%), which indicates a large incidence of muscle-imbalance, especially when associated with a nearly 40% occurrence of scoliosis. General tension was observed in 55% of the subjects while local tension was a common occurrence (88%) - which was mainly present in the upper quarter.

8.3.5 Discussion

8.3.5.1 Body alignment

Only 2 subjects in the present study were close to a linear alignment of joint centres. The positions of the body landmarks found in the present study were compared to those found by Woodhull *et al.* (1985), in 15 normal volunteers, aged 18 to 29 years (Figure 8.4). In the subjects of both studies the landmarks were arranged on top of each other in an S-shaped pattern, with alternate landmarks in line with each other. This can be clearly seen in Figure 8.4b where the hip joints were aligned directly beneath the ears and the knees beneath the shoulders, the sigmoid shape being more pronounced in the subjects of Woodhull *et al.* (1985).

Mean values of landmark positions in front of the ankle joint indicated that the subjects in both studies were not vertical, with differences between the relative positions of the ear, shoulders and hips more marked in the subjects of Woodhull *et al.* (1985). The position of the hips was about 9 millimetres further forward in Woodhull *et al.*'s (1985) subjects than in those of the present study (62,0 versus 53,4 millimetres, respectively), the shoulder joints, on the other hand, were further back in Woodhull *et al.*'s (1985) subjects by about 11 millimetres (38 versus 49,6 millimetres, respectively) (Figure 8.4).

It appears that on average vertical alignment and the position of the body segments relative to each other in the adults were worse than those of the school children (Figure 8.4a,b). Asmussen and Klausen (1962) cited a study by Heelbøll-Nielsen (1958), in which the form and function of 201 boys, whose ages ranged from 8 to 15 years, were reported upon. Heelbøll-Nielsen's (1958, cited by Asmussen & Klausen, 1962) children showed a definite trend towards greater forward inclination with increasing age (Figure 8.5). The large individual variation in vertical alignment of the subjects in the present study unfortunately did not allow for a similar analysis.

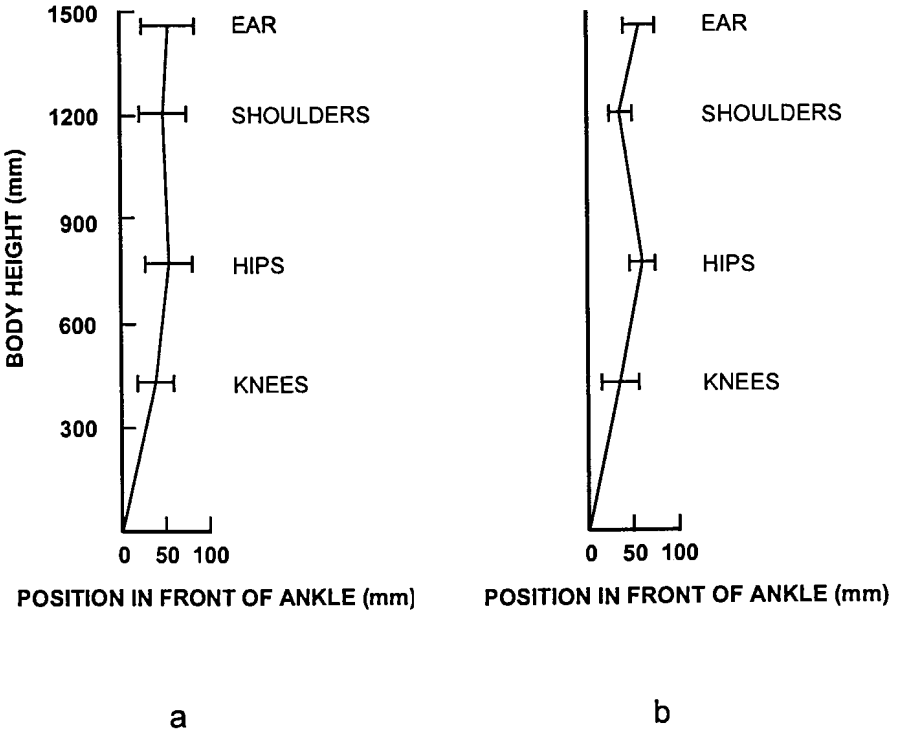

Fig. 8.4 **Mean positions of body landmarks in front of ankle and standard deviation in subjects of the present study and that of Woodhull *et al.* (1985) (drawn on the same scale).**

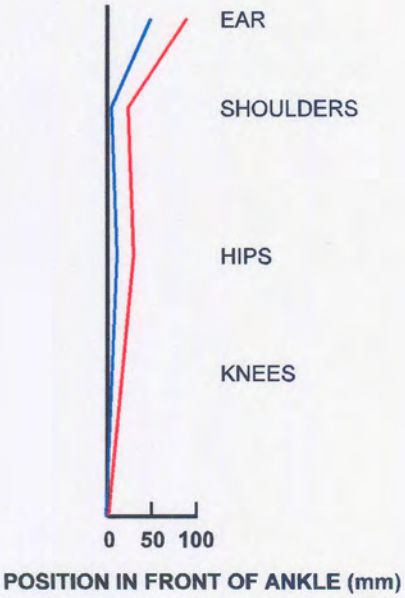

Fig. 8.5 Change in vertical alignment with increasing age. Mean age of subjects 8,3 years (blue line) and 15,8 years (red line), respectively (Adapted from data in Fig 12. of Asmussen & Klausen, 1962).

Individual parameters tended to vary in the subjects of the present study, and the position of one landmark did not appreciably influence those of the others above it (Table 8.7).

Table 8.7 Correlations between the different body-landmarks

	EAR	SHOULDER	HIP	KNEE
Ear	100	66	47	58
Shoulder	66	100	43	53
Hip	44	43	100	45
Knee	58	53	45	100

This is obvious from the low correlation between the different body landmarks in front of the vertical, the lowest being 0,43 and the highest being 0,66, which

implies that at the utmost only 46,6% of the position of the ear landmark could be explained by the position of the one directly below it - the shoulder. In Woodhull *et al.*'s (1985) study these correlations were of the same magnitude, ranging from 0,394 to 0,714.

It seems that each subject compensated in his own individual way for the position of the different body segments in relation to each other, as well as for the direction of the force of gravity. This is clearly shown in the large variation in vertical alignment - some more effective than others - adopted by subjects of the present study, and those of Woodhull *et al.* (1985) (Figure 8.6a,b).

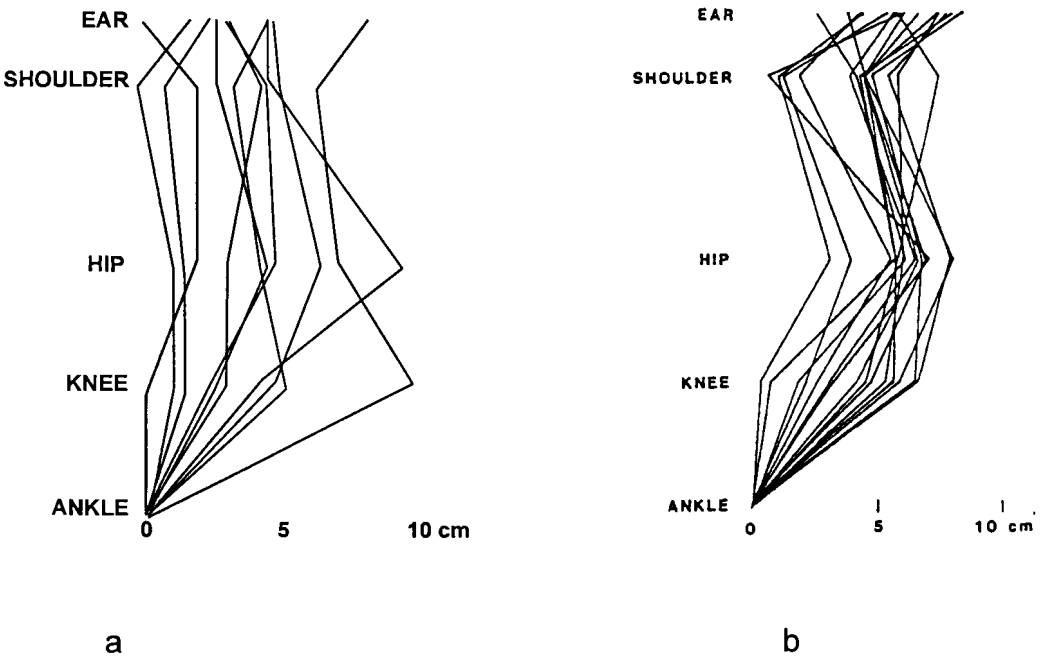

Fig. 8.6 **Body alignment of 10 primary school boys in the present study (a), and adults in the Woodhull *et al.* (1985) study (b), showing individual variation in posture.**

8.3.5.2 Postural defects

The White House report in 1932 painted a bleak picture about postural defects in American school children (Kiernander, 1956). Postural defects were detected

in 92% of the children studied, with 44% of these having extremely bad postural defects. Bang and Bojlén, (1950, cited by Asmussen & Heelbøll-Nielsen, 1959) in a group of more than a 1000 school children found that 55% of these had postures that were poor and 20% very poor. The subjects of the present study all had postural defects with very severe postural defects (48, 3%) and gross deformity (27,6%) adding up to a total percentage of 75,9 of the boys studied, indicating an increase in the incidence and severity of postural problems amongst school children.

By the age of 11, 70% of all children will already show obvious muscular and posture deficiencies. Usually these defects appear as passing inefficiencies and difficulties in learning, becoming accentuated in emotional situations. During adolescence the childhood faults become fully fledged defects and by the age of 18, 65% of the population will have severe defects and 15% will have very severe defects (Barlow, 1990).

The postural defects found in the subjects of the present study agree with those reported by others (Asher, 1975; Barlow, 1990; Dickson, 1983; Fenton, 1973; Rolf, 1977), in that kyphosis (and its associated rounded shoulders), lordosis and scoliosis are common postural problems, with other postural defects also being present. Additionally, in the present study 49 of the subjects (84,5%) had abducted and "winged" scapulae, while the remaining 9 (15,5%), had shoulders that were pulled together.

Kyphosis in a minor degree appears to be a common occurrence in infancy, childhood and adolescence and ·····*is reminiscent of the days before our ancestors assumed their upright posture* (Asher, 1975: 26). Asmussen and Klausen, (1962) supported this by stating that thoracic kyphosis is a feature common to all mammals. The incidence of increased kyphosis increases between the ages of 11 and 16 and diminishes thereafter (Asher, 1975). In the present study kyphosis was prevalent (89,7% of all subjects, Table 8,7).

Kendall and McCreary (1983) identified four abnormal posture types, namely: Lordotic, kypholordotic, sway back and flat back. The first two of these are, according to Kendall and McCreary (1983), associated with an anteriorly tilted pelvis and hyperextended knees. Some of these types are shown in Figure 8.6. In the present study 5,1% of the subjects were lordotic and 85% kypholordotic. Of these all had forward tilted pelvises, but only 24% had hyperextended knees. None of the subjects in the present study had flat or sway backs.

Scoliosis, however, is rarely seen under 8 years of age, and not often thereafter. If a single lateral curve, usually to the left, is observed which disappears on flexion of the spine or when lying down, the condition is of postural origin (Asher, 1975). Dickson (1983), however, found scoliosis in 14,48% of a sample of 5303 schoolchildren studied. With more accurate evaluation this figure may be as high as 30% (Burwell, James, Johnson, & Webb, 1982), which is more in agreement with the results (39,7%) of the present study. An interesting explanation for this problem by Dickson *et al.* (1984) is that idiophatic scoliosis (biplanar spinal asymmetry) is the reverse of Scheuermann's disease.

Round shoulders was a term used by Asher (1975) to describe a whole range of postures in children namely: forward shoulders, poking head, poking neck, kyphosis and mobile scapula. She found that in most primary school children the tip of the acromion process appeared to be pointing forward, and in the older group round shoulders was a serious postural defect which was used as a position of rest. She advocated discovering where the main fault lay and making the child appreciate the importance of recognizing the fault, as this particular posture was frequently part of the body image, and a new body image needed to be established (Asher, 1975). Body image is a term used for the visual, mental and memory images that a person has of his body. It influences the way the body is habitually used, as well as forming the background to his perceptions and it is embedded in his habitual resting state while influencing his posture, movement and communication (Barlow, 1990).

The subjects in the present study all competed in some sport or other physical activity, and therefore could, to some extent, be used to determine the effects of regular participation in physical activity/sport on posture. Postural defects of the subjects in the present study were therefore, compared to those in the study undertaken by Barlow (1956, 1990).

In collaboration with Tanner, from the Institute of Child Health, Barlow (1956, 1990) conducted studies on physical education students. This study was done at some of the leading physical education colleges in the United Kingdom. When the postural faults of the students in Barlow's (1956, 1990) study and the subjects of the present study are compared (Figure 8.7), a definite pattern emerged, in that the largest percentage of subjects in both the present and the study by Barlow (1956, 1990) fell in the categories of severe and very severe postural defects. Notably disturbing is the fact that in the group of physical education students in the Barlow (1956, 1990) study, the majority showed severe (62,0%), or very severe (26,5%) postural defects. In the present study these values were 20,7% and 48,3%, respectively, with gross deformities found in an appreciable number of the subjects (27,6%). None of the subjects in the present study had *poise*, with only a very small percentage having slight postural defects (3,4%).

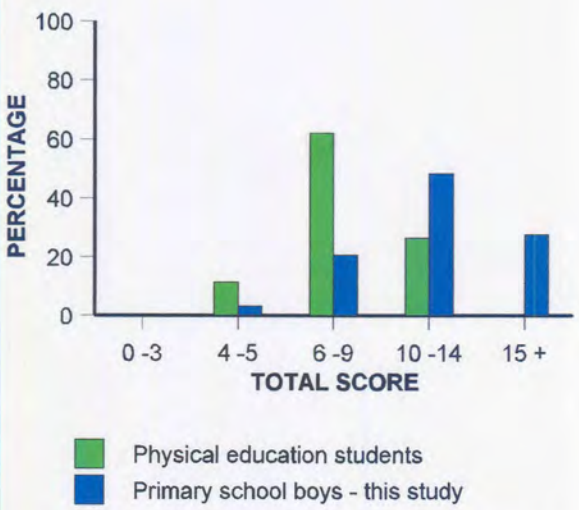

Fig. 8.7 A comparison between the postural defects in physical education students in the Barlow (1956, 1990) study, and primary school boys of the present study.

In the United Kingdom high physical standards were required on entry into a tertiary training institution which drew on some of the best athletes and games players in the country. The large number of postural faults in physically active and fit individuals do **not** support the idea that: ·····*plenty of fresh air and exercise will ensure a reasonably good USE*[1] (Barlow, 1990: 187).

8.4 GENERAL DISCUSSION ON THE UPRIGHT POSTURE

8.4.1 Vertical alignment of the body

Results from all the above-mentioned research projects indicate that the subjects had an average body alignment which is not in accordance with the biomechanical ideal proposed by some (Barlow, 1990; Kendall & McCreary, 1983). Woodhull *et al.* (1985) were of the opinion that a forward leaning upright stance is the norm, rather than the exception. The upright stance of Barker (1985) and Dangerfield (1996) also allows for some forward leaning, with the vertical line passing from the ear, through the acromion and trochanter, in front of the knee joint and the malleolus. Burt (1950) suspended a plumb line from the tip of the mastoid process which should pass through the greater tuberosity of the humerus, the great trochanters of the femur and through a point about 45 millimetres in front of the lateral malleolus, if the posture is good. In the present study and that of Woodhull *et al*, (1985) the vertical line did not pass through all the body landmarks - in fact a zig-zag pattern was found, with a great variation found between subjects (see Figure 8.5). All the body landmarks, however, were well in front of a plumbline going through the lateral maleolus. The vertical line going through the highest body landmark - the ear - would go 50,8 millimetres and 59,0 millimetres in front of the malleolus in the present study and in that of Woodhull *et al.* (1985) respectively, thus supporting the opinions of Barker (1985), Burt (1950) and Dangerfield (1996).

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[1] In this sense the word *use* is not used here in the limited sense of the use of any specific body part, as, for instance, the use of an arm or a leg, **but in a much wider and comprehensive sense applying to the working of the body in general** (Alexander, 1932).

A crucial element of *poise* (Dart, 1946, 1947) is the vertical alignment of body structures on top of each other, thus favouring the ideal biomechanical posture (Macdonald, 1998; Kendall & McCreary, 1983; Rolf, 1977) during the upright stance (see Figure 2.1a). Whether this assumption, and not that of Barker (1985), Dangerfield (1996) and Woodhull *et al.* (1985), is the correct one, is debatable. Approached from a biomechanical perspective, however, vertical alignment of structures on top of each other makes more sense (Barker, 1985; Rolf, 1977). Posture is dynamic, and although a static photograph can only record the posture of a moment, postural patterns are habitual, and a photograph represents an individual's typical postural pattern (Flint & Diehl, 1961).

The study of posture gives an indication whether the body as a whole is "out of line" or not. When it has moved from the ideal position of balance, and is thus out of balance, the body segments are not properly aligned on top of each other (Barker, 1985; Rolf, 1977). A physical reason for this could be muscle imbalance in certain areas, an aspect which has received some consideration (Flint & Diehl, 1961; Janda, 1993; Janda & Schmidt, 1980; Jull & Janda, 1987; Norris, 1995). Low, but significant, relationships, between antero-posterior alignment of the trunk, and back-extensor muscle strength and abdominal strength was found by Flint and Diehl (1961). The curvature of the lumbar spine, and that in the upper quarters may be influenced by muscle imbalance (Ayub, 1987; Janda, 1993; Janda & Schmidt, 1980; Jull & Janda, 1987; Norris, 1995; Chapter 5, section 5.9.3). Asmussen and Heelbøll-Nielsen (1959), in this respect, noted that in school children the stronger backs exhibited more pronounced curves.

8.4.2 Misalignment and intellectual potential

One of the implications of this misalignment is that full intellectual potential is not being reached, as evidence shows that equilibrium shifts in an anterior direction are correlated with lower academic performances (Kohen-Raz, 1981). Even an inappropriate sitting posture lowers the IQ score of preschoolers (Sents & Marks, 1989). According to Brown (1992: 62):

The lack of equilibrium in the so-called "physical" sphere will be found in every case to go hand-in-hand with a corresponding lack of equilibrium in the so-called "mental" spheres.

8.4.3 Awareness of body regions

Lestienne and Gurfinkel (1988) postulated that the body has an inborn structural organization for posture (body scheme), incorporating upper and lower, left and right, front and back sides of the body. Alexander (1987) and Lowen (1994) advocated "awareness". In order to prevent malposture or improve the use of the body, it is necessary to be aware of positions and activities of body parts. Perhaps the leaning forward posture is due to the fact that most people are not aware of their backs and thus do not stimulate the area of the brain representing the back. (Even in the event of back pain the person is usually aware of the pain, rather than the back) (Martini, 1992).

8.4.4 Implications of the rounded shoulder posture

Many of the subjects, both young and old, had a rounded shoulder or slumped posture. This has been called the 'fatigue posture' by Christaldi and Mueller (1963) who blamed it on physical unfitness and suggested postural exercises. According to Riskind and Gotay's (1982) experimental research, this posture has a detrimental effect on a person's ability to perform tasks effectively. Lower persistence in execution of tasks, and feelings of helplessness were features that developed as result of this posture.

8.4.4.1 The startle pattern posture

Jones (1965) and Jones *et al.* (1964) demonstrated that the sound of a slamming door immediately produces a bad posture. He called this a "startle pattern" and it is characterized by raised, forward shoulders, flattened chest and head thrust forward. This is the posture detected in many subjects of the present study. According to Jones (1979) and Jones *et al.* (1964) the stimuli for

startle, for anxiety and for fear are always with us and bad posture could be a reflection of a response to these powerful stimuli. He suggested that finding the origin of the response may be a more profitable way of improving posture than exercises would be, which means that curing the anxiety is the first step in curing the malposture. Lowen (1971) and Reich (Wilson, 1982) held the same views.

8.4.4.2 Reversion

Forward, rounded shoulders are reminiscent of an earlier phase in the phylogenetic development of the human. McGraw (1932), studying the ontogenetic development of the human individual, suggested that during development of the infant a new pattern unfolds bit by bit and dovetails with the old pattern and gradually the new pattern becomes more and more dominant until finally it is superimposed upon the old pattern. However, in times of stress and strain the infant will revert to the less mature response. This leads one to wonder whether, in later life, stress and strain might also cause a reversion to an earlier pattern in development (see chapter 2). When a child can maintain and control posture, position and attitudes he has achieved equilibrium (de Quiros, 1976). Stooping and submissive postures are derived from feelings of abasement and abandonment associated with infantile regression according to Le Vay (1947). The infant's first unsupported sitting posture is that of the "open-jack-knife" position (the infant is still very vulnerable and dependent at this stage). This is followed by the upright sitting position and a more independent infant. One might conjecture that in later life the flat back reverts to the rounded back of early infant life during periods of stress.

8.4.4.3 Protection

The rounded shoulders are a mechanism for protecting the vital organs in the chest. Today the projected message is one of submission with the intended purpose that cringing will avert the wrath of the (momentarily) superior individual. These are ancient behavioural patterns that are commonly found in animal

behaviour (Lorenz, 1957; Morris, 1984). It is a primitive, lower-brain reflex of survival (Hanna, 1988).

Feldenkrais (1985) described the protective acts as lowering the head, sinking the chest, protecting the throat and stomach. These are accomplished by flexor contraction and are effective measures that give a sense of security in the face of danger. The result is the offer to the threat of a hard, bony obstacle or the withdrawal of the soft organs. The motive for all of this is the fear of falling and the effect is a bad posture, similar to that seen in the research subjects. According to Feldenkrais (1985) the anxiety originates in early childhood when lowering the head and sinking the chest are the best movements to protect the body from injury expected to come from above, when flight or hitting back is unthinkable.

8.4.5 The forward head position

A significant percentage of the subjects evaluated in the study assumed a forward head position. Findings by Enwemeka, Bonet and Ingle, (1986) indicated that persons who habitually assume a forward head position often develop neck pain and spasm of the posterior neck muscles. Neck pain is frequently accompanied by protective muscle spasms which develop pressure within the muscles which then produces ischemia, more pain and abnormal neck posture (Barlow, 1990; Enwemeka *et al.*, 1986; Plummer, 1982). Postural correction *per se* was found to relieve neck pain as effectively as some other physical therapy treatment procedures (Enwemeka *et al.*, 1986).

8.5 POSTURAL REHABILITATION

8.5.1 Introduction

In the first two studies described in this chapter an attempt was made to gain more insight into posture of primary school boys and adult males (sections 8.2

& 8.3, respectively). Both studies indicated the correctness of Woodhull *et al.*'s (1985) conclusion that a forward leaning posture is the norm, as well as the prevalence of misalignment between body segments. Scrutiny of work done by those involved in postural training, however, showed that this resulted in a change towards a more vertical stance, as well as an improved alignment between body segments (Barker, 1985; Barlow, 1990; Gelb, 1981; Lawson-Wood & Lawson-Wood, 1977; Macdonald; 1998; Rolf, 1977; Turner, 1965). In the following sections (8.5.2 & 8.5.3) two studies investigating the consequences of postural rehabilitation will be described. The first of these studies deals with the outcome of the use of an active-intermittent technique, while the second considers physical and mental impacts of participation in exercises/procedures aiming at the attainment of *poise.*

8.5.2 Body re-alignment and its effects on simple body movements

8.5.2.1 Methods

8.5.2.1.1 Subjects

Four young tennis players (2 boys and 2 girls) volunteered to take part in the study. Their ages ranged from 11 to 16 years.

8.5.2.1.2 Procedures

Before training commenced, the subjects were photographed in their usual standing positions with arms along their sides. Anterior, posterior and lateral pictures were obtained. Simple movements of walking and running were recorded on videotape. Similar procedures were used for re-evaluation.

The postural training course decided upon was the Mitzvah Exercise (Cohen-Nehemia, 1983; Cohen-Nehemia & Clinch, 1982). This exercise is an active-intermittent technique, which is easy to learn, and which can be practised without the presence of a highly trained instructor. The Mitzvah Exercise

comprises a series of simple acts to be used in getting up from and sitting down in a chair and is designed to re-align the body, exercise every muscle and rebalance the body in relation to gravity.

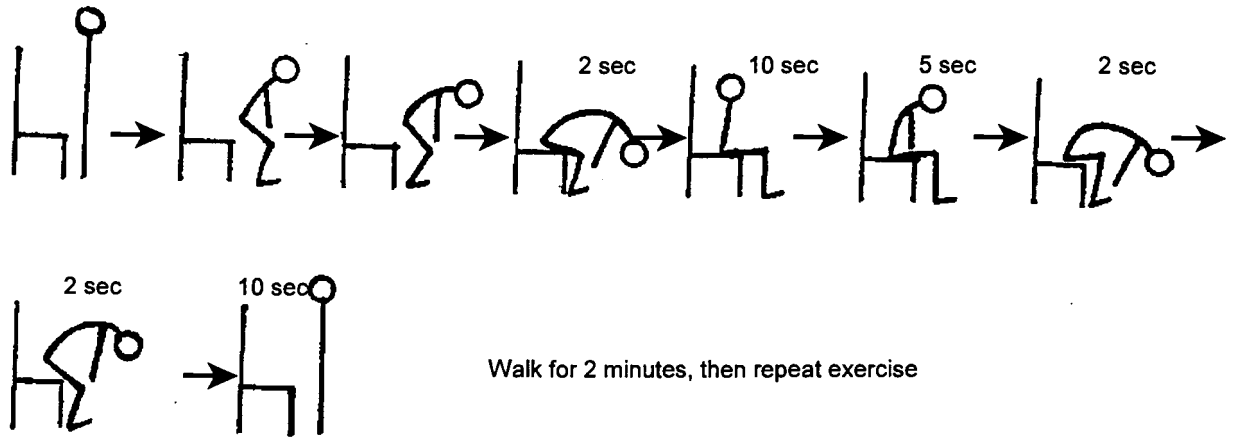


Fig. 8.8 The Mitzvah Exercise (Cohen-Nehemia, 1983; Cohen-Nehemia & Clinch, 1982). Postures are held for the periods indicated

The exercise is shown diagrammatically in Figure 8.8. The exercise consists of a series of simple acts to be used in getting up from and sitting down in a chair. No attributes to correct sitting or standing positions are given. Attention was paid to the process of changing from sitting to standing and vice versa (Cohen-Nehemia & Clinch, 1982).

The subjects were requested to do the set of exercises at home at least once daily. Their progress and correct execution of the exercise were monitored on a twice per week basis. They were again re-evaluated after a period of twelve weeks.

8.5.2.2 Results

The changes in body alignment are shown in Figure 8.9. In all the subjects a clear tendency towards a more vertical and balanced stance could be observed. The changes were observed in both the coronal and saggital planes.

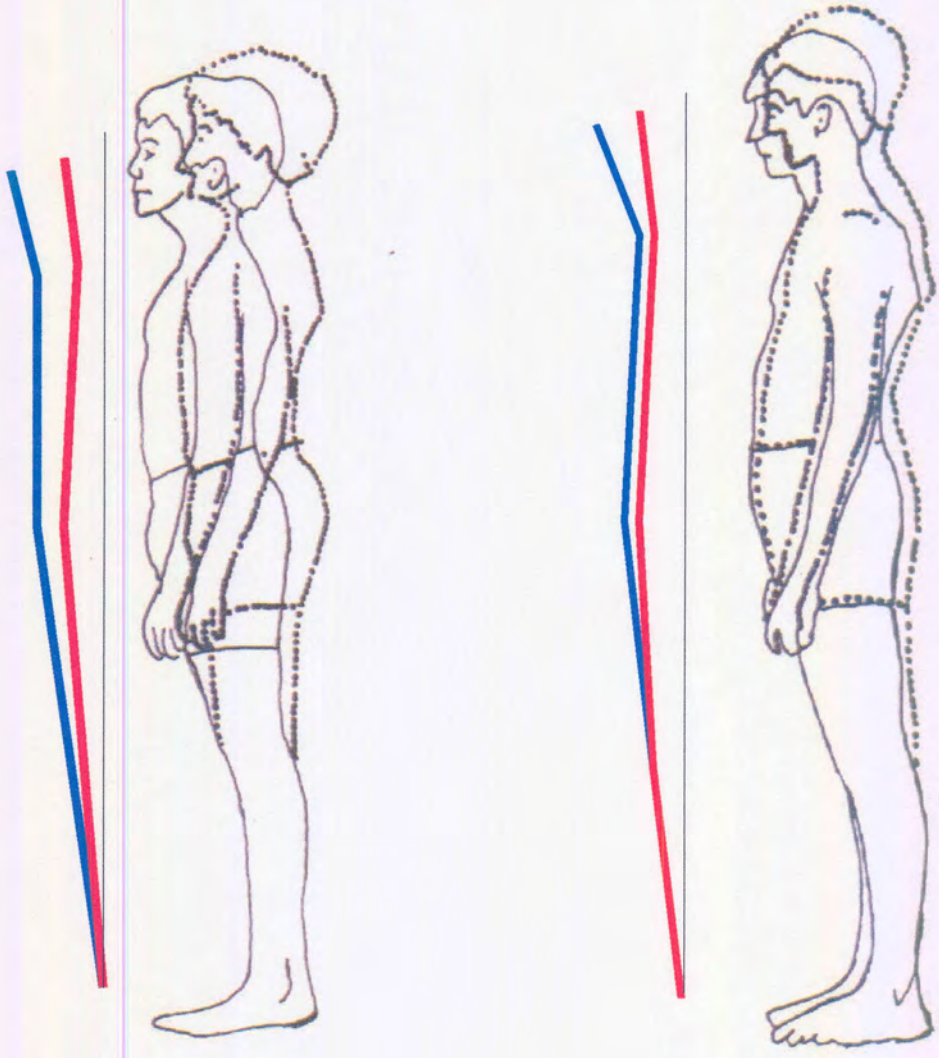
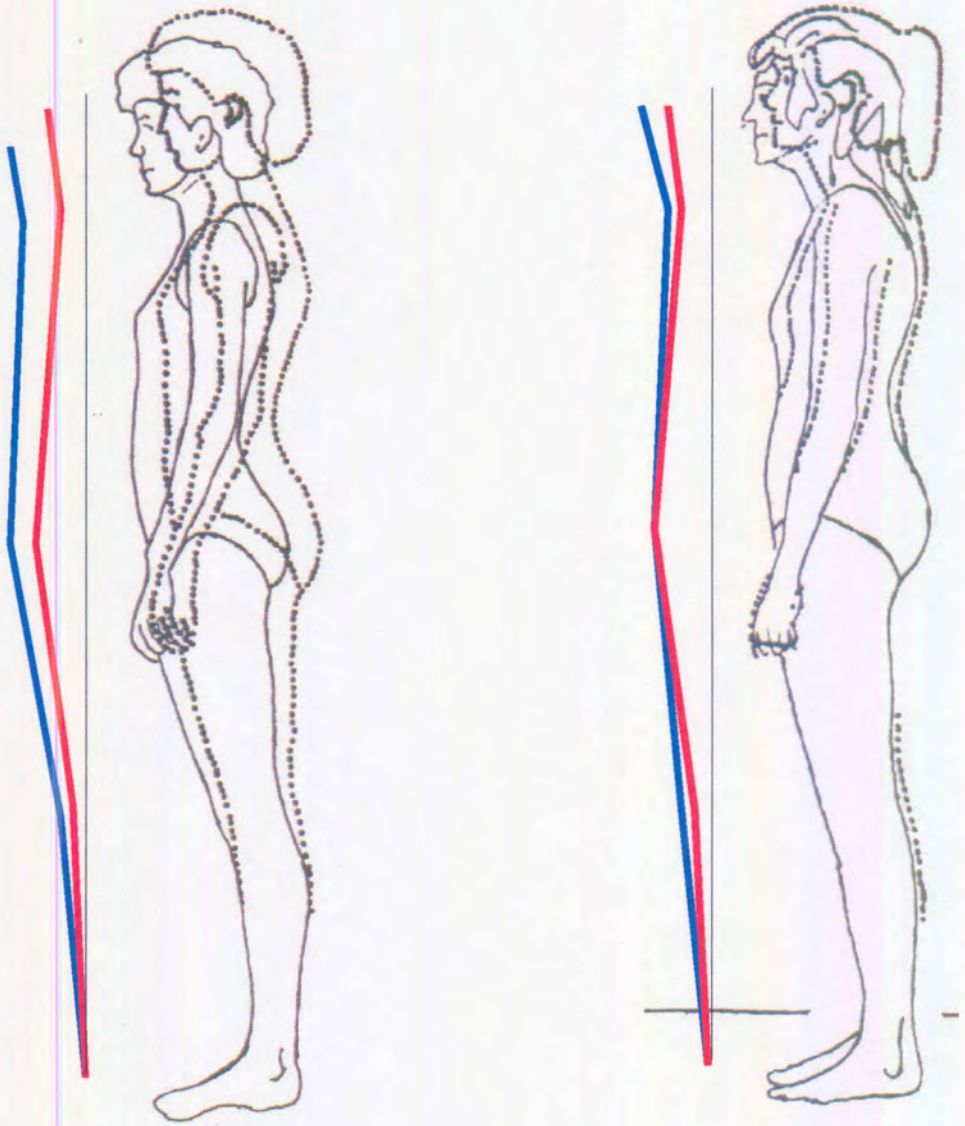


Fig. 8.9 The effect of the Mitzvah Exercise on posture of subjects. Before and after treatment postures are shown. Vertical alignment before treatment is shown in blue, while the effects of the Mitzvah Exercise on vertical alignment is shown in red.



c d

Fig. 8.9 (continued)

With time all subjects became aware of undue muscular tensions in their bodies, as well as a greater ease in movement.

Little or no change was found in the spinal curvature. Head carriage was improved in all subjects and forward poking of the chin decreased.

Walking and running were executed more economically, straighter and with less uncoordinated movement of the arms and legs. One subject noted a distinct change in the way he awaited a serve in tennis - prior to the Mitzvah Exercise he tended to assume a broad-based stance, which subsequent to intervention, narrowed to the feet being hip-width apart.

8.5.2.3 Discussion

Postural education/rehabilitation produces a more vertical and efficient biomechanical arrangement of the upright body and its segments. In the 1932 White House survey, it was found that exposure of children with postural defects, to a year of remedial exercises, resulted in improvement in posture in 62% of the subjects, 37% did not change, while 1% regressed (Kiernander, 1956).

Examples of the effect of postural rehabilitation was taken from the literature and is shown in Figure 8.10. For this purpose a series of photographs were selected from the literature (Barlow, 1990; Lawson-Wood & Lawson-Wood, 1977; Rolf, 1977; Turner, 1965) in order to demonstrate the physical outcomes of postural rehabilitation. All in all postural changes in 5 subjects were evaluated. Postural education/rehabilitation in these subjects was done by using various approaches, namely: The Alexander technique (Barker, 1981; Barlow, 1990; Macdonald, 1988), physical exercises (Turner, 1965), deep massage such as Rolfing (Lawson-Wood & Lawson-Wood, 1977; Rolf, 1977). In all the subjects examined the upright stance became more vertical, with a decrease in the spinal curvatures. The subject in Figure 8.10b shows a particularly well-balanced posture well in accordance with the idea of structures balanced on top of each other proposed by Barker (1985) and Rolf (1977).

For the duration period of the study, the Mitzvah Exercise did not result in any significant change in the curvature of the spine (Figure 8.9). In the subjects of the present study two basic changes were evident, namely a more vertical standing posture (Figure 8.9), and more economical movement. This may

indicate that a change in posture could lead to concomitant changes in other aspects of motor control such as locomotion and other forms of movement. An example is the relationship between the superb bodily use and posture of the excellent riders from the Spanish Riding School in Vienna (Pevsner 1980). Watson (1995) observed that better posture was associated with decreased possibilities of injury. Another practical consequence of a more vertical stance, according to Pritchard (1985) is less tension in the calf and hamstring muscles (Watson, 1995), while Gelb, (1981) found that it improved running.

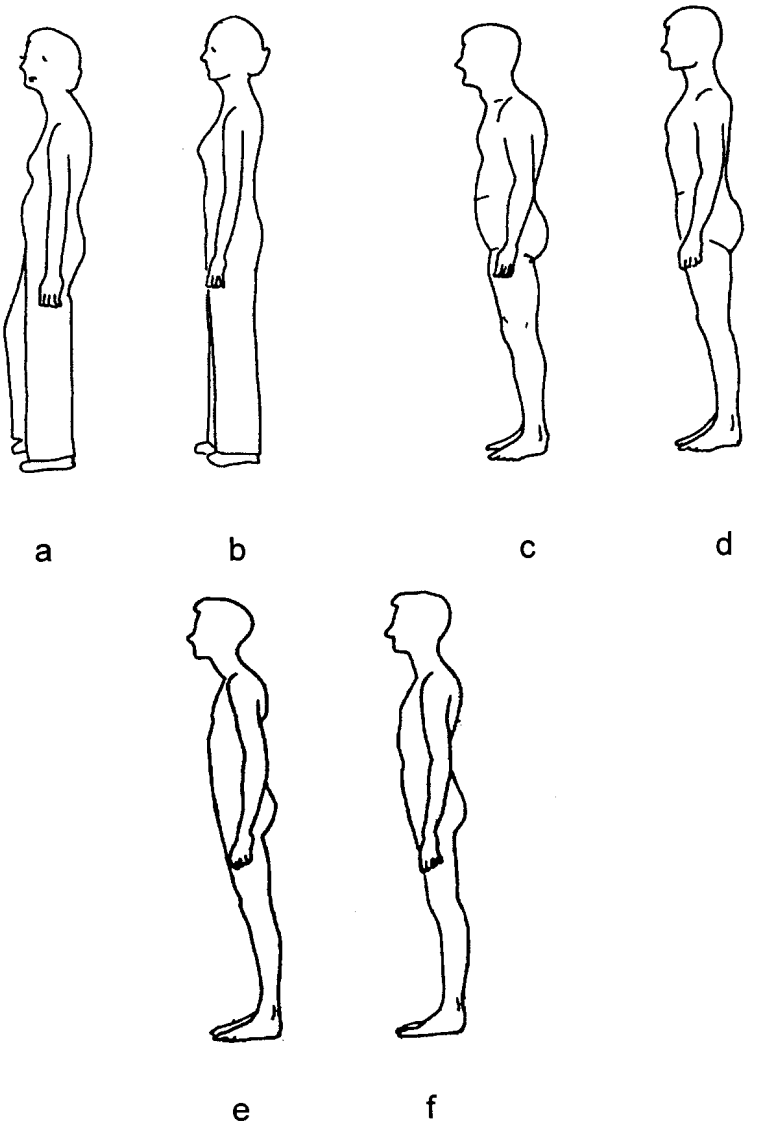


Fig. 8.10 Some postures of those who underwent postural education/rehabilitation (adapted from Barlow, 1990; Barker, 1981; Lawson-Wood & Lawson-Wood, 1977; Rolf, 1977; Turner, 1965).

The more vertical stance in the subjects was probably not only due to a mechanical change, but also due to a change in the way motor acts are controlled by the central nervous system. According to Cohen-Nehemia (1983) the body has a defence mechanism which can release contracted muscles before they adapt to their shortened, contracted state. Shortened, contracted muscles lose their sensory sensitivity (Plummer, 1982). The defence system can restore sensory sensitivity throughout the body and prevent loss of muscular stretching ability, strain of joints and connective tissue which gradually lead to distortion of the skeletal framework. In a body which functions efficiently the defence mechanism is activated instinctively by frequent body movements which involve the pelvis, thus freeing the body from pressures which interfere with its efficiency, realigns the body for better functionality, exercises every muscle and rebalances the body in relation to gravity (Cohen-Nehemia, 1983).

8.5.3 Subjective responses to postural education/rehabilitation in adults

Subjective responses of individuals who have undergone postural rehabilitation were investigated in this section of the study. The measurement tools were two questionnaires.

8.5.3.1 Methods

8.5.3.1.1 Subjects

For the purpose of this section of the study 6 subjects were selected. Two were trained in the Alexander Technique (Barlow, 1990; Brennan, 1992; Gelb, 1981), 1 in a combination of the Alexander Technique and Tai Chi Chuan, 2 in a combination of Somatics (Hanna, 1988) and the Alexander Technique and 1 had postural education on horseback. All the subjects had undergone at least a full year's (12 months) training and at least two years had elapsed since the training commenced. Physically, all the subjects have a near vertical alignment, with good body use.

8.5.3.1.2 The questionnaires

Two questionnaires (Tables 8.8 & 8.9) were compiled. The purpose of the first of these questionnaires was to obtain subjective information on the physical and psychological outcomes after receiving education in postural education/rehabilitation. Questions in this questionnaire were largely based on those proposed by Cailliet (1995), De Beer (1996) and Fischer (1995) for those who suffer from low back pain and osteoarthritis. The purpose of the second questionnaire was to determine whether assumptions made by those involved in bodywork (Brennan, 1992) can be verified. The gathering of information was not restricted to the questionnaires only - additional information was also obtained by means of free interviews with the subjects.

Table 8.8 Questionnaire to determine the physical and emotional outcomes of postural rehabilitation (Y = yes, N = no and U = unsure).

QUESTIONS		RESPONSES		
A: BEFORE REHABILITATION				
What was the main purpose for going for postural integration/rehabilitation?				
		Y	**N**	**U**
1.	Were you aware of any postural problem in your body? If yes please state whether you were aware of the following:			
	a Hollow neck, forward poked head, shortened neck or retracted head?			
	b Rounded shoulders and upper back?			
	c Hollow back?			
	d Stiffness in the neck?			
	e Stiffness in the back?			
	f Neck pain?			
	g Pain in the back?			

QUESTIONS		RESPONSES		
		Y	N	U
h	Problems with activities of daily life such as walking, sitting, sitting down, getting up, climbing stairs, etc?			
2.	Were you aware of strain in any body-part before it became stiff or painful?			
3.	Did you have a tendency to tire easily?			
B: AFTER REHABILITATION		**Y**	**N**	**U**
1.	Are you currently aware of any problem in the body? If yes, go to the questions below:			
	a Has the position of your neck improved?			
	b Is your upper back straighter, and your shoulder blades more flat against your thorax?			
	c Is your lower back more flat?			
	d Do you still suffer from stiffness in the neck?			
	e Do you still experience stiffness in the back?			
	f Are you still suffering from neck pain?			
	g Is back pain still a problem?			
	h Are you aware of any problems with activities of daily life?			
2.	Are you still aware of strains in your body?			
3.	Has your concentration ability improved?			
4.	Do you still have a tendency to tire easily?			
5.	Did postural rehabilitation affect you emotionally? If so:			
	a Was it in a negative way?			
	b Was it in a positive way?			

Table 8.9 Questionnaire to evaluate feelings of subjects about their bodies based on the possible outcomes of postural integration as proposed by Brennan (1992) (Y = yes, N = no and U = unsure).

QUESTIONS		RESPONSES		
		Y	N	U
1.	Do you have a better understanding of the working of the body?			
2.	Do you have a heightened awareness of yourself and the world around you?			
3.	Do you find that you are using your body in a way that maintains your physical and psychological equilibrium?			
4.	Do you recognise interferences that you inflict upon the body's natural functions?			
5.	Do you use your thinking capacity to bring about desired change so that you may go about your daily activities in a more coordinated fashion?			
6.	Do you feel more aware on many levels?			
7.	Do you find that you can move in a way that carries a minimum amount of tension?			

8.5.3.2 Results and discussion

In an unbalanced body extra energy is expended in order to overcome the negative effects thereof (Robinson & Fisher, 1998). Tristan Roberts, formerly Reader in Physiology at the University of Glasgow (Macdonald, 1998: 18), explains this more explicitly:

> *The correction of some postural habits can significantly improve a person's well-being. For example, many people exert additional effort to supplement the muscular actions called for in maintaining uprightness and in supporting the limbs. As this*

> *extra effort frequently involves simultaneous activity in opposing muscle groups, the effect is to stiffen the joints and cause undue fatigue and even pain. To correct such habitual inappropriate muscular activity, the therapist must somehow induce the patient to become aware of the proprioceptive signals that initiate the unwanted activity. If this awareness can be achieved, the patient is provided with an opportunity of voluntary refraining from initiating the stiffening actions. His posture thereafter becomes more supple and, consequently, more comfortable to maintain.*

All the subjects interviewed tired easily before treatment commenced (Table 8.10). After postural integration rehabilitation, only 1 subject alleged that she still tired easily. This supports Jones (1979) and Feldenkrais (1985) who maintained that well-balanced physical bodies are not prone to fatigue.

Before treatment all the subjects interviewed were aware of physical problems in their bodies (Table 8.10). After treatment five of the subjects were still aware of problems in their bodies.

The second questionnaire (Table 8.11) evaluated emotional responses to postural rehabilitation. All the participants responded positively to the whole of the questionnaire except for one subject who responded negatively to one of the 7 questions. The overwhelmingly positive emotional results to postural integration supports the contention that the mind and emotions can be affected by balance in the physical body. As the body becomes more symmetrical and upright, the personality becomes more open, expressive and softer (Painter, 1986).

The subject who still became easily tired, was also the only subject who reportedly did not feel more aware on many levels. This subject received her postural training in conjunction with sport training (riding lessons), and one could speculate that the two learning processes should rather be separated than

integrated. However, much more work needs to be done in this field before a final opinion can be formulated.

Stiffness in the back was alleviated in all subjects, indicating that people with back problems could benefit from postural integration.

Stiffness in the neck seems to be a more persistent problem with all but 2 subjects retaining stiffness in the neck, despite therapy in postural integration.

All the subjects experienced a marked improvement in posture, irrespective of their initial postural shortcomings.

The reasons for attendance of postural rehabilitation training were varied, namely curiosity, low back and neck pain, and improvement of physical and mental awareness.

One of the aims as well as results of most bodywork techniques is the improvement of awareness, which can bring an improvement in a variety of mental attitudes such as focus and consciousness (Alexander, 1996; Feldenkrais, 1985; Painter, 1986; Rolf, 1977). Following treatment all the subjects reported a heightened awareness and understanding of their bodies (Table 8.11), emphasizing the fact that postural rehabilitation has the ability to bring about changes in the perception of the self as advocated, for example, by teachers of the Alexander Technique (Brennan, 1992).

Table 8.10 ***Response to questions about physical awareness about problems in the body before and after postural rehabilitation.***

QUESTIONS			RESPONSES	
A: BEFORE REHABILITATION			**Y**	**N**
1.	Awareness of postural problems in the body:		6	0
	a	Hollow neck, forward poked head, shortened neck or retracted head	4	2
	b.	Rounded shoulders and upper back	3	3
	c	Hollow back	4	2
	d	Stiffness in the neck	4	2
	e	Stiffness in the back	3	3
	f	Neck pain	4	2
	g	Back pain	3	3
	h	Problems with activities of daily life	0	6
2.	Awareness of strain in any body-part before it became stiff or painful		2	4
3.	Tendency to tire easily		5	1
B: AFTER REHABILITATION			**Y**	**N**
1.	Current awareness of any problem in the body:		5	1
	a	Improvement in the position of the neck	6	0
	b	Improvement in the shape of the upper back, and position of shoulder blades against the thorax	6	0
	c	Improvement in lordotic curve of lower back	6	0
	d	Decrease in stiffness in the neck	2	4
	e	Decrease in stiffness in the back	1	5
	f	Presence of neck pain	2	4
	g	Presence of back pain	1	5
	h	Problems with activities of daily life	3	3
2.	Awareness of strains in the body		5	1
3.	Improvement in concentration		4	2
4.	Tendency to tire easily		1	5

QUESTIONS		RESPONSES	
		Y	N
5.	Emotional response to postural rehabilitation	6	0
	a Negatively	0	0
	b Positively	6	0

Table 8.11 ***Subjective responses to postural re-education.***

QUESTIONS		RESPONSES	
		Y	N
1.	Improved understanding of the working of the body	6	0
2.	Heightened awareness of oneself and the environment	6	0
3.	Using the body in a way that maintains physical and psychological equilibrium	6	0
4.	Recognition of interferences inflicted upon the body's natural functions	6	0
5.	Use of thinking capacity to bring about desired changes, in order to go about daily activities in a more coordinated fashion	6	0
6.	Increase of awareness on many levels	5	1
7.	Moving in a way that carries a minimum amount of tension	6	0

CHAPTER 9

CONCLUSION AND RECOMMENDATIONS

An individual in trouble unconsciously modifies his flesh, solidifies his mental attitude into biological concrete. When he does, the here-and-now goal of psychotherapy fails to have meaning for him (Rolf, 1977: 37).

9.1 CONCLUSION

When the present study was initiated, it was mainly with the intention of answering the following questions: Why do people not stand erect, and what significant physical and psychological consequences result from malposture? These questions led to interesting and sometimes unexpected answers. At the conclusion of this study the inference drawn is that posture should not be taken for granted as it is not simply a random occurrence. It was carefully developed by the human species over a period of millions of years, and as far as the individual is concerned, for most of his growing years. Yet, at present, this important aspect of humanness is unappreciated to such an extent that malposture has become an endemic problem, indicating individuals in trouble.

From an anthropological perspective, the erect, bipedal stance, which is exclusive to man, evolved over millions of years. Structures and their usages changed with time and requirement. Man adapted to his physical changes, not randomly but by developing specific deeper voluntary/skeletal muscles for posture which had previously been used only for movement. Muscular imbalances in the present time result from the fact that muscles are not used for their intended purpose, with the postural muscles, for example, showing an increased tendency to tighten or weaken (Alexander, 1932; Norris, 1995; Robinson & Fisher, 1998). This is probably the underlying physical cause of the various aspects of malposture such as scoliosis, lordosis, muscular imbalance

and undue muscular tension (Alexander, 1932; Barlow; 1990; Janda & Schmidt, 1980; Lowen, 1994; Reich, 1999, Rolf, 1977).

Postural muscles, the stabilizing and endurance muscles, should work in synergy with the mobilizing, superficial muscles to attain the most favourable posture which would be the perfect posture (Robinson & Fisher, 1998; Robinson & Thomson, 1999). This ideal state is prevented by alterations in motor control, which may be brought about by stimulation of the limbic system, due to emotional factors and stress or by impairment of afferent input through a reduction in proprioception (Boadella, 1985; Lowen, 1969, 1971, 1975, 1994; Norris, 1995). Mobilizers may then take on a stabilizing role (Robinson & Thomson, 1999).

> *By the time we reach adult life, if not before, most of us will have developed tension habits which are harmful. The habits at first may show themselves only as trifling inconsistencies of behaviour, or perhaps as occasional muscular pain or clumsiness. Frequently, however, they show themselves as infuriating blockages which prevent us from giving our best just when we most need to, whether it be in the everyday business of personal relations, or in the more exacting situations of competitive sport, public speaking, making music or making love. In any situation, in fact, in which our FUNCTIONING is affected by our USE* (Barlow, 1990: 22).

> *It is the soma's internal process of self-regulation that guarantees the existence of the external bodily structure. Hence, the dictum that is universally valid in somatics: function maintains structure* (Hanna, 1986a: 6).

The present study provided convincing support for the concept of an integrated mind-body unity. This is an ancient Eastern concept, which views the human being as a single unity with many gradations. The human is thus a being of many interconnected layered depths, the body gaining its meaning in the spirit and the spirit its expressiveness in the body (Hanna, 1986b).

Hanna (1986b) considered the mind-body problem to have been solved during the past generation (30 years). During that time somatic ethics and somatic science came into being and self-responsibility, following on self-awareness, became the norm. There is now an increasing awareness of the fact that the condition of the human body can be influenced by how it is voluntarily used during its daily activities, as well as by external factors like nutrition and pollution. In the words of Hanna (1986b: 179) *.....somatic science is a science of self-awareness, a self-knowledge that surprisingly leads directly to self-control.*

In the wake of this spirit of taking responsibility for the own body, comes the spirit of learning. While a few decades ago there was a willingness to entrust the body's well-being to professionals, the trend is now more towards taking responsibility for the own body and working in conjunction with the professional. The attitude of being a victim of external forces such as circumstances or people, has been replaced by a willingness to actively take part in personal improvement and not to expect it to come from somewhere else or even to become dependent on a therapy (McCullough, 1995). Many therapies tend to be learning processes where people are trained in correct ways of using the mind and the body, and developing both to their maximum potential (Alexander, 1932; Barlow, 1990: Feldenkrais, 1972, 1985; Hanna, 1988; Hannaford, 1995; Lowen; 1994; Pang & Hock, 1984; Perls, Hefferline & Goodman, 1980; Pilates & Miller, 1998; Putkisto, 1997).

This attitude has particular significance in the realm of posture. Proponents of improved posture for physical benefits, have throughout this century advocated inner awareness of the physical body for the improvement of posture, with added psychological benefits as a side-effect. The ground-breaking work of teacher-therapists, rather than of exclusively therapists, is remembered today and is still being followed. Notable amongst these are Alexander, Dart, Feldenkrais, Lowen, Reich and Rolf (refer to Chapter 7), brave individuals who had practical experience of the effect of the body on the mind and who used the mind-body concept at a time before it became more generally accepted by conventional practitioners in the field of health.

Posture, having both a mind and body component, needs to be viewed from both a first person perspective as well as from a third person perspective. The observable, measurable and analysable body reveals universal physical and chemical principles from the third person point of view. Different data are observed from a first person viewpoint. Here somatic information is communicated to proprioceptive centres and self-observation takes place which is immediately factual - no interpretation through universal laws is necessary. The human being experiencing himself from the inside is a somatic phenomenon causing self-awareness and self-regulation (Hanna, 1986a).

Conditioning, however, is a procedure imposed upon an individual by external manipulations which reduce the repertoire of voluntary consciousness. Thus a condition termed sensory-motor amnesia may be the conditioned result of long-term stress conditions. Stressful stimuli constantly repeated, will cause loss of conscious voluntary control and sensation in areas of the body's musculature (Hanna, 1986a; Lowen, 1994; Reich, 1999). This phenomenon has been described by Mann (1999) in relation to another endemic condition, namely that of high blood pressure. He found a crucial connection between high blood pressure and emotions, not emotions actively experienced, but those harboured and not felt. In other words, most people with high blood pressure do not claim to feel particularly tense or angry, yet there was ample physical proof of their tenseness (Mann, 1999). This is an example of the effects of loss of bodily awareness as brought about by conditioning due to stress, and can be directly applied to malposture.

Due to the fact that malposture is many times more prevalent than good posture (Dart, 1947; Kiernander, 1956; Lawson-Wood & Lawson-Wood, 1977; Sherrington, 1946 and Chapter 8, this study), it is hardly noticed from either a first person or a third person viewpoint. However, once the condition is rectified, it is thoroughly noticed, both by the self and others. Improvement in posture facilitates ease of movement and smoother execution of physical tasks (Chapter 8, section 8.5). This is appreciated by both the self and the observer. Learning to bring the physical body into balance, allows the release of uncomfortable strains in some muscles with the added benefit of a more efficient energy use (Roberts, cited by Macdonald, 1998). Achieving a good posture and giving

up a bad posture, is a serious commitment as patience is needed for this long term task. Effective posture training is accomplished by attempting it from the inside. Postural muscles are the deeper muscles that are stimulated, stretched or relaxed as the need may be. At the same time, following the evolutionary, developmental route of becoming erect, assures that the segments of the body attain the balance they were intended for.

Individuals are recognized by their postures; posture and personality are thus intertwined. As an example, protective or defensive attitudes of the shoulders are usually direct results of an emotional state of an individual, not necessarily an immediate feeling, but an unresolved past experience. The inner feelings become external expressions carried in the posture and inner imbalance translates into muscular imbalance which may become a permanent habit (Cailliet, 1995; Feldenkrais, 1985; Kiernander, 1956; Lowen, 1994; Reich, 1999). Muscular imbalances around the neck and shoulders affect the cervical or thoracic curve (or both) and the increase or decrease of any of these curves directly affects the rest of the spinal curves. Muscular imbalances in other parts of the body are then experienced, usually accompanied by misalignment. The result of the original defensive or protective attitude is malposture. The suggestion now is that reversing the procedure and treating the malposture, could probably result in eliminating the emotional imbalance (Katchmer, 1993). Once the body is free from the restraints of misalignment and/or malposture, a natural sigmoid shape asserts itself and undulates wavelike from the feet to the head when the body is viewed from the side. The spiral arrangement of the voluntary muscles becomes apparent in their functioning and in addition to the feelings of certainty and power inherent in the balanced position, free and flowing movements are executed.

Fostering an awareness of posture from an early age could serve as a preventative measure for many modern lifestyle diseases such as headaches and backaches ,while also playing a role in mental health.

9.2 RECOMMENDATIONS

9.2.1 Postural training

Early in this century Cochrane (1924: 312) remarked on what he perceived to be a necessity for modern mankind:

> *Problems relating to man's posture have a direct bearing on medical and surgical practice. Many of the chronic conditions requiring treatment represent a derangement of the mechanism which regulates and maintains the proper and correct posture of the body.*

Posture encompasses more than medical and surgical practice, numerous other aspects of human life can be improved by timely implementation of the following:

- Postural training in schools could profit scholars on an academic level and in the delicate childhood emotional sphere, since postures reflect the thoughts, feelings and moods (Kiernander, 1956; Sherrill, 1980) of children. They are more than passive indicators of emotions; they may have the capability of partially affecting the susceptibility to emotions (Riskind & Gotay, 1982). Alleviating malposture could go a long way in establishing emotional balance. Awareness and discipline brought about by postural training could benefit communication at all levels and improve inter-learner and inter-generation relationships.

- Posture forms the basis of all physical activity (Latash, 1998a; Massion et al., 1998). Any physical and/or sporting activity at any age should therefore be preceded and/or accompanied by postural training. This strategy could decrease unnecessary energy expenditure, ensure smoother movements and reduce the incidence of sport injuries (Watson, 1983, 1995). Once muscle balance has been brought about, any sporting activity can be approached with impunity.

  The lack of physical education in the young of our communities, especially at colleges and universities, is to be deplored. The lines on which such

education should be carried out are indicated in an appreciation of proper posture and its resulting efficiency. Such work by the orthopaedic surgeon and educator represents the best kind of preventive medicine and should have a place in the programme of those who have charge of the health of the country (Cochrane, 1924; 312).

It is incredible that a pandemic problem (Dart, 1947) which has been identified so long ago, with its accompanying solution, should at present still elicit so little attention; especially when other problems such as obesity receive front page attention on a magazine such as *Time,* and on which millions are spent world wide (Gleic, 1999).

- Postural exercises, especially if linked to exercises suggested by Pilates and Miller (1998) and Wikler (1980), for example, can increase physical capacity and output at the work place. This is a way of optimizing the process of brain activation, leading to sustained vigilance, attention and memory span. Monotony at work may be diminished or eliminated and excessive, unproductive nervous tension reduced (Briedis *et al.,* 1978). Paying attention to the ergonomic designs of furniture and tools plays a great role in preventing malposture (Mandal, 1984). Loss of man-hours and financial expenditures can be prevented by eliminating headaches and backaches due to malposture.

- Health professionals may benefit their patients by being aware of the fact that some diseases have a postural origin, and therefore have a postural solution. More information about malposture and its implications can be to the advantage of health professionals.

- Training of therapists such as physical educators, biokineticists and physiotherapists in preventative and rehabilitatory methods in the field of posture, could make a significant impact on the general health of society. An in depth instruction in the function of the neuromuscular-skeletal (tripartite) system, postural muscles and nervous control of posture, is essential if a worthwhile contribution by therapists is to be made.

9.3 AREAS FOR FUTURE RESEARCH

Areas for future research were identified from this study. Some of them may include aspects discussed under "Recommendations" (section 9.2). Main areas would be in the realms of the physical and the psychological.

9.3.1 The physical aspects of posture

In the physical domain the following aspects of posture need careful consideration:

- A critical issue which has never been fully investigated is that of what actually constitutes optimum posture and body alignment. Most of this research will firstly have to be based on in-depth studies on the ideal theoretical biomechanical models of posture during standing, sitting and movement, and secondly on the investigation of these principles on human subjects, especially on those who are well trained in correct body mechanics.

- The nature and extent of postural defects in the South African population. Especially relevant would be an investigation into postures and body mechanics of urban and rural populations. In this respect rural populations would constitute those who still live outside the influence of western civilization.
- Empirical studies on the extent of the link between posture and movement could examine the connection between posture and movement as found in daily functional movements, as well in the realm of performing arts and competitive sport.

- Physical problems such as chronic muscle pain, low back and neck pain, pain resulting from tension in so-called trigger points.

9.2.2.2 The psychological and social aspects of posture

Psychological and social aspects of the study merit further investigation. These comprise the following:

- The nature and the extent of the link between posture (use) and the psyche in all its ramifications, such as emotions, intelligence, moods, performance in cognitive and learning tasks, personality and its disorders,

- The role and effect of posture in verbal and non-verbal communication.

- Posture as the cause of stress and posture rehabilitation in the ability to cope with stress.

- The role of posture training in the prevention of mood- and anxiety disorders as well as antisocial behaviour, which may include criminality.