Useful Models of Neuropsychology for Today's Practical Alexander Work

Adrian Mühlebach

1. Preliminary remarks and introduction

Every Alexander teacher has heard the question "What is the Alexander Technique?" This is not an easy one to answer. One possible answer might be that the Alexander Technique is something you have to experience, it is almost impossible to explain what it is. But in my humble opinion this answer is not really satisfactory.

The 1990s – when I was training to become an Alexander teacher – was known as "the decade of the brain". Thanks to the application of new imaging methods such as fMRI, it was possible to look inside the living brain. At that time many new insights were slowly beginning to reach the general public. I was fascinated by this new knowledge, because both brain research and the Alexander Technique share the same field of work and research: the human nervous system.

In this text I would like to show how we can integrate findings of modern brain research into the theory of the Alexander Technique. This is a text about and for the brain.

1.1 What are models and what function do they have for us?

Models are something normal in our daily life. They provide us with the words with which we can express our experiences as language. Our language consists of nothing but models. We think with the help of models. Models are attempts to categorise experiences in our thinking. But they can never represent the reality, experienced in its diversity and complexity. They never include the whole of reality, they are simplifications. In order to talk about an experience at all, we must leave out much.

1.2 What requirements must our models fulfil to be useful?

Models must be adapted to the cultural environment, which means that they must use the current state of knowledge and current language. Models have to be useful in our thinking, acting and speaking. This is the spirit of pragmatism: "Truth is what proves itself in the experience."
This means that models must be tested again and again. A model that was used a century ago to describe a particular experience perhaps no longer reflects current thinking and speaking. We are therefore challenged to look at current models and to examine whether they might be better at putting experience into words. It is also appropriate to check new neuropsychological models according to their suitability for the Alexander Technique; I think they are actually very appropriate to describe and to reflect our experiences.

1.3 Models in the theory of the Alexander Technique

Alexander used current scientific models in his books to put his practical experiences with himself and with his students into words. For example, Charles Darwin's theory of evolution was new and exciting in the scientific world at the beginning of the 20th Century. His model gave a new explanation for the origin of different species. Alexander studied this theory and used it in his first book. (Alexander 1988 [1910], pp. 1–21). Another example is the importance of habits for the control of behaviour. Many thoughts on this topic can be found in the works of John Dewey (Dewey 1931).

It is very likely that Alexander found the stimulus–response model in behaviourism, the psychological direction that shaped psychology until the 1970s. But he interpreted it in his own way. From the behaviouristic viewpoint, a particular stimulus is followed by a particular predetermined reaction. Alexander believed that the human reaction can be controlled consciously using the Alexander Technique.

A final example of a model that I want to mention here is the primary control. It is the

idea of an instance in our body, our nervous system, which is of central importance for the control of our behaviour. Alexander was convinced that the correct alignment of the head, neck and upper back is the precondition of good overall functioning. Alexander believed his own model of primary control was confirmed in the research of Rudolf Magnus on the so-called "Zentralapparat", a part of the brain stem (Bloch 2004, pp. 132–133).

As we can see, Alexander integrated the science (for example Darwin, Spencer, James, Dewey) and also in particular the neuroscientific findings (for example Magnus, Sherrington, Coghill) of his time into his theoretical considerations. It is the challenge of today's Alexander Technique teacher community to stay in contact with the constantly evolving science and to combine useful current models with our classic theory and practice (Petzold 2001, p. 233).

1.4 The case study

I would now like to change into practice and get to know Tom (Figure 1). Tom is my case study with which I will illustrate the theoretical considerations that I consider relevant for today's Alexander Technique. Tom is a typical Alexander Technique student who makes his learning experiences. Tom's neck hurts and he has lower back pain. What is the solution to his problems? What can the Alexander Technique offer?

Figure 1.
Tom in his habitual posture.

I am going to present some current models which I will explain and discuss in the following. The solution to Tom's problem is this: as a first step he learns a natural motor programme and installs it in his brain. The natural motor programme gives him the alignment in the length and width of his body and frees him from unnecessary muscular tension. Then he learns to apply it, first in the Alexander Technique lesson and later in his everyday life. And he learns to perceive the influence that emotions have on his motor control and how to use them in a constructive way.

2. How we can install natural motor programmes

2.1 How our brain learns

Now I will introduce the model of the motor programme. Our movement organisation is based on our motor programmes (Illert and Kuhtz-Buschbeck 2000). They control the interaction of the various aspects of movement organisation. Motor programmes are learned. Learning means having new experiences and storing them in our brain. This happens by the networking of nerve cells in our brain. Brain researchers call this ability of the brain to change its structure neuroplasticity. For a long time it was believed that there are no structural changes after puberty. It is true that the brain as a whole has matured up to this stage of life. However, after puberty

new neural connections are still created and existing ones are resolved. This is how our learning functions. We have 100 billion nerve cells in our brain, and they are all linked together. In the schematic drawing (Figure 2) we see four nerve cells and just a few of their interconnections. When we experience a new movement, new connections are formed between neurons or groups of neurons.

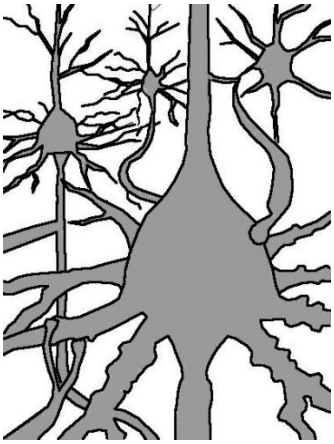

Figure 2.
Networked neurons.

We can represent these connections with a simplified wiring diagram (Figure 3). On the left side are two groups of neurons (circles) and their connections (black lines) before a new experience has taken place; the right side shows the same groups only now we are seeing them after storing the new experience, with more new connections (white lines). If we want to repeat the same movement experience, then these neural connections will provide the information for movement control.

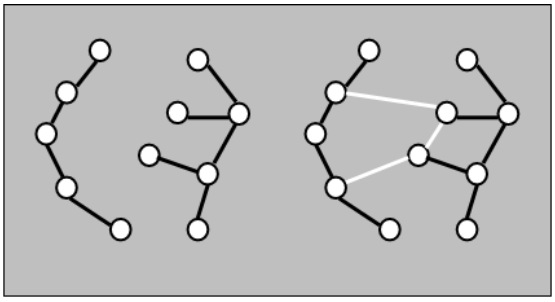

Figure 3.
Group of neurons before (left) and after (right) storing the new experience.

The motor programmes are stored mainly in the motor cortex. It is located in the parietal area of our cerebrum, in the cerebral cortex. Like all areas of the brain, the motor cortex is networked with other near and also distant brain areas. Individual brain functions can indeed be assigned to individual brain areas, but it is a functional principle of the brain that different areas always work together. This is illustrated by the schematic networking shown in Figure 4, in which we see a brain with a representation of the motor cortex (grey) and some of its many pathways of connectivity (black lines). Other areas of importance for motor control are the cerebellum and the basal ganglia

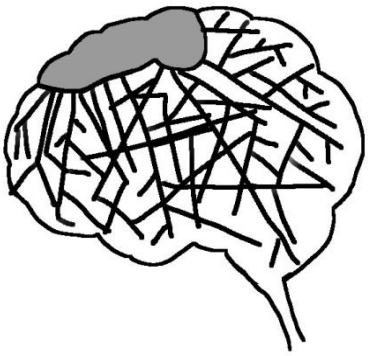

Figure 4.
The networked motor cortex.

2.2 Memory systems

When we talk about storing information in the brain, we speak about our memory. We can distinguish different memory systems (Roth 2001, pp.150–169; Roth 2007, pp. 144–154): the unconscious memory, the conscious memory, the emotional experience memory and the short-term or working memory.

In addition to skills, habits, expectations and classical conditioning (Birnbaumer and Schmidt 2000, p. 450), motor programmes are stored (LeDoux 2006, p. 45) in the unconscious memory. This has the advantage that we do not have to think about the way we move. We are able to get up out of bed in the morning without sending a command to the muscles telling them what they have to do. If we had to send such commands, we probably would not get out of bed. It also has the disadvantage that we cannot change easily our habits of movement, because our consciousness has no access to motor programmes. If we want to change them, we need a specific methodology, such as the one developed by Alexander.

In our conscious memory we store our knowledge of what we learned in school, how much 3 × 5 is and what the capital of Italy is called, also our ideas about the world and how it works, and finally our experiences, for example, the memory of our last holiday. The emotional aspects of our experiences are stored in the emotional experience memory. This memory is responsible for behavioural motivation, for the evaluation of experiences and the emergence of our emotions. The short-term or working memory is the place where we think, consider and make decisions.

2.3 Motor control

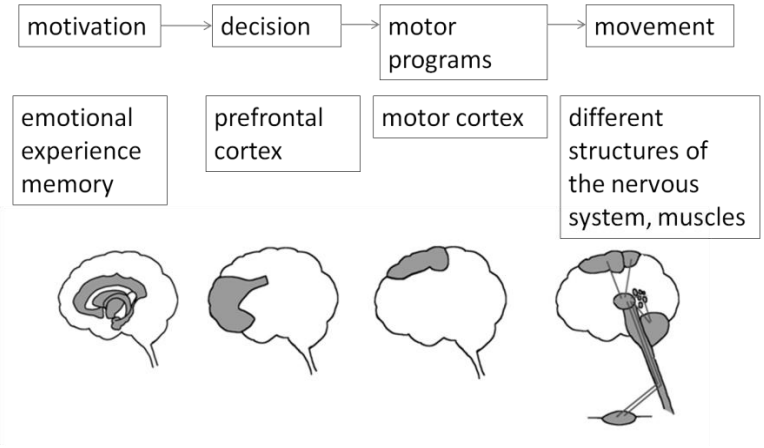

Figure 5.
Motor control.

Let us look at the role of motor programmes in motor control. To describe movement control we use a model of psychology called the Rubicon model (Figure 5). The Rubicon model was originally developed by Heckhausen (1989) and Gollwitzer (1990) in order to investigate the process through which motivation will be implemented as action. It distinguishes the phases of motivation, planning, action evaluation. Grawe (1998) extended the model: he added a further phase at the very beginning containing the unconscious motivation (Storch and Krause 2005, pp. 57–74). Illert and Kuhtz-Buschbeck (2000) used the model to describe motor control. To the first phase they attribute action drive, movement design and planning. To the second phase they attribute the programme for a posture or movement; to the third phase the execution of the posture or movement is allotted. Illert and Kuhtz-Buschbeck (2000) use the phases action drive, decision phase, programming phase and movement execution. I have modified this scheme somewhat for our purposes and distinguish motivation, decision, motor programme and movement.

A practical example will illustrate this model. Imagine you are standing in front of a table on which a glass of water is standing. In the emotional experience memory a need for drinking is caused. The sight of the glass of water creates anticipation and a relaxing effect on your muscles.

In the transition to the decision your need to drink matures, comes into consciousness and becomes a decision for action. In the motor cortex, the motor programmes necessary to perform the action are activated. And finally, the appropriate muscles are controlled by the motor nerves. The arm lifts, the hand grips the glass.

To each phase of movement control we can assign structures of the nervous system. We can assign the motivation to the emotional experience memory, the decision for action to the prefrontal cortex, and the motor programme to the motor cortex, various structures of the nervous system and the muscles required for the movement.

You can see these structures shown schematically. The emotional experience memory is located below the cerebral cortex and consists of various structures. The prefrontal cortex is located in the forehead, the motor cortex is under the parietal bone and the various structures that perform the movement, in addition to the motor cortex, include the somatosensory cortex, the thalamus, the basal ganglia, the brain stem, the cerebellum, the spinal cord and finally the muscles (Figure 6).

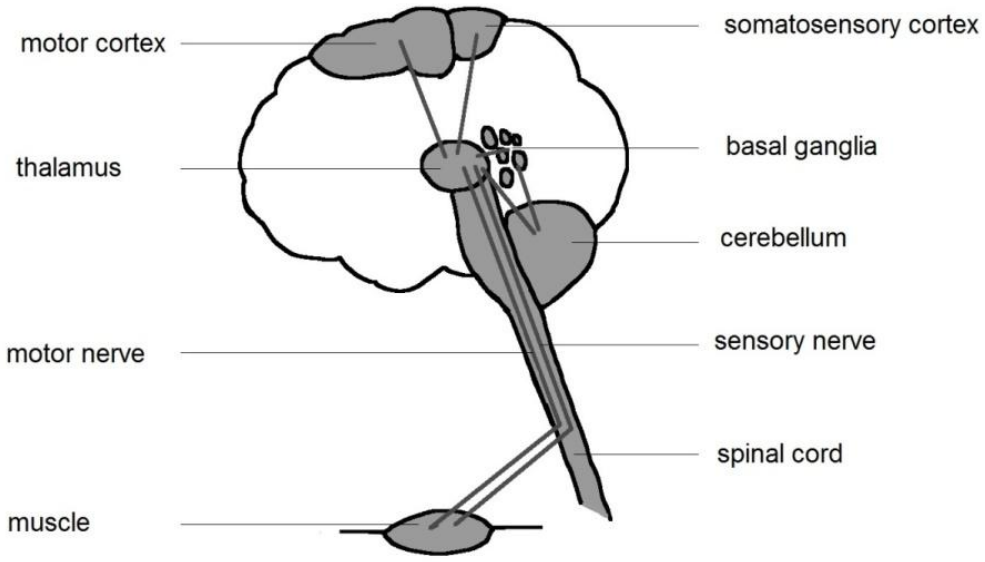

Figure 6.
The various structures of the nervous system which perform the movement.

2.4 Quality of motor programmes

We can distinguish different qualities of motor programmes. I call them natural and interfering motor programmes. While natural motor programmes support the organism in its functioning, the interfering programmes disturb it.

Going back to our case study, we can say that Tom has his personal movement organisation. The causes of his problems lie in his interfering motor programmes. The solution to his problems is to recognise the interfering motor programmes and to replace them by natural motor programmes.

What are the characteristics of natural programmes? How do we recognise them? They can be described clearly as having two characteristics. They align the body in its full length and width and they do not cause unnecessary tension in the body.

In contrast, interfering motor programmes reduce the length and width of the body, they make it close (what does this mean?). And they lead to unnecessary muscle tension. In the case

study of Tom, we see shortenings in the neck and lower back, where he feels pain. We also recognise unnecessary tension in the toes, calves, the front thigh muscles, the buttocks, the belly, in the lower back, neck and jaw muscles (Figure 7).

Figure 7.

The shortenings and tensions in Tom's body.

For Tom it is anything but easy to recognise these interfering motor programmes. We remember the following.

- Motor programmes are stored in the unconscious memory.
- We are not aware that the interfering motor programmes impact the functionality of our organism.

But with the Alexander Technique we have a method with which we can overcome these difficulties. We learn the natural motor programmes and with their help we detect unwanted motor programmes. We perceive the difference between the two programmes, we have the opportunity to choose which programme we want to activate. So how is this working in our case study? What does Tom experience in practising the Alexander Technique?

Tom collects experiences in different learning situations: lying on the table, sitting on the chair, and standing. On the table, he learns to relax his back muscles, he learns to let go, to do nothing, he perceives his breath movement in the abdomen and pelvis. Sitting on the chair, he discovers the movability of his pelvis; sitting on his sitting bones, he perceives his breathing movement in this position. When standing he sets his pelvis upright and leaves it in the plumb line position. He learns how to relax his leg muscles and he learns to endure "unstable standing".

Figure 8.
Tom has activated the natural motor programme.

When standing, Tom's pelvis is now upright and located in the plumb line position, the load on the feet is shifted backwards more toward his heels (Figure 8). This is the natural motor programme and it is connected with new knowledge, ideas and experiences. His teacher tells him that he is supported by his bones, allowing two-thirds of his body weight to rest on the heels, that the main breathing muscle is the diaphragm and that the respiratory movements can go down to the pelvis. The teacher gives him a picture that he can imagine: the skull rises up lightly like a balloon. Tom perceives the difference from his usual way of standing. He realises how his toes are relieved of weight. He can feel the relaxation in his neck and back muscles. He experiences more ease while standing.

2.5 Important factors for successful learning

The positive emotional evaluation of the new experience

At the beginning of each movement, as the Rubicon model explains, the motivation is created in the emotional experience memory. Its influence on our behaviour is much more powerful than that of our mind (Roth 2007, p.178). Therefore, a positive emotional evaluation of a new experience in the Alexander Technique learning process is extremely important. What does that mean exactly?

First we have to mention the relationship of trust between the student and the teacher, a good atmosphere, the external conditions, an appropriate practice room and, very importantly, the willingness of the student. If the student is in a life situation that absorbs all his energy, professionally or privately, then the energy for the learning process will not be available. If he is burdened with his life story, this may complicate the stages of learning, and it will take time and support to complete them. The appropriate attitude is also important. A willingness to reflect and to modify one's own behaviour is needed, and a healthy dose of curiosity. I will explain constructive handling with the emotional evaluation of the new movement experiences in Section 4.

Connecting the experience with the new contents of the conscious memory

Because we cannot call up the motor programmes from the unconscious memory, we need to connect them with the contents of the conscious memory. We combine experience with knowledge of anatomy and physiology, with ideas – for example the skull is as light as a balloon, the heels may grow into the floor – or with experiences – for example the memory of lying on the table, the touch of the teacher's hands. Thus, this enables us to retrieve motor programmes.

Repetition of the experience
The more often we repeat the new programme under different conditions, the more strongly it is networked in our brain and thus the more easily it can be activated. First there is repetition in different learning situations (lying, sitting, standing, walking, seeing, speaking, writing, etc.) which is important. Then the interval between lessons is important. At the beginning, there should be at least two per week, later fewer. And finally, the new learning is transferred into everyday life (at home, at work, in sports, in practising hobbies, etc.). After we have learned the new motor programmes, they must also be applied.

3. APPLYING NATURAL MOTOR PROGRAMMES

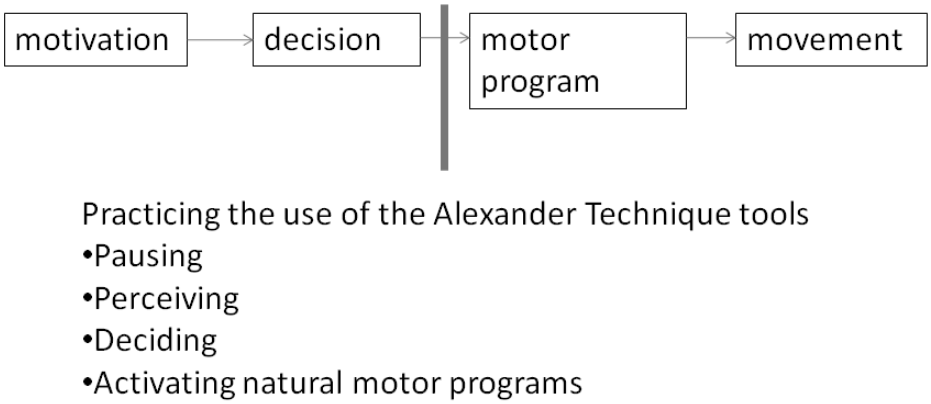

Figure 9.

Alexander Technique tools in movement control. The usual movement control happens in four successive phases. If we use the Alexander Technique tools, we interrupt this process with a pause before the usual motor programme would be activated. We perceive our body, decide to use the natural motor programme and activate it directly or indirectly using mental instructions.

We see here again the Rubicon model (Figure 9): the motivation, the decision to move, the programme and the movement. Now we can use the Alexander Technique instruments: pause and perception, the decision to use and the activation of the natural motor programme by mental instructions. Pausing and inhibiting unwanted motor programmes is an activity of the prefrontal cortex. We have the ability to inhibit our habits using the prefrontal cortex, interrupting processes which normally control us. This skill can be learned. Pausing leaves room for perception. Control programmes which we do not want might have been activated. Maybe patterns of tension are already established and we cannot let them go. In order to let them go, we must perceive them first. The conscious perception is a collaboration between the prefrontal cortex and the somatosensory cortex.

Then we can choose which programme we want to use. We decide on the natural motor programme and activate it, either directly or indirectly using mental instructions. The control process goes from the prefrontal cortex to the motor cortex. In direct activation, for example, we change the posture or the way of performing a movement.

Let us look at Tom. He brings the pelvis into the plumb line position, from the shape of a bow to the natural upright posture. He can monitor this change by feeling the weight in his feet. The toes are released and the heels take more weight.

The indirect activation is the fine alignment. We do this with mental instructions. We do not carry out a movement or change, we only think it. We do this by calling up the contents of the conscious memory and thus we activate the associated motor programmes.

For Tom, this would be thoughts like

- I allow my bones to carry me,
- I allow my skull to rise up into the air, lightly as a balloon.

This indirect activation of the natural motor programme will result in an alignment of the body in the length and width and in a reduction of unnecessary muscular tension. It could be that simple.

Tom learns the natural motor programme, he applies it in his everyday life and thus inhibits the interfering programme. Tom's posture then will be different, his symptoms will disappear and he will be happy – but often it is not so simple. Up to now we have left something vital aside, namely the emotions. Emotions often hinder us in learning and applying natural motor programmes.

4. How do emotions affect the motor control and how can we use them constructively?

4.1 The emotional experience memory

There are emotions that we like: love, joy, pleasure, curiosity. And there are emotions we would rather not have, such as fear, anxiety, sadness, disappointment, anger, envy, hatred or jealousy.

Figure 10.

Longitudinal section of the brain, showing the various structures of the emotional experience memory (grey).

The emotions are created, as I said, by the emotional experience memory, also called the limbic system. In it, the motivation emerges for our actions. Modern brain research has shown that it is mainly the emotions that determine our decisions and actions. The mind plays a subordinate role. It works much more slowly than the emotional experience memory and has a limited processing capacity. It will only be requested if the emotional experience memory is not able to cope with a situation on its own, when it is new or complex and cannot be assessed automatically based on previous experiences. If the mind has made a decision, there are again the emotions that agree with the action or deny it. In the action control the emotional experience memory has the first word in the emergence of the wishes and plans, and the last word in deciding whether the intended action is to be actually implemented (Roth 2007, p.178). In between comes the great scene of intellect and reason. But they are only consultants. Crucial for our decisions are the experiences, feelings, hopes, fears, that shaped a man, who shaped during his life and determine his behaviour (Roth 2004).

When we have an experience, a packet is stored in our emotional experience memory. In this packet there is sensory information such as smells, images, noises, touch, etc., the evaluation of the experience, either positive or negative, and the body's reaction, such as a changed heart beat, pressure in the stomach or tension in the jaw. This whole packet of information is stored and when we have a similar experience it will be activated again. So we can evaluate new experiences with our wealth of experience. If the evaluation process is positive it brings us into the approach mode, we like to stay with this experience and maybe we try to intensify it. If the

evaluation is negative we adopt the avoiding mode, which means we try to avoid this experience, to end it (Grawe 2004, p. 187ff). We protect ourselves from it.

4.2 Movement, feeling and thinking

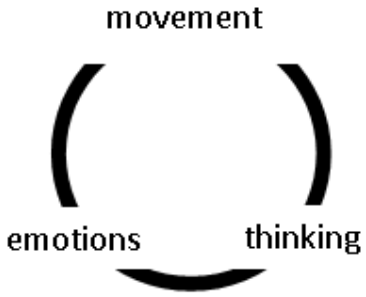

Figure 11.

The human self-organisation.

In human self-organisation, we can distinguish movements, emotions and thinking. They are connected at the physiological level of the nervous system. They are in mutual dependence and influence one another (Figure 11).

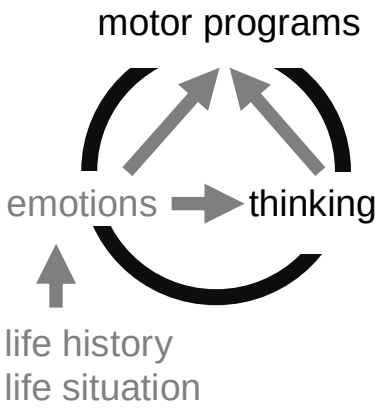

Figure 12.

Influence of the emotions on our movement organisation.

Emotions have a direct influence on the motor programmes because they trigger physical reactions and they influence our thinking, which decides the motor programmes. Our emotions are influenced by our life situation and our life story (Figure 12). If we want to replace an interfering motor programme with a natural motor programme, then it must be evaluated as emotionally positive and integrated into our own thinking, so we can handle our emotions constructively.

Even if a natural motor programme, for example a lengthening of the spine, would improve the movement organisation, the emotional experience might evaluate this as negative. This leads the student into the avoidance mode because the interfering motor programme has proven successful in his life: replacing it by a natural motor programme might cause fear.

4.3 Constructive use of emotions

Let us come back to the case study of Tom. His present interfering motor programme feels positive, it gives him a feeling of strength, his high body tension gives him security. He knows what he wants, he is aligned clearly toward his goals. However, standing in the plumb line position he feels weak, the movability of the legs gives him an unstable feeling. He feels insecure. The sense of openness gives him too much and unwanted information. How do we deal with this negative evaluation? Tom does not evaluate the natural motor programme as only negative. Actually, a natural motor programme will never be evaluated as only negative, it is

rather a mixture of positive and negative evaluations. Tom feels how his tensed muscles relax and he suspects that this might free him from his pain. His judgement tells him it is worthwhile collecting more experiences. He is ready to experiment with natural motor programmes in the protected area of the Alexander Technique lessons, to repeat the experience, to reflect on them and make the programme more anchored in his brain.

Let us consider again the model of motor control. We do not know Tom's motivation for his posture. Tom is also unable to explain why he stands in his specific way. He will say: "I always stand like that. This is normal." As Alexander Technique teachers, we might guess why he does it. And maybe later in the learning process, when Tom has had more experience with the new way of standing and knows the difference between the two postures, he may tell us something about the emotional and intellectual background of his usual posture.

Perhaps he has gained this posture as an officer in the military. It gives him a feeling of strength, of a clear focus on set goals. It has become his habit. It is not a conscious decision to have this posture. Unconsciously, this motor programme is activated and leads to the habitual posture. Thus, using the Alexander Technique instruments, Tom is able to move away from his usual motivation.

First comes the pause. Tom stops his motor control in order to perceive the physical, emotional and intellectual differences between his habitual posture and the new posture. He perceives the contraction of his body, the unnecessary tension of his muscles. On the one hand he recognises his need to stand firm, on the other hand there is his need for a relaxed body. And this is his new motivation. He can decide consciously what motivation he wants to choose. If he opts for the new motivation, then this is already an indirect activation. The memory of relaxed standing acts as a mental direction for the natural motor programme. Tom's body aligns itself along the plumb line.

This natural posture has an impact on his self awareness and the awareness of his environment. He perceives his body differently, his perception of the space is different, maybe now he sees things he has not considered before. He notices how other emotions and thoughts come into his consciousness. This offers him the opportunity to change his behaviour, which in turn acts on his motivation.

Tom has new possibilities in his behaviour. He can practise awareness by pausing and perceiving. He can consciously decide on the relaxed upright posture, allowing the breathing movement going into the belly and pelvis. The more positive experiences that are stored with the natural programme in Tom's emotional experience memory, the more it will motivate him to choose the new programme. The new programme will replace the habitual programme, which will have an impact on his behaviour. His approach to life may shift in the direction of less stress and more well-being, more being in the moment and a better balance between goal orientation and self-care.

The learning process caused by his pain, not only brought Tom freedom from pain, but also gave him new impetus for his life design. This is a good example of how the integration of emotional aspects of motor control leads to a holistic learning process.

5. Final remarks

Neuropsychological models give us explanations for the functioning of the Alexander Technique. They give us inspiration for our way of working, and encourage us to question our theoretical concepts and our practical actions. What does it mean for our work when our students learn movement programmes? What significance does the talking in the Alexander Technique lesson have, if unconsciously stored motor programmes are linked with the contents of the conscious memory? If the mind does not play the most important role in control of behaviour, but instead it is the emotional experience memory that is important, how is constructive conscious control possible? In addition, the neuropsychological models provide us with terms in a contemporary

language which we can use for communication of the Alexander Technique. This makes it easier to answer the question “What is the Alexander Technique”

Bibliography

Alexander, F. M. (1988 [1910]). *Man's Supreme Inheritance*. Centerline Press: Long Beach, CA.

Birnbaumer, N. and R. F. Schmidt (2000). Lernen und Gedächtnis. In R. F. Schmidt and H.-G. Schaible (editors), *Neuro- und Sinnesphysiologie*, pp. 435–454. Springer: Berlin.

Bloch, M. (2004). *F.M. Alexander*. Little, Brown: London.

Dewey, J. (1931). *Die menschliche Natur.* Deutsche Verlags-Anstalt: Stuttgart.

Gollwitzer, P. M. (1990). Action phases and mind-sets. In E. T. Higgins and R. M. Sorriento (editors), *Handbook of Motivation and Cognition. Foundation of Social Behaviour*, Volume II, pp. 53–92. Guilford Press: New York.

Grawe, K. (1998). *Psychologische Psychotherapie*. Hogrefe Verlag: Göttingen.

Grawe, K. (2004). *Neuropsychotherapie*. Hogrefe Verlag: Göttingen.

Heckhausen, H. (1989). *Motivation und Handeln*. Springer: Berlin.

Illert, M. and J. P. Kuhtz-Buschbeck (2000). Motorische Systeme. In R. F. Schmidt and H.-G. Schaible (editors), *Neuro- und Sinnesphysiologie*, pp. 111–150. Springer: Berlin.

LeDoux, J. (2006). *Das Netz der Persönlichkeit*. dtv: München.

Mühlebach, A. (2011). *Vom Autopiloten zur Selbststeuerung. Alexander-Technik in Theorie und Praxis*. Hans Huber Verlag: Bern.

Petzold H. (2001). Überlegungen zu Praxeologien – körper- und bewegungsorientierte Arbeit mit Menschen aus integrativer Perspektive. In W. Steinmüller, K. Schaefer and M. Fortwängler (editors), *Gesundheit-Lernen-Kreativität*, pp. 225–246. Hans Huber Verlag: Bern.

Roth, G. (2001). *Fühlen, Denken, Handeln*. Suhrkamp: Frankfurt am Main.

Roth, G. (2004). *Das Gehirn trickst das Ich aus.* In Der Spiegel 52/2004. Spiegel Hamburg

Roth, G. (2007). *Persönlichkeit, Entscheidung und Verhalten*. Klett-Cotta: Stuttgart.

Schmidt, R.F. (1987). Motorische Systeme. In R. F. Schmidt (editor), *Grundriss der Neurophysiologie*, pp. 157–205. Springer: Berlin.

Storch, M. and F. Krause (2005) *Selbstmanagement – ressourcenorientiert*. Hans Huber Verlag: Bern.

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