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The pleasure of touching:

A suggested correlation between the change of the surface of cellmembrans and the effectiveness of body psychotherapeutic methods

Abstract

In order to bring together experiences of the effect of body psychotherapy and late findings in biochemistry, this article begins by describing thixotropic¹ qualities of connective tissue, the extracellular substance of the body, the "organ of our structure" (Rolf, I., 1978). This is similar to Willhelm Reich's understanding of the correlation between the biophysical charge of tissue and the emotional state of a person. The article includes the work of Painter (2011) who pointed out that a certain tissue quality and a dominant character type coincide. This has become an effective instrument in diagnosis and in developing effective techniques of body psychotherapy. The latest relevant findings of biochemistry by Heine (1997) and Pischinger (2010) are also explored in search for an explanation of those experiences clients have reported following body psychotherapy treatment. The motivating question was: Is the thixotropic quality of the extracellular substance responsible for the effects brought about by professional touch?

Keywords: character structure, connective tissue, extracellular substance, thixotropy

She was a turkey. Or, more precisely, part of the leg musculature of a turkey. He was a cameraman, with the technical equipment to

¹ The property exhibited by certain gels of becoming fluid when stirred or shaken and returning to the semisolid state upon standing.

[Greek thixis, *touch* (from thinganein, thig-, *to touch*; see dheigh- in Indo-European roots) + -tropy.]

be able to film in the macro area. Each single coating of the muscles was lifted with a pair of pincers as the structures were filmed. One could see threadlike structures, surrounded by moisture, stretched out in three dimensions; sliding, netlike structures that were capable of changing their form completely depending on the tension applied to them. They were capable of stretching or thickening; of changing the structures of the three-dimensional net; of shifting the base angle of single fibers and thereby modulating the effective leverage. It was absolutely impossible to see this as a mere reaction, but an entire semi-fluid system was in effect, adapting itself to changing conditions.

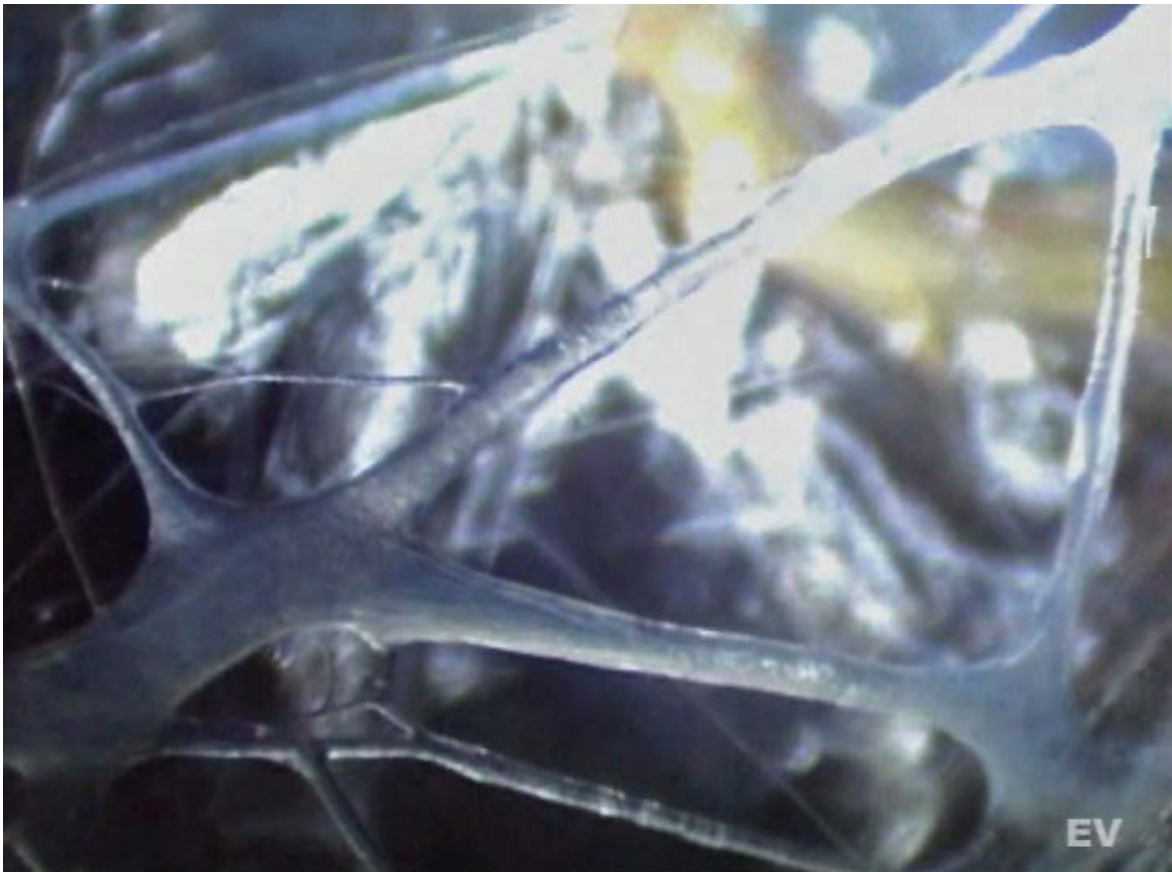


Figure 1. Semi-fluid system responding to environment, (Guimberteau, 2010)

Several questions arose regarding what might happen to this cellular structure if it was damaged by external influences.

- (1) How it would change if it were suddenly hit or pushed, compressed by shock, and react by thickening and tightening?

- (2) How might the quality of moisture be disturbed by becoming too watery on account of unhealthy drinking and eating habits?
Would it lose its ability to give support and form?
- (3) How might it be severed and cut during an operation on deep tissue and how might it attempt to regain form afterwards?

I realized that all this kneading, pressing and pushing during massage treatment is light years away from an appropriate handling of this basic structure of fasciae in our body.

The extracellular substance of our tissues is permeated by these fascia structures: between the surface of the skin and the muscles, among the single fibrils inside the muscles, around the organs, in the depth of the calves as well as around the ovaries of a woman. The well-known systemic biologist, Francesco Varela (1987) supports this by saying that if one would extract from a cat all of its bones, organs, and muscle tissue so that merely the fasciae were left, we would still see the complete form of the body of the animal before us (Varela, 1987, p. 72-73). Tom Myers, in his latest book on myofascial meridians, describes how this test is presently being done even on human bodies (Myers, 2001). On account of this quality, Ida Rolf liked to refer to these fasciae as 'the organ of our structure' (Rolf, 1978, p. 34).

I have no objections whatsoever against massages for wellbeing, and enjoy many ways of nourishing touch. Yet, watching this film, I realized how many of our theories of treating muscular tension and pain have little in common with the reality of that which is being treated, and I felt an increasing interest in these fasciae structures. We have to realise, that fascia is a structure, you can find under your skin, in the structural form of our muscles, through the skin of our bones, deep down to the surface of our cells. It is all the same structure! Like the skin of an orange is from the outside, down to the slices and deep down to every single fruit part and cell the same structural unit. We have to understand, how this structure functions, to understand, why our work on tissue brings this wonderful effects, our clients tell us.

The earliest obtainable information concerning these basic tissue structures is to be found in James Oschman's (1986) examinations of the gel-/sol-structure (Oschman, 1986) of connective tissue. He describes how, under certain conditions, the extracellular

substance is capable of hardening and tightening while, being warmed and touched with gently increasing pressure (by the hand of the therapist), it can liquefy and loosen again (Oschman, 1986). After sessions where I had applied 'Rolfing'- or 'Myofascial Release'-techniques, clients repeatedly described to me the incredibly relieving effect upon their physical experiences as well as upon their emotional wellbeing (Schwind, 1985).

In the same period, Milton Trager (see Juhan, 1987) developed methods of treatment that allowed the area of the joints to benefit by these effects as well. Deane Juhan describes these methods in his *Lehrbuch der Körperarbeit* ("Manual of Body Work") (Juhan, 1987). The ability of fasciae to change is the topic of the dissertation of Robert Schleip (2006). He extracted segments of human and animal fasciae and, under in-vivo conditions, proved that these structures are capable of changing their forms by movements (contraction and elongation, thickening and elasticity) independently of the innervations (Schleip, 2006). From these experiments, conclusions can be drawn in relation to physiotherapeutic treatments. It may take some time for these new insights to become integrated into general medical treatment models. In my first book on body psychotherapy (Schlage, 2008, p. 86 et seq.) as well as on several professional congresses (Schlage, 1995) I was keen to compare these insights with the work of Wilhelm Reich and his understanding of 'emotional/biophysical charge within tissue' (Reich, 1948).

Recognition by touching

Reich used qualities of touch in his work that did not aim at mechanical loosening or softening of tissue, but instead intended to make feelings, experiences and memories of the client conscious. In his earliest remarks concerning this, he used terms from the nervous system and differentiated between sympathetic and parasympathetic charge of tissue. He related how treatment techniques have to be adjusted to the state of the vegetative nervous system. However, the deeper Reich delved into the exploration of what he names 'biones', the more clearly he developed a terminology that spoke of 'cell charge' and of calcium/sodium balance within the charge of the cell membrane in the extracellular substance' (Reich, 1948, p. 216). Later, his thesis of a cellular, emotional memory found recognition in the

work of Erich Jantsch (1982).

Psychotherapy practitioners developed Reich's methods further. Lowen, (2005) and Boyesen, (1987) were searching for the source of the charge/energy in the body of their clients and they developed ways of utilizing tissue work described as 'de-armorings' or 'liberation'. Reading these works now one can only wonder at how the quality of the relationship between therapist and client, as a resource for a release of these energies, was perceived as being of little significance at that time².

In his later work, Reich began to realize that the source of the energies of the body, which he now named 'orgone' (Reich, 1973), were to be looked for in the atmosphere of the earth. Although for many of his contemporaries it was quite difficult to comprehend Reich's important research on the 'atmospheric orgone' and influences of the weather, the so-called DOR-busting (Sharaf, 1983), he approached - without being beware of it himself - the Asian idea of an atmospheric energy. In his late work (Reich, W., 1954) one can find the Asian understanding that this ki cannot be awakened within the person. Instead, one has to make the person receptive to atmospheric ki (Hei, 1990, p. 54).

From sexual liberation to developing emotional intelligence

Before anyone else Reich understood the correlation between the ability of a person to express her/his basic emotions and the alteration of the energetic charge of tissue areas - that extracellular substance which is at the core of interest in this article. Up to today, his description of how character causes fixation of life energy in certain parts of the body, and the clearly distinctive body-forms that result from this, serve as the foundation of the knowledge of human nature within humanistic psychology. Lowen (2005), Kurtz (1985, p. 298) and Dietrich (2007), among others, use the framework of his typology as a basis for their elaboration of therapeutic strategies.

Today, Reich's emphasis on the release of sexual energy and his

² Concerning therapy in the light of transference and counter transference you may also have a look at a more recent article: Schlage, (2012)

idea that by restoring the 'full orgiastic potency' (Reich, 1948, p. 76) all problems of life can be managed, can be looked upon in a new way. Since Ken Wilber's (2000) formulation of the 'four quadrants of life experience' we know that therapy has to take into consideration all quadrants, within all levels, in order to succeed³. Reich's insight that it is necessary to provide adequate 'affect-motoric concepts' (Downing, 1972) to reach emotional release is a standard in internationally standardized curricula today for a training in body psychotherapy⁴. Daniel Goleman (1995) wrote bestsellers dealing with popular scientific neurological findings and their significance for the development of emotional expression and thereby for our emotional and social health (Goleman, 1995).

Less well known in this context is the pioneering work of Jack Painter (2011, p. 47). He established the connection between the different tissue qualities of clients and their dominant character structure. The basis of these diagnostic tools is the tissue types according to Sheldon (1996) and his differentiation according to the development of each blastodermic layer during the growth of the embryo. Sheldon distinguishes between endomorph, mesomorph, and ectomorph tissue types; for example people with a pronounced digestive tract, those with a pronounced muscle system, and those with a highly active nervous system (Sheldon, 1996). During his 40 years of professional practice, Painter classified the manifold impressions of touch and passed on to his students the knowledge of how it is possible to draw conclusions from the quality of the tissue to the main psychic conflicts and then create a very efficient path of psychotherapeutic treatment.

All these details show the importance the phenotype of tissue has upon the body-psychotherapeutic treatment. However, they give little insight into the structure of the extracellular substance of the connective tissue itself. The latest knowledge concerning this comes mainly from two sources: Hartmut Heine's work about the fundamental regulation of the extra cellular matrix (Heine, 1997), and the work by Alfred Pischinger and his students about the 'system of fundamental regulation' (Pischinger, 2010). Let us make

3 the intentional self, the behavioral self, the collective self, the cultural self) (Wilber, 2000)

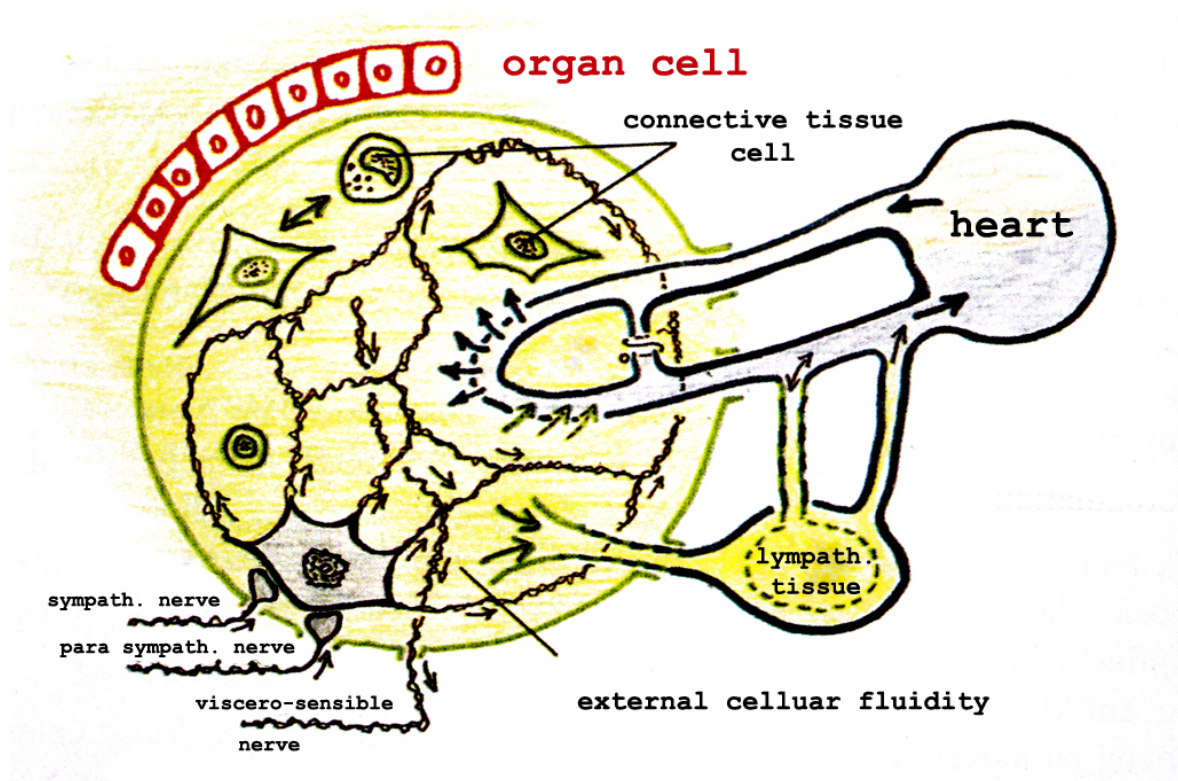
4 <http://www.eabp.org>

an attempt, as non-biochemists, to find our way into the mental world of these researchers.

The mechanical bed of our sensations

Starting with Hippocrates' idea that the problem with disease is not the pathogen but the surrounding tissue and the reaction of the immune system (Diller, H., 1932), Pischinger began his research into the extracellular substance of human connective tissue in the eighties in Austria. It soon became clear that each single cell, be it a muscle, nerve or organ cell, exists in an environment of fluid substance. The ability of each cell to fulfill its function within the organism depends very much upon the structure of this extracellular substance. Pischinger calls this the functional unit of the cell and extracellular space (Pischinger, 2010, p. 18).

Here is a diagram basic regulation (system of ground regulation) to illustrate this.



(Pischinger, 2010, p. 18)

The nutrients transported by blood vessels and penetrating into surrounding tissue (the so-called lymphatic tissue stream), the

functioning of the vegetative nervous signal currents, and the functioning of the connective tissue cells, form a functional unit. Its modus of functioning is determined by the state of the extracellular matrix. Pischinger named this triad 'the system of basic regulation' (Pischinger, 2010, p. 12). If we want to know more about how body psychotherapy influences the tissue structures altering the form, especially how the so called 'gel to sol' (Oschman, 1986) change of the connective tissue (thixotropy) comes about, we have to concern ourselves with the system of basic regulation.

Let us have a look at the conclusion we may draw from Pischinger's research for the present models. Each and every muscle in the body that we touch is embedded deeply in a liquid bed of extracellular substance. This is true for the muscle as a whole and for each of its fibrils. Let us recall the picture of the film at the beginning of this article: our touching can orientate itself towards this fluidal basic structure and less towards the mechanical-physical models of leverage.

The charge states of cell membranes of muscles, nerves and connective tissue allow an understanding of an electromagnetic regulatory principle within the tissue areas treated (Reich, 1948, p. 216). Heine's understanding of 'electrochemical sluice gates' (Heine, 1997, p. 216), Pischinger's 'bioelectrical appearances' (in proving the effect of acupuncture) (Pischinger, 2010, p. 139), and Oschman's understanding of 'piezo-electrical charges within the liquid crystal of connective tissue' (Oschman, 2000) are astoundingly similar despite the differing paths of research.

This holds true for the local conditions of charge and discharge as well as for the stimuli transmission to central areas of the nervous system. Skin and connective tissue may be seen as the surface of the deep layers of our brain and memory that we are able to touch. A comparison can be made to the morphological unity of the growth of skin and brain during the development of ectodermal structures in the fertilized ovum in the beginning of embryonic development (Schlage, 2008, p. 159).

These charge states may be worked with by modulating the quality of our touch (pressure, movement, speed of touch) and by changing the charge of the whole organism by, for instance, movement, deep

breathing or emotional expression. Here I want to stress the point: structural work on the connective tissue is always linked to the whole of the body, its state and its memories (Schleip, 2012; Rywerant, 1985, p. 82).

The Bodyworkers Wheel,⁵ tells how the effects of body psychotherapy can be explained (Schlage, 2010). Also, presented in a logical way, is a differentiation between methods of treatment along with a basic understanding of cosmic energy according to Traditional Chinese Medicine; working with the energetic charge of the cell membrane, work relating to the nervous stimuli transmission of emotion and memory, and working with the thixotropic effect.

The self-creating connective tissue

The connective tissue, as a 'dissipative structure' (Prigogine, 1998) is open for such changes of energy, and, consequently, is capable of creating and recreating its own molecular key elements. This phenomenon has been well proved by the example of the fibroblasts: those cells that help build up the extracellular substance, and that also change the quality and consistency of the basic molecular elements (Juhan, 1987, p. 82). They will, for instance, increase the deposit of minerals in tissue areas subject to great pull, to build stronger tendons f. i.. This is well known in the cases of ganglions at the wrist, or the development of a ganglion in the tendon of the musculus gracilis at the medial part of the upper leg of cowboys. We also know the reverse, from methods focusing on relaxation. Along with the decrease of muscle tonus the muscle itself may become more lithe because of an increased fluidity of the extracellular substance.

Until now, most colleagues believed that the activity of fibroblasts in altering the extracellular substance was the primary mechanism leading to the malleably perceptible slipping-gliding or melting changes in the tissue during a specific treatment. Robert Schleip (2012) points out why this explanation

⁵ These are: a) working with muscles, b) working with morphocycles of fibroblasts, c) working with charging and discharging, d) working with spiral dynamics, e) working with change of nutrition, f) working with skin-brain connection, g) working with pacing of speech, h) working with fields of awareness.

of the thixotropic effect is no longer sufficient: the life cycle of fibroblasts is too slow to account for the immediately palpable change (Schleip, 2012). More provocatively, Ingraham asks, if thixotropy happens through mechanical pressure and warmth, why doesn't it work while sitting in the sauna? (Ingraham, 2009). It has been shown that the thixotropic effect happens for a couple of minutes and then reverses to its original state (Schleip, 2012). Clients can sense this effect of relaxing the chronic hypertonic tissue or pain resulting from scars, in a couple of sessions, resulting in more relaxed and coordinated movement. It seems that the thixotropic effect supports coming back to the origin of the flexibility and aliveness, which we had in our youth.

Since the activity of the fibroblasts no longer suffices to explain the perceptible connective tissue phenomenon clearly described at the beginning of this article, I will now look at the development of the extracellular substance.

Looking at evolution from the beginning of the planet up to the forming of the first living beings it can be seen that, for the development of extracellular substances, it was significant that the first macromolecules could surround themselves with a protective cover so that inside, an environment could come into being that provided the condition for the survival of living beings (Maturana, H. R., & Varela, F. J., 1992).

In his movie *The Evolution of Life*, Thomas Brodbeck illustrates that the earliest forms of this membrane came about quite by chance (Brodbeck, T., 1996). The current theory is as follows. The phosphor lipids necessary for the membrane were floating loosely on the surface of the ocean. By the impact of raindrops on the water surface they momentarily formed a membrane on account of their surface tension, which at once dissolved when the drops immersed themselves in the ocean. By constant repetition of this event and by additional effects, more stable cell membranes developed. This is also called the evolutionary principle of "shaping" (Maturana, H. R., & Varela, F. J., 1992).

How sugar structures our tissue

Today it is only this slowly stabilizing membrane that forms the precondition for control of biosynthesis, (...) that guard our

genetic inheritance. Looking at the surface of these cells we find in between the well known phosphorlipidmolecules so called "glycoproteins" (...) that allow the cells to build up contact with other cells. These substances such as murein, pectin, chitin, glykan and cellulose are parts of the surface of bacteria, protozoa, yeasts, fungi and plants, and add considerably to the functions of the cell. Pischinger (2010) writes that these polymer sugar-protein compounds "form a molecular filter through which the whole of the metabolism has to pass forth and back" (Pischinger, 2010, p. 22).

This effect, by the way, plays a role in the formation of diseases of the joint by synthesizing hyaluronic acid in the joints. And in technology, it is utilized for instance in the production of paints and lacquers, or for deep drilling in the search for oil (*Barnes*, 1997). Barnes (1997) wrote that "thixotropy is one of the more complex characteristics associated with the behavior of non-Newtonian liquids. Most of the available data leaves something to be desired" (p. 29).

So, while the fibroblasts form the centre of the extracellular substance with a high activity of metabolism, the sugar coating of the cell, the so-called glycocalyx (Heine, 1997, p. 73), makes the evolution of a different behavior of multi-cellular organisms possible. This cell coating is decisive for anchoring the cells within the extracellular substance as well as for the identification of the cell. For instance, immune defense cells, develop a specific surface to protect against infiltrating bacteria in order to attach to the intruders, just like the well-known 'lego' building elements, and thereby eliminating them (Heine, 1997).

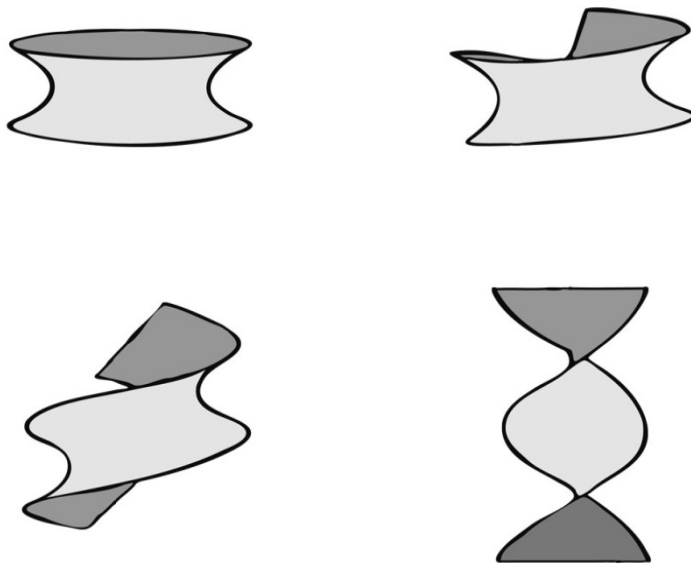
Every organic function depends on the adequate composition and decomposition of this extracellular substance. The function of a molecular filter is tied to the rapid availability of many different sugar surfaces of the cell membrane as possible. Heine (1997) writes:

Its structure in the DNA is not as strictly coded as the sequence of amino acids of a protein. Besides, there are many more possibilities of combinations as is the case with the twenty amino acids. The synthesized fundamental frame of the sugar-bio-polymers

is only put in shape after being passed into the extracellular space by corresponding enzymes (...). This allows for great fluctuations of the micro composition of the proteoglycane/glycosaminoglycane (of the cell coats). In addition, spontaneous, self catalytic polymerization, de-polymerization and ring closures of the sugar chains come about (...) as well as bridge forming of ions and hydrogen with structure and linkage glycol proteins" (Heine, 1997, p. 51).

Karcher and Polthier describe these structures in different so called "hyperbolic space dividers" (Karcher and Polthier, 1990).

Today we can illustrate graphically how the sugar-bio-polymer of the extracellular substance may alter by the sensitive touch of a body-worker - the melting experience of something between the cells of clients' skin becomes visible. Let us take time to have a look at such an alteration of the structure:



(Taken from an illustration of Heine, 1997, p. 55)

Let us appreciate here the fact that many of these aspects of cell membrane research were not yet known when Ida Rolf, who had started off as biochemist, developed her hypothesis about the change from the gel state to the sol state. Additionally, it was not possible at that time to illustrate graphically phenomena of structure components by computer-aided simulations. Could we

acknowledge that it is the (...) organization of the sugar polymers in the extracellular substance that allows us to find a way to understand those phenomena in body psychotherapy known as thixotropy?

With these approaches, have we found a better understanding of those phenomena shown in Guimberteau's film and felt beneath our hands as practicing body psychotherapists? It is the extracellular substance that is joined with the gland system via the capillaries and, with the central nervous system via peripheral nerve fibers, ending blindly in the extracellular substance. It is its qualities, its pH-value, its ability to alter the form of a cell surface, which is responsible for our immune reactions and the healing of tissue. And it is the thixotropy of the extracellular substance that offers us a new starting point to explain those phenomena experienced during a tissue treatment by touch.

Can we today, as body therapists, carry Ida Rolf's statement further, that we orientate our work towards 'the organ of our body structure', and can we say that we deal professionally with the reactivation of this extracellular substance that is so essential to the whole of our health? For the well-being of our clients?

Only further research will show to what extent we have found an explanation for those impressive experiences for which our clients express their gratitude to us.

BIOGRAPHY

Bernhard Schlage has given workshops since 1980 in most European countries and has run a private body psychotherapy practice since 1984. He has given lectures at international congresses f.i. in San Francisco, Paris and Sydney. In 1986 he co-founded an adult-education-centre for health care in northern Germany and later was in charge of a mental health centre until 2008. He has been a trainer for Postural Integration since 1999 and ECP-holder since 2001. Specialised in treating psychosomatic disorders, he is now focusing his work on training the next generation of health care practitioners in body psychotherapy. Bernhard is author of more than 100 articles about body psychotherapy and has written four books.

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