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NEURO-TRANSFORMATIVE PERFORMANCE PROCESSES – FROM NEUROPLASTICITY TO THE REORGANIZATION OF PERFORMER'S BODY PARTITURE

Can we bring into the dialogue performance studies and cognitive neuroscience, theoretical biology, eclectic genetics theory, ethology, or digital biology? Is the body of performer exactly the one that makes all the potentiality of these research disciplines relational and possible?

According to recent studies on cognitive neuroscience - the same or very similar neural structures connect our three brains: the brain or the center of the central nervous system, heart and digestive system. In Digital biology: how nature transforms our technology Bentley describes the brain as a triune entity or the one that consists of the amphibian brain, old mammalian brain or limbic system and evolutionary youngest - the neocortex. A long time ago, while on Earth lived the first multicellular organisms, the earliest form of communication between the cells was completely chemical. Our bodies still possess a form of chemical signaling through hormones. This form of communication has changed through new chemical substances that have enabled the creation of electricity, which led to the first occurrence of the nerve cells and provided gestures to simple organisms and reacting to stimuli. Following evolution, neural networks were used to control the digestive system of simple tubular organisms. In this context, digestive system was also known as "the intestinal nervous system,

which some neurologists call "the second brain", since the embryo develops separately from the brain with which later becomes connected through a nerve called vagus. Some of neurologists think this is the brain that is responsible for butterflies in your stomach before going on stage, as it holds the discomfort of the central nervous system" (Bentley, 2004: 91). So-called senior brains are centers of affects and feelings, pre-reflective corporeal *awareness,* while the so-called third, the youngest brain, is the center of language and speech, reflective corporeal *awareness.* According to these centers, we have a few memory systems: affective memory system (amphibian brain/affective brain), emotional memory system (old mammalian brain/emotional brain), and intellectual memory system (neocortex/intellectual brain). Contemporary cognitive neuroscience in dialogue with performing arts is discovering that the practice of performance is also the practice of integration and reorganization of our all three brains. Nerve cells that structure the brain can be multiplicated - new cells are formed in the hippocampus, a brain region responsible for memory. Number of nerve cells (neurons) in terms of stimulation and activity significantly increases as compared to the situation of non-activity. One area of research where dialogue between cognitive neuroscience and performing arts becomes interesting is the one that explores the plasticity of the brain or its ability to transform not only in childhood, but throughout life. Furthermore, the term neuroplasticity explains how the brain structure may vary over time due to changes in behavior or environment. In this context we can also think about experience-dependent and environment-dependent structural synaptic (neuro)plasticity. As a result of these changes, synaptic reorganization emerges among certain brain parts. Neuroplasticity also suggests the creation of new synaptic patterns by repetition. Furthermore, repetition causes synaptic pattern displacement, and the change in neural energy patterns. Memory, repetition and attention become three phenomena central to development of neuroplasticity, and therefore corpoplasticity. Selective attention is central to all aspects of learning, memory, and fluid intelligence. Attention itself is something that can be practiced towards the role of a catalyst or enhancer. Selective attention is of particular importance in enabling neuroplasticity of different brain systems. The ability to concentrate on a particular stimulus

and choose what will our brains process also points to the phenomenon of the neuroplasticity of attention itself - selective, peripheral or subliminal. If the most important becomes the relation between memory and repetition, as much as the relation between attention - creative, sensory, or imaginative, and memory - cellular, corporeal, affective, emotional, sensory – how can we physicaly think about the neuroplasticity of the performance partiture itself?

Elizabeth Wilson uses the term "body schema" in order to describe intertwining of various neural networks that constitute our body. Performative act – is an act of continuous conversion and reorganization of neural networks through repetition. During the performative act, the body is changing at the biological and chemical level, it changes its own compounds and compositions. Physical schema constitutes itself within the accumulation of experiences and their cognitive processes. Furthermore, the physical schema can be understood as physical neural network formed by the corporeal inscription of physical, emotional and affective memory. Upcoming stimuli are always interpreted in relation to the existing body schema; performer's perception of an event at the same time is influenced by awareness of the past, lived experience, and an experience that is always forthcoming , unaware; performer exists in both, and in an irreducibly third - the sphere of his own physical chrono-singularity. Physical memory is also a neural memory or the one that directs our feelings and consciousness. Neural memory is integrative, since it integrates cellular, corporeal, affective, emotional, and sensory memory. Neural memory – within the repetition – causes synaptic repatterning or creation of new synaptic patterns. Repetition becomes crucial for neural, integrative memory - due to the release of spontaneity and increase of new synaptic patterning. According to Rhonda Blair, learning, training and rehearsals could be perceived as a performative and transformative practices of reorganization of our own brain. Cognitive neuroscience indicates that practical experience (such as memory, imagination, attention, repetition) strongest modifies the brain. Neuro-transformative performance processes - memory, attention and repetition are directly related to physical schema remapping, and performer's physical becoming. According to Le Doux, in the context of learning and repeating the neuro-transformative process, such as memory - we are able to

change and convert our own genes, as much as the genes code. Can we think of genes as fluctuating partitures; how to simultaneously move and be moved by these predeterminant and emerging partitures? Memory is never "mere representation of an element stored somewhere; memory is always imaginative reconstruction, the constant variation without the original" (Wilson 1998: 173). We are witnessing a shift towards the process of reimagining the memory. This indicates a change in performer's relation towards the experience of remembering, precisely this excess of imagining a memory is a parallel process of its remapping. Imagining is remapping. The process of reimagining a memory shows itself as always present, and memory as such is a tool of the performer's imagination. According to Le Doux, "a brain that remembers is not the same one that formed initial remembrance" (Le Doux, 2002: 160). Neural or integrative memory by repetition becomes a re-imagining of affective and cognitive performer's gestus. Neural memory is characterized by multi-sensory integration and multi-sensory fusion or total connection of sensory information to the level of mutual conversion, and furthermore transformation and reorganization of the existing body schema. Furthermore, multi-sensorial reintegration occurs within a neural-sensory memory and action of recombining two or more senses in a fusion of sensory information. It refers to performer's conscious work with reimagining his own neural networks, or his entire body schema. Neuro-imaginative connectivity of the performer refers to his potential of interenactivity and transformational intertwining towards the neural networks of the other - performers, spectators, environment. For many theories of embodied cognition and emotional processing - the process of reembodiment of an experience and its situated physical memory is central. Is performer someone who is simultaneously mirroring and reimagining experience? Mirror neurons are essential for the learning processes such as imitation, identification, naming, but also the ones such as empathy and pain. According to Damasio, between actor and spectator brain mediates as a convergence zone. Through mirror neurons, in the brain of one who performs (the performer) and the one who observes (the spectator) are activated the same centers, at the level of neuro-chemical reactions - performer and spectator are equal, but what makes the difference then?

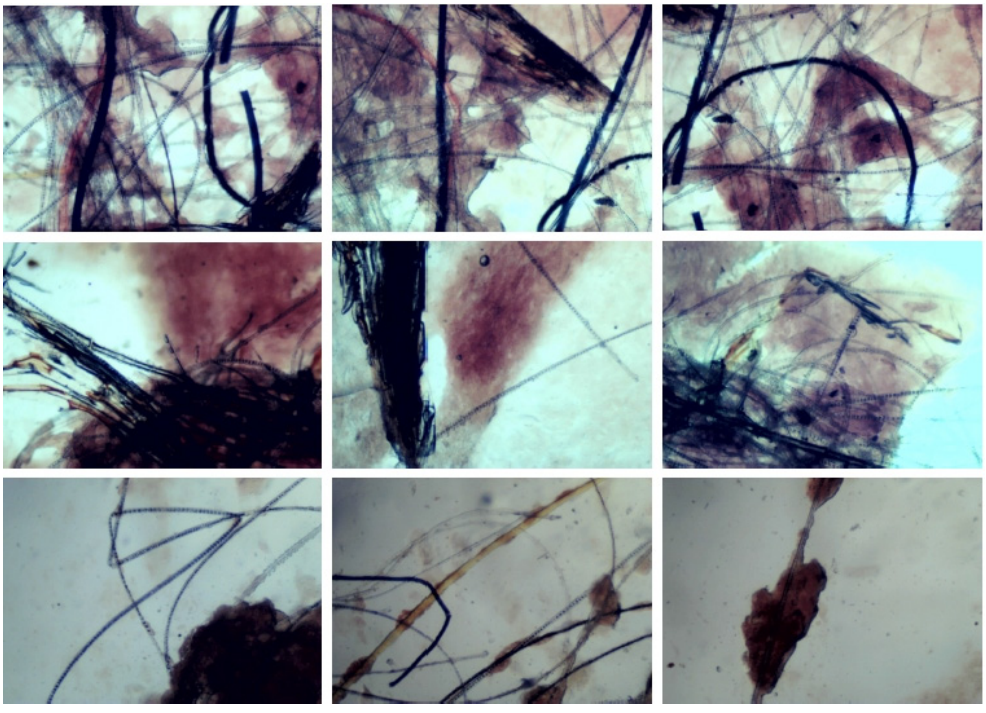
Imaginary equals real; the chair that we imagine – for our brain equals the real, physical chair situated in the space. Imagination causes a modification of neural networks in the triune brain or theater in the theater in the theater. According to Damasio, "emotions play a role in the theater of our body. Feelings play in the theater of the mind" (Damasio, 1999: 28). Emotions - belong to prehuman, vegetal and animal performances, while feelings belong to human, and as such are a synaptic bridge between (pre)reflexive and (pre)reflective embodied knowledge. Feeling refers to how we register and interpret the emotions and consciousness; it begins with our a "sense of feeling feelings" (Damasio, 1999: 43). Joseph Le Doux first discovered the key role of the amygdala in the emotional brain. Le Doux research suggests that the amygdala, which acts as a kind of "neural alarm", can take control of behavior, even when the prefrontal cortex is still at the stage of selecting an appropriate response. This shorter route which takes only twelve milliseconds to activate the amygdala is related with emotional reactions that could be created without the slightest conscious, cognitive contributions. According to Le Doux - consciousness is a product of unconscious cognitive processes. According to Bentley, unconscious activities of our brain delimit and expand our conscious activities (Bentley, 2004 : 93). Our Self could be also perceived as autoactualisation of multilayered unconsciousness. Thus, the Self is fluid and dynamic, it is not real even thought it exists. "Performer's Self is an ensemble in and for itself. Emily Dickinson and Walt Whitman were right: the brain is wider than the sky, and each of us contains multitudes" (Blair, 2007: 54). Further more, Bentley compares the functioning of the brain with the activity of the crowd : "Your mind, your consciousness, is the activity of the crowd, of all the billions of nerve cells organized in different areas of your brain . There isn't one point in your brain where your Self lives. Your consciousness, as much as your Self - is made of your whole brain" (Bentley, 2004 : 96) . Can we perceive performance as potential practice of full brain activity, but also as total, reversible practice of (re)embodying brain and (re)embraining body? On a conscious level, "who we are is interdependent with the linguistic interpretation of the narratives of our experience (limits of my world are the limits of my narrative/language). Le Doux represents the idea of narrative Self, which compared with Damasio's autobiographical Self – is created

from memory and conscious experience, but furthermore, Le Doux juxtaposes quiet Self to narrative Self (my body-worlding begins with delimitation of my narrative/language). Consequently, "explicit Self is not separated entity, but kind of configuration of implicit, unconscious Self" (Le Doux, 2002: 199).

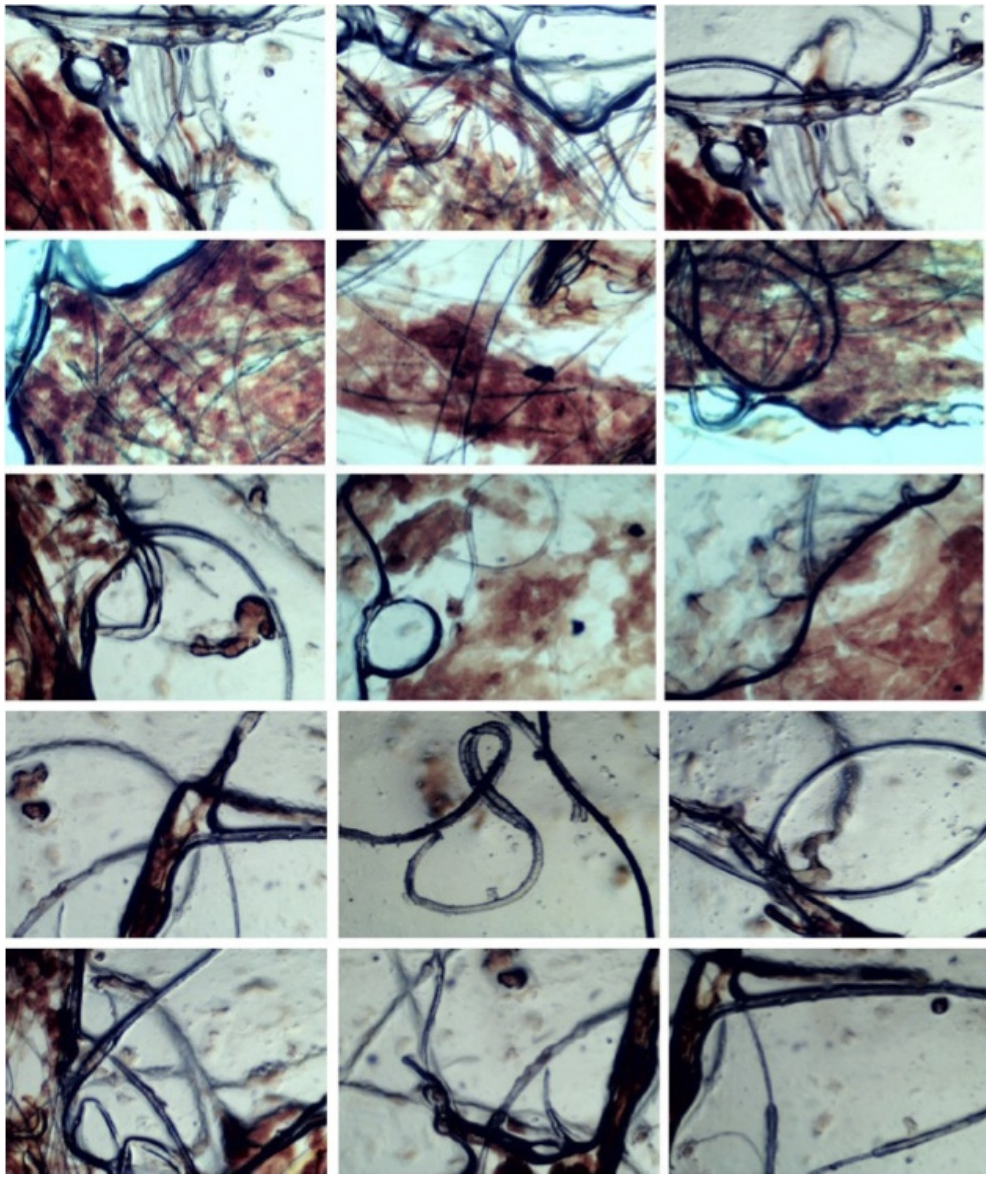
Continuity of our awareness is enabled by the unconscious flow of nonverbal narratives that Damasio recognizes as the central consciousness. Can we think of body-worlding as externalizing, performative flow of the central consciousness? Central consciousness could be also perceived and experienced as the sphere of performer's corporeal singularity. Combination of sensory and emotional information Damasio determines as "somatic markers" (Damasio, 2005: 50). Throughout somatic markers sensory information become organism guides - at the level of cognitive actions. What kind of relation there is between somatic markers and expanded consciousness; can we think of this inter-relational co-becoming as becoming of the singular body-worlding itself? What if fluctuating and transformative character of an expanded consciousness becomes the transitional atractor of performer's mode of being? Is this a practice of relational becoming-Other, as much as practice of conversion or reorganization of our own neural network at the level of our whole body shema? Can we bring string theory into a dialogue with cognitive neurosciences and performance, and introduce the idea of inter-body, membrane-body or multidimensional resonant body ? Membrane bodies - at particle and energy levels are continuously intertwined in their own creation and destruction, mutual reorganization, without gaining a final physical existence pattern.

In the wake of Deleuze's interpretation of Spinoza, the body is not defined by its shape, organs or functions, but the length and width: "The length of a body is the totality of its relations of speed and slowness, stillness and movement, relations which rule between an unformed elements, between the particles. The width of a body is the totality of affects that fulfill the body the any time, it is some nameless force (the force of existence, of being susceptible to influences). Thus we establish the cartography of the body. The totality of the length and width forms Nature, plane of immanence or *consistency* which is always variable due to the individuals and communities that is constantly being changed and rearranged by" (Deleuze,

2011: 142). The body is the multitude of different modes of becoming – of the Body itself in the plane of immanence. The plane of immanence constitutes itself within the plane of processual assembling, rather than organizing. Instead of shape, we bodily experience the relation of speed and slowness in-between the smallest, particles of unformed organisms. The plane of immanence constitutes itself betwixt the dynamic affective charges - movement and stillness.



transformation and intertwining of vegetal and human tissues through 24 hours



transformation and intertwining of vegetal and human tissues through 72 hours

Performance itself is the context for creating the conditions for all possible, and (in)compossible corporeal and chronoreal becomings. All of them are molecular, precisely because "becoming is not an imitation of something or someone, it does not mean identification. Neither of these two figures of analogy is equal to becoming, neither an imitation of some entity, nor proportionality of some form. Starting from the form that someone has, from the subject that someone is, organs that possesses or function that fulfills, becoming means displacement of particles. Between the particles establishes the relations of movement and stillness, speed and slowness, and these relations are closest to what someone is in the chain of becoming and through which it becomes. Becoming indicates entering the zone or neighborhood of some particles co-presence, it indicates the movement in which all the particles are retracted when they enter into this zone" (Deleuze/Guattari, 1988: 359). When two or more types of particles enter the intermediate zone, singular relations of movement and stillness constitute a new incompossible multi-bodiness. Molecular, in relation towards the duality of the molar, does not generate itself from the imitation, shape, form, organs or functions, but (e)motional particles that enter the relationscape of a molecular multi-becomings.

Maurice Merleau-Ponty in his Phenomenology of perception defines body as a silent *cogito*, unspoken *cogito*. The body as a primary subjectivity is the form of consciousness that determines the language, but consciousness as such partly remains quiet, inarticulated. Representation of somatic perception can be approached by Merleau-Ponty's concept of "somatic silence" and Shusterman's concept of "somatic awareness or somaesthetic reflection" (Shusterman, 2008: 50). Merleau-Ponty defines primary consciousness as unreflected and unpredictable life of consciousness, and consciousness as such associates with intentionality of the body. Next level of consciousness associates with the perception that allows us constant awareness of external objects, as well as our body in physical (sens)a(c)tion. Primary perception and pre- reflexive consciousness are embodied in physical intentionality that can be expressed through the immediacy and spontaneity. The primordial perception belongs to the experience of the world that is beyond the reflective consciousness, and the possibility of capturing it in language. This nondiscursive level of intentionality can

be determined as "silent consciousness" or "primary subjectivity" and as "primordial expression". Merleau-Ponty creates a division between the lived experience and the abstract representation of experience, and Shusterman introduces the third, combined idea of "situated somaesthetic reflection" (Shusterman, 2008: 63) which embodies itself in the simultaneity of moving as physical thinking and procedurality of decision-making on the same movement. Situated and embodied somaesthetic reflection, as well as the expanded awareness in the context of performer's conscious change of somatic markers are some of the points for exploring performer's physical singularity. The body leads us towards "unreflected experience of consciousness " as Merleau-Ponty describes in his work The structure of behavior: "the body, therefore, opens the way towards the thinking that in its exploring movement cannot be stopped, thinking that is directed towards the unthought, knowledge which is directed toward the unknown, the speech that is directed towards speechless in order to regain its own thought and speech" (Merleau-Ponty, 1984: 26).

In the book Understanding theater: the outlines of a new theatrology, Marco De Marinis in chapter Artificial body discusses transcultural preexpressive principles that Eugenio Barba consideres the basis of extra-daily acting techniques: "In order to find extra-daily acting techniques, performer does not study physiology, but creates a network of external stimuli to which responds with physical actions" (De Marinis, 2006: 165). Extra-daily acting techniques are also called techniques of dramatic presence, since they characterize "the life of the performer even before that life begins to represent or express something or itself"; between everyday body of performer and the imaginary body of the Other, is Moriaki Watanabe's corps fictif or the body that is no longer or not yet in the representational function, but also isn't in the mode of presence of everyday life (De Marinis, 2006: 166). Within the context of preexpressive, De Marinis opens the theme of ontological status of preexpressive principles, relations between preexpressive and precultural, expressive and preexpressive, preexpressivity as specific theatrical force, as well as the mutual relation of physical and mental in force-field of preexpressive. Preexpressivity consists of elements that we find in "gaps" between the two semantic expressions – pure, concrete movement,

performer still on the scene, but no longer in the role, etc. Performative particles-signs also consist of preexpressive basis. We distinguish "mental and physical preexpressive" (De Marinis, 2006: 182); the first one relates to mental and the other to physical aspect of the performer's preexpressivity, but they are intertwined by mutual inseparability of the performer's body-mind co-becomings.

Furthermore, mental preexpressive does not apply to what (is being generated) but to how (is something being generated); it is connected with "the physical aspect of thinking, ways of its unfolding, changing direction or behavior" (De Marinis, 2006: 185). Except as prerequisite of the performative act, preexpressivity can be also considered as "a deep level of dramaturgical composition", and as such its purpose lies in the activation of certain ways of thinking: "The essential characteristic of creative thought, continues Barba, is actually the fact that it moves within its own displacements, using unexpected disorientation that is forced to reorganize itself in new ways, abandoning its own well-organized schema. It is a thought-that- lives, and it is not straightforward, nor unambiguous" (De Marinis, 2006: 186). How can we learn from insects if we perceive them as networked and tactile oriented units of action? A characteristic features of many social insects are self-organizing and collective decision-making. Self-organizing system is one that is dynamic, in the continuous change and modification of predeterminant and emergent levels of embodied actions, and as such is characterized by "multiple interactions (forms of self-organization and collective decision-making appear to be mediated by multiple interactions), positive feedback (an act that causes something to happen is likely to repeat iself) , negative feedback (an act that causes something to happen is less likely to repeat iself) and increased fluctuations (the butterfly effect, chance opens new possibilities and enables new selections)" (Bentley, 2004: 129). Multi compound eye of some insects consists of up to four thousand sensors that enable perceptual experience of mosaic-like image, since each individual sensor delivers one part of the information, and not the information as complete. Can we bodily or within our corporeal imagination enter the co-motional and co-perceptual zone of insects?

Can we get there through interaction, transformation and reorganization of our body partiture, and is this situated transformation also co-experienced conversion

of shared body? Does our perception within itself constitute the potentiality of other forms of perceiving, as well as other perceptual apparatuses? Jakob von Uexküll within the frame of theoretical biology and ethology opens the theme of situated embodiment or the one that happens in interaction with the environment and co-creates new capacities of perceiving, feeling, and orientation. Situated embodiment also includes the idea of nonanthropomorphic and metamorphic body intelligence. The body of the performer can be perceived as an intensive molecular flow, and as a medium in becoming. Life, in its dual articulation, is present as a bios, discourse or sphere of human and as zoe or sphere of inhuman intensity. Does the perfomer's body become the body itself through intense energy flows and molecular connection with the inside-outside world; does it move through and as environmental co-becoming? Does the body constitute in relationality and relations as such belong to the sphere of the pre-individual reality, potentiality and vitality; does the becoming-insect of perfomer's body emerge in the field of transindividual individuation?

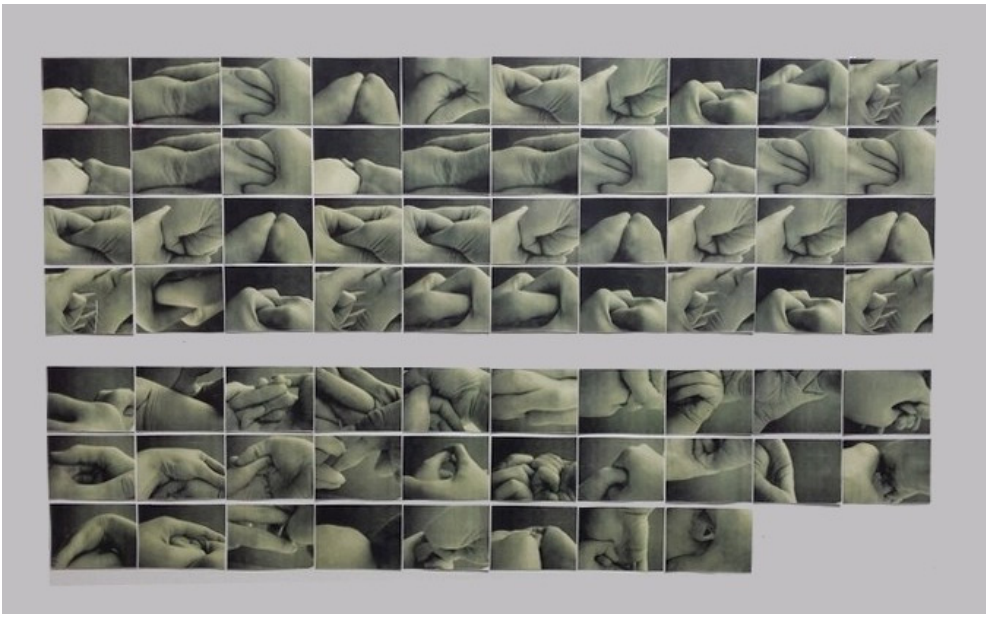
Mapping the different modalities of the animal's body language expression, J.F. Lyotard determines animal's language as affective phraseology or one that opens up another way of establishing and maintaining relations and non-linguistic individuations. Affects denote transitions and passages between dimensions of co-becomings - viruses, plants, animals and humans. J. Derrida perceives the animal as heterogeneous multiplicity; plant or animal are just the modes of intensifications, interactions and relations between different embodiments in the form of assemblage. Assemblage does not consist of already existing elements; it is the mode of establishing and cutting energy and molecular flows. As such, it consists of speed, slowness, and its arriving into the expression instead of representing the expression as such. Becoming-plant and becoming-animal of the performer's body does not happen at the level of imitation, but at the level of the molecular expression of singular, assembled affects. Manuel DeLanda through the concept of universal singularity raises the question on the space of potential and virtual, or the one that simultaneously limits and delimits what singular body-assemblage can do, or is capable of. According to Foucault, particularly through the technique of spatialization of the body – the creation of new diagrammatic

maps becomes possible. As such, these maps are not stable and closed structures, but the modes of distribution (of) singularities. Diagrammatic becoming as such refers to the potentiality of capturing and spatialization of intensities and singularities of different body diagrams. Diversity among body diagrams also indicates the potential modes of actualization of specific body plan. Singularities of primitive life forms - vertebrates, or insects - have developed diagrammatic space of possibilities that defines what is a singular body capable of. Animal knee has such a topology of potentiality.

The primary characteristic of insects is a transformation which can be also considered as some kind of a body technique; since the technique and tools are not separated from the body of insects – their body as such is self-organizing tool and technique. Through mimicry - insects are characterized by a parallel mode of becoming in terms of body transformation and development of the temporal body. Insects as a living and interactive entities are in direct relation with the environment as active participants and constructors of it.

If the embryo itself has a history and potentiality of all kinds, does the performer have the potentiality of reorganization of his own body partiture through becoming-Other? According to contemporary research from the sphere of eclectic genetics: "the right way of thinking about development is that we face the cells that change their behavior" (Bentley, 2004: 221). In the Creative evolution Bergson describes the life as the totality of potential live forms. Within the performer's body – there is potentiality of temporal becoming-plant and becoming-animal. The body as the totality of its own modes of transformation and reorganization also presents itself as the tool. More specifically, the body and the structure of insects, as well as performers, become natural tool of becoming-insect of perfomer's body and becoming-performer of insect's body. Since the tool is not separated from the body, the body becomes technical-integrational asseblage in continuous change and conversion. The body as such – is the assemblage of the interaction, transformation and reorganization. The body in its materiality can be experienced as temporal variation of affective assemblages. Insects, except representing a specific mode of action, are also the intensifiers of internal repetition. In the world of insects, repetition is experienced as an

intensification of certain instinctive reactions, and therefore, is more interesting because of its central role in neuroplasticity and body partiture remapping. In their relation to the environment, insects are interesting because they do not represent a case in which a multi-organism adapts to the environment, or environment to the colony, but it is question of a mutual negotiation and co-becoming. Ant as autopoietic natural machine, is also polymorphic, and metamorphic. Heterogeneity of an ant colony indicates potentiality of the body as a collective organism - organized around different tasks. Primitive forms of life are characterized by non-human models of organization. Insect as such instinctively interwoves with the environment, and as such is characterized by transformative modulation of the living environment which is simultaneously treated as an outer space and inner space as well, or the one that simultaneously belongs and does not belong to the body of the insect. Insect performatively treats space as an entity, subject, as its own temporal and spatial co-extending. Flock as a multi-agent system includes paradox of predeterminant and emergent layer of co-motion, autonavigation and navigation of multiplicity. The flock brings into existence different becomings which are always situated and co-motional. The flock is an example of mobile choreo-architecture which is not stable and hierarchically organized, but fluid - like a living multi-organism. Flocks and insects form living architectures or living systems - unstructured, and between the simultaneous becoming-spatial and spatial-becoming. The flock as a superorganism also embodies the relationality of microperceptions which coexist and cooperate in a time sequence. What flock perceives - becomes integrated into their world of collective action. A flock represents a multitudinous and self-organizing, emergent system, while insects represent non-hierarchical models of decision-making.



an attempt of converting the logic of hand movements

Idea of emergence relates to a new type of relation - towards atoms, molecules, organisms, the body , as well as extrinsic interdependence of all of these relations. The question of repetition and difference is the question of emergent singularity of the performer's body. Since there are no two identical events, every atom, molecule or organism in its own relationality is singular and emergent. Are the events of breathing, blinking and moving actually events of repeating differences or singularities? Predators and parasites through symbiosis become structural couples who form new entity, entity resulting from the singular interactions of various vectors of transindividuality. Performer's body as a temporal becoming of autopoietic network is determined by sensation or sphere of potentiality that is never exhausted in the current perception of the world. If we consider movement as the force that precedes an organized body, the body and the life of an insect or performer are not substances, but modes of living and compressing movements in real entities. Can we perceive affects as a technique that is not technical, nor technological, but

temporal, fluctuating, becoming? Can we think of the performer's body as time, continuously on the verge of becoming and arriving into our co-presence?

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