

ENACTIVE CINEMA
SIMULATORIUM EISENSTEINENSE

Pia Tikka



For Urpo Tikka in memoriam
and Ulla Tikka

*How sheer the threads entangled
woven in this instance
a mesh of being*

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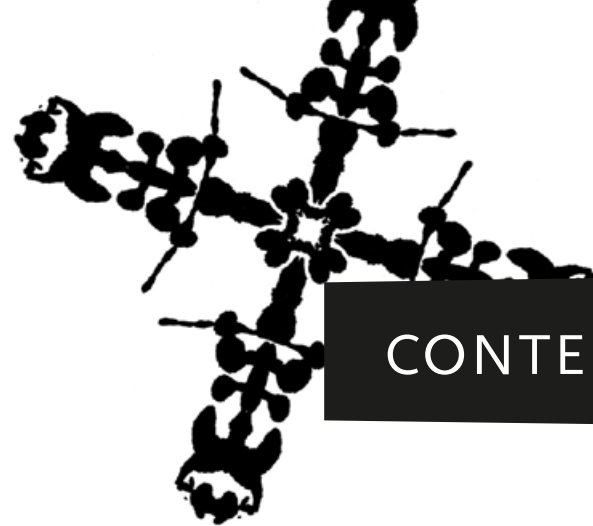
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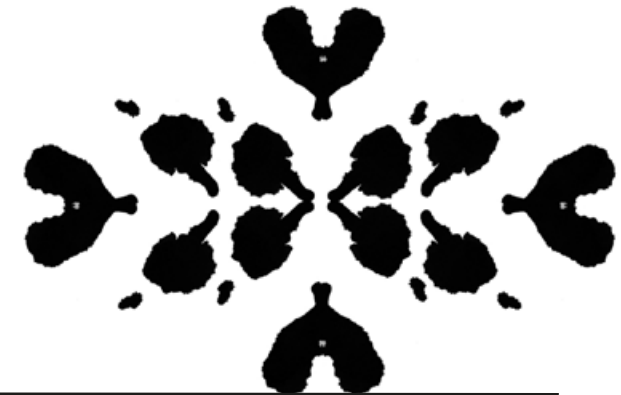
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The transliteration of Russian names follows the practice of David Bordwell in *The Cinema of Eisenstein* (1993, xiii) and Oksana Bulgakowa in *Sergei Eisenstein. A Biography* (1988). They utilize a slightly adapted version of J. Thomas Shaw's *The Transliteration of Modern Russian for English-Language Publications* (1967/1979). In the adapted practice the well-known Russian names remain in their conventional Anglicized spellings, thus Eisenstein and not Eizenshtein. The Russian names in direct quotations and in secondary references adhere to the system of transliteration followed by the original sources.

1 PRELUDIUM

“I should like to start by saying this: it is very curious that certain theories and viewpoints, the expression of scientific and theoretical knowledge in one historical period, lose their scientific value in the next; but they persist, possible and admissible not as science but as art and imagery” (ESW3, 26).

Sergei M. Eisenstein had climbed to the podium of the All-Union Creative Conference of Soviet Filmworkers in January 1935 with the purpose of convincing the Soviet film society that he held the keys to a successful research program for Soviet cinema. “The fact is that, when we proclaimed the priority of montage, or of intellectual cinema, or of documentary cinema, or of any other militant programme depending on what school we belonged to, this had above all a tendentious character. What I am now trying to get across to you, to hint at, is that what I am working on now has a completely different character” (ESW3, 40).

Eisenstein had already put into play his most vivid metaphors and most accurate scientific understanding in explaining how Soviet film practice could gain from his theory. From his platform of the Great Hall of the Bolshoi Theater Eisenstein dared to take his visions further towards an interdisciplinary synthesis of universal knowledge. The signs were already in the air: “We can see that a whole series of theories and tendencies is ceasing to exist as an original ‘current’ and beginning to be considered in its variations and developments as questions of methodology and science” (ESW3, 40).

Eisenstein’s position in 1935 was peculiar and contradictory in many ways. The principal issues of disagreement between Eisenstein and his Soviet colleagues accumulated as a conflict between practice and research.

In 1929 Eisenstein had left for the United States and Mexico as the internationally recognized author of *Battleship Potemkin* (1925), his mind empowered with eccentric ideas. After failing to complete any film projects while abroad, Eisenstein was ordered to return home in 1932. His exploration may have resulted in empty hands but certainly not an empty head: his mind was filled with theoretical ideas that he wanted to put into practice.

According to Oksana Bulgakowa's *Sergei Eisenstein: A Biography* (1998), subsequent to his return none of Eisenstein's film ideas were approved, and his creative energy exploded in the domain of theoretical thinking and teaching. Despite the artificial separation of creative work from theory, as promoted by the leading ideologists of Socialist Realism, Eisenstein enthusiastically proceeded with his writings on holistic cinema. In January 1935 Eisenstein had already initiated several theoretical projects, and published several articles, which he was eager to share and in turn receive acknowledgement (Bulgakowa 1998, 147–163). However, Eisenstein was condemned to fail. He spoke to a crowded hall filled with hostile film-workers and film critics. Many explicitly uttered their disapproval of Eisenstein's interest in theoretical work, accusing him of isolating himself in his 'ivory tower' and having abandoned the practice of film, while others would have preferred Eisenstein to disappear from the Soviet cinema scene forever (Bulgakowa 1998, 168–176; Seton 1978, 329–350).

The speech Eisenstein gave at the All-Union Creative Conference of Soviet Film-workers in 1935 exposes a dramatic point of departure for the present study as a stage of a historical battle between theory and practice. It may be regarded also as a point of no return. From the perspective of personal situatedness, Eisenstein had set his foot on the *research-based* path, which he was to take very much alone.

Inspired and encouraged by Eisenstein's performance before the public in 1935, the research laboratory of *Simulatorium Eisensteinense* anticipates facing – at the podium of the 21st century – an audience interested in and oriented towards the developing cinematic media.

The present research is based on the idea that, as opposed to proposing a ready-made theory in conclusion, perhaps the extended reach of the mind's conceptual grasp (read 'research') may provide the practical domain of cinema with new insights. This means adopting *research-based practice* as a reciprocally complementary methodological approach to the established *practice-based* research widely promoted in European art universities today.

In research-based practice theoretical research precedes practice, and the acquired new understanding inspires practical work. Practice requires the expertise of filmmaking: a craftsman's skills learned by doing. Furthermore, this expertise allows theoretical claims to be defended by means of practice, while, reciprocally, practical implementations are developed and modified with respect to the theoretical background.

Research-based practice as a process has thereby affected the consequent elaboration of the topic of this dissertation. Research-based practice implies two parts, a theoretical study and its practical implementation. While the research considered here includes a practical part, analyses of Eisenstein's films themselves are excluded. The particular emphasis here is not on the practice but on the research part of Eisenstein's

practice. It goes without saying that while Eisenstein is exceptionally portrayed here as a theoretician, his position as a remarkable filmmaker is indisputable.

While differentiating from dominant cultural constructivist approaches to cinema by assuming a science-based approach to the biological basis of cinema, this research needs to cover a wide selection of interdisciplinary, interrelated theories, each itself the subject of an entire body of literature. Consequently, due to limited time and space, the scrutiny is restricted to a more general overview of the topics of interest. When necessary, discussion on more specific details will indicate particularly significant theoretical landmarks.

When deciding upon the framing and depth of the theoretical discussion such that it would make sense to film and media artists of the 21st century, the following assumptions were considered relevant:

Eisenstein's early eccentric views on montage are more familiar to the audience than the principal claims of his later holistic montage considerations. One hypothesis is that perhaps Eisenstein's early metaphoric, abrupt, and heuristic texts soon exhaust the non-motivated reader, and thus discourage one from proceeding further to the later texts.

The audience in general may be more familiar with the artistic and aesthetic influences and background of Eisenstein's era than with his theoretical scientific and academic influences. This division correlates with the exhaustive body of research on Eisenstein the artist versus Eisenstein the researcher.

Recent achievements in cognitive sciences, neurosciences, emotion studies, and complex dynamical systems theories may not be familiar to the whole audience. Many artists seem to inherit in cultural conventions a distrust of (sometimes even disgust) towards natural sciences and technologies, thus on their part keeping alive the dichotomy between arts and sciences.

The above assumptions have made it necessary to include overviews of the less familiar domains, thus contributing to a great number of pages.

Research-based practice differs fundamentally from practice-based research. The practice-part in practice-based places a practicing artist in a complicated situation, not least because any artistic action often relies on intuition, feelings, lived experiences, or heuristics, which are often based on unconscious decisions. Neither do they easily translate into words.

It was this apparent incommensurability with images and words that motivated Eisenstein's research on *figurative thinking*. Without proper understanding of how sensuous, 'figurative', nonpropositional phenomena, such as images or feelings, connect with language formation, the practice-based researcher will build her descriptions on sand. This is true in the domain of cinema as well as in any scientific discipline.

The terminology is typically *a priori* provided by the academic paradigm one is representative of and often incommensurable by nature with the terminology of other research domains. What will eventually enable comprehension between very distinct conceptual frameworks is the *common source of being human* in a particular kind of continuously changing world. In Eisensteinian figurative thinking, a mediating domain of *metaphors* enables bridging the gap between cinematic understanding

and practical meaning conceptualization. In a quite plastic manner, metaphors serve poetic or hermeneutic descriptions of any experiential world phenomena. The cognitive semantics of George Lakoff and Mark Johnson (*Philosophy in the Flesh* 1999) argue that everyday metaphors also serve as the cognitive building blocks for exclusive symbolic abstractions in the domain of the natural sciences. Furthermore, inspired by Zoltán Kövecses's *Metaphor and Emotion: Language, Culture, and Body in Human Feeling* Kathrin Fahlenbrach has directed the discussion particularly to the mind's ability to conceptualize complex audiovisual representation of bodily and emotional experiences in terms of audiovisual metaphors ('Embodied spaces: Film spaces as leading audiovisual metaphors' 2007). This is in accordance with Eisenstein's idea that emotional experience constitutes the basis of all human expressiveness, the starting point of my inquiry as well.

Experimental evidence provided in the scientific publications of today will be applied in a similar manner as how Eisenstein appeared to harness the contemporary psychological and physiological evidence available to him: in other words, *by recycling* the scientific discoveries and interpretations of the scientific community. This applies equally to all scientific communities. Any hypothetical research on such topics as mind, emotions, learning, memory, dreaming, or neural correlates of consciousness, is dependent on the work conducted in experimental laboratories equipped with neuroimaging and psychophysiological experiment technology.

The founder of neuroesthetic studies Semir Zeki in his *Science Magazine* article 'Artistic creativity and the brain' (2001) has popularized the idea of artists as neurologists, who unknowingly study the brain with techniques unique to them. Zeki points the way to a convergence of the critical studies of the philosophical, aesthetic, and ethical functions of cinema *with* discoveries in neurosciences and cognitive sciences. This study thus aims to develop fresh methodological models for bio-cultural and historico-theoretical exploration and practical applications, which would further provoke a diversity of biology-inspired solutions to 'gapping' the contemporary dichotomy between theory and practice. Together with Zeki the following pages will call attention to the fact that "it is not sufficiently acknowledged that the almost infinite creative variability that allows different artists to create radically different styles arises out of common neurobiological processes" (Zeki 2001, 51).

Dedicated to Sergei Eisenstein's holistic perspectives on the interplay between cinema and the human mind, the conceptual workspace of *Simulatorium Eisensteinense* offers novel perspectives on today's evolving art of cinema. Eisenstein's visions of a synthesis of arts and sciences will be here reformulated as enactive cinema.



2 STARTING POINTS

Simulatorium Eisensteinense explores the very grounds from which the phenomenon of *cinema* emerges. It is a study of the intrinsic dynamics of a cinema author's mind in the process of creating a moving image. Rather than representing a historical, cultural, or ideological study into the handicraft of cinema, narrative genres, cinematographic aesthetics, or technological developments of cinema, the present treatment discusses the possible foundations of cinema in human nature, as seems viable in the light of contemporary biological and psychological viewpoints.



2.1 EISENSTEIN AGAIN?

What has Eisenstein to do with recent findings of neurosciences, the theory of embodied metaphors, or interactive computer-driven media? Would it not be better to file Eisenstein in historical archives and direct the attention of 21st century cinema research to the more recent pathfinders in the domain of cinema?

One could put forward Jean-Luc Godard, for example, who empowered the French New Wave with a completely new qualitative level of cinematic expressiveness, by returning to the old – to Eisensteinian montage. Or, why not the eclectic, architectonic orchestration of Peter Greenaway's universe conducted in the 21st century cinematic multimedia production *Tulse Luper Suitcases*?¹ On his journey beyond classical cinema, Greenaway also explicitly pays homage to Eisenstein as one of the rebellious pathfinders of cinematic expressiveness², who in his *October* (1928) reacted against the theatrical naturalism of actors and continuity cinema. Furthermore, Greenaway draws attention to the fact that it was Eisenstein who, in his speech of 'Dynamical Frame' (1930), fought against the standardization of the wide screen cinema frame. With similar pathos, Greenaway in his Cinema Militans Lecture 'Cinema Is Dead, Long Live Cinema?' argues that cinema needs to legitimize the aesthetic possibilities of new media and go beyond the four tyrannies of cinema: the script, the actors, the camera, and the frame, for more intimate relations "with human experience in its interactions between reality, memory and imagination" (Greenaway 2003).

Whether for or against Eisenstein's cinematic ideas, one cannot ignore Eisenstein's major impact on cinema theories. Noël Burch constitutes his *Theory of Film Practice* (1969) on Eisenstein's organic-parametric montage dynamics, which contradicted the prevailing film criticism of André Bazin (*What is Cinema?* 1967). As indicated in Jacques Aumont's *Montage Eisenstein*, not only Bazin and his associates ('Bazinians'), but also many other theoreticians such as Jean Mitry (*S.M. Eisenstein* 1955) and Béla Balázs ('On the Future of Film' 1926) were of the opinion that it was particularly the Eisensteinian kind of montage that first took distance from the realistic nature of cinema as imitation of life (Aumont 1987, 90, 145–150). Due to the vibrant, continuously changing aspects of Eisenstein's theoretical development, the idea that there exists many Eisensteins rather than one has also gained popular-

¹ Peter Greenaway's Keynote Lecture held in 2006 in the University of Art and Design Helsinki. The Tulse Luper Suitcases project includes three feature films, a TV series, 92 DVDs, CD-ROMs, and books. See URL (4/2008): <http://www.tulselupernetzwerk.com/basis.html>

² In 'Tyrannies of technology and tradition', an interview by Hugh Aldersey-Williams (2000).

ity (Aumont 1987, 146). However, this is more a matter of selected perspective of scrutiny than fact. This study agrees with Aumont, who argues that behind the obvious superficial differences at the conceptual level, Eisenstein's life-long theoretical system shows consistency and unity, this beyond the mere adaptation to the changes in the scenery of Marxist-Leninist ideology (Aumont 1987, 67, 146, 199). This study will outline in the following pages some ideas of what might form the system underpinning Eisenstein's theoretical coherence.

When regarding posthumous interpretations on Eisenstein, one cannot avoid the impression that his early eccentric montage theory of attractions, highlighted particularly in the early films *Strike* (1925), *The Battleship Potemkin* (1925), and *October* (1928), has attracted more attention than the mature holism of his later thinking. Eisenstein has often been described to "maximize the dramatic, expressive collision" (Le Grice 2001, 59), and he has been accused of and criticized for pioneering commercial mass manipulation à la Hollywood (Le Grice 2001, 49). It seems that these prevailing canonical images of Eisenstein have prevented a full recognition of Eisenstein's posthumous contribution to the modern evolution of cinema montage.

In addition, Eisenstein has often been contrasted in a superficial manner with his contemporary filmmaker Dziga Vertov. For example, Malcolm Le Grice in *Experimental Cinema in the Digital Age* credits Vertov as a filmmaker for whom filmmaking was not mere manipulation of facts but rather a process of thinking-through-editing (Le Grice 2001, 49). When Lev Manovich celebrates Vertov as the pioneer of database narration in *The Language of New Media* (2001) and in *Soft Cinema* (Manovich & Kratky 2002, 2005), Seth Feldman's article 'Vertov after Manovich' assigns Manovich the role of "the second version of a twenty-first century Vertov" (Feldman 2007, 10).

Eisenstein inspires the recombinant poetics of Bill Seaman (2002, 1999), who returns to Eisenstein's montage of conflicts when exploring digital video in the virtual space of *The World Generator/The Engine of Desire* (1996–1999). Sean Cubitt sketches the idea of total cinema first let 'out of the bottle' by Eisenstein's cinema thus: "Sixty years later, the montage of effects has become montage of affects, and total cinema serves no longer the needs of the anti-Nazi struggle³, but the perverse desire for the simulacrum that permeates the contemporary blockbuster" (Cubitt 2004, 129).

Moreover, when Gilles Deleuze in *Cinema I/II* (1986) discusses Bergsonian cinema conceptualizations of the pre-war movement-image in contrast to the post-war time-image, Eisenstein is involved. Deleuze's conceptual reversal equips Eisenstein's montage considerations as being one of the main reflectors of movement-dependent time against that of the time-dependent movement represented by modern filmmakers (Deleuze C2 1989, 41). In this study, in comparison with the Deleuzian

³ Cubitt discusses in his book chapter 'Eisenstein: The Dictatorship of the Effect' (2004) Eisenstein's film *Alexander Nevsky* (1939), which was closely supervised by the General Secretary of the Communist Party of the Soviet Union's Central Committee (1922–1953) Joseph Stalin himself.

linguistic playground or “the formless world of Bergsonian flux” (Cubitt 2004, 128), the Eisensteinian artillery of figurative imagery is seen to reach beyond mere philosophical conceptualizations, towards establishing cinema as a method for naturalizing the phenomenal domain of embodied experience. In Eisenstein’s words, “outside of a concrete connection with a definite system of images, this ‘special’ feeling cannot really be ‘materialized,’ cannot be embodied in any way” (NIN, 182). Eisenstein thus still appears to determine important philosophical, technological, or socio-political dimensions of today’s forward-leaning cinema applications, and he remains an important source of inspiration for many contemporary artists.

Looking back on Eisenstein’s own time, his idea of cinema as a psychological laboratory for studying the human mind was appreciated beyond mere cinema practice. The *Gestalt* psychologist Kurt Lewin claimed Eisenstein’s ideas on expressive movement had more value than those of his contemporary scientists (Bulgakowa 1998a, 92). The neuroscientist Alexander Luria planned research projects with Eisenstein, and invited him to lecture on the psychology of art (ECOL, 226n2). Eisenstein’s figurative thinking may also be regarded as a philosophy in its own right (Nesbet 2003, 214; Lambert 2000, 259; Aumont 1987, viii).

Eisenstein insisted that studying the emotional dynamics of the authoring practice might provide a psychophysiological laboratory for the more general study of the emotional dimensions of the human mind. This research aspect of Eisenstein’s work has generally been underestimated. The exhaustive body of cultural cinema studies (e.g. psycho-analytical, semiotic, structuralist, and neoformalist studies) seems to continue to recycle the canonical images of Eisenstein, such as Eisenstein equaling a ‘montage of attractions,’ or Eisenstein as the godfather of pervasive Hollywood cinema. The cultural environment of today does tolerate a greater diversity of research topics; for example, Eisenstein’s homosexuality has become a hot potato of socio-psychological debate. This study however deviates from these prevailing lines of cultural constructivist Eisenstein interpretations by drawing its framing from the natural sciences instead. This means scrutinizing the theoretical structures of Eisenstein’s cinema montage as a complex systemic model of the psychophysiology of human experience.

Due to the chosen framing, Eisenstein’s private self-image, personality, sexuality, social life, or everyday routines fall out of the focus here. However, contemporary understanding of the holism of memory as situated and socially conditioned (e.g. Sutton 2006; Nelson & Fivush 2004; Damasio 2000; Thelen & Smith 1994; Vygotsky 1978) suggests generally that thinking embodies previous autobiographic experiences. So must it be with the mature Eisenstein, too, both as a private person and a public figure. Eisenstein’s later views on the human body, mind and emotional experience are also in debt to the organic-dynamical setting of his historically situated youth. This is reflected in his idea that in a reciprocal, and here also retrospective, manner, the *whole* is embedded in *particularities*, or vice versa: the particulars and details only gain significance in experiential unity.

Eisenstein has provided his researchers with an exhaustive archive of published and unfinished essays, scripts, films, book projects, drawings, cartoons, notes, and

newspaper and magazine clips spiced with eccentric humor or paradoxes: in short, anything that he found intellectually challenging to his figurative thinking. Eisenstein’s texts continuously refer to others’ works of art, books, or scientific papers, freely juxtaposing and extrapolating very different historically or disciplinarily distant sources. Eisenstein’s mastery of adapting any existing cultural objects, verbal or visual, into his constructive purposes is also recognized with respect to quoting Lenin’s philosophical ideas (Bohn 2003, 248n4). In addition, Eisenstein’s background sources are often retrieved from memory. It follows that they are not always guaranteed to be correct, and sometimes the references to the original sources of inspiration or information may be lacking completely.

Indeed, it would have been difficult to orient oneself to Eisenstein’s original sources of inspiration without the invaluable historical windows provided in the research of Anna Bohn (*Film und Macht: Zur Kunsttheorie Sergej M. Eisensteins 1930–1948* 2003), David Bordwell (*The Cinema of Eisenstein* 1993), and Oksana Bulgakowa (*Sergei Eisenstein: A Biography* 1998; *Sergej Eisenstein – drei Utopien: Architekturentwürfe zur Filmtheorie* 1996). While other researchers have also provided valuable insights to this study on Eisenstein’s theory formation, the contribution of the above-mentioned three scholars has become the most important.

This study has set out to explore what Eisenstein’s ideas of expressiveness and the *embodiment of an emotional theme*, i.e., a bodily understanding mediated by the emotional dimensions of experience, might mean in terms of a *contemporary* scientific understanding of emotion and cognition in cinema. According to Eisenstein, the cinema author’s *expressiveness* comes into being in authored montage composition. Not only does it externalize the author’s embodiment of an emotional theme cinema montage also transposes it further into the spectator’s emotional viewing experience. What kinds of biological and conceptual processes may be involved, and how do these processes shape human expressiveness, particularly in cinematic structures?

2.2 AUTHOR’S POINT OF VIEW ON CINEMA

The notion of *cinema author*, or *author*, or *filmmaker* refers here to a hypothetical agent whose proper mind in the process of authoring cinema is simultaneously equipped with all the freedom of cinematic imagination *and* fundamentally and inseparably constrained within the surrounding socio-cultural environment. This accords with David Bordwell’s or Casper Tybjerg’s idea of a filmmaker as a rational agent as discussed in Tybjerg’s essay ‘The Makers of Movies: Authors, Subjects, Personalities, Agents?’ (2005, 60, 62). In focusing on the concrete filmmaking during production, Tybjerg seems to defend a moderate version of a kind of intentionalistic auteurism: “the film-

maker is the origin of the work” (Tybjerg 2005, 39). Accordingly, cinema is here conceived as an *authored* medium. In addition, Tybjerg rejects the popular notion of authorship, because it suggests that concrete films somehow pop out “from the foreheads of imposing but imaginary creator-figures” (Tybjerg 2005, 62).

Within the scope of this research, defining a preferred agency from the options of an individual author, (co-) authorship, or multiple authors, is not relevant. Because this study will explicitly focus on the hypothetical imagery aspects of the author’s mental working process, it deviates from any discussion on the filmmaker, author, or authorship in the midst of production-based decision-making and problem solving. This set-up implicitly excludes the other potential agencies of authorship, and the collaborative teamwork of cinematographers, sound designers, scriptwriters, set designers, actors, and other film professionals is understood to converge into a single holistic embodiment of expertise, as exemplified by Sergei Eisenstein’s own use of the word ‘author’ or ‘creator’.

In another perspective on authorship, in his essay ‘The Audience as Creator’ (1947) Eisenstein credits the audience as the authoring agency of a new social consciousness. However, while the filmmaker’s celluloid strip plays only a minor role when it documents the struggle of the Soviet people, only in the professional hands of the filmmaker does the product of the creative social process reach its final crystallization: “the screen work itself is one of the finest embodiments of the creative inspiration of our great people” (ESW3, 339–340).

As Eisenstein’s interest in the biological and psychophysiological dynamics of the authoring process frames the starting point for the present study, it will also explicitly guide the review of the contemporary cinema research discussed here. This means that an exhaustive body of recent psychoanalytical, phenomenological, and cultural cinema discourse, which interprets the spectator experience from the embodied mind point of view, has been excluded. Yet, such studies as *Carnal Thoughts* (2004) by Vivian Sobchack, *The Skin of the Film* (1999) and *Touch; Sensuous Theory and Multisensory Media* (2002) by Laura U. Marks, *The Cinematic Body* (1993) by Steven Shaviro, and *The Tactile Eye* (2004) by Jennifer Barker amongst many others, are acknowledged as contributing to the understanding of the carnal sensuality of the spectator’s meaning construction (Sobchack 2004, 56).

While the present discussion on the author’s creative mind puts aside the spectator-related issues of film-viewing experience, however, it also excludes the discussion of the spectator as co-author. Consequently, instances of media art with augmented spectator participation or story-world navigation as in Janet H. Murray’s *Hamlet on the Holodeck: The Future of Narrative in Cyberspace* (2001, 129–130) are interpreted as *authored*. This means that in such art, it is the authoring team that creates and produces the virtual space or the navigation environment, and thereby also designs the experiential potentialities and constraints of the spectators. Martin Rieser depicts in his essay ‘Interactive Narratives: A Form of Fiction?’ (1997) the situation thus: “For artists struggling to achieve this transfer of control of narrative flow to the reader, the task often seems akin to squaring the circle. Without direct authorial control the narrative risks fragmentation into a matrix of small, seemingly arbitrary story pieces or

disappears altogether in a maelstrom of chaotic events” (Rieser 1997, 2). In a similar manner Torben Grodal’s essay ‘Agency in Film, Filmmaking, and Reception’ points out that the interactive game designers, who are responsible for the authoring of the rules, are the ones responsible for the player’s interaction experience (Grodal 2005, 24).

Most, if not all, cognitive cinema theories share an interest in spectator psychology. In addition, some cognitive researchers are keen to discover how recent scientific understanding of the dynamics of the mind has been reflected in the dichotomy of the author or authorship versus the spectator or spectatorship in *Visual Authorship: Creativity and Intentionality in Media* (Grodal *et al.* 2004). The contributors to the book, amongst them Patrick Colm Hogan, Espen Aarseth, and Berys Gaut, spell out the need to define who or what is an author in cinema; that is, their purpose is to provide tools for critics and those who theorize about films and filmmaking. On the contrary, this work focuses on understanding the biological basis of creative mental imagery *from the point of view of a proper filmmaker*. On this path, the following aspects are emphasized.

Aiming at finding answers and new insights into the authoring process, this treatment relies on recent scientific findings on emotions and the human mind. Cinema may be argued to come into being *only* as a product of the author’s emotionally experienced processes, as far as the intersubjective world it depicts and the emotional experiences it elicits in the spectators are concerned. Here, it is assumed that the spectator’s cognitive construction processes correlate to those of an author’s cognitive processes, due to biologically inherent similarities between different individuals as humans. This assumed correlation has a long tradition in psychology, from Sigmund Freud and William James to recent cognitive studies. The similarity between different individuals is understood to be naturally but not significantly more so within relatively similar cultural and epistemological situatedness (Western societies, gender views, religion, etc.). Adapting Torben Grodal’s remark accordingly, “cognitive neurosciences provide the theoretical basis for understanding that [also the authors] are biological and cultural individuals, who possess universal as well as individual features reflecting [their] individual life stories” (Grodal 2005, 16).

The author is no more a dead agency today than in Eisenstein’s times, Roland Barthes! Indeed, Rieser has also emphasized the responsibility of the author, who has to be very much alive: “Perhaps after all, the ‘audience’s freedom is ultimately measured not in terms of activity or interactivity, but in the ability of the work to convey the complexity of meaning found in all successful artforms” (Rieser 1997, 11). The new challenges in authoring cinema as a dynamical complexity need an author more than ever, though the authoring process is focused on different aspects of the authoring process than previously. Instead of assuming the role of an omniscient and omnipotent controller, the author has to accept a more modest approach to control. To meet this challenge, the author has to assume a more enactive role backed by a holistic and biological system, where she and her dynamical enactive cinema artwork together form a cinematic system as a whole.

People generally associate the events and fates of the characters on the cinema screen in terms of their own experiential reality. However, they are also ready to ac-

cept very strange worlds, as long as the entities inhabiting those worlds interact with each other in some emotionally meaningful, human-like manner, as in the Walt Disney animations that so fascinated Eisenstein. The many worlds of cinema may range from documenting the most ‘normal’ everyday life (*cinéma vérité* or reality television) to authoring visions of a future *Armageddon* or *Utopia*. However, it is acknowledged that even in its most incredible creative visions, cinema generally represents a kind of *intersubjectively shared prototype of life*. Such intersubjectivity could also provide the playground and the rules for an Aristotelian art of persuasion.

2.3 EPISTEMOLOGICAL GROUNDS

The epistemological orientation of *Simulacrum Eisensteinense* takes a holistic and organistic position to mind and creativity. Throughout the history of human culture, artists and poets have been assumed to be privileged to ‘subjective’ sensuous, mythic domains of enchanting beauty, as well as destructive uncontrollable passions. This domain has however been generally found incommensurable with the rational side of existence, referred to as the ‘objective’ and ‘true’ knowledge to which only rational thinkers (philosophers, later scientists) have had access, and which supposedly had little to do with the emotional side of life.

The epistemological view, which assumes a dualism of the body (*res extensa*) as the playground of emotions and the mind (*res cogitans*) as playground of reasoning and moral judgments, was established in René Descartes’ *The Principles of Philosophy* (1644). This dualism is argued to be false in neuroscientist Antonio Damasio’s book *Descartes’ Error* (1994, 248). The Cartesian view of the body–mind system separated “the most refined operations of mind from the structure and operation of a biological organism” (Damasio 1994, 250). As a contribution to correcting this conceptual division of rational mind and emotional body, this study also claims that the very same Cartesian error is underpinning the culturally established but disputable separation of the scientist’s ways of thinking from those of the artist. This mind–body dualism is behind the polarities of subjective/objective, material/mental, rational/emotional, visible/invisible, neural/phenomenal, and so on. Such dualism needs re-contextualization not as an epistemological statement but as a cognitive schema for facilitating conceptualization, this with respect to the epistemology of mind–body holism.

Person-person relationships suggest another debatable epistemological topic. Intersubjectivity assumes to some extent what Mark Johnson in *The Body in the Mind* describes as a “*shared, relatively intelligible world*” (1987, 209). Relativist mid-point views are also advocated, for example, in philosopher Richard Rorty’s discourse relativism, and Hilary Putman’s value-dependent ‘realism with a human face’ (Rorty 1980, 380; Johnson 2007, 40, 46; Johnson 1987, 196, 226n1). These so-called ‘dis-

embodied’ views of the mind are representative of classical philosophies, which consider mind, language, and philosophy as separate from bodily being, while Johnson advocated the embodied mind view. Yet, all are in accordance with the Soviet psychologist Lev Vygotsky’s argument that individuality is socially conditioned, an idea he elaborated until his early death in 1934, for example, in *The Psychology of Art* (Vygotsky [1925] 1971, 14). In this treatment, the ‘internal’ character of the mind–body system and the ‘external’ character of intersubjectivity converge to a dyadic two-faceted prerequisite, which has yet to be defined.

Assuming that there is no access from ‘subjective’ knowledge (first-person perspective) to ‘objective’ knowledge (third-person perspective), then one cannot know what exists in ‘reality’ or what the natural world is like. Yet one may assume a *natural world* inhabited by biological beings and man-made cultural constructions, language systems, scientific theories, technologies, conceptual descriptions, evolutionary laws, and the like. In turn, and often confused with this ‘real’ or natural world, the *phenomenal world* describes the surrounding world as experienced from one unique first-person perspective. One may thus further assume an emergent consensus between people about what they believe exists, based on their previous experience.

Intersubjectivity emerges within the multiplicity of unique perspectives on the phenomenal world, due to *reciprocal* transgressions, conflicts, adjustments, and dialogues between people; some epistemological, ideological, or experiential aspects may overlap, coincide, or conflict, while others meet only in the incommensurable. It is also assumed that an extra-linguistic ‘will to understand the other’ plays a more significant role in intersubjective communication than generally admitted. This correlates with what the psychologist Ed Tan refers to as genuine emotion of ‘interest’ in his *Emotion and the Structure of Narrative Film* (1996), while it conflicts with the emotional/rational division explicated in *Narration of Film Form* by David Bordwell, when he writes: “I am assuming that a spectator’s comprehension of the film’s narrative is theoretically separable from his or her emotional response” (Bordwell 1985, 30).

The multiplicity of experiential perspectives on the world is framed with the notions of *relative objectivity* and *relative similarity*. While cultural constructivists, or post-modernists, such as Michel Foucault, Gilles Deleuze, Jacques Derrida, and many others, emphasize the role of *that small difference* that advocates the notion of individuality, here, instead, a complementary shift turns the focus to *that great similarity* between people. If a small difference within crowds guarantees cultural mutations, a great biological similarity guarantees a background for all meaningful differences to emerge. Relatively similar evolutionary goal-driven activities (constituting a family, earning a living, exploring new possibilities, breaking out of a cage, fighting for one’s rights, etc.) have always been embedded in cultural expressions (Barrett *et al.* 2002). This becomes clear when one considers the iteration of constituent narrative patterns in the arts, symbolic systems, scientific theories, cinematic imageries – and more recently, in interactive story-worlds, artificial second lives, virtual communities, etc. The organismic perspective, which leads the epistemological inquiries

of the following pages, will provoke new kinds of insights into these 'old' issues.

As described in Thomas Kuhn's *The Structure of Scientific Revolution* (1962), and later in the discourse relativism of Richard Rorty's *Philosophy and the Mirror of Nature* (1980), dominant paradigms reluctantly give up their privileged status. Neither is the revolutionary paradigm going to win the 'battle' if it adopts the terminology of the dominating paradigm (Rorty 1980, 58n28). On the one hand, the wide body of phenomenological studies seems to have 'owned' and to a great extent exhausted the research object of subjective experience, for example in the writings of Edmund Husserl, Maurice Merleau-Ponty, and Martin Heidegger. On the other hand, positivist sciences and analytical philosophy since Gottlob Frege and his essay 'On Sense and Reference' (1892) have explicitly rejected the subjective in favor of the objective, as exemplified by W. V. O. Quine and 'meaning holism' in *Methods of Logic* (1959) (Lakoff & Johnson 1999, Ch. 21), or Karl R. Popper and 'falsificationism' in *Objective Knowledge: An Evolutionary Approach* (1986). The present treatment intends to build a bridge between these opposing views of subjectivism and objectivism in order to elucidate the biological basis of the cultural phenomenon of cinema.

The epistemological question is, how does the emergent phenomenological experience of being and interacting in the world, often referred to as *consciousness*, correlate with the biological body-brain system? The well-known notion of 'explanatory gap' persists also here: no consensus on explaining this correlation exists. The concept was introduced in Joseph Levine's 1983 article 'Materialism and qualia: The explanatory gap' and he later returned to it in 'Conceivability, Identity, and the Explanatory Gap' (1999). This study accords with Levine's notion that while the explanatory gap apparently exists and lives well in philosophical language games, there is no evidence to assume that such a gap exists in the biological world. On the contrary, the world is assumed here to be an organic unity. How each individual mind perceives the world is another issue, in fact, and a topic of this cinema research.

In this effort, this research relies quite heavily on George Lakoff and Mark Johnson (*Philosophy in the Flesh* 1999), who challenge Western 'objective' epistemology with their embodied mind views. This contrasts the previously dominant idea of mind as a rational immaterial entity separated from the physiological needs of an emotional body, which it in some unexplained manner inhabits. While these are far too complex issues to be exhausted in a sufficient manner here, these classical paradigm conflicts are obviously embedded in the epistemological grounding acquired here. This treatment will join the discourse of a community mainly consisting of cognitive cinema theorists, who argue for an interdisciplinary application of the discoveries and terminology of natural sciences to the cinema paradigm. Later, in the overview of the theoretical framework, several ongoing radical paradigm shifts will be considered.

2.4 HOLISTIC MIND

One of the most controversial concepts circulating in human culture is that of *mind*. As it embraces literally and practically all aspects of human life, and is also evolving within an individual's lifespan, it is impossible to exhaust the issue here. However, because the cinema author's cognitive activities are the main issue of *Simulatorium Eisensteinense*, 'mind' calls for a preliminary definition.

As a premise of this research, mind is understood in holistic terms, involving both sides of what is in the dualist paradigm separated into mind and body. The experiential dimension of the body-mind system is well described with the metaphor of a stream of thought (William James 1890), or its modern version of 'movie-in-the-brain' (Antonio Damasio 2000). Today, many contemporary cognitive scientists would consider the mind as an emergent feature of a psychophysiological brain or brain-body system, while a more radical group argues that the mind expands from the traditional brain-body system to the world. While cognitive sciences in general are interested in human cognition, or human mind, there are significant epistemological differences in how, for example, the relation between mind and world is defined. Without entering here into a detailed discussion on the differences and similarities between the classical cognitivist, connectionist (emergence), and enactive approaches, the present work draws from the last and most recent one.

The *enactive* cognitive sciences, first introduced in 1999 by Francisco J. Varela, Evan Thompson, and Eleanor Rosch in *The Embodied Mind: Cognitive Science and Human Experience*, assume that the mind is *embodied* and *emerges* through continuous bodily enactment with the world. The notions of mind, body, and world are considered inter-related, interdependent, and parallel conceptual perspectives on the subject's *enactive situatedness*, i.e., the holistic first-person experience of being and playing a part in the intersubjective world.

While the attribute of 'enactive' carries the explicit sense of *pragmatic* doing and meaningful acting in the world, it is the *embodied simulation* of the world that will provide the cognitive environment for creative enactment. Emotions, in addition to determining an unconscious, involuntary understanding about the state of things, also determine all conscious, intentional, and imaginative aspects of cognition.

These attributes of dynamical, enactive, and embodied refer to vast fields of study into the mind to be described later as this treatment unfolds. They help here to determine what this study will exclude, for example the representationalist, objectivist, realist, idealist, cognitivist, or cultural constructivist perspectives and the therapeutical treatments of mind typical in domains such as neurophysiology, psychotherapy, or psychoanalysis. The normative cultural paradigms of aesthetics, ethics, meaning semantics, and narrative comprehension also fall outside the focus of this study. They are assumed however to relate to the emotive-cognitive evaluation dynamics of a bio-culturally conceived mind.

An exhaustive philosophical debate over mind and its neural correlates is nonethe-



less not possible within the present focus, and the same holds for the classical philosophical discourses of consciousness, explanatory gap, phenomenology of perception, 'raw feels' (qualia), intentionality, and the speculations of the theory-theory of mind versus simulation theory of mind.⁴ These issues will be re-conceptualized within the most recent neurocognitive framework. This does not mean reducing the treatment to mere biology, but *naturalizing* the issue in terms of the most imaginative and fascinating interpretations provided by leading biologists and neuroscientists. For example, Francisco Varela, Evan Thompson, Alva Noë, Luis Pessoa, Timothy van Gelder, and Natalie Depraz, are all contributors to the publication *Naturalizing Phenomenology: Issues in Contemporary Phenomenology and Cognitive Sciences* (1999), juxtaposing phenomenological first-person inquiries with recent neuroscientific views.

It has been suggested that the bodily ground of artistic expressiveness is embedded in the integration of all senses. *Synesthesia* is the general notion for the many ways senses can interact within unconscious experience, as suggested for example by V. S. Ramachandran and W. Hirstein in *The Science of Art: A Neurological Theory of Aesthetic Experience* (1999). One may consider the neuroscientific evidence in D. D. Hoffman's *Visual Intelligence: How We Create What We See* (2000), which suggests that the visual system alone occupies about half of the brain's cortical activities. It has also been found that the olfactory system (smelling), in turn, is directly channeled to the core region of emotional experiences in the brain, thus bypassing conscious orientation (LeDoux 2008). This may perhaps explain why a bunch of favorite flowers from a home garden elicits a happy smile on the face of a severe dementia patient. It may also allow the assumption that seeing actors on the screen enjoying a cheese table with wine not only affects conscious cognition via audiovisual dimensions but also involves the sensory dimensions of smell, taste and touch. A comprehensive coverage of physiological descriptions of visual system or other sense systems is however excluded from this treatment.

Antonio Damasio's *Looking for Spinoza* (2003) supports the principal argument of the present study: the emotional system is assumed to form the basis of human cognition. This happens in holistic terms: "What emerges in the mind, in the form of an idea, corresponds to some structure of the body, in a particular state and set of circumstances" (Damasio 2003, 197).

The treatment in *Simulacrum Eisensteinense* will be oriented towards generally defining a certain kind of cinema, one that reflects recent scientific knowledge about the neural underpinnings of human activity, and draws its emotional power from one's experimental resources of understanding and interacting with others within the everyday world. The pages that follow will show how such recent topics as a biological basis of intersubjectivity, or the neural mirroring dynamics of metaphorical understanding can retrospectively be connected to Eisenstein's montage thinking in a meaningful way.

⁴ The research program of *Naturalizing Phenomenology* (Petitot et al. 1999) provides extensive discussion on these topics. Bernard Baars, Daniel Dennett, Vittorio Gallese and Thomas Metzinger are also concerned with the philosophical description of consciousness and the body-mind relationship.

2.5 COGNITIVE VIEWS ON CINEMA

Cinema has often been argued to be a pervasively emotion-driven medium. Although Eisenstein takes his position as a predecessor of recent studies into cinema emotions, discussion on the biological basis of cinema emotions has not taken place until only recent cognitive cinema theories. Furthermore, as noted by Greg M. Smith in his *The Film Structure and the Emotion System*, the cognitive cinema researchers' orientation on cinema emotions is often split. On the one hand, the researchers seem to draw from philosophical thought experiments, and on the other, from the neuroscientific evidence provided by psychophysiological experiments (Smith 2003, 67).

Following this division, due to the chosen focus, the culturally-oriented philosophical or constructivist perspectives on the spectator's cinema comprehension provided by, for example, Noël Carroll (1996), Richard Allen (1995), Murray Smith (1995), David Bordwell (1985), and Edward Branigan (1992) are excluded from the present context. Consequently, all aesthetical evaluations based on conventions of cinema genre typically established by academic cinema criticism fall out of the scope of the scrutiny. Thus, the analysis of Eisenstein's films is entrusted to such eminent cognitive critics as Kristin Thomson (*Eisenstein's Ivan the Terrible: A Neoformalist Analysis* 1981), while the work will concentrate on Eisenstein's psychological considerations on the authoring process. Omitting discussions on the properties of particular films or film genres is consistent with Eisenstein's own idea of creating his theory of cinematic expressiveness in a highly generalized systemic manner.

The conventional division between main stream, documentary, experimental or art house films is subjected to re-negotiation. Eisenstein is often categorized as an experimental filmmaker, even though he aimed his films for the mass audiences. He had set off to make popular films, the effect of which would be far-reaching in socio-cultural terms, not more or less than contributing to creation of a New Soviet Man. In this study it is argued that Eisenstein did not make experimental art films in the sense often designated to video art, interactive media art, or other types of moving image projections. Instead, he made mass audience films, which deliberately *experimented* with the unconscious emotional responses of his audience. This is also the purpose of the work ahead, to study the biological and psychophysiological aspects of interactive cinema, yet refusing to be categorized to the marginal fringes of experimental cinema. On the contrary, in the spirit of Eisenstein, a psychological laboratory of interactive cinema aims to study through practical experiment how a traditional fiction film bends to the new kind of form of interaction in terms of emotion-driven enactive cinema.

The biologically-oriented discussion on cinema emotions led by Torben Grodal's bio-cultural approach in *Moving pictures: A new theory of film genres, feelings and cognition* (1997) and the psychologist Ed Tan's *Emotion and the Structure of Narrative Film* (1996) has paved the way. While Grodal scrutinizes the effect of bodily equilibrium, or *homeostasis*, on cinema genres and emotions, Tan studies the spectator's *interest* as a genuine cinema emotion. Furthermore, Greg M. Smith, inspired by Eisenstein, has

a specific interest in metaphoric expressions and cinematic emotion cues embedded in the cinema structure. His interpretation in *Moving Explosions: Metaphors of Emotion in Sergei Eisenstein's Writings* suggests that instead of describing emotional elements or themes as a mere machine for emotion-loaded cinematic experience, Eisenstein considered emotionally organized montage composition as the all-penetrating guiding principle for the cognitive activities of both the cinema author and the spectator (Smith 2004, 314). All the above-mentioned research work will contribute to the *Simulatorium Eisensteinense*.

This cinema study also draws from the ecologism of psychology. J. J. Gibson's pioneering work from the fifties to the seventies resulted in *The Ecological Approach to Visual Perception* (1986). Gibsonian ecology has inspired the cinema studies of Joseph Anderson and Barbara Fisher Anderson, first, in *The Reality of Illusion: An Ecological Approach to Cognitive Film Theory* (1996), and further, empowered a group of ecological cinema researchers in *Moving Image Theory: Ecological Considerations* (2005). Ulric Neisser's ecological idea of a cognitive interaction cycle in *Cognition and Reality: Principles and Implications of Cognitive Psychology* (1976) has inspired the description of a dynamic emotion ecology of interactive cinema (Tikka 2005, 2006), which, in turn, has led to the ongoing interpretation process of emotion-driven interactivity in *Simulatorium Eisensteinense*.

Interestingly, cognitive views on cinema ecology are more in debt to biological views and biosemiotic elaborations than to cultural constructivist information ecologies. However, since 1964 in *Understanding Media: The Extensions of Man*, Marshall McLuhan has foreseen "the technological simulation of consciousness when the creative process of knowing will be collectively and corporately extended to the whole of human society, much as we have already extended our sense and our nerves by the various media" (McLuhan 1997, 3–4). He is acknowledged as a pioneer of the ecologist approach in the field of culture and media studies with such statements as 'we shape our tools and thereafter, our tools shape us', in Celia Pearce's *The Interactive Book: A Guide to the Interactive Revolution* (1997, 11). In fact, while McLuhan is rarely referred to in the field of cinema, he knows his Eisenstein, when demanding from his contemporary cinema "that free interplay among the senses and the media that seems so natural to Eisenstein" (McLuhan 1997, 289).

Due to the chosen historical framing, which concentrates on finding similarities between Eisenstein's era and the neuroscientific era around the turn of the millennium, the organic dialectics of Noël Burch in *Theory of Film Practice* (1973) has been excluded. Nonetheless, Burch's formalism stands out as a single and thereby even more significant landmark between the 1920s organic-dynamical views of Eisenstein (and the Russian Formalists) and the 1980s Eisenstein-inspired neo-formalist views of David Bordwell and Kristin Thompson (1981, 1988). While in his book *Narration in the Fiction Film* (1985) Bordwell credits Burch as an important source of his inspiration, amusingly, he seems to be in pains when trying to categorize Burch's unique 'parametric', 'style centered', dialectical', permutational, or 'poetic' ['Eisensteinian'] approach amongst the other canonical paradigms of cinema (Bordwell 1985, 274).

In this brief introduction, Burch is momentarily highlighted as a mid-post between

Eisenstein and the later computerized approaches to cinema. The manner in which Burch's analysis of the formal dynamics of audiovisual works appears preparatory for the later developed database cinema is an issue worthy of an exhaustive study in future. Yet, today, while inspired by Eisenstein, Bill Seaman's 'Recombinant Poetics' (1999), for example, does not recognize Burch's contribution to the discussion on the serial organization of plastic compositions (*découpage*) according to its temporal and spatial parameters (Burch 1973, 97–98). This is the case also with other researchers, who advocate systemic approaches to database cinema, for example, Lev Manovich, Martin Rieser, or Andrea Zapp. As a rare example, Zoe Beloff in 'An Ersatz of Life: The Dream Life of Technology' cites Burch from *Life of those shadows* (1990) (Beloff 2002, 293).

Some marks of re-cognition as a precursor of the later computational cinema are in the air, though. This is indicated by a retrospective of Noël Burch's work, edited by Constanze Ruhm and shown in the exhibition *Future Cinema: The Cinematic Imagery after Film* curated by Jeffrey Shaw and Peter Weibel (2003, 629). Sean Cubitt when outlining his history of cinema from the point of view of digital media in *The Cinema Effect* also notes that Burch (1973, 3–16) recognized that "the 'flickers' of hand-cranked machines were already the 'direct image of time', and that the long detour of cinema may just be its return to the aesthetics of distraction" (Cubitt 2005). Here it is emphasized that Burch's thinking highlighted those mid-point landmarks on the way towards the parametric organization of digital database cinema, which are retrospectively to be discovered in a more or less embryonic state already in Eisenstein's writings.

2.6 MEETING CURRENT CHALLENGES TO CINEMA

In the media environment of the 21st century, the cinema of the previous century must surrender to re-evaluation and adaptation if it is to survive in the ongoing techno-cultural turmoil, implying new kinds of cinematic media forms. Educated to consume computer-based virtual products and services in the domains of entertainment, gaming, social life, health care, banking and other activities, the cinema audience will eventually begin to expect real-time interaction and augmented participation within the cinematic framework as well. This is enforced by the emerging field of interactive database cinema, which emphasizes the active constructive modes of the spectatorship, for example, in the concepts of 'participation', 'creative exploration', 'spectator as co-author', or what Seaman has described as a '*vuser*' (viewer-user).

That accepted, even the idea of interactive interfaces, which assumes a conscious spectator, is challenged by *Simulatorium Eisensteinense*. In other words, a new kind

of *authored* cinema is designed to elicit the *emotional, unconscious immersion of the spectator*. The spectator's uncontrollable, continuous involvement with cinematic imagery has often been compared to a dream-like state, because the surrounding world becomes momentarily 'closed out' of the spectator's conscious attention. Supporting this phenomenon of immersion requires that the future cinema author will have a kind of understanding of the human mind, which facilitates designing *unconscious modes of meaningful cinematic interactivity*.

The attribute of 'cinematic' refers to a set of features, each of which on its own typifies a particular moving image representation inherent to the traditional reign of cinema. In *The History of Film Style* (1997) David Bordwell analyzes how features of cinematographic images are negotiated between the cinema author's *practical* problem-solving processes and the prevailing cinematic conventions of the mainstream cinema. Cinematic conventions range from narrative genres to the technical and temporal aspects of cinematic imagery, and relate to such cinematic characteristics as high-quality image projection and sound environment, persuasiveness, as well as being emotion-driven and fully authored. These aspects reflect a continuation of that particular kind of *cinematic* expressiveness that characterizes the one-hundred-year-old cinema form.

It is remarked that Eisenstein, a step ahead others, highly emphasized the skillful elaboration of the stylistic and technical aspects of the cinematic imagery as the principal method for cuing the spectator's intellectual processes via multisensory perception. However, due to its focus, the present study excludes the discussion on any stylistic, aesthetic, cinematographic, compositional, or technical aspects of cinematic image, and further, how these aspects may appeal to the spectator(s). This is necessary in order to keep the focus of scrutiny on the author's cognitive processes, such as mental simulation or imagination.

Today, technological platforms of cinema evolve in an accelerating manner. Cinema may be considered an independent spatio-temporal *product* in a concrete sense of, for example, videotapes or film rolls, but also in an abstract sense of digits downloaded on demand. From the author's point of view, future cinema may no more be defined by the media format and media technologies of distribution, but rather by the *experiential* dimensions it opens to the spectators. Already now conventional cinema theaters find it difficult to compete with home theaters and cinema-on-demand services on the Internet, or interactive, collaborative, locative, or ubiquitous audiovisual devices.

Steve Anderson's article 'Open Source: Cinema in the Public Domain' (2005) anticipates a remarkable increase of the organizations and online projects, such as the *Open Video Project*, *Open Source Cinema*, or *Common Content*, which challenge the current copyright system of the entertainment and media industries with their Creative Commons licenses. The open source programming communities have enabled launching free software such as the *Korsakow System*, which guides the non-experienced users step-by-step to create interactive database narratives. Together with video games they "continue their siege of the film industry, transforming cinematic narrative structures from the inside and the business of media conglomerates from the outside" (Anderson 2004, 53).

Many kinds of mobile cinema platforms are rapidly emerging alongside the devel-

opment of personalized, generative, context-aware media formats. Different screen forms, even wearable screens, implemented in public and private spaces give rise to variants of mobile cinema, interactive cinema, experimental cinema, participatory cinema, live cinema, virtual reality cinema, 'gaming' cinema, and so on. The above implies a more expanded definition of authored cinema than classical cinema studies are willing to consider. Is this trend in conflict with the Eisensteinian kind of fully authored cinema, or do Eisenstein's visionary views embed answers even to these challenging questions of the open source cinema?

Classical cinema genres need to be challenged not only by the 21st century technological innovations but also by the contemporary holistic understanding of the mind. Such a challenge to cinema is exposed in the pioneering work of Grodal, who in *Moving Pictures* categorizes a new set of cinema genres by the kinds of bodily changes (emotions) they elicit in the spectator (Grodal 1997, 180–181). Later, in 'Video Games and the Pleasures of Control' (2000) Grodal argues that emotional simulation in video games is considerably higher than in films, because "emotions are motivators for actions" in a similar manner as in real life situations. The question remains of how cinema and interactivity ought to be linked together in future cinema, such that this real-life kind of emotional motivation could also be described as part of the cinema viewer's experience. Because the creative processes start in the author's imagination, as a starting point to the previous question, one first has to ask how new knowledge on the biological and psychological constraints of the author, rather than the spectator, could serve the creative purposes of future cinematic media.

Following one of the leading principles of the present study, the principle of reciprocity, it would be one-sided to argue that the demanding audience will challenge the cinema. The reverse is also true: future cinema should find itself a step ahead in challenging its audience. While still today many, if not all, contemporary filmmakers relate cinema to the two sensory dimensions of image and sound, it was already Eisenstein who hypothesized that the affect of cinema is based on a more complex repertoire of sensory dimensions than the mere audiovisual combination. As pioneering the cinema of challenges, it will be Eisenstein himself who in the following pages explodes the dynamite core of why he, in particular, has been selected as the main character of this study – and not someone else.

To meet the challenges of the 21st century cinema audience in practice, in the final part of this study research on the author's creative processes will be encoded into an Eisenstein-inspired living laboratory for modeling a new kind of emotion-driven cinematic experience.

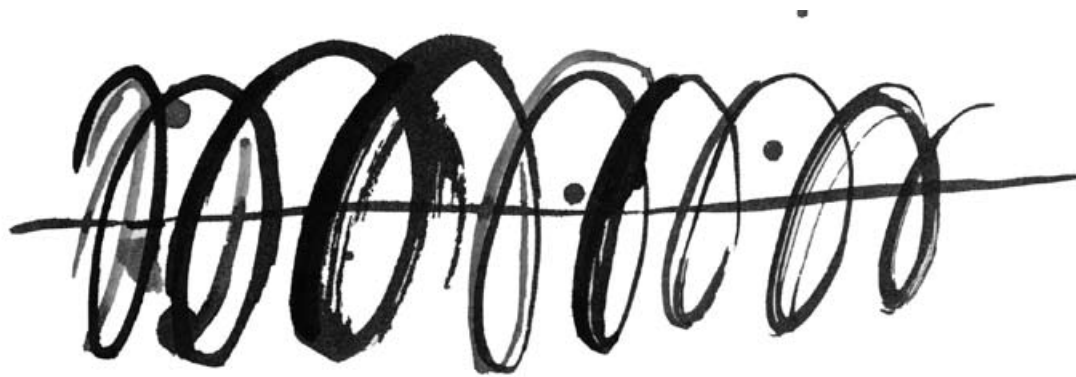


3 METHODS

The methods of this study will involve *historical* and *systemic* scrutiny. The first is applied not as a classical historical approach but from the momentary research point-of-view on history by means of what is termed the *parachronic method*, while the latter applies *dynamic simulation* as a source of methodological inspiration.



3.1 PARACHRONIC METHOD



The study will apply what can be termed a *parachronic method*. This means that the linearity of historical time is put into brackets, or substituted by a recursive dynamics of experiential ‘nowness’, involving even events of the past in a spiral manner. The scrutiny is reciprocal: following the flow of historical time as the inheritance of Eisenstein’s historically distant theoretical work and his contemporary influences are extrapolated to the 21st century’s scientific understanding and interactive media environment. This works also in reverse by means of extrapolating the 21st century scientific understanding back to the reading of scientific theories of Eisenstein’s era. New dynamical perspectives on Eisenstein’s views on the psychophysiological phenomenon of embodiment of experience will be derived from today’s cognitive and neuroscientific theories.

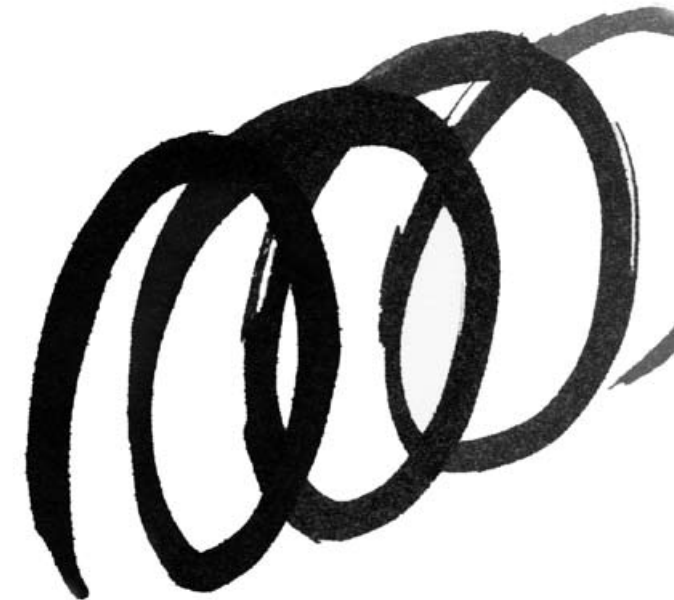
The attribute of ‘parachronic’ refers to something ‘outside of time.’ This concept implies that a linear representation of history is regarded inadequate to describe the evolution of bio-cultural cognition, and particularly its apparent characteristics: sense-making methods that recycle generation after generation. Instead of assuming a linear progress, where the momentary point of ‘nowness’ is in a deterministic manner distancing itself from the starting point (the past), progress is understood as a spiral movement, where the momentary point of present, at some historico-temporal point of its loop, ‘returns’ approximating its historically and linearly distant ‘start point’.

Parachronic reading takes into account this spiral-like, slow scale evolution, in which modifications of the emergent ideas on the human mind unfold in a historical

timeline. Indeed, the slowness of biological evolution seems to ‘balance’ or parallel the fast evolving techno-scientific ecologies of human culture. On the one hand, the human mind apparently prefers the conceptualization of time as a one-directional, continuous linear process. On the other hand, certain tendencies of thinking insist on emerging anew within each generation’s modes of thought as in a self-sustaining iteration, outside of the order of chronological time.

A similar treatment of temporality can be acknowledged in Manuel De Landa’s materialistic nonlinear history reading in *A Thousand Years of Nonlinear History*, in which the continuous accumulation of new emergent elements in a cyclic manner enriches the reservoir of their proper phase of emergence (De Landa 1997, 21). The ‘new’ is generated in an interdependent dynamical manner within the available resources of the ‘old’ phases, such that the old is simultaneously embedded in the new, and vice versa. Emphasis on *evolvment via recursion* draws from dynamic systems views and characterizes the parachronic treatment of the theoretically related but historically distinct topics. Curiously, Eisenstein may be argued to apply the idea of parachronic reading, when he refers with a notion of ‘extra-historicity’ to those underpinning structures that remain constant in cinematic form throughout its then thirty years of historical evolution (ECOL, 232).

The treatment deliberately seeks cyclic relations that are based on a similar kind of bio-cognitive underpinning, such as *Gestalt* principles, patterns of narratives, or a metaphorical inference of historically distinct discourses, outside of or regardless of a linear depiction of chronological time. The elementary similarities and lines of continuation between the distinct historical eras may be interpreted as recycling of certain tendencies through cognitive generations. The parachronic method creates a fresh point of view, serving as an analytic approach and a source of creative expressiveness.



3.2 SIMULATION METHOD

The 20th century evolution of the simulation method was made possible by the digital computer. Previously, conceptual and spatial models (e.g. maps) existed, but what the digital computer enabled was the monitoring and testing of complex processes with different parameters and values, with a speculative or hypothetical epistemological purpose. Though simulation does not necessarily involve computers (e.g. chess games, or ‘dancing fingers’), it has come typically to mean computerized simulations within natural sciences as applied to the dynamics of cosmological scales via human-size phenomena to nano-size environments. This means creating controllable virtual realities that resemble particular operational or observational environments (e.g. weather forecasts, space pilot training, medical surgeries, nano-scale operations, *ad infinitum*). Computational simulations enable, for example, physically realistic models of human motion, as described in ‘Perceiving Human Motion in Synthesized Images’ (2005) by Joseph Anderson and Jessica Hodgins. In this study, the simulation method relates to two aspects of the authoring process: a hypothetical simulation of the author’s cognitive processes and a practical simulation of the spectator interaction in a cinematic installation.

The related notions of ‘simulation’ and ‘simulacrum’ trace back to the *simulacra* of the Greek atomists, an atomic replica of an object entering the human eye (Hoffman 1998, 65). Plato in *The Sophists* and *The Republic* (400 BCE) differentiated two kinds of copies of real things: (1) an exact one-to-one copy of the thing as such, and (2) a simulacrum, a distorted copy, which was modified in such a manner that it appeared to be more real, rather than an exact one-to-one representation of the real thing it was a copy of (Hegarty 2006). Influenced by Plato and Aristotle, simulation in the arts has come to refer to the *Greek* notion of *mimesis* as ‘re-presentation’ or ‘imitation’ of nature rather than “copying” (*Encyclopedia Britannica* 2007). This is also Eisenstein’s view when he argues in ‘Imitation as mastery’ (1929) that Aristotle was an imitator not of the form of objects but of the principle involved in the imitated event (ERD, 67). The simulacrum as an object comes into being in an act of imitation of a real object, which modifies the representation of the object so that the perceiver’s point of view is taken into account (Hegarty 2006).

The discussion on simulacrum and simulation has been taken further by post-modern philosophers. Devin Sandoz in ‘Simulation-Simulacrum’ (2003) defines simulation as a dynamic process and simulacrum as a static entity. He cites Gilles Deleuze’s essay ‘Plato and the Simulacrum’ (1983) from Michael Camille’s article ‘Simulacrum’: “The simulacrum is not a degraded copy”, Deleuze states, but instead it “harbors a positive power which denies the original and the copy, the model and the reproduction... There is no longer any privileged point of view except that of the object common to all points of view” (Deleuze 1983 in Camille 1996, 33). On the contrary, Jean Baudrillard in his essay ‘Simulacra and Simulations’ (1998) sees simulation as a power

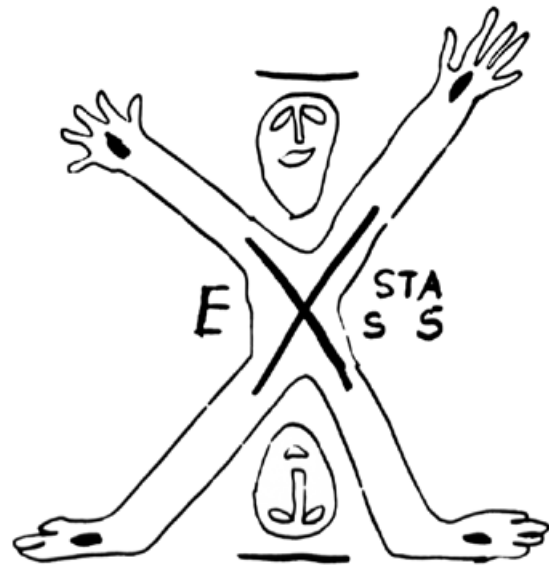
destroying the real, which it simulates, replacing it with a simulacrum. “Whereas representation tries to absorb simulation by interpreting it as false representation, simulation envelops the whole edifice of representation as itself a simulacrum” (Baudrillard 1998). Baudrillard’s book ‘Simulations’ from 1983 describes “a system where empty signs refer to themselves and where meaning and value are absent” (Sandoz 2003). Simply put, according to Celia Pearce’s definition in *The Interactive Book*, a simulation is a model of a system (Pearce 1997, 453).

The particular notion of *simulacrum* is coined here for referring to a kind of metaphoric *workspace* embedded in the author’s mind. By mental simulation, that is, by imagining, framing, and modifying the experiential aspects of the surrounding world, the author emphasizes a particular mode of being – out of many possible modes of being.

Though the bodily imitation or mirroring of the other’s emotions or intentions has been hypothesized since the time of Aristotle’s, only recently, due to new real-time neuroimaging technologies, have related neural dynamics been discovered in the human brain. A later section will describe how findings by neuroscientists such as Giacomo Rizzolatti, Michael A. Arbib, Vittorio Gallese, and Riitta Hari may help link first-person with third-person perspectives. Earlier, neural simulation dynamics were adapted in my articles ‘Dynamic Emotion Ecologies of Cinema’ (2005) and ‘Cinema as Externalization of Consciousness’ (2006) in order to describe the cinema author’s bodily basis of understanding the ‘other’ and ‘otherness’. Elaboration on this theme will continue in *Simulacrum Eisensteinense*.

The key interest of this study thus lies in the cognitive (unconscious or conscious) simulation by the author of the world and the other people. The focus is on a diversity of experiential phenomena within different media applications, games, animations, and cinema. For example, cinema as a spatio-temporal object can be conceived of as a kind of *authored simulation model* of the experiential world. It carries features of an autonomous, self-referential simulation system, which, once when produced and set into movement, goes on playing out the fictional world independently of its author, or an allopoietic system, as the authors of *Autopoiesis and Cognition: The Realization of the Living* (1980), Humberto Maturana and Francisco Varela, would call it. Cinema as an autonomous artwork can be conceived of as a model simulating aspects of human cognition as an externalization of the author’s cognitive processes. The latter thus become embedded in the cinematic work through a particular kind of expressive worldview or attitude. This treatment presumes that computerized simulation enables a new kind of mapping of body, brain, and otherness within particular kinds of interactive cinema systems. Perhaps future cinema will emerge within consensual body spaces, thus becoming a new biological form of virtual cyberspace. As reiterated in Timothy Druckrey’s ‘Preface’ for *New Screen Media, Neuromancer* (1984) author William Gibson calls cyberspaces ‘consensual hallucinations’ (Druckrey 2002, xxii).





Ex-stasis (Eisenstein 1931)

4 EISENSTEIN REVISITED

“These ideas are childishly obvious, but in them are contained the most complex problems of the structure of a work of art, for they touch on the most vital aspect of our work: *the problem of representation and relationship to what is being represented*” (Eisenstein 1939; NIN, 3).

This chapter tracks the historical sources of inspiration and the lines of thought that led Sergei M. Eisenstein to the podium of the All-Union Creative Conference of Soviet Filmworkers, where he gave his speech describing his theoretical views. It will expose the intellectual and critical interaction between the proponents of Russian Marxism, early systemic thinking, and psychological theories, altogether characterizing the particularly Soviet idea of *engineering the human mind*, which later, in the thirties, supported Eisenstein’s development as a holistic theoretician. This study suggests that Eisenstein’s social and aesthetic discourses on cinema montage were empowered by his preliminary interest in psychological, biological, and systemic views as a ‘scientist’.

Before discussing the specific discourses of Eisenstein's era, two aspects of his intellectual landscape should be highlighted. On the one hand, a brief description of the mature Eisenstein's *political situatedness* as an artist-researcher from the 1930's onwards will highlight the almost intolerable intellectual constraints of the Soviet cultural and scientific environment. On the other hand, the emergence of *early systemic thinking* in 20th century Russia, backed by the German scientific and philosophical thinking of the time, is brought to the foreground as an important, yet often neglected, lifelong resource for Eisenstein's theoretical montage considerations.

Only after first drafting the evolutionary path of Eisenstein's montage theories, and then describing the political constraints and systemic potentialities of Eisenstein's intellectual life-environment, may the focus of this chapter 'Eisenstein revisited' move on to the specific interdisciplinary discourses of his era. Along the way it will become obvious that the heuristically interdisciplinary compilation of the scientific understanding on the dynamics of the mind was present and available to Eisenstein in his time. The last section of the chapter will be devoted to the main themes that characterized the mature Eisenstein's scientific studies on the expressive and emotional nature of the human mind. His work became radically more systematic and intensive from the 1930's onwards to his death in 1948.

Biographical details will mainly follow Eisenstein's own narratives, for example, in *Beyond the Stars: The Memoirs of Sergei Eisenstein* (later BTS), and the historical accounts of Oksana Bulgakowa (1996, 1998, 2000), David Bordwell (1993), and Anna Bohn (2003). Retrospectively, the early 20th century organicism and systemicity of Eisenstein's interdisciplinary environment already embedded many ideas of the later systemic sciences, cognitive psychology, and dynamical views on the mind to be discussed in the next major chapter 'Eisenstein extrapolated'.

4.1 ON THE PATH TOWARDS HOLISTIC MONTAGE

In February 1947 Eisenstein analyzed in the essay 'The Psychology of Composition' Edgar Allan Poe's creative process, based on Poe's own self-analysis titled 'The Philosophy of Composition'. "And it is to this 'necessity', to this 'stimulus', to this 'driving motive', that we shall turn our attention, first and foremost, as the true source of all those peculiarities, which Poe himself would like to portray as homunculi of pure abstraction engendered in laboratory retorts!" (ECOL, 261) Eisenstein captured Poe's most secret and most true embodiment of emotional theme, the tragic death of his teen-age wife, which haunted the poet throughout his *oeuvre* – against the poet's own insistence of being a logical creator (ECOL, 263). How Eisenstein treats Poe's creative process

directs the present treatment to the path towards holistic montage. The key word for holistic montage will be Eisenstein's *embodiment of emotional theme* (ECOL, 262).

4.1.1 BOOK PROJECTS

A significant key to understanding the various methodological and epistemological developments in Eisenstein's theory formation is provided by his major book projects. Their review relies to a great degree on Oksana Bulgakowa's essay 'The Evolving Eisenstein: Three Theoretical Constructs of Sergei Eisenstein' (2001). The unfinished book projects *Spherical Book* (1929), *Montage* (1937–1940), and *Method* (1932–1947) appear to imply a change from Eisenstein's mechanistic engineering view to organic-dynamic metaphysics, and further universal holism (Bulgakowa 2001, 38–51).

According to Bordwell (1993) there were originally several book projects that eventually either dissolved into the above three or were published as separate essays. The first of the planned three volumes of *Direction*, titled *Mise en scène*, was completed in the early 1930's and the second volume *Mise en cadre* remained at the idea stage (Taylor in ESW2, xi). Eisenstein's 1934 report to Party Congress is entitled 'For Elevated Ideological Content, for Film Culture!': "I'm busy for days and nights, on the trot writing the first part of my book *Direction*: the theory and practice, summarizing my experience as professor at GIK (especially in the last two years) and ... my fourteen years as director (ten of them in cinema). The book will be bulky: it is based on the 1,500 typescript pages of my course at GIK" (ESW1, 278). Another unfinished book entitled *Colour* (1946–48) involved later essays, such as 'The Psychology of Composition' and 'The Psychology of Art' (ECOL, 249–286, 279n1; IP3).

Eisenstein also worked on a biographical project on the Russian poet and founder of modern Russian literature Alexander Pushkin (1799–1837), which had been suggested to him by the documentary filmmaker, film editor, and lifelong friend Esfir Shub (Bulgakowa 1998, 208). According to Bulgakowa, Shub guided Eisenstein to the Russian formalist and Pushkin expert Yury Tynyanov, who had published the essay 'Pushkin's Anonymous Love' (1939) and was preparing a *Pushkin* novel. It was to remain unfinished due to Tynyanov's early death, and was published posthumously as *Young Pushkin*. Flavored with psychoanalytical interpretations, Eisenstein's study on 'Pushkin and Cinema' became 'The Love of a Poet', a screenplay about Pushkin's secret lifelong love story (Bulgakowa 1998, 190, 208).

Altogether, Eisenstein's book projects reveal that as a collector by nature, he preferred to revise a well-elaborated theoretical viewpoint or an artistic idea instead of giving it up totally. He re-edited many of his earlier texts, updating them according to changes in emphasis in his later thinking (Bulgakowa 2001, 44).

4.1.1.1 Spherical book (1929)

The *Spherical Book* coincides with the official State ideology affirmed in Lenin's posthumously published *Philosophical Notebooks* (1929) (Bulgakowa 1998, 88). The book emerged from a mixture of personal and professional ambitions, during a period of Eisenstein's life where his position as the internationally recognized filmmaker and genius had been established, swinging all doors open before him. It summarizes theoretical developments in dialectical methods of montage until the excursion to the United States. During the years 1928–1929 Eisenstein had written several essays, also reworking his earlier theoretical texts. He was keen to take his place amongst the other theoreticians of Soviet cinema: the Russian Formalists Boris Eikhenbaum, Yury Tynyanov, and Viktor Shklovsky, as well as Lev Kuleshov, Vsevolod Pudovkin, Semyon Timoshenko, and others (Bulgakowa 2001, 39, 50n1; Eagle 1981, 29–36).

Under the interdisciplinary umbrella of Soviet Marxist dialectics, the *Spherical Book* constitutes a radical effort in terms of its heterogeneous content and multilayered metaphoric structure (Bulgakowa 2001, 49). *Spherical Book* introduced “a model part-way between” cinema as language (the Russian Formalists) and cinema as psychological laboratory (Lev Vygotsky, Alexander Luria, the *Gestalt* psychologists) in its emphasis on typicality, direct part-whole relations, the inner monologue, and sensory logic (Ibid. 39). Bulgakowa analyzes the essays of the *Spherical Book* as drawing from one of the following domains: 1) reflexology (“the film-engineer develops a combination of stimuli, a classical conditioning, by assembling arbitrary shocks in order to train social reflexes like class hate or class solidarity”), 2) dialectics (“montage as unity of opposites”), 3) linguistics (“montage as a chain of oppositions”), and 4) psychology (“a process of dynamic integration”) (Ibid. 42).

Curiously enough, as Bulgakowa notes, Eisenstein seems to bypass the methodological fragmentation of the 1920's scientific field as in his work, rather different points-of-scrutiny of incompatible research fields (psychology, psychoanalysis, anthropology, etymology, linguistics, mathematics, geometry, literature, theater, art, and music) converge into one dynamical sphere of multiple points of view (Ibid. 37, 48–49). One of the essays, ‘The Dramaturgy of Film Form’ (ESW1 1929, 180), declares *cinema as synthesis of art and science*. As the project was never finished, several of the articles intended for the unfinished *Spherical book* were published in Eisenstein's first English language book *Film Sense* (1943). These essays written during the twenties serve for this research as a reference to support comparative study, against which Eisenstein's mature texts of the thirties and the forties will be evaluated.

4.1.1.2 Montage (1937–1940)

In the second book project, also unfinished, *Montage* (1937–1940), Eisenstein elaborated cinema as “a reservoir of universal knowledge” (Bulgakowa 2001, 43). He de-

fining new objectives for research on “*the action of structuring a work of art*” (ESW2, 6). A series of articles followed.⁵ In 1940 Eisenstein outlined the three evolutionary phases of montage in his book (ESW2, 4): (1) The first part reviewed the single set-up cinema and plastic shot composition of the twenties. (2) The ‘present’, contemporary, phase of montage evolution involved the multiple set-up cinema of ‘horizontal montage’. (3) The future phase foresaw sound cinema and musical composition in ‘vertical montage’ (ESW2, 327–399).

The model of montage based on the concept of ‘image’ worked for Eisenstein as an analogue between the senses and their material appearances (Bulgakowa 2001, 38). In Bulgakowa's interpretation, the isomorphic relations among artwork, nature and human beings also extend to describe the experiential relation between an author and spectator (Ibid. 46). Eisenstein found his inspiration in the integration of the senses, synesthesia, wholeness, organic unity, and ecstasy (Ibid. 44), which he reflected upon in the light of, for instance, Sigmund Freud or William James in his treatments of the unconscious and conscious dimensions of human psychology.

Other sources included the systemic structure of James Joyce's *Ulysses*, personal conversations with Alexander Luria on the physiology of synesthesia, the aesthetics of Alexander Scriabin, and the concept of participation and mystery in Lévy-Bruhl studies (e.g., *How Natives Think* 1926) (Ibid. 49), reviewed later in this volume. Applying the opposites of image vs. representation, invisible vs. visible, subject vs. object, and unconscious vs. conscious, Eisenstein harnessed his montage theory with the ontology of Ernst Cassirer's universal *Philosophy of Symbolic Form* (1924–1929) and the German philosophical discourse on ‘organicism’ (Ibid. 45, 49). The latter part of this study will continue the theoretical montage elaborations to which Eisenstein's unfinished *Montage* boldly gave a start.

4.1.1.3 Method (1932–1947)

In *Method* a generally applicable bipolar model describes the organic unity of artwork “as a form isomorphic to the structure of multilayered consciousness” (Bulgakowa 2001, 47). Eisenstein's concepts of ‘montage’ (1929) and ‘image’ (1937) converge into the notion of ‘method’ (Ibid. 46). Bulgakowa notes that in *Method* Eisenstein elaborates the mere “organic correspondences between the human body, art, and nature”

⁵ As Eisenstein particularly in the later period continuously revised his earlier essays, and often published them in parts, under different names, it is somewhat complicated to keep track of their chronological writing order and/or publishing order. The originally titled ‘Montage 1940’ became the article ‘On the structure of things’ (1939) (Taylor in ESW2, xii); the essay [‘On Structure’] is a fragment from Eisenstein's book project on direction published in *Iskusstvo kino* 1939 (Leyda in FEL, 91), first published in 1939, then revised for the monograph *Nonindifferent nature*, outlined 1945 (Eagle 1987, ix); the essay [‘Once More on Structure’] is a second fragment from Eisenstein's book project on direction (Leyda in FEL, 91). ‘Again on structure’ was published in *Iskusstvo kino* 1940 (Leyda in FEL, 204). Furthermore, the two first parts of Vertical Montage were published in *Iskusstvo kino* in 1940, the third in 1941 (Leyda in FEL, 205). See also Naum Kleiman's essay ‘On the Story of ‘Montage 1937’ (ERD, xvii–xx)

of *Montage* towards an expanded holistic frame, where he is able to actually treat his proper analysis “*within* the frame of this assumption” (Ibid. 47). Eisenstein’s dyadic method was to embrace all sensual and logical domains of the mind, synthesizing also arts and sciences, in order to equip an artist with the ability to use this synthesis *operationally* in artistic practice (Ibid. 48).

Bulgakowa also recognizes similarities between Eisenstein’s union of structure and consciousness, as represented in *Method*, and recent directions taken in cognitive cinema studies, for example, by David Bordwell and Kristin Thompson (Ibid. 50). According to Bulgakowa, one may argue that the film project *Ivan the Terrible* seems to have initiated a *new phase of montage as a method*, which suggests a direct continuation of the ideas in *Montage*, and further convergence with the theoretical developments of *Method*. From the science philosophical point of view of today, Lev Vygotsky’s discussion in ‘Crisis of Psychology’ (1927) also provides in a retrospective manner an interesting window to the Marxist dialectics of epistemology and ontology reflected in Eisenstein’s methodological considerations.

4.1.2 RETROSPECT TO MONTAGE OF CONFLICTS 1923–1929

Retrospectively writing in 1935 Eisenstein referred to the years of 1924–1929 in Soviet film as the time of *typage* and *montage* (ESW3, 17). In this early stage of Eisenstein’s thinking ‘attractions’ are artificial, arbitrarily selected units that were designed to create the most effective impact on the spectators’ emotions. Though the method of attractions drew from physical everyday-life experience, its montage of ‘realistic artificialities’ rejected the naturalistic theater tradition. Instead, the focus shifted to the unusual, unexpected intentions of the production, forcing through its eccentric form the spectators to become aware of revolutionary creation (ESW1, 33–38).

From 1923 onwards the techno-urban combination of units of measurements (‘attractions’) and the metaphor of Ford’s automobile assembly line (‘montage’) came to serve Eisenstein’s methodological search for a systemic unity of arts and sciences in cinema. The concept of ‘*montage of attractions*’ surfaced during the Proletkult production of the eccentric spectacle *Wise man* (1923), which, as Eisenstein’s diary reveals (1923–2–1102, 2; Bulgakowa 1998, 39), was carefully kept secret until the right moment. Whether the theory preceded the practice or vice versa, the sketches, drawings, notes and newspaper clips that he collected when preparing his projects show that ‘*montage as a method*’ for organizing one’s thinking was in progress long before his first art productions.

It is not the physical world alone that one may describe in terms of these mathematical models: such is the case with the psychological (or phenomenal) world as well. The young Eisenstein recalled having been “fascinated by the mathematically pure course of montage thought and less by the ‘thick’ stroke of the accentuated shot”

(BTS, 579). In ‘Unexpected Juncture’ (1928) Eisenstein concluded thus: “Montage thinking, the peak of the differentiatedly sensed and expounded ‘organic’ world, is realised anew in a mathematically faultless instrument, the machine” (ESW1, 122).

The *intellectual montage*, outlined in 1929, revised earlier ideas on attractions. Now the evolution of Eisenstein’s montage categories equaled that of the teleological dialectics of social consciousness in V. I. Lenin’s posthumously published *Philosophical Notebooks* (1929) (Bulgakowa 1998, 88). Social consciousness was also advocated in Lev Vygotsky’s dialectical *Psychology of Art* (1925). In Eisenstein’s texts the dynamical accumulation of opposing montage elements forced the formal order of the (lower) montage state to ‘leap’ into a new (higher) montage state. Eisenstein’s metaphors applied the prevailing systemic ideas of organization of procedural structures, borrowing from general models of the sciences including physics and biology, but also from socio-economic dynamics.

The essay ‘Beyond the Shot’ (1929) stressed the author’s bi-directional process between abstract and concrete dimensions, intellectual and emotional: visualizing abstract concepts with montage methods, and vice versa, producing abstractions on a psychological level through combining simple elements of the material level (ESW1, 141). Such a process can be expressed by means of conflicts of graphic directions, lines, surfaces, masses, sizes, fields filled by different lighting intensities, dimensions and the conflicts between montage shots, close and wide shots, dark and light, and graphically differentiating particles (ESW1, 145). By changing and manipulating the forms and shapes of the montage, the author can express how he or she is related to the event shown (EM, 94).

‘The Fourth Dimension in Cinema’ (1929) describes the five *methods of montage*: metric, rhythmic, tonal, overtone, and intellectual montage (ESW1, 181–194). Occurring simultaneously, these different phases of montage gain meaningfulness only in conflicting dynamical interactions with one another. The deterministically evolutionary characteristic of montage demands the lower level elements to be superimposed within the higher order elements (ESW1, 191).

Since 1924, the violent collision depicted in Eisenstein’s essay ‘The Montage of Film Attractions’ had become an inherent and integral part of composition. In 1929 ‘The Fourth Dimension in Cinema’ argued thus: “Cinema begins where the collision between different cinematic measures of movement and vibration begins” (ESW1, 192). For example, the shift from the metric to the rhythmic method emerges in the conflict between the length of the shot and movement within the shot. Similarly, the conflict between the rhythmic and tonal qualities of the shot empowers the change to tonal montage. Likewise, the *tonal* is overridden by *overtone* in the conflict between what is perceived as the dominating emotional tone and what is understood in the excess of aural or visual resonances of the montage (ESW1, 191). As ‘The Fourth Dimension in Cinema’ implies, all this juxtaposing and replacing indicates that opposing energies and conflicting directions of forces are inherently (potentially) present in the cinematic movement. Simultaneously, from the point of view of the author, Eisenstein was aware of the psychophysiological effects of collision montage on the spectator.

4.1.2.1 Metric montage

Metric montage is applied in terms of the *absolute* lengths of the shots, following a formulaic scheme similar to a measure of music.⁶ The pulse-beat of the metric montage has to be composed in such a way that it provokes an equal beat in the spectator's heart. Eisenstein (ESW1, 186) categorizes Kuleshov's montage as a primitive form of metric method (3:4, 2:4, 1:4, etc.). In turn, degeneration of the metric method occurs when the metrics are mathematically so complex (e.g. Vertov's montage in *The Eleventh Year*) that the pattern can only be determined "by measuring rather than perceiving" (ESW1, 187). In his film *October*, the sophisticated metric montage, by using extremes of both metric simplicity and complexity, allowed a complex alternation of shots. Yet, as Eisenstein contended, all shots are *subordinated* to their absolute length, this in respect to the primitive dominant character (the possible 'unambiguity') of each shot (ESW1, 187). Metric montage relies on a primitive sensorimotor system, which Eisenstein exemplified with the audience swaying to the rhythm of the hay-making sequence in *The General Line* (ESW1, 192).

4.1.2.2 Rhythmic montage

Rhythmic montage exemplified 'primitive emotional'. Rhythmic montage takes equally into consideration both the flexible variations of the *actual* length and the qualitative content of the shots (ESW1, 187). Instead of being determined by a metric formula, the actual length is defined as "the derivate of the specific quality of the shot and of the 'theoretical' lengths allocated to it according to the scheme" (ESW1, 187). While the metric length of two shots may be identical, rhythmic montage emerges from combining the shots according to their dominating content features, i.e. perceived movements in the shot, or the compositionally guided movements of the spectator's eye.

Acceleration of the montage rhythm is gained by shortening the shots, this more efficiently by using material of the same tempo but with more intense content (ESW1, 188; EM, 146). Eisenstein's 'Odessa steps' scene in *Potemkin* introduced a methodological intensification of the same descending *action*, the switch from the rhythm of the soldier's boots to another form of movement – a baby's pram rolling down the stairs.

⁶ Taylor's (1988) translation has dropped the reference to music formula, while in Leyda (FF, 72) it is preserved. Perhaps the reference to music is added to the second part of the article in the Leyda version because the first part of the article appeared in the newspaper Kino (Aug 27, 1929) dedicated to issues from the All-Union Conference on Sound Film (Editor Leyda 1949, 70n).

4.1.2.3 Tonal montage

Tonal montage was associated with 'melodic emotional' features, meaning that the perceived movement results in emotional vibration of an even higher order (ESW1, 186–192). Tonal montage thus relates to the dominating emotional resonance or tone of the shot. The emotionally experienced qualitative movements, also rhythmical by nature, are as accurately measurable as any other changes in the shot, even though they may not involve spatial transpositions (ESW1, 189). In Eisenstein's example of 'light tonality', the effect of 'more gloomy' may be defined visually and by a mathematical coefficient representing a degree of illumination. In the case of 'graphic tonality', the 'sharp feel' of the image may result from an excessive amount of sharp-angled compositional elements (ESW1, 188–191; EM, 149–155).

The model of consonance describes how the spatial rhythm and the emotional tone interact in the shot composition, creating the harmony of the shot "in internal combination of movement as *transposition* and movement as *light variation*" (ESW1, 189). It is an emotional structure applied to non-emotional material: in the English translation Eisenstein offered the example not of Saint Grail but the milk separator as the object of the peasants' suspicion and ecstasy, in the fifth reel of *General Line* (as noted in EM, 154). The collision between two tendencies, the intensification of the static ('storm clouds') and intensification of the dynamic ('wind'), according to Eisenstein, provides "a clear instance of *dissonance* in tonal montage construction" (ESW1, 190).

Eisenstein differentiates, from the point of view of emotional experience, the *tragic* (active) minor key and the *lyrical* (passive) minor key (ESW1, 190–191). The lyrical may relate to the 'color', i.e. the shift from dark grey to misty white is equivalent to the everyday understanding of the 'dawn'. In turn, Eisenstein continues, the tragic emerges in the shift from light grey to lead-black clouds, indicating 'the approaching storm', in growing intensity of tonal and rhythmic variations. In fact, Eisenstein concludes, tone is a stage of rhythm (ESW1, 192). The rhythm performs in space-time the emotional state or tone in a similar manner as the relationship between shots and montage is established (ESW1, 192).

4.1.2.4 Overtonal montage

Interestingly, Eisenstein returned the effect of the fourth category of overtone montage 'back to the old' or what he called pure 'physiologism', claiming that the intensity of involuntary motor reactions in metric montage are in the viewing process itself brought to a new emotional level of perceptual intensity (ESW1, 186–192). Overtone montage is an organic follow-up to tonal montage, ranging from the domain of "melodically emotional colouring to a direct physical sensation" (ESW1, 191; EM, 155–158). Overtone montage relates to the feelings that the elements of the shots elicit in the viewer. Functioning on a kind of synesthetic level, in the physiological

body–mind system, overtone qualities can only be perceived in temporal processes. This equals visual overtone elements comparable to those of music. Eisenstein assumes that the overtone elements affect the viewer in a similar manner, independent of the perceptual sensory paths. Aural and visual overtones may thus have the same effect, despite originating from different sensory organs (ESW1, 185). Overtone montage is about ‘feeling’ the image; it is about the ‘psychophysiological resonance’ of the shot (ESW1, 184). In Eisenstein’s view it is the only solution for a successful combination of image and sound in sound film (ESW1, 185).

4.1.2.5 Intellectual montage

Intellectual montage is the highest category of montage, its overtone qualities springing from the conflicting juxtaposition of intellectual stimulants. Intellectual montage is however guided according to the same organic dynamic law that guides the physiologically perceived metric montage, the only difference being that the intellectual processes occur in the higher nervous system and not in the reflexive motor system (ESW1, 193; EM, 155–158).

The attribute of ‘intellectual’ leads “the development of overtone montage towards semantic overtones” (ESW3, 92). For example, following dialectical ideas of returning to the old, in Eisenstein’s treatment in *October*, the highly intellectualized images of Gods are eventually returned back to their roots, to primitive wooden blocks, which, in any event, execute the highest powers (ESW1, 194). In Eisenstein’s dialectics, intellectual cinema will be the cinema that resolves the conflicting combination of physiological overtones and intellectual overtones: while the emotional principle is generally human, the intellectual principle is inherently social, class-conscious (ESW1, 194).

Thus far, as Eisenstein summarized in retrospect, the early montage theory of the twenties discussed a set of methods of montage categorized according to the ‘plastic’ qualities of the material, with the main interest in “*movement* – mass movement, social movement, dramatic movement” (ESW2, 1). The montage of conflicts of the twenties presented a developmental phase in Eisenstein’s path towards holistic montage, and it remained an important dynamical dimension of Eisenstein’s later dialectics.

4.1.3 VERTICAL MONTAGE

From 1938 onwards, it was time to study the embodiment of man “in that stage of the creative process in which the underlying idea and theme of the work themselves become means of exerting an artistic impact on the perceptions” (ESW2, 2). The semantic series in the directors’ study program in VGIK (1936) may reflect Eisenstein’s

theoretical elaborations preceding vertical montage in comparison with the earlier 1929 ‘kinetic series’ of methods of montage (ESW3, 92). ‘Kinetic series’ seems to be constituted on the complex interdependence of montage compositions on the sensorimotor biodynamics of the body, while ‘semantic series’ refers to the montage of interconnected, gradually increasing conceptual complexities of parallels, metaphors, metonyms, figurative thinking, or conceptualizations.

In semantic series the parallel movements of primitive, temporal, sensuous, figurative, or conceptual dimensions seem to support different aspects in the construction of meaning. Perhaps the semantic dimensions correspond to the metric, rhythmic, tonal, overtone, and intellectual cinema, respectively. The leap from lower to the higher embeds the teleological evolution towards the higher cognitive activities of the mind. The semantic series thus corresponds to the evolution of humankind from primitive to higher cultural forms (drawing from Levy-Bruhl, Cassirer, Vygotsky, Luria, Marr, and others).

- a) Montage parallel with the developing course of an event (primitive informational montage)
- b) Montage parallel with the course of several actions (‘parallel montage’)
- c) Montage parallel with the sense (the montage of primitive comparison)
- d) Montage parallel with the sense and meaning (figurative montage)
- e) Montage parallel with the ideas (montage constructing the concept). Eisenstein’s VGIK program on teaching the theory and practice of direction (1933) was modified by Eisenstein in 1936 and translated in Vladimir Nizhny’s *Lessons with Eisenstein* (Leyda in FEL 1968, 200).



Soon Eisenstein discarded the notion of horizontal montage, which originally referred to his idea of the multiple set-up montage, as defined in the essay ‘Montage 1938’: “*Depiction A* and *Depiction B* must be chosen from all the possible features inherent in the story that the *juxtaposition* of them – specifically the juxtaposition of *them*, not of any other elements – will evoke in the perceptions and emotions of the spectator the most exhaustive, total *image of the film’s theme*” (ESW2, 299; in ESW2, 327). Interpreted in terms of emotional theme, horizontal montage offers various points of view on the theme under scrutiny, each of them revealing, by the method of *pars pro toto*, some significant aspect of the theme. Juxtaposed in perception, the total *image of the film’s theme* emerges (ESW2, 327). However, a meta-

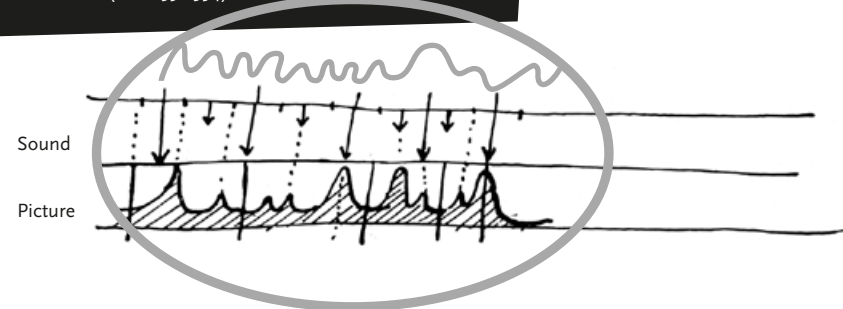
Eisenstein’s schematic analysis of ‘vertical’ landscape in Chinese art (NIN, 151)

phor of horizontality indicates a strictly linear oneness, comparable to the path of the eye when viewing a landscape horizon. This is so, unless the flow of linearity is broken into sub-layers, which interact and counterpoint each other in a dynamical manner.

Alas, inspired by contrapuntal but synchronized image- and soundtracks and modeled in terms of polyphonic orchestration, Eisenstein resolved to model a dynamics of multiple, simultaneously flowing, horizontal montages. The vertically (simultaneously) organized variety of instruments moves horizontally in the flow of time (ESW2, 330). As such, it allows scrutiny of the internal structure in terms of differentiation and integration of the vertical interconnectedness of the sub-layers. The *polyphonic structure* of vertical montage forms a general perception or a kind of ‘physiognomy’ of the scene or sequence (ESW2, 332). Instead of the artificiality of horizontal montage, vertical dynamics open up to spherical dimensions. The model, according to Eisenstein, has a ‘sideways annexation’ of sequence to sequence, and simultaneously a kind of ‘upward superstructure’ on the vertical plane – this, in another dimension (ESW2, 332).

While rejecting the notions of blending or dissolving, also Eisenstein applies the notion of ‘superimposition’ from the lower level of mere creation of movement by

The study at hand has been inspired by Eisenstein’s elaboration of vertical montage and the plastic compositions of sound and image. In ‘The music of landscape...’ (1945) Eisenstein draws a set of graphs to illustrate different levels of accents and their counter-points in terms of ‘brick-laying method’ (NIN, 352-354). According to Eisenstein, the audiovisual counterpoints function well when the weak coincides with the strong, and vice versa. The result is often weaker, when the strong coincides with the strong, and vice versa. (NIN, 352-354)



Eisenstein’s graph (NIN, 354) illustrates how the complex bonding between the stressed and unstressed sound and image ‘accents’ can be used to create the montage rhythm by varying, becoming remote, or approaching the ‘classical brick-laying’ method. It invites adding another layer (gray graph) to depict the viewer’s psycho-physiological responses to an audiovisual cinema montage.

superimposing one frame on top of another, to the highest and most complex stage of montage. Visually “the *simultaneous movement* of a number of motifs advances through a succession of sequences, each motif having its own rate of compositional progression, while being at the same time inseparable from the overall compositional progression as a whole” (ESW2, 333). It appears that the latest generation of Eisensteinian montage involves also the earlier 1929 stages of montage method, as discussed in ‘The Fourth Dimension in Cinema’ (ESW1, 181–194). The next section on the intellectual environment will discuss in more detail this type of recycling of organizational structures as *tektological* systemicity.

4.1.4 SUMMARY

In ‘On the structure of things’ (1939) Eisenstein explicates the core of his mature montage considerations when he writes: “It is obvious that a work of this type has a very particular effect on the perceiver, not only because it is raised to the same level as natural phenomena but also because the law of its structuring is also the law governing those who perceive the work, for they too are part of organic nature. (...) To a greater or lesser degree this feeling is inevitable in each of us, and the secret consists of the fact that in each case both *us and the work* are governed by *one and the same canon of law*” (NIN, 12). Development of the vertical montage continues in the later years of 1945–1947 towards a synesthetic holism organized in terms of the natural laws of an emotional landscape, which Eisenstein defined by the notion of ‘nonindifferent nature’ (NIN, 216). The search for these emotional principles of ‘nonindifferent nature’ will also empower this treatment, when in the following pages it will explore Eisenstein’s intellectual environment.

4.2 INTELLECTUAL ENVIRONMENT

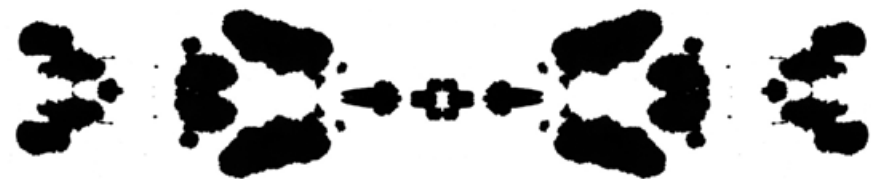
This section discusses the scientifico-philosophical views of Marxism, dialectics, materialism and the dynamical organization of complexities, which dominated the early Soviet era and were cultivated in Eisenstein’s writings. Eisenstein can be identified as a Hegelian philosopher-scientist. This is an agency to which G. W. F. Hegel, according to Terrell Carver in his essay ‘Marx and Marxism,’ assigned the task “of discovering meaning in creation and reconciling consciousness to itself. In his hands, this was a pro-

cess of finding the positive in the negative, or transcending contradictions, by tracing conceptual relations ‘dialectically’, based upon the claim that they develop towards realization in practice and toward absolute mind in knowledge” (Carver 2003, 184).

The roots of dialectics are often traced back to the time when Heraclitus documented in writing his first steps into the river of flux. Here, dialectics refers to many different approaches, from G. W. F. Hegel’s teleological dialectics to the socio-economic materialism of Karl Marx, the Hegelian-Darwinist interpretation of Marx by his collaborator Friedrich Engels, Russian philosopher Georgy V. Plekhanov’s (1856–1918) interpretation of Hegel and the historical materialism of Engels’ Marxism in *Fundamental Problems of Marxism* (1908), the Plekhanovian-Engelsian line of the Marxist-Leninist dialectical materialism advocated by V. I. Lenin, and Joseph Stalin’s revised dialectics, when after 1929 the views of the Marxist theorist and founder of the dialectic-materialist society Abram Deborin had been condemned as promoting “reductionist”, “mechanical” and “vulgar” materialism (Bulgakowa 1998, 88). Cyril Smith’s essay ‘How the “Marxists” Buried Marx’ highlights that the notion of ‘Dialectical Materialism’ was not introduced to Russia in Marx’s original writing but by Plekhanov (Smith 1998, Ch. 2).⁷ In addition, Eisenstein harnessed a reversed concept of ‘materialist dialectics’ in, for example, ‘Autobiographical note’ (1933) (in Seton 1978, 479–481).

Another important framework of Eisenstein’s thinking was Alexander Bogdanov’s scientific Marxism formulated in *Essays in Tektology: The General Science of Organization* (1913–1922), which has been introduced to the Western world only recently and will receive particular attention in this treatment. In retrospect, Bogdanov’s systemic thinking, which was driven to near extinction due to political pressure, is assumed to have penetrated the whole Soviet state in Eisenstein’s active years.

In this section describing the intellectual environment, a reverse chronological order has been applied in the following overview. The overview begins from the mature Eisenstein’s political situatedness, from the thirties onwards. Only secondly is the earlier euphoric era of the Soviet systemic ‘life-building’ of the twenties reviewed. This contra-stream against historical time is intentional in order to create a greater contrast between the mature Eisenstein’s intellectual difficulties and the inspiring environment of his youth.



⁷ “The term ‘dialectical materialism’ was introduced in 1891 by Plekhanov, in an article in Kautsky’s *Neue Zeit*. (...) He thought wrongly, I believe – that he was merely adapting it from Engels’s usage in *Anti-Dühring* [1877] and *Ludwig Feuerbach* [1886]. (...) on combating the tendency of the populists (*narodniki*) to put subjective revolutionary will at the foundation of their idea of the Russian Revolution” (Smith C. 1998, Ch. 2).

4.2.1 POLITICAL SITUATEDNESS

An internationally recognized artist, honored with various awards for services to the Soviet Union, a Doctor of Arts (1938), and the first director of the Cinema Section at the Institute of Art History of the Academy of Sciences (1947) (Bulgakowa 1998, 236–237), Eisenstein belonged to a privileged group of the Soviet intellectual elite, whose wellbeing was a State concern as long as the elite worked in favor of the Soviet government. Yet even Eisenstein saw his share of the unpredictable instability in the political engineering of the Communist Utopia, when the Central Committee of the Communist Party led by its chairman Joseph Stalin (1924–1953) introduced the keywords of centralization, industrialization, and at the turn of the decade, political liquidation. The political situatedness of the mature Eisenstein is not an insignificant issue when Eisenstein’s research orientation is studied. The apparent deviation from the eccentric line of the young Eisenstein is often described as a kind of epistemological shift due to adaptation to the changes in the official Soviet ideological environment (e.g. Bordwell 1993, 168; Bordwell 2001, 23–24). Indeed, when Eisenstein defended his theoretical ideas at the 1935 All-Union Creative Conference of Soviet Filmworkers, he laid his head on the stake – literally.

The Stalinist Lysenkoism may describe the spirit of Stalin’s intellectual dictatorship, which shaped the domain of academic science policy during the last two decades of Eisenstein’s active theoretical period. Lysenkoism relates to the activities of the architect of Soviet agricultural sciences Trofim D. Lysenko. International scientific communities were outraged to hear that many of the leading Soviet scientists, who had refused to give up their belief in the genetic inheritance of an organism’s features, had been executed (e.g. N. I. Vavilov⁸). Soviet genetics were to disappear from the U.S.S.R. science landscape from the 1930’s until the 70’s (Abramson *et al.* 1996). Indeed, immediate adaptation to the continuously changing political environment seemed to be *the* key to survival. With the favorable support of Stalin, in Lysenko’s new Marxist biology no genetic inheritance existed.⁹ Calling for practical implementations, and practical results (e.g. in the productivity of food), the scientific Lysenkoism was in accordance with the hostile cultural policy of Socialist Realism as well.

Alas, when the Soviet Film Committee systematically refused Eisenstein’s film project proposals from 1932 onwards for many years (Bulgakowa 1998; Bordwell 1993),

⁸ “On July 9, 1941, the Soviet Supreme Court found [N. I. Vavilov] guilty of belonging to a rightist conspiracy, espionage, sabotage, and other charges, and was sentenced to death. He died in Saratov prison on January 26, 1943. He had given his own epitaph; during his 1939 plea he had told his jeering audience ‘This is a complex matter. It is not to be solved by decree even of the Commissariat of Agriculture. We shall go to the pyre, we shall burn, but we shall not retreat from our convictions’” (Sandefur 2004).

⁹ Trofim D. Lysenko argued that instead the properties of an individual organism develop during its lifespan in terms of external environmental conditions only, this process further enabling totally new species to emerge from the living organism of an ‘old’ species; the organisms can inherit traits which have been acquired by their ancestors: “The creation of new conditions for organisms or the withdrawal of these organisms from the action of certain existing environmental conditions makes it possible to produce new plant species useful to practical agriculturists” (Lysenko 1951). (Haldane 1940)

Eisenstein had more than a faint reason to be worried. Eisenstein supported himself (physically and psychologically) by lecturing in the Moscow film school (GIK/VGIK). Bordwell has noted that Eisenstein successfully harnessed the prevailing ideological grounding to serve his theoretical practice (Bordwell 1993, 164). Taking adaptation further to moral grounding, Eisenstein has retrospectively been accused of political incorrectness and opportunism. For example, Alexander Solzhenitsyn's fictional character in *One Day in the Life of Ivan Denisovich* (1962) calls the author of the film *Ivan the Terrible* [to be read as Eisenstein] 'an ass-kisser': "Geniuses don't adjust their interpretations to fit the taste of tyrants" (Solzhenitsyn 1963, 84; cited in Bordwell 1993, 259).

In this review of Eisenstein's political situatedness, however, it is to be emphasized that *despite* the theory-hostile environment, Eisenstein had courage to continue his theoretical elaborations. Naturally, Eisenstein's study program for the film students in GIK, which suggested an interdisciplinary scientific and cultural reading that an excellent film director should master, is assumed here to contain only officially tolerated sources (ESW2, 74–97).

Already in 1927 Eisenstein had witnessed marks of political changes, when Stalin visited his editing room of the film *October*. Stalin personally approved, co-wrote, and even co-edited most of the films that were produced and/or distributed in the country. Stalin's line "Lenin's liberalism is no longer valid today" implied an order to cut off a section of Lenin's speech, this according to Eisenstein's assistant Gregory Alexandrov (Barna 1973, 123). The First Party Conference on Cinema in March 1928 attacked the non-party filmmakers and formalists, propagandizing the naturalistic style. The Five-Year Plan in 1929 condemned selected views of dialectical materialism (e.g. Abram Deborin) as 'reductionist', 'mechanical', and 'vulgar' and outcast several Party members as 'Trotskyite' (Bulgakowa 1998, 88).

In 1932 the disappointed Eisenstein had returned to Moscow from an unsuccessful two-year journey to the United States and Mexico, leaving behind him about 110,000 feet of film material of the unedited *Que Viva Mexico!* (Seton 1978, 220). Following the more global political turbulences of Stalin's government, a disobedient Eisenstein had lost his favorable position. A cabled letter from Stalin himself to Eisenstein's producer Upton Sinclair in November 1931 (as printed in Seton's Eisenstein biography) claims that "[Eisenstein] is thought to be a deserter who broke off with his own country" and that "[I] am afraid the people here would have no interest in him soon" (Ibid. 517).

In the year 1932 Maxim Gorky accepted an invitation from Stalin to return to Soviet Russia from his voluntary exile in Capri, Italy.¹⁰ Stalin himself participated in the formulation of a new artistic method, Socialist Realism, in the literary circle led by Gorky (Bulgakowa 1998, 150). In the Bordwell summary, Socialist Realist artworks had to show reality as 'in its revolutionary development', they had to be faithful to 'typical' characters and situations, to involve a treatment of social milieus in their totality, and this without lacking an idealizing optimism expressed in 'heroic realism' or 'revolutionary romanticism' and adherence both to 'Party spirit' and 'national spirit' (Bordwell 1993, 164).

Labor had been equated with the act of creation and vice versa: to create art in the spirit of Socialist Realism had equaled working for social wellbeing already at the beginning of the revolution. Within Socialist Realism the Communist party thus began to control creative work. In the Soviet Writers Congress in 1934 Gorky's speech was directed to all cultural agents in the arts and sciences, alas also to filmmakers: The proletarian state must educate thousands of first class "craftsmen of culture", or "engineers of the soul" (Gorky 1934). It is generally argued that Gorky echoed a Soviet Taylorism modified from the American F. W. Taylor's (*The Principles of Scientific Management* 1911) ideas on the organization of labor and economic productivity. "As the principal hero of our books we should choose labour, i.e., a person, organized by the processes of labour, who in our country is armed with the full might of modern technique, a person who, in his turn, so organizes labour that it becomes easier and more productive, raising it to the level of an art. We must learn to understand labour as creation" (Gorky 1934). It is noted that already before the revolution Gorky was a friend and an ideological collaborator of Alexander Bogdanov, a political rival of V. I. Lenin since 1905. Perhaps Gorky's elaboration of Socialist Realism also echoed Bogdanov's 'forbidden' organizational ideas developed in his science of Tektology of the twenties.

For the theory-hostile Socialist Realism the art of montage appeared as a false *formalist* device (Bulgakowa 1998, 150). Because Eisenstein's international cinema trademark was based on his ideas of 'montage as a method' and 'the proletarian masses as its main character' (*Strike* 1925; *Potemkin* 1925; *October* 1928; *The Old and the New* 1929), Eisenstein got into trouble – retrospectively. In 'An Attack by Class Allies' (1933) Eisenstein defended his montage theory against accusations of being a 'reactionary formalist' (ESW1, 261–275). Later, in 'Eh! On the Purity of Film Language' (1934), he wrote: "For many people montage and the left deviation in Formalism are synonyms" (ESW1, 287), but in fact it is a *device* for constructing a *plot*, similar to the

¹⁰ As a curiosity, in 1896 in Tsarist Russia, Maxim Gorky (alter ego I. M. Pacatus) had reviewed the recently premiered Lumière Cinématographé tour in his hometown's newspaper (Christie 1996; Yangirov and McKernan 1996): "Last night I was in the kingdom of the shadows" where the colorless silhouettes of the eternally doomed moved in the shadows of lifeless silence (4.7.1896) (citation transl. from von Bagh 1998, 24–25). Gorky's impressions of the silent moving images of the Lumière show are reflected in his short story 'Revenge': one of Aurmont's showgirls commits suicide after seeing real family life documented in the Lumière film *Repas de bébé* (Christie 1996). Also, later, around 1909–1911, Gorky together with Lenin's political rival Alexander Bogdanov and Anatoly Lunacharsky had founded an international Socialist workers' school in Capri, which competed with the Socialist workers' school led by Lenin's supporters.



devices used by great writers (ESW1, 194). This defense was published but did not prevent public attacks directed at Eisenstein (Bulgakowa 1998, 150).

Despite his unfavorable position in terms of the official Soviet cinema scene, in 1935, after ten years of extensive studying, reading, and writing, Eisenstein took the risk of sharing the fruits of his theoretical thinking at the All-Union Creative Conference of Soviet Filmworkers... Indeed, Eisenstein took over the entire show, but not in the productive manner he had hoped. Instead, the Conference seemed to focus on two main issues: Firstly, the party leaders explicitly proclaimed socialist realism as the official style for Soviet cinema (Lary 1998, 318). Secondly, it focused on humiliating Eisenstein, who was dwelling on his theoretical research. He was a living example of a filmmaker who failed to practice Socialist Realism.

Eisenstein's position as a Marxist artist and dialectical theoretician was re-evaluated in a collegial crossfire. According to the personal account of Marie Seton in *Sergei M. Eisenstein: A Biography* (1978, 340–341), the head of the Institute of Scientific Cinematographic Research Nikolai Lebedev remarked that Eisenstein began studying Marxism only after his return from abroad, and that it was “only now that we can speak of him as a theoretician, who has mastered the methods of Marxism” (Seton 1978, 340). Lebedev also associated Eisenstein with Bogdanov's theories of the Proletkult (Seton 1978, 340). In that time, to be claimed to practice Bogdanovism or named a ‘*Bogdanovshchina*’ (Plyutto 1998, 79) could be read as a potential sentence to a workcamp. Total collegial disapproval thus well describes Eisenstein's political situatedness. It had since 1932 gradually worsened and was soon to meet almost unbearable limits of humiliation. The international media was following the disappearances and public trials of cultural and political individuals, and in December 1936 the Paris *Cinéma* cried out, “Is Eisenstein in prison?” (Bulgakowa 1998, 187).

What Eisenstein himself described as a ‘five-year’ period of Party disfavor reached its peak in 1937: Eisenstein's film *Bezhin Meadow* was banned and followed by a humiliating circus of public written and spoken apologies, which Eisenstein was forced to provide. Eisenstein's political situation became so explosive that his long-time friend and collaborator Isaak Babel advised Eisenstein to move away from Moscow for a time (Bulgakowa 1998). The same year Eisenstein was dismissed from his position as a VGIK teacher. Eisenstein's public appearances and related aspects thus ought to be contextualized against this survival game occurring nationwide. Terror amongst the intellectuals, artists, and scientists but also amongst governmental bureaucrats had gradually increased (witness the liquidations of Meyerhold, Babel, Tretyakov, and many others). Not least because of his bisexual orientation and the fact that homosexuality had been made a crime, in 1934 Eisenstein married the Soviet journalist Pera Atasheva, his long-time friend and assistant (Bulgakowa 1998, 165).

The political climate then took a new turn and Eisenstein was re-nominated as a professor in VGIK. In 1939 Eisenstein received the ‘Order of Lenin’ and an honorary degree of ‘Doctor of Art’ for his film *Alexander Nevsky*. It seems that under this new favorable atmosphere, Eisenstein's mature theoretical developments also began to flourish, resulting in several published essays, the books *Film Sense* (1942) and *Film Form* (1949), and unfinished book projects *Grundproblem* and *On Direction*, which

were integrated into *Montage* (1937–1949) and *Method* (1933–1947), to name the most significant. In 1940 Eisenstein directed Richard Wagner's *Die Walküre* in the Moscow Bolshoi Theater. His completed films *Alexander Nevsky* (1938) and *Ivan the Terrible* (Part I and II, 1941–46) brought into practice his cinematic thinking in its fullest sense. During this period Eisenstein developed his holistic ideas of the vertical multisensory montage and of the embodiment of emotional theme.

Stalin appreciated the first part of *Ivan the Terrible* (1944–46), but in the second part, the psychological portrait of the tyranny turned out to be too ‘psychological’, perhaps too much like Stalin himself. In 1946 Soviet film censorship ordered the re-edited part two to be banned and the unedited material for part three destroyed (Thompson 1981). According to Bulgakowa (1998), in January 1948 Stalin's anti-Semitic campaign had started. Eisenstein had been active in the Anti-Fascist Jewish Committee during the war and had all reason to fear for his life. Standing at the grave of a fellow member of the same committee, actor Solomon Mikhoëls, who had been killed in Minsk in a ‘car accident’, Eisenstein is reported to have foreseen himself as the next victim (Ibid. 232).

In February 1948 Eisenstein discussed his theory on color montage in a letter addressed to his lifelong friend Lev Kuleshov: “I think that from the point of view of method the best thing would be to show such a principle in action on a concrete example. So I shall give a short description of how the colour sequence was constructed in *Ivan the Terrible*” (NFD, 128). This never happens. Eisenstein's biological heart gives up and his stream of thinking is interrupted. Just before his death on February 11, 1948, Eisenstein had been informed he had been granted permission to travel to Prague, Paris, and London. Instead of traveling to Europe, Eisenstein's brain was donated to longtime friend Alexander Luria for neuroscientific research purposes (Bulgakowa 1998, 232).

This brief introduction to Eisenstein's political situatedness and the ongoing ideological conflict between theory and practice enforced by Socialist Realism suggests that *despite* the politically repressive situation, Eisenstein did not give up but *continued* to follow the path of his pure inspiration – that of scientific research into understanding the hidden emotional dynamics of cinematic cognition. However, the Marxist-Leninist phraseology cultivated in Eisenstein's publications has typically provoked post-humous political judgments on Eisenstein as an opportunist, uncritical servant of the ruling power. In this study these characterizations are considered superficial. Instead, here it is emphasized that *despite* the dangerous political environment, Eisenstein's goal-directed research program on the human mind and cinema amazingly surfaced *beyond the political realities*. It appears that this is possible due to the early euphoric decade of the 1920's, which provided infinite creative resources for Eisenstein's lifelong organic-dynamical thinking. Moreover, *due to* interest in the systemic nature of life phenomena, Eisenstein's thinking was conveniently at home in the midst of the systemic dialectics of the Marxist-Leninist ideology. Eisenstein's later confidence in his theoretical research, even under ideological pressure, grew out of his creative collaboration between scientists and artists during the twenties, which is here attributed as the era of euphoric ‘life-building’.

4.2.2 EARLY SYSTEMIC THINKING

Systemic thinking was ‘in the air’ at the turn of the 20th century around the world (François 1999; Susiluoto 1982). Emerging ideas on systemic self-organization in the organic and physical structures of the natural world inspired scientific and philosophical considerations such as pragmatism (United States), positivism (Western Europe) and Marxism (Russia) (Susiluoto 1982, 25).

In 1945 Eisenstein recalled, in his essay ‘How I became a director’, how the “ecstasy of the epoch, despite the declarations, and contrary to the banished term ‘creativity’ (which had been replaced with the word ‘work’), despite ‘construction’ (trying to throttle ‘image’ with its bony extremities), bore one creative (and that is the correct word) product after another” (ESW3, 289).

This ideological euphoria transformed the New Soviet Land into a melting pot of the latest revolutionary discoveries in natural and social sciences as portrayed in Emma Widdis’ *Visions of a new land: Soviet film from the revolution to the Second World War*,¹¹ and in Lev Manovich’s *The Engineering of Vision from Constructivism to Computer*. Ilmari Susiluoto’s pioneering publication of 1982 *The Origins and Development of Systems Thinking in the Soviet Union* particularly exposed the influence of the physician, social scientist, systemic philosopher, and utopian novelist Alexander Bogdanov (1873–1928), something also recognized in Bordwell (1993). These sources along with the more recent collection of essays *Alexander Bogdanov and the origins of systems thinking in Russia* (1998), edited by John Biggart, Peter Dudley and Francis King, will serve as principal sources. The fact that since 1905 Bogdanov was one of the main ideological rivals (‘ultimatists’) of the Bolsheviks’ leadership in V. I. Lenin (1908, 1918–1924) resulted in “Bogdanovism” being banned as a false, anti-Marxist paradigm. Curiously, the 1903 archives of the Department of Police of Tsarist Russia mention the two most dangerous individuals: Bogdanov and Lenin (Alekseeva 1998, 100). Yet the social goal as ideological architect of the Proletkult Workers movement (1917–1932), Bogdanov and his political activities, together with other ‘ultimatists’ Maxim Gorky and Anatoly Lunacharsky,¹² was that of a communist utopia of harmony. If retrospectively considering the euphoric era of dynamical and systemic thinking in Eisenstein’s time, it seems impossible to ignore Bogdanov and his influence on the intellectual environment of the young Eisenstein.

Bogdanov knew his Marx by heart after having translated the Russian edition of *Das Kapital*. Bogdanov’s dialectics proposed that all natural complexities are guided

¹¹ Interestingly, though discussing Soviet planning of organizing the new Soviet territory in terms of economic and social reform in the early era of post-revolution, Emma Widdis in *Visions of a new land: Soviet film from the revolution to the Second World War* (2003) does not mention the systemic thinking of Bogdanov or Bukharin. Alas, she follows the established interpretation based on the official rejection of Bogdanov’s theoretical views expressed e.g. in ‘Tectonics’, initiated by V. I. Lenin in the early years of the 1900’s.

¹² Lunacharsky, the people’s Commissar for Enlightenment, headed the committee that decided that Eisenstein would direct a film to celebrate the 1905 events; thus, the birth of *The Battleship Potemkin* was on March 17, 1926 (Bulgakowa 1998, 56).

by a tendency towards equilibrium, e.g., ‘social harmony’, while the rivaling interpretation of Lenin emphasized conflict as the catalyst for continuous progress (Susiluoto 1982). However, not so much due to epistemological disagreements but stemming more from the political rivalry between Lenin and Bogdanov, from the early twenties until the collapse of Soviet Union it was politically impossible to publish or present anything that related to Alexander Bogdanov or what came to be referred to as ‘Bogdanovism’ (Susiluoto 1982; Biggart 1998, 3–4).

The Proletkult ideology promoted art with its emotionally powerful imagery as the main instrument of the utopian Communist society (Bordwell 1993, 2–3). Cinema provided the number one tool for building a New Soviet Man. It had been established by the Communist party leader V. I. Lenin as one of the principal instruments for educating the working masses in new socialist class-consciousness.

As the ideological leader of Proletkult, Bogdanov argued for “a rational organization of the forces of production and harmonious social development” to be studied scientifically as an organic whole (Susiluoto 1982, 29). This was exemplified in the writings of, for example, N. K. Koltsov, *Organization of the Cell* (1936), and by the whole arsenal of post-revolutionary artistic, intellectual, and scientific effort that would feed positively back into Soviet ‘life-building’ [*zhiznestroenie*]. This term coined in 1923 in Nikolai F. Chuzhak’s article ‘Under the Sign of Life-Building: How to Perceive Today’s Art’ reflected an embryonic cybernetic idea of man’s control over Nature (Widdis 2003, 207n99; Manovich 1993; Susiluoto 1982). The natural and social sciences of Tsarist Russia soon adapted to the new Soviet ‘life-building’ phraseology.

Many researchers describe the cross-disciplinary atmosphere that synthesized foreign scientific and socio-economic tendencies with the principles of the new socialist order (e.g., Widdis 2003; Alekseeva 1998; Manovich 1993; Susiluoto 1982; Bordwell 1993). Debates concerning the modern ideas of non-Euclidian spaces, Albert Einstein’s relativity theory, and Werner Heisenberg and Niels Bohr’s ‘Copenhagen interpretation’ of quantum mechanics were also seemingly reflected in Soviet ‘life-building’. However, the new ideas were not always accepted: for example, the Mach-inspired Bogdanov, whose main interest was to adapt Marxism to the latest discoveries in the natural sciences, took the stand of defending Einstein’s relativity theory against accusations of ‘mathematical refutation’ by G. A. Kharazov and of ‘ideological refutation’ by A. K. Timiryazev (Plyutto 1998, 78).

Inspired by the laws of thermodynamics, what Widdis calls the cult of energy [*energetika*] was created around electrification: responding “to the vision of progress and dynamism that was propagated by Soviet culture but also echoed the Marxist thesis of ‘the appropriation of human reality’” (Widdis 2003, 57). This meant a “closer relationship between the human body and the physical world”, in terms of a web-like spatial distribution of work and wellbeing across the country (Ibid. 56).

The interpretations of Hegelian organic-dynamical systemicity, Marxist historical materialism, the positivism of the Vienna Circuit, and the Western dreams of industrialization, economic growth, and social wellbeing seemed to converge with the images of the Ford factory assembly lines and the Taylorian man as working machine. All fields of activities adopted scientific methods in organizing and rationalizing education, la-

bor, and economic productivity according to American ‘flow diagrams’ of production (Widdis 2003, 57). As a consequence, a range of time and motion studies emerged converging the Soviet forms of Taylorism and Fordism with experimental psychology (Manovich 1993, 24). Encouraged by official policy, the psychology came to represent one of the major research fields for the engineering mind: for example, the Russian physiologists Vladimir Bekhterev and Ivan Pavlov introduced a cause-effect relation of stimulus-response, aiming to channel the discipline of reflexology to the service of building ‘living machines’ (Ibid. 25).

In 1920, the same year Eisenstein joined the Proletkult movement, its ideological leader Bogdanov was forced to resign and returned to his medical practice (Bulgakowa 1998, 32). The late 1920’s made advocating Bogdanov or his ideas dangerous. Lenin writes in *Pravda*, Dec 1, 1921 thus: “Behind the mask of proletarian culture, workers are being offered bourgeois opinions in the realm of philosophy (Machism) and silly, depraved, degenerate tastes in the realm of art (Futurism)” (in Bulgakowa 1998, 32). Yet, Bogdanov’s influential ideas lingered on. As Susiluoto notes, Bogdanov’s epistemological philosophy of tektology reached over one million workers through the magazine ‘Proletarskaja Kultura’ (Susiluoto 1982, 67, n89). Moreover, the second volume of Bogdanov’s *Tektology: Universal Organization Science* had been published in Moscow around 1927, and German translations appeared in Berlin in 1926–1928 (Ibid.).

Gaining full control over the human mind by mathematically calculated means excited not only the young Eisenstein. Many Soviet artists and intellectuals in Proletkult and LEF movements were inspired by the systemic ideas of Bogdanov’s Tektology. Apparently recasting Bogdanov, many constructivist artists and the Russian Formalists echoed Sergei Tretyakov’s tektology-oriented *LEF*-manifesto that the artist’s position as a ‘psycho-engineer, or psycho-constructor’ equals that of the scientist (Tretyakov 1923, 216; Tretyakov 1923, 202 in Manovich 1993, 22; Bordwell 1993, 5, 136). For example, Alexander Rodchenko, Dziga Vertov, Lev Kuleshov, Vsevolod Meyerhold, and others, conducted scientific experiments in the Soviet art institutes, as discussed in Manovich (1993, 17, 18n25).

Inspired by thermodynamics, the constructivist theorist Alexei Gan, the founder of the first Soviet film journal *Kinofot* (1922) and the husband of Eisenstein’s friend Esfir Shub, elaborated his ‘Tectonics’ on the idea of “fluidity [*tekuchest’*] as formulation of the workers’ active social force” (Gan 1922, 56; in Widdis 2003, 60, 208n5). Cinema provides “a conscious extension of the proletarian state”, Gan argues in ‘Constructivism in Cinema’ (1928) (Bann 1974, 130; in Petric 1987, 13, 15). The lead author of ‘Scientific Organization of Work’ (1921), a Proletkult member, and a poet, Alexei Gastev coined the term “social engineering” to describe *techne*-oriented research (Kozulin 1984; Bordwell 1993, 35, 37; Widdis 2003, 57; see Golomstock *Totalitarian Art* (1990) in Manovich 1993, 22). Also *techne*-bound, symbolist Andrei Bely scrutinized “prosodic patterns of minute detail, generating tables and graphs through which he hoped to discover poetic laws and to found an empirical science of literary form” (Bordwell 1993, 35). Constructivist artist Rodchenko (1921) echoed systemic thinking: “A construction is an objective or a task performed according to a particular system, for which purpose particular materials have been organized and worked in a manner

corresponding to their inherent characteristics” (Rodchenko 1921, 60; in Bordwell 1993, 35). Yet, Bordwell notes, Rodchenko’s interest in material differentiated constructivists from Bogdanov’s scientific universalism, which focused “on the constraints of organizational structure” (Ibid.).

Outside of the political scene, and if considering Eisenstein’s eclectic, universalist tendencies, it seems implausible that he had not familiarized himself with Bogdanov’s organizational principles for governing the relationships in the separate systems of natural sciences and social sciences. As one of the principal architects of Soviet Marxism, Bogdanov and his systemic ideas dominated the official Proletkult program of Marxist ‘life-building’, if not later publicly then as a significant underpinning. Bogdanov’s influence on Eisenstein is also suggested in Bordwell (1993, 35–37, 135–136). Eisenstein’s *techne*-oriented appreciation of education and his studies of the cultural achievements of the past relates him to Bogdanov, Bukharin, Lunacharsky, and Trotsky; furthermore, Eisenstein’s emotion studies relate him to Bogdanov, Tolstoy, and Tretyakov (Bordwell 1993, 37).

Peter Plyutto notes that no other academic links than that between Nikolai Bukharin and Bogdanov have so far been traced (1998, 81). While Bukharin applied Bogdanov’s ideas without referring to him, Anatoly Lunacharsky has been mentioned as adopting his friend Bogdanov’s thinking, and doing so openly (Aleksieva 1998, 101). Aleksieva also argues, based on her research, that the science world as organized in the 1920’s and 1930’s applied Bogdanov’s organizational principles to a level of up to seventy percent: “when it came to founding such ideological centres as the Institute of Marxism-Leninism, the Lenin Institute, the Institute of Red Professors, the Workers’ Faculties, the Communist Universities or the Higher Party Schools, the ruling elite of the 1920s and 1930s was guided by organizational principles derived from the work of Bogdanov” (Ibid. 102).

According to Susiluoto, the political mistake of the systemic thinkers was, in the midst of an era of technological and scientific excitement, to try to update the socio-economic approach of Marxist materialism with the scientific standards of natural sciences (1982, 34). However, outside of this ideological urge to ‘naturalize’ Marxism, Soviet systemic thinking was also closely linked to Hegel’s dialectical idealism and later elaboration within the Marxists’ historical materialism (Ibid.).

Another Marxist theorist and author of ‘The Economics of the Transition Period’ (1920) Nikolai Bukharin (1888–1838) developed his systemic ideas on marginal utility theory and imperialism. Openly influenced by Bogdanov, Bukharin’s interpretation of Marxism as a form of natural sciences caused Lenin to name him a ‘mechanical materialist’ (Susiluoto 1982, 27, 34). Bukharin later revised his ideological views and returned to design the *New Economic Plan* (NEP) of Lenin’s Communist Party (Ibid.). As a founding member of the Soviet Academy of Arts and Sciences, Bukharin’s views on organizing social and economic structures shaped Soviet governmental, educational, and industrial planning (Ibid. 27). Later, in 1938, Bukharin’s lifelong friend and

party colleague Josef Stalin personally ordered his execution. One may argue that along with Bukharin's liquidation, the line of Bogdanovian 'general organizing science' was driven to extinction, disappearing from the Soviet ideological scene and official documents (Ibid. 30).

Political pressure became part of everyday life for cinema professionals from the thirties onwards, to a great extent in the disguise of Socialist Realism, as discussed in the previous section. It appears that the intellectual environment of the twenties, in the midst of the political and scientific revolution, supported the synthesis of arts and sciences, but it also supported the synthesis of old cultural inheritance and new revolutionary eccentrics, a synthesis that came to characterize Eisenstein's later thinking. In the following section, systemic and organistic views are reviewed from a more theoretical perspective.

4.2.2.1 Tektology – a science of organization

The most interesting study object in terms of the present treatment is not Bogdanov's political contribution but his major scientific work *Tektology*, though these two domains intertwine in a complex manner as became evident above. Bogdanov worked with *Tektology: Universal Organization Science* (Vol I–III) during 1913 to 1922 and revised new editions of the three parts until his death; the German translations appeared in Berlin (1926–1928) (Biggart *et al.* 1998, 333–341). All physical and mental phenomena found their place under the multidisciplinary organizational umbrella of Tektology, 'science of sciences', 'mathematics of complexities', or 'science of building' (1913–1922) (Susiluoto 1982, 50). Tektology has been retrospectively argued to pioneer ideas similar to what was to become Western cybernetics and General Systems Theory from the 1950's onwards (Francois 1999; Susiluoto 1982, 45).

As with many early revolutionary socialists and systemic thinkers in Tsarist Russia, Bogdanov was also influenced by the ideas of Austrian physicist and philosopher Ernst Mach (1838–1916), Richard Avenarius (1843–1896), and the Vienna Circle.¹³ In his earlier texts *Basic Elements of the Historical View of Nature* (1899), *Empiriomonism* (1906), and *Philosophy and living experience* (1913), Bogdanov aimed at converging the static Newtonian view with Darwin's evolution theory, leading to a 'naturalizing' of Marxism with Machian positivism (Susiluoto 1982, 41). In philosophical terms, Bogdanov's empiriomonism advocated an active relationship with the world: it aimed to end the dualism of physical and psychical, juxtaposing cause and effect as two phases of same event, suggesting the principle of economy of thought, and adopting the practical criterion of truth (Ibid. 44). Tektology would ultimately replace empiri-

¹³ Avenarius, R. *Critique of Pure Experience* (1888–90) and *The Human Concept of the World* (1891) also influenced William James. Lenin's rejection of empirio-criticism can explain why James was also later a politically suspect thinker for the Marxist-Leninist ideologists.

omonism and Marxism with the oneness of collective structure, an idealized social harmony of the Communist utopia (Ibid. 50).

While Bogdanov has mainly been portrayed as a social scientist, political ideologist, and system scientist, he was also a practicing physician and the founder of the Institute of Blood Transfusion (Gloveli 1998, 88). Georgii Gloveli's essay 'Psychological applications of Tektology' highlights Bogdanov's interests in the predominance of pleasure and pain in the human psyche, a selective orientation towards the hedonic aspect of life, 'characterology', and 'thanatology' (the science of death) (1998, 88–91). Sigmund Freud's psychoanalytical texts and Carl Gustav Jung's *Psychological Types: or, the Psychology of Individuation* (1923), were the sources of inspiration he shared with his contemporary Eisenstein.

Bogdanov's main sources of inspiration were Darwinism, thermodynamics, and energetics (Susiluoto 1982, 192). All human technological practices comprised the worldview that he described as the organization of ideas (Ibid. 46). While Emile Durkheim discussed 'mechanical solidarity' Bogdanov assumed intellectual substance was contained in these rules (Ibid. 47, n4).

Interest in Ludwig Noire links Bogdanov to the German philosophical system, as highlighted in James White's essay 'Sources and precursors of Bogdanov's Tektology' (1998, 103). Bogdanov viewed religious experiences as the basis for customs and rules in earlier societies, drawing from Noire's evolution of technology and Müller's research on natural mythologies (Susiluoto 1982, 46; see original references 1982, 46n3). While the corresponding ideas may be recognized in Eisenstein's mature essays (e.g. 'habit logic' and 'participation'), his sources seem to differ (e.g. Cassirer, Levy-Bruhl, Bühler). In turn, the overlapping references are, not surprisingly, Darwin, Marx, James, and Johann Wolfgang von Goethe. V. V. Popkov emphasizes the influence of Goethe, "poet-encyclopaedist" and "teacher of the creative process" on Bogdanov, and this is also underlined in Gloveli (1998, 91). Popkov further notes that Bogdanov "interpreted Faust as a metaphor for the striving of the human soul for a 'harmonious integral life' devoted to work for the collective well-being of humanity" (V.V. Popkov). Bordwell further identifies cultural studies and emotions studies as overlapping domains concerning Eisenstein and Bogdanov (Bordwell 1993, 37).

Tektology focused on organizing the socialist order according to the principles of socio-economic equilibrium, self-regulation, and the oscillation dynamics of opposing forces as the main principle in creating and managing social harmony (Susiluoto 1982). For Bogdanov, though Hegel did not apply the idea of organization, "the systematization that Hegel carries out with the aid of dialectics surpassed in its grandeur everything that philosophy had hitherto achieved and had enormous influence on the further progress of organizational thought" (Bogdanov Vol. I 1989, 112; in Plyutto 1998, 80). Simona Poustilnik summarizes tektological development in her essay 'Biological ideas in Tektology' as follows: "interaction with the environment creates disequilibrium in the complex and leads to its development, and the instability which this produces leads either to crisis, or to self-development, to the transformation of the system" (1998, 67).

Bogdanov modified existing concepts from concrete sciences (conjugation, selec-

tion), created new concepts (bi-regulator), and empowered concepts anew (instability, irreversibility, crises) (Poustilnik 1998, 70). For example, a Bogdanovian tektological crisis is “the destruction of this equilibrium and a transition to a new equilibrium, in which the complex is correlated with its environment. (...) Any continuous process can be broken down into a chain of crises. Crisis is a universal characteristic, whereas equilibrium is just a specific example of a crisis” (Ibid. 72).

Some correlations or similarities between Eisenstein’s systemicity and that of Bogdanov can be found. Tektological concepts such as conjunction, ingression, linkage, disingression, boundary, and connecting crises and separating crises (Bogdanov 1980, 74) resemble a typically Eisensteinian kind of terminology. Eisenstein’s complex dynamics of the opposing forces within a unified whole appear very similar to that presented in Bogdanov’s ‘general science of organization’. Bogdanov’s tektological considerations reiterate, in a similar manner as also Eisenstein (and the *Gestalt* psychologists), that the experiential whole is greater than the sum of its parts. This also appears true with Eisenstein’s treatment of the montage ‘organism’ in terms of emotional dimensions, knowing that Bogdanov also had a particular theoretical interest in the dualism of pain and pleasure in ‘hedonism’. However, in retrospective reading, indicating some direct interdisciplinary adaptations or influences is difficult due to the lack of documentation. This is so even when assuming the active recycling and consumption of all ideas that seems characteristic of the era.

Today, positioning Bogdanov as one of the major influences on Eisenstein’s contemporary intellectual and artistic environment, an overview of the other systemic thinkers of the era will provide a broader picture of the domain, which involved several influential scholars. According to Alexander Ogurtsov’s essay ‘Bogdanov and the idea of co-evolution’, Bogdanov himself pointed out that tektology in its embryonic form was applied, for example, in the analysis of the principles of organization by P. M. Kerzhentsev and S. Chakhotin, as well as in the psychotechnics of labor power by I. N. Shpilrein (1998, 262). However, as explicated in a lecture by Graig Brandist in 2008, the Shpilrein psychosemiotic approach reacted against Soviet Taylorism and the mechanization of life as it was presented in the work of A. Gastev, for instance (Brandist 2008, n.d.). As was also pointed out in Nikita Moiseev’s ‘Tektology in contemporary perspective’ (1998), systemic thinking was emerging in a broader frontier.

Other Russian systemic thinkers were V. I. Vernadsky (1863–1945), whose Kant-inspired philosophy introduced the concept of biosphere in 1926; K. Ciolkovsky (1857–1935) published already in 1903 his study of atmospheric resistance and rocket motion; the physiologist N. Belov formulated a concept of feedback in 1911; E. Fedorov studied structure and organization; and G. Gruzincev (1880–1929) conducted set-theoretical studies. In addition to the construction of ‘logical machines’ by P. D. Khruscov (1849–1909) and A. N. Sukarov (1864–1936), E. I. Orlov (1865–1944) is mentioned as the first cybernetic thinker and M. Dynnik as suggesting “the construction of computers for information retrieval” around 1925 (Susiluoto 1982, 26).

In 1935 P. K. Anokhin published a physiological study on “back afferentation,” which relates to neural and humoral feedback directed from the body’s peripheral areas towards the brain; he introduced the concept of ‘feed-back’ thus preceding bio-

cybernetics (Moiseev 1998, 221). Stefan Odobleja (1902–1978), the Romanian pioneer of cybernetic thinking in psychology, left about 50,000 pages of research during the years 1938–39 that suggested many cybernetic principles, such as the notion of participation and the reversibility law of feedback (Jurcau 1998).

4.2.2.2 Organicism and holism

Eisenstein had close connections to German intellectual circles,¹⁴ firstly through his extensive reading and studying, and secondly in his later association with the *Gestalt* psychologists and the philosophy of science of Ernst Cassirer.

Both of these theoretical standpoints were influential amongst the Russian intellectual circuits during the first decades of the 1900’s. How they were connected to Eisenstein’s theoretical developments will be discussed later in this chapter of ‘Eisenstein revisited’. In addition, both the views of the *Gestalt* theorists and Cassirer are retrospectively associated with J. J. Gibson’s *The Perception of the Visual World* (1950) and the emerging paradigm of ecological psychology in the 1960’s. Thus they will also inform the discussion of the next major chapter ‘Eisenstein extrapolated’. However, in the following, Cassirer’s *The Problem of Knowledge: Philosophy, Science, and History since Hegel* (1950) serves as a guide to the paradigm shifts witnessed in 1920’s Germany: a shift from the dominating Darwinian mechanistic monism via vitalism towards organicism or holism.¹⁵

Through the discipline and personal acquaintance of Darwin, German biologist Ernst Haeckel (1834–1919) is credited with introducing to the science of biology the term ‘ecology’ (1866) [the Greek *oikos* (house, dwelling place, habitation) and *logia* (study of.)].¹⁶ He combined Darwin’s ideas with Lamarck’s precedent views on heredity and adaptation, arguing that while the environment to a great extent determines the survival conditions of the living species, the lived experience also determines the embryonic evolution of the species (Haeckel 1875; in Cassirer 1950, 163). His roots are in Cuvier’s (1828) revolutionary biological system, which in considering each part “presupposes the whole, this is, the general in particular” (Cassirer 1950, 131–132). Haeckel interpreted Darwin’s theory of evolution, rejecting teleology or purposefulness, and along with it all anthropomorphic features of biology (Ibid. 162). Instead,

¹⁴ As a reminder, cultural and scientific exchange with Germany had been active before the revolution and was officially re-established around 1924 (also with e.g. France, the United Kingdom, and Finland).

¹⁵ In the essay ‘Holistic theories of twentieth century Germany: History of Science’ (1998) Jonathan Harwood outlines the general tendencies of the era. He reviews Harrington, Anne. *Reenchanted Science: Holism in German Culture from Wilhelm II to Hitler*; Ash, Mitchell G. *Gestalt Psychology in German Culture, 1890–1967: Holism and the Quest for Objectivity*.

¹⁶ Haeckel argued that ‘politics is applied biology’; this is comparable to the later social autopoiesis. Haeckel in *Generelle Morphologie der Organismen* (1866): Haeckel, E. *Riddle of the Universe at the Close of the Nineteenth Century* (1899). Other works, Haeckel, E. *The History of Creation* (1868, tr. 1906); *The Evolution of Man* (1874, tr. 1910). URL (2/2007): <http://www.ucmp.berkeley.edu/history/haeckel.html>

based on physics and mathematics, he emphasized the dynamical viewpoint: “The origin of new species by natural selection or, what is the same thing, through the cooperation of inheritance and adaptation in the struggle for existence, is consequently a mathematical necessity of nature that needs no further proof” (Haeckel in Cassirer 1950, 162).

However, the German organicism of the twenties would find its explanatory framework, not in mathematical sciences, but in Kant’s epistemological grounding. Cassirer argues that in fact Kant in his *Critique of Judgment* “stood nearer to modern biology than he did to that of his own day” when expressing the distinction between causal concepts having a ‘constitutive’ role and form concepts having a ‘regulative’ role or a ‘heuristic maxim’ (Cassirer 1950, 210–211). The Kantian analysis of Emil Ungerer *Die Teleologie Kants und ihre Bedeutung für die Logik der Biologie* (1922) explicitly found support from Kant and *Die Regulationen der Pflanzen: ein System der Ganzheitbezogen Vorgänge bei den Pflanzen* (1926) specified Ungerer’s three types of wholeness, which strive for the ‘maintenance of the organization’ (Ibid. 214): (1) the *form* of organism is repaired or restored; (2) the *ordered connection* of all metabolic functions; or (3) in the *coordinated activities* of a motor apparatus (Ibid.).

One of the originators of the notion of ‘holism’ or ‘organicism’ was J. S. Haldane in *The New Physiology and Other Addresses* (1919) and *The Philosophical Basis of Biology* (1931) (Cassirer 1950, 212). In the 1920’s his son and the author of *Causes of Evolution*, J. S. B. Haldane, juxtaposed in the neo-Darwinism, or a ‘modern evolutionary synthesis’, Darwin’s evolution of species and his natural selection with Gregor Mendel’s theory of genetics as the basis for biological inheritance (Okasha 2001, 71–72; Cassirer 1950, 168). Haldane Jr. was in active collaboration with Soviet genetic researchers until the late 1930s when Lysenkoism, a neo-Lamarckian line of biology, wiped out Soviet genetics research (Okasha 2001).

The Baltic-German zoologist Jakob von Uexküll, author of *Umwelt and Innenwelt der Tiere* (1909), is promoted by Cassirer as a pioneer of *Umweltforschung*, i.e., the research of the organism’s interaction within its subjective world (Cassirer 1950, 202; Nöth 1995, 36–37). In *Theoretische Biologie* (1928) von Uexküll reacted against physicalism, arguing for biology as a descriptive science based on observation. Torsten Rütting notes: “Already at the beginning of the 20th century Uexküll recognized the important role of negative feedback and reafferent control in organisms. He used the concept of the *Funktionskreis* (functional cycle) to illustrate behavior as a regulated process. Uexküll’s models can be seen as predecessors of cybernetic models” (2004, 11).¹⁷ Cassirer’s own systemized philosophy of symbolic form and his acknowledgment of, for example, the bio-systemic thinking of von Uexküll opened the way for further elaboration of universal bio-cultural systems and descriptions of socio-cultural techno-ecologies in terms of biological ecologies.

¹⁷ “Uexküll’s approach became influential on the development of the *Organismic Biology and System Theory* of Ludwig von Bertalanffy (1901–1972) and the ethology of Konrad Lorenz (1903–1989) and Nico Tinbergen (1907–1988)” (Schmidt 1980; in Rütting 2004a, 38).

Von Uexküll studied the autonomy of *form* (Cassirer 1950, 200). His research on “a nonmaterial ordering, a rule of the living process that gives to organic matter whatever arrangement it may have”, and on the pure relationships of *geometry* and *stereometry* in nature applied concepts such as ‘structural character’, ‘functional character’, ‘harmony’, or ‘wisdom’ (Ibid. 200, 202–203). “In 1899 he went to Paris to study in the laboratory of the physiologist Etienne Jules Marey (1830–1904), the master of the ‘graphical method’ for the recording of body movements and one of the pioneers of the cinema. Marey had constructed a camera for chronophotography that produced the first short ‘movies’ of moving animals. Uexküll bought one of them and used the chronophotographic method for studying the details of the movements e.g. of starfish and the flight of butterflies” (Harrington 1996, 42 in Rütting 2004, 12).¹⁸ The research of von Uexküll and his colleagues Th. Beer and A. Bethe (1899) influenced the reflex concepts of Pavlov and Bekhterev in Russia (Harrington 1996, 42; in Rütting 2004, 12; Vucinich 1988). Today, von Uexküll is retrospectively recognized as a pioneer of ecological psychology and cognitive psychology, and as a pioneer of cybernetics and Artificial Intelligence (Lagerspetz 2001, Emmeche 2001, Roepstorf 2001; Rütting 2004, 11, 13).¹⁹

Considering Eisenstein’s organic metaphors, he apparently drew from the organic theories of his time. Here it is assumed that Eisenstein was familiar with von Uexküll’s ideas, which were explicitly discussed in Cassirer’s texts. This is also an indirect connection, because it is assumed that Cassirer’s own organic approach to semantics was implicitly Uexküllian. This will be discussed in detail in a later section.

Eisenstein listed *Wisdom of Body* (1932) by Walter Cannon as obligatory literature reading for film students in GIK/VGIK (1933/1936). Cannon suggested a comparative study between the self-regulating systems of homeostasis and the self-righting adjustments of social organizations. “It seems not impossible that the means employed by the more highly evolved animals for preserving uniform and stable their internal economy (...) may present some general principles for the establishment, regulation and control of steady states, that would be suggestive for other kinds of organizations — even social and industrial — which suffer from distressing perturbations” (Cannon 1932, 24–25). Towards the conclusion of his book Cannon develops the analogue between the body’s homeostasis and state-controlled equilibrium: “(...) a much greater control of credit, currency, production, distribution, wages and workmen’s welfare is anticipated than has been regarded as expedient or justifiable in the individualistic

¹⁸ Amongst the 19th century scientists who ordered Edward Muybridge’s series of images included Helmholtz, Mach, Auguste Rodin, and Marey (Tosi 2005, 68). Auguste Rodin wrote: “It is the artist that tells the truth and the photographer who lies because in reality time does not stop, and if the artist is able to give the impression of a movement that requires other movements to be accomplished his work is certainly less conventional than the scientific image, where time is brusquely suspended” (First in Scharf, A. 1968, 173–174; in Tosi 2005, 211n195).

¹⁹ The dynamical views in physiology and biology on self-regulation and the autonomy of the organism were elaborated in many laboratories. W. Roux’s (1905) *developmental mechanics* involved dynamical concepts such as ‘typical development’, ‘autonomous completion’, ‘self-regulation’, and ‘functional adaptation’ (Cassirer 1950, 193). Hans Driesch (1901, 1903) applied the Aristotelian concept of ‘entelechy’ for describing “a specific autonomy of function”, the vitalist life phenomenon of ‘something-like-a-soul’ or a kind of a ‘psychoid’ (Cassirer 1950, 195–196).

enterprises of the past. Communists have offered their solution of the problem and are trying out their ideas on a large scale in Soviet Russia" (Ibid. 302).

Thermodynamics not only stood for a model of technological constructions, but also a model of the 'dynamics of a natural phenomenon' (Harwood 1998). Some pioneering representatives of these German tendencies were, for instance, the German chemist Wilhelm Ostwald (1853–1932), whose 'Kulturwissenschaft' influenced Bogdanov's Tektology (1913–1922), and who studied chemical catalysis, equilibrium, reaction velocity, and introduced the idea of the transformation of an invariant of 'energy' as constitutive to all phenomena, social, physical, or cultural (Susiluoto 1982, 24).²⁰ Felix Auerbach (1856–1933) applied thermodynamics to biology in a 1910 publication, where he suggested the idea of 'ektropy' [today 'negentropy'], the tendency of life to resist disorder (Ibid.). French architect Jacques Lafitte (1884–1966) proposed in a 1911 paper (published 1933) 'Reflections on the Science of Machines' a theory of hierarchic organization (Susiluoto 1982, 23). Lawrence J. Henderson (1878–1942) is credited with developing the concepts of equilibrium and system in *The Fitness of the Environment* (1913) (Ibid. 23–26n1–10).

German biological holism resulted in the first outlines of the General System Theory of Ludwig von Bertalanffy in the early years of the 1930's (von Bertalanffy 1968, 89–90). In *The Problem of Knowledge* (1950) Cassirer concludes his analysis of German holism with a citation from *Theoretische Biologie* by von Bertalanffy "What we call 'life' is a system arranged in hierarchic order" (von Bertalanffy 1932 in Cassirer 1950, 216, 214n61). Arturo Rosenblueth, Norbert Wiener, and Julian Bigelow published their article 'Behavior, Purpose and Teleology' on the mathematical modeling of regulatory processes in 1943. Warren McCulloch and Walter Pitts (1943/1965) studied the network of formal neurons, proposing the correspondence between neurophysiology (the neuron being the base logic unit of the brain) and computational logic (the Turing machine), for example, in 'A Logical Calculus of the Ideas Immanent in Nervous Activity' (Pangaro 2006).

Whether the pioneers of general systems sciences Wiener or von Bertalanffy were



²⁰ Ostwald is mentioned as a practitioner of pragmatism when William James (1904) writes in his lecture What is Pragmatism thus: "I found a few years ago that Ostwald, the illustrious Leipzig chemist, had been making perfectly distinct use of the principle of pragmatism in his lectures on the philosophy of science, though he had not called it by that name. 'All realities influence our practice,' he wrote me, 'and that influence is their meaning for us. I am accustomed to put questions to my classes in this way: In what respects would the world be different if this alternative or that were true? If I can find nothing that would become different, then the alternative has no sense'" (James 1904/1906).

familiar with Bogdanov's tektology is an issue of ongoing debate.²¹ David Rowley, in his review 'How Important Was Alexander Bogdanov?' (2000), emphasizes the consensus of von Bertalanffy not being familiar with tektological elaborations, while several contributors in *Alexander Bogdanov and the Origins of Systems Thinking in Russia* do not rule out the possibility. Many are of the view that even without these speculations, the history of systems sciences should be rewritten to include Russia and Bogdanov positioned as a pioneer theoretician of the organization of complex systems (Biggart *et al.* 1998).

In his historical study *Tektology* (1988) Milan Zeleny suggested that Bogdanov is a precursor to Humberto Maturana and Francisco Varela's theory of *autopoiesis*, which describes a biological self-organization of a living organism in very similar terms (Zeleny 1995; in Poustilnik 1998, 66, 73). Similarities are also found in the emergent processes of thermodynamics by Ilya Prigogine (Poustilnik 1998, 70): Bogdanov anticipated the irreversibility resulting from instability and active matter by stating that "the sum total of organization increases as a result of inequality between positive and negative selection" (Bogdanov 1980; in Poustilnik 1998, 71). According to Poustilnik, Bogdanov seems to share principles of self-development with the systems scientist Erich Jantsch's *Self-Organizing Universe: the Scientific and Human Implication of the Emerging Paradigm of Evolution* (1980). With both scientists, "organization is an uninterrupted flow of formation, transition, co-ordinated development of the whole world, a single world-wide organizational process" (Poustilnik 1998, 71).

In conclusion, Bogdanov's interdisciplinary tektological science, which seemingly formed the underground force of the early 'life-building' of Eisenstein's Russia, may also be acknowledged as a precedent for the later emerging disciplines of Cybernetics and General Systems Theory in the whole of Europe and in the United States.

4.2.2.3 Dialectical materialism

Soviet Marxism is regarded here as one line of theoretical adaptation of the wider systemic thinking in early Russia. Because it also explicitly penetrated all power structures of the Soviet life-building project, its socio-political dimensions cannot be neglected,

²¹ No literal proof exists (Susiluoto 1982, 41n25). However, Bogdanov's Tektology was published in Berlin when von Bertalanffy also lived in Germany. According to Susiluoto, von Bertalanffy defined system, totality, and organization as different expressions of a new comprehensive way of thinking, which were already present in the thinking of Leibniz, Nicholas of Cusa, Hegel, and Marx. He was influenced by the *Gestalt* psychologist Köhler, the biologist Lotka, and even Herman Hesse (Von Bertalanffy 1968, 10–11; in Susiluoto 1982, 23).

Susiluoto (1982), Biggart *et al.* (1998) and many others discuss the similarities: for example, both Bogdanov's observer-hypothesis and von Bertalanffy's treatment of the question suggest that the (e.g. cultural, social, educational) perspective from which the object is examined determines how it is understood, or the assumption of isomorphism as a premise for theory development. While von Bertalanffy draws from Piaget's genetic epistemology, Cassirer's analysis concerning the origin of concepts, and Whorf's hypotheses (Susiluoto 1982, 52, n29), the corresponding elaborations were conducted also in Russia. A plausible mediating agent also exists. The philosopher of the Vienna circle and one of the teachers of Ludvig von Bertalanffy, Moritz Schlick (1882–1936) knew Bogdanov's work (Susiluoto 1982).

as has been delineated above in connection with the fate of Bogdanov's Tektology. Outside of the political aspects, this section briefly outlines the inherent features of systemicity from the official view of Plekhanovian-Leninist dialectics, which cultivated 'conflict' and 'struggle' as an organizational evolutionary force of complexities (Fuchs 2004). It must be noted that Eisenstein often used the notion of materialist dialectics against the Plekhanovian dialectical materialism.

The literal sources of the official dialectics of the era were Lenin's publication *On the Question of Dialectics* (1925) and Engels' *Dialectics of Nature* (1925) (Bordwell 1993, 127). Terrell Carver in his analysis of 'Marx and Marxism' notes that Marxist-Leninist dialectical materialism "was directly derived from Engels' claim that Marx's materialist dialectic comprised three laws common to 'nature, history, and thought': (1) the transformation of quantity to quality, (2) the unity of opposites, and (3) the negation of the negation" (Carver 2003, 196). In dialectical materialism the intellectual contributions of Marx's socio-economic account of historical progress converge with Engels' emphasis on what may be called social Darwinism, the natural selection and physiological evolution of primates (Ibid. 196–198). Carver argues that Marx was more interested in Darwin's ability to extract the underpinning global *patterns* of evolution than on the actual consequences on biology as a science (Ibid. 197).

Relying on the above interpretation, one may suggest that how Engels' dialectical approach to class struggle treated Marx's posthumous texts, in terms of natural sciences and biology, could be described as an act of 'naturalization of Marxism'. However, the act of 'naturalization' formed the ideological core conflict between Bogdanov and Lenin, the former leaning towards augmenting Marxism with the ideas of positivism and natural sciences, and the latter leaning on Plekhanov's historical interpretation of Engels' (Hegelian) Marxism when establishing an orthodox line of dialectical materialism. While Bogdanov was interested in discovering the universal patterns of the phenomenon of organization (compared to Marx's interest in Darwin's evolutionary patterns), Lenin emphasized the physiological, concrete, material aspects of the dialectics.

Eisenstein regularly returned to Lenin's dominating principles of dialectics, which are found in Lenin's *Philosophical Notebooks* (1895–1916/1929; 1965, 437), and which, in turn, comment on Hegel's book *The Science of Logic* (1914–1916, 19–20). In 1914 Lenin summarized dialectics (Vol. 38, 221–222).²²

The following is a direct citation from the Lenin Works Archive [*italics by P.T.*]:



²² Lenin summarizes his conception of dialectics while reading Hegel's Book III, Section 3, Chapter 3 "The Absolute Idea" (In Lenin Works Archive 2003). Reference to Hegel, *Werke*, Bd. V, Berlin, 1834; See "the doctrine of the unity of opposites" in Lenin's *Philosophical Notebook* (1965, 446).

LENIN'S SUMMARY OF DIALECTICS

1) The determination of the concept out of itself [the thing itself must be considered in its relations and in its development]; 2) the contradictory nature of the thing itself (the other of itself), the contradictory forces and tendencies in each phenomenon; 3) the union of analysis and synthesis.

One could perhaps present these elements [of dialectics] in greater detail as follows:

(1) the *objectivity* of consideration (not examples, not divergencies, but the Thing in-itself); (2) the entire totality of the *manifold relations* of this thing to others; (3) the development of this thing, (phenomenon, respectively), its own *movement*, its own life; (4) the internally *contradictory* tendencies (and sides) in this thing; (5) the thing (phenomenon, etc.) as the *sum and unity of opposites*; (6) the *struggle*, respectively unfolding, of these opposites, contradictory strivings, etc.; (7) the *union of analysis and synthesis* – the breakdown of the separate parts and the totality, the summation of these parts; (8) the relations of each thing (phenomenon, etc.) are not only manifold, but *general, universal*. Each thing (phenomenon, etc.) is connected with every other; (9) not only the unity of opposites, but the *transitions* of every determination, quality, feature, side, property into every other [into its opposite?]; (10) the endless process of the *discovery* of new sides, relations, etc.; (11) the *endless process of the deepening of man's knowledge* of the thing, of phenomena, processes, etc., from appearance to essence and from less profound to more profound essence; (12) from *co-existence* to causality and from one form of connection and *reciprocal dependence* to another, deeper, more general form; (13) the *repetition* at a higher stage of certain features, properties, etc., of the lower and; (14) the *apparent return* to the old (negation of the negation); (15) the struggle of *content* with *form* and conversely, the throwing off of the form, the transformation of the content; (16) the *transition of quantity into quality* and vice versa (15 and 16 are examples of 9). Lenin's Collected Works summarized that "dialectics can be defined as the doctrine of the unity of opposites. This embodies the essence of dialectics, but it requires explanations and development", as cited from the Lenin Works Archive (Vol. 38, 221–222).

In 'The Fourth Dimension in Cinema' (1929) Eisenstein cites Lenin's doctrines of the unity of opposites from 10) to 14) (see in Lenin 1965, 446). Perhaps due to the shift in the ideological environment in 1929, Eisenstein abandoned the idea of shocking conflict and adopted the organic metaphor cultivated in the writings of both Engel and Lenin: the division of cells as a leap from quantitative to qualitative dimensions (Bulgakowa 1998, 88). Later, Eisenstein also seemed to interpret Lenin's concept of 'image' in organic terms of a synthesis of isolated sensations (Bordwell 1993, 175). "The abstraction of *matter*, of a *law* of nature, the abstraction of *value*, etc., in short all scientific (correct, serious, not absurd) abstractions reflect nature more deeply, truly and *completely*. From living perception to abstract thought, *and from this to practice*, – such is the dialectical path of the cognition of *truth*, of the cognition of objective reality" (Lenin 1965, 441).

4.2.3 SUMMARY

The section on Eisenstein's intellectual environment above showed that in Eisenstein's era the scientific exploration of systemic ideas was active and even euphoric, encompassing the notion of self-control as an organizational force, organicism, and holistic universalism. All keywords of the intellectual and artistic discourse of Eisenstein's Russia seemed to arise from techno-scientific excitement, e.g. 'energetics', 'life-building', 'psychoengineering', urbanism, ions, electrons, neutrons, thermodynamics, calculations, labor as creation, and so on, and were widely reflected in the practices of the artists and intellectuals of the techno-cultural movement of Russian Modernism.

Until today, only a few cinema researchers in addition to David Bordwell have emphasized the complex systematic and organizational orientation in Eisenstein's dialectical thinking. In his article 'Eisenstein as theoretician' Edoardo Grossi (1993) emphasizes Eisenstein's position amongst the representatives of the Russian scientific tradition. Researchers of Soviet semiotics such as Karl Eimermacher (1982) have acknowledged Eisenstein's theoretical writings as representing a peculiar philosophical branch of the field of Soviet semiotics.

The Soviet cybernetic structuralism emerging in the 1960's highlighted Eisenstein's cinematic work as a forerunner for later semiotics (Bordwell 1993, 261). Alexander Zholkovsky's *Themes and Texts: Towards a Poetics of Expressiveness* (1969) elaborated his poetics of expressiveness on the basis of what Zholkovsky names as 'Eisenstein's generative poetics' as well as on Eisenstein's structuralist/generativist models in his later essay 'Eisenstein's poetics: dialogical or totalitarian?' (1996) (Bordwell 1993, 288). Zholkovsky (1969) draws from the 'Mise-en-scene' chapter in Vladimir Nizhny's *Lessons with Eisenstein* (1979), where Eisenstein appeared as a precursor of the 'generative poetics of expressiveness' (Nizhny 1979, 19–62; Zholkovsky 1996, n1; 1969, 35–52; see Bordwell 1993, 261).

In addition, in the 1974 essay 'Aspects of Structuralism in Soviet philology' Dmitri Segal described the effort that the Soviet linguist and cybernetic Vyacheslav V. Ivanov invested in shaping the identity of Soviet Structuralism, and at the Conference on Structural Linguistics (1960) highlighted the film director Eisenstein "as one of the forerunners of the structural description of meaning in semiotic systems" (Segal 1974 P1, 23).²³ In 1976 Ivanov's *Notes on the History of Semiotics in the USSR* considers Eisenstein's organic-dynamical views as a major contribution to Russian semiotics (Eagle in NIN, viii). The credit is shared with Lev Vygotsky and Mikhail Bakhtin (Ivanov 1974, 1971; Bordwell 1993, 261). According to Segal, Ivanov emphasized that Eisenstein's manner of recycling quotations from 'classical literature' reflected his idea, similar to that of Bakhtin, that quotations as cultural objects play a part in constituting

²³ In the 1960's Ivanov was one of the first to promote the Moscow Linguistic Circle (N. Trubetzkoy, R. Jakobson, N. Durnovo, D. Ushakov), the ideas of the Russian formalist school of literary criticism (V. Shklovsky, B. Eikhenbaum, B. Tomashovsky, R. Jakobson, O. Brik, Y. Tynyanov), and the scientific heritage of the OPOJAZ (the Russian formalist schools) (Segal 1974 P1, 23).

cultural systems (Ivanov 1976; Segal P3 1974, 128).

The Marxist emphasis on the synthesis of theory and practice triggered a range of applied disciplines to accompany "the abstract science of the universal properties of sign systems" (Segal 1974 P1, 2). Differing from European semiotics, the paradigm of Soviet semiotics embraced a wider field of academic tradition including paradigms of "cultural (social, structural) anthropology, social psychology, historical ethnography, content analysis, poetics, art criticism, etc." (Segal 1973 translated in Grossi 1999, 173, 244n32).

More particularly, Bogdanov's tektology provided the organizational instruments for Eisenstein's mature thinking. As discussing Bogdanov's views was forbidden game in any public conference even in the 1970's (Susiluoto 1982; Biggart 1989, 4), the consequence was that later generations were prevented from a fruitful development of Tektology. Furthermore, because Western philosophers regarded Bogdanov as mainly an active Marxist revolutionist, the ideas of the pioneer of science of sciences reached wider international recognition only at the dawn of the new millennium (Rowley 2000; Susiluoto 1982). The direct influence is difficult to track, because Eisenstein did not refer to Bogdanov or tektology. The fact is that no one did, due to the aforementioned political situatedness. Yet the influence was mediated through the widely distributed systemic thinking in Eisenstein's intellectual environment, whose ideological architect was without doubt Bogdanov. The next section 'Mind Engineering' will focus on these academic paradigms and more specifically on those particular discourses on human expressiveness and dynamics of mind that converged within Eisenstein's organic-dynamical systems of cinema montage.

4.3 MIND ENGINEERING

Similar to how the young Soviet state found its way and constitution, gradually, in his growing scientific interest, in addition to being keen on using scientific metaphors, the focus of the mature Eisenstein shifted from the automated machine-like physiology of expressiveness to the subtle, unconscious, multisensory dynamics of montage. This apparent deviation from the eccentric line of young Eisenstein is often described as an adaptation to the ideological scenery. This study emphasizes less the political changes than the dynamic nature of Eisenstein's own lifelong learning processes, which generated in a creative manner new focuses of interests, new research domains, and new formulations of cinematic processes.

Being a child of his own time, Eisenstein was able to taste only the first starter from the exclusive meal served today to those hungry for knowledge on the psychophysiology of the human body-brain system. Nonetheless, due to frequent visits to the neuroscientific laboratory of Alexander Luria, Eisenstein was able to follow closely Luria's

psychological studies and neurosurgery practice, which came later to be defined as a paradigm of neurophysiology. The assumed linkage between the (higher-level) organic unity of cinematic expressiveness and the (lower-level) integration of sensory perceptions inspired Eisenstein with the potentiality of *cinema as a psychological laboratory*.

In addition to this friendship with Luria, Eisenstein's theory development was empowered by other personal contacts with the representatives of Soviet psychology (Lev Vygotsky), psychoanalytic studies (Otto Rank, Hans Sachs), linguistics (Nikolai Marr), and German Gestalt psychologists (Kurt Lewin, Wolfgang Köhler, Kurt Koffka). Continuous readings of the science classics (Hegel, Marx, Engels, Sigmund Freud, William James) were complemented by the anthropological ideas of myths, primitive thinking and emotional participation (Lucian Levy-Brühl, Ernst Cassirer), to name only a few among many. They all supported Eisenstein's later treatment of the embodiment of an emotional theme with organic complexity, which had not been present in the bio-mechanistic views he started with in the early twenties.

In November 1947 in 'Conspectus of Lectures on The Psychology of Art', the day after Luria had requested him to give a series of lectures on the psychology of art at the Psychology Institute of Moscow University, Eisenstein sketched his ideas (ECOL, 231). This essay repeats how essential it is for an artist to understand the human body-mind system in order to gain control over governing the life-building processes in the human mind 1) in the realm of expressive movement, 2) in the realm of the image, and 3) in the realm of the art of cinema – "yet, one more 'avatar' of the formula of interaction between the direct and mediated source" (ECOL, 232). In the following, Eisenstein's path towards this position of the master of the psychology of art is traced from his early discourse on emotional expressiveness, through the discourse of the multisensory and unconscious, to the bio-cultural roots of shared consciousness.

4.3.1 REFLEXOLOGY

"Had I been more familiar with Ivan Pavlov's teaching, I would have called the 'theory of montage of attractions' the 'theory of artistic stimulants,'" Eisenstein reflects retrospectively in 'How I Became a Film Director' (1945) (NFD, 17).

Honored in 1904 with the Nobel Prize in Physiology and Medicine, Ivan Pavlov's (1849–1936) research on temperament, conditioning, and involuntary reflex actions dominated early Soviet psychology (Bordwell 1993, 116), particularly after 1940, when Pavlovian psychology became the official Marxist view. In the late twenties, when Pavlov's *Conditioned Reflexes: An Investigation of the Physiological Activity of the Cerebral Cortex* was published, Vsevolod Pudovkin was documenting Pavlov's research in his first state-commissioned film *The Mechanics of the Brain* (1925) (Nichtenhauser 1953, 46).

Bordwell suggests that Eisenstein draws more from the theory of reflexology by the

neuropathologist and physiologist Vladimir M. Bekhterev (1857–1927), who emphasized the discovered physiological laws of acquired and innate reflexes extended from the animal world to all human activities and social processes (1993, 116).²⁴ Naum Kleiman's essay 'Arguments and ancestors' implies that the image of Eisenstein as manipulator of the spectators' minds was erroneous – Eisenstein, in fact, was saying the opposite. Eisenstein's unpublished notes on Bekhterev's work state, in the words of Kleiman, that "art must change the conditioned reflexes that is provoked by the social context and, in particular, the audience must be diverted from reflex reactions of servility and terror" (Kleiman 1993, 34).

Reflexology, typically addressed to Pavlov, popularized the idea of a direct cause-effect connection between the screen and the spectator's mind. The critic Leo Mur for instance wrote about the psychoengineering of reflexes in the work of the director of *Potemkin*, who "not only edits the reel, but also the cells in the brain of the spectator" and creates "montage not only on the screen of the movie theater, but also on the screen of the brain" (cited in Nesbet 2003, 54).

The field of physiological and psychological studies in the Soviet Union was thus at a high level internationally. In 'The Fourth Dimension in Cinema' (1929) Eisenstein wrote: "The felt stimulants vary according to their 'external nature' but are bound together in an iron unity through their reflex physiological essence" (...) "the 'psychic' in perception is merely the physiological process of a *higher nervous activity*" (ESW1, 183). Eisenstein's reference to higher nervous activity suggests that he was familiar with the psychophysiological research of the early Soviet era. This may link to writings by the Georgian neurophysiologist I. S. Beritashvili, who practiced electrophysiological techniques, while Pavlov was not interested in this 'wire' physiology (Shuranova 1996 in Abramson *et al.* 1996). Beritashvili (1947) introduced the concept of 'psycho-nervous' activity. He studied reflexive and complex behavior, the ontogenetic and phylogenetic development of specific types of behavior, and the dependence of behavior on context (Abramson *et al.* 1996, 21). Research on electrophysiology and the cellular chemistry of the brain by Ivan Sechenov (1829–1905) was also influential (Bulgakowa 1998, 88). However, the branches of embryology, biophysics, and genetics were repressed from the mid 1920's onwards (Abramson *et al.* 1996, 26).

In 1937 Eisenstein's essay 'On color' discussed the act of creating "*new chains of association*" on top of established chains, and with this he seems to return to the reflexological premises of 1923–24 (ESW2, 260; in Bordwell 1993, 175). This physio-phraseology may partly relate to the more general intellectual environment, where empirical research on physiology (Pavlovian reflexology) had become the officially encouraged view and the other forms of theoretical psychology (psychotechnics, psychoanalysis, dialectical psychology), on the one hand, and such biological sciences as genetics, on the other, were suppressed to practice-oriented discourse. From the mid-1920's to

24 'Introduction' by Michael Cole for Luria's *The Making of Mind*: "At almost the same time William James was encouraging his students to conduct experiments at Harvard; Francis Galton in England was initiating the first applications of intelligence tests; and Vladimir Bekhterev opened a laboratory in Kazan that explored (...) [!] earning mechanisms, alcoholism, and psychopathology (.../.)" (Cole 1979, 2).

the 50's psychology as a discipline was gradually eliminated. In 1940 Stalin declared Pavlovian psychophysiology as the methodological core of Marxist psychology. The so-called Pavlovian sessions took place, where Marxist sciences were rewritten (Abramson *et al.* 1996). During this period, reflexology fell into the category of practical sciences, because its proponents emphasized its significance to studying learning processes.

4.3.2 EXPRESSIVE MANIFESTATION

“Don’t forget it was a young engineer who was bent on finding a scientific approach to the secrets and mysteries of art.” Eisenstein remarked in his autobiographical narrative ‘How I Became a Film Director’ (1945) thus: “The disciplines he had studied had taught him one thing: in every scientific investigation there must be a unit of measurement” (NFD, 16).²⁵ Eisenstein’s thinking elaborated this unit of measurement, which was first represented in an organic-dynamic montage cell, and later, in any organic experiential aspect of a film shot.

In the scientific search for artistic methods, Eisenstein attended Kuleshov’s film workshop on montage in the year 1920 and Meyerhold’s direction class on biomechanics in 1921. In both schools the emphasis was on total psychological control of the actor’s physiological movements, with emphasis on the Freudian unconscious and the art of ‘psychoengineering.’ The young Eisenstein became fascinated with the reciprocal interaction between ‘external’ expressive movements and ‘internal’ physiological stimulation of the senses. This fascination lasted a lifetime. Soon Eisenstein was to experiment by composing expressive movements in his eccentric Proletkult theater direction *Enough Simplicity for Every Wise Man*, which included his first piece of film, *Glumov’s Diary* (1923). These experiments resulted in his manifestos of ‘montage of attractions’ (1923/1924), described as “the two-folded designation that comes half from manufacturing and half from the music-hall” in his essay ‘How I Became a Director’ (1945) (ESW3, 289). However, one of Eisenstein’s motives for publishing the essay ‘Montage of Film Attractions’ (1924) was the need to differentiate himself from the other existing practices of ‘psychoengineering’, particularly those of his teachers Kuleshov and Meyerhold.

²⁵ Often the translations differ radically in mood. This citation is from Richard Griffith’s translation in *Notes of Film Director Sergei Eisenstein* (1970). Taylor’s (1996) translation is wordier but, one may say, more academic (ESW3, 289). Both, though, reveal the expressive metaphoric drive of Eisenstein’s flow of thought.

4.3.2.1 Kuleshov’s effect

An important window on the physiological studies on actors’ expressions, in contrast to the *psychologism* of naturalistic acting, was offered in Kuleshov’s film workshop in 1920. Eisenstein enrolled to study the ‘Kuleshov effect’ for few months, notes Ronald Levaco in his introduction to *Kuleshov on Film* (Levaco 1974, 8). In his essay ‘Americanism’ (1922) Kuleshov outlined his notion of *montage* as based on rapidly-cut American formats: he referred to the slapstick comedies (Chaplin, Lloyd, etc.) and drama films (Griffith, Porter, etc.) whose close-ups and scenes were organized by separate shots (Kuleshov 1974, 130). Soviet Taylorism and Fordism had redefined the domain of the arts according to industrial and technological metaphors (Manovich 1993). The French etymology assigns ‘montage’ to moving assembly lines (‘chaîne mobile de montage’), first implemented in naval production in England (1801) and one hundred years later in Ford car factories. The notion of American montage was harnessed in the LEF to define narrative continuity editing (ESW1, 310n52). Only later did the Western point of view rename the Soviet’s American montage as Russian montage (Kuleshov 1974).

According to Ronald Levaco in *Kuleshov on Film*, “(...) the Kuleshov method sought to clarify and externalize the actor’s emotions before the camera, to systemize and virtually to codify his use of physiognomy and gesture to express specific emotional states” (1974, 9). Kuleshov composed his frames according to a virtual ‘metric web,’ constituted of Cartesian coordinates of horizontal and vertical lines [plus diagonals (depth)], in which he placed the trained bodies of his actors (‘models’) with a few carefully chosen objects (Levaco 1974, 10; see also Khopkar 1993, 155).

Kuleshov’s ‘model’ was constructed according to an inventory of the actor’s stage gestures and movements and their classification as “normal, eccentric, and concentric, and the combination of these” (Kuleshov 1974, 107). His teaching applied the ideas of Francois Delsarte (1811–1870) the teacher of Meyerhold’s source Emile Jacques-Dalcroze. Levaco suggests that Delsarte may have provided Eisenstein with the concept of ‘typage’ (1974, 9).²⁶ Kuleshov was influenced by Meyerhold’s biomechanics, as was also his student Eisenstein.

The idea of engineering the actor’s performance was a widespread approach in the arts. Eisenstein also worked with the Soviet theater director Nikolai Foregger, who elaborated a *tyefe-trenage* method, systemizing the actor’s expressive gestures into “a grid of three hundred poses” (Bordwell 1993, 3, 117). Eisenstein initiated the Laboratory for Modeling New Behavioral Norms together with a theoretician of Constructivist production art, Boris Arvatov, this during their mutual Proletkult production of *The Mexican* in 1921 (Bulgakowa 1998, 44; Bordwell 1993, 3).

Kuleshov may be credited with introducing Eisenstein to cinematic expressiveness.

²⁶ In 1936 Eisenstein’s study program for directors (VGIK) included Delsarte, but qualified his theory to “obviously fallacious theories” regarding Delsarte’s Russian interpretation of prince Sergei M. Volkonsky (1860–1937; author of *Expressive Man*) (ESW3, 86; Taylor in ESW3, 368n3).

Soon after his first montage essays Eisenstein deviated from Kuleshov's and his student and collaborator Vsevolod Pudovkin's 'brick by brick' metaphor. He drew a metaphor from physics to emphasize that his montage method in its dynamical complexity had developed beyond that of Kuleshov and Pudovkin: "Remember that physics is aware of an infinite number of combinations arising from the impact (collision) between spheres. Depending on whether they are elastic, non-elastic or a mixture of the two. Among these combinations there is one in which the collision is reduced to a uniform movement of both in the same direction" (ESW1, 144). According to Eisenstein's conclusion, serial montage advocates the case of uniform movement in the same direction, thus limiting itself to this particular type of montage method, while a winner embraces them all (ESW1, 144). Eisenstein's dialectical montage leapt past his teacher Kuleshov 'beyond the shot', where an organic whole came into being in the interaction of reactive montage cells (ESW1, 143–144).

Despite professional disagreements Kuleshov and Eisenstein remained friends: Kuleshov was one of the very few (if not the only one) who defended Eisenstein against systematic attacks in the Creative Conference in 1935. He also remained a lifelong friend of Eisenstein, this tragically and literally: Eisenstein had his fatal heart attack while discussing the montage of color in film in a letter to Kuleshov on February 10, 1948.

Another important figure was Esfir Shub, a professional filmmaker and editor, who had been re-editing foreign films already in Tsarist Russia. Together with her in 1923–1924 Eisenstein re-edited Fritz Lang's film *Doctor Mabuse* (1922) (Chochlowa 1998, 115–123). Though neglected in later film histories, in her own time Shub (together with Vertov) was appraised in constructivist publications and in the LEF group as one of the most important representatives of Soviet "cinematographic journalism" (Petric 1987, 19). As a creator of the compilation film genre, which uses archive footage (e.g. *The Fall of the Romanov Dynasty* 1927), she also highlighted montage as a method (Taylor in ECOL, 64n1).

Shub remained Eisenstein's lifelong friend and correspondent (Taylor in ECOL, 64n1), related to Alexei Gan, the constructivist artist, founder of *Kinofot*, and supporter of Dziga Vertov (Bulgakowa 1998, 36). Vertov as well as Pudovkin had studied psychophysiology. This educational background must have supported Vertov's idea of pure perception-based cinema, "as dynamic geometry, a succession of dots, lines, planes, and volumes, as movement of pure form in an organized space that consciously made use of rhythm" (Bulgakowa 1998, 36).

Vertov may be considered an important influence on Eisenstein's own theoretical considerations. Yet, due to his aggressive, competitive attitude towards both Kuleshov and Eisenstein (Ibid.), one may argue in the spirit of Bogdanov's tektology that Vertov challenged Eisenstein via his negative feedback.



4.3.2.2 Biomechanics

Participation in Symbolist theatre director Meyerhold's experiments in the Higher Workshop of Directing (GVYRM) in 1921 formed a fundamental basis for Eisenstein's own elaborations on what he defined as 'expressive movement'. In 'Chaplin and chaplinims' (1936), Meyerhold recalls Eisenstein's experiments with biomechanics in his studio during the years 1922–1924: how Eisenstein learned to apply the method of 'attractions' in a similar manner as Chaplin, by connecting effectively to the web of emotionally loaded associations in the spectator experience (Meyerhold 1981, 241). Many of the issues addressed in Meyerhold re-emerge in Eisenstein's essays, showing that the impressions Meyerhold left on young Eisenstein remained for the duration of his life. For example, in the 1947 essay 'Stereoscopic cinema' Eisenstein seems to transpose Meyerhold's trademark of staging his actors amid the audience to his vision of a unified space connecting the screen and the spectator (as noted also in Khopkar 1993, 157).

In a reciprocal manner Eisenstein's montage elaborations also nourished Meyerhold's thinking. For example, in the essay collection *A Revolution in the theatre*, Meyerhold discusses cinema's economical style of compressing space in 1930 (Meyerhold 1981, 135), while in 1912 cinema had served as only a scientific curiosity for Meyerhold (Ibid. 86). The following are further indications of consensual domains between the men: Griffith's typage casting from the streets (Ibid. 135, 136); the character-faithful acting of Charlie Chaplin and Harold Lloyd (Ibid. 123–124); again Chaplin, Douglas Fairbanks, and expressive gestures on the 'screen' that only the most sensitive film emulsion may capture (Ibid. 177–178); acting and music in Japanese and Chinese theater (Ibid. 124–125); the artist's attitude towards the world as the core of all creative action (Ibid. 89); any piece of Variété theater 'attractions' in which one finds more art than in any serious drama (Ibid. 88n1); the tragi-comic features of the grotesque, synthesizing, and contrasting dimensions of life; and the idea of the director leading the spectator from one level of experience to another unexpected, more challenging one, as a method (Ibid. 91).

Art is about organizing material in the most effective, quick, and purposeful manner, wrote Meyerhold in 1922. An artist is always also an engineer, while an actor's performance is both a product and an instrument for organizing the wellbeing of society (Meyerhold 1981, 103–104). Soviet Taylorism as adopted from F. W. Taylor's *The Principles of Scientific Management* (1911) and tektological systems thinking converge in Meyerhold's article 'Future Actor and Biomechanics' (1922). Work resembles dance when the following principles are fulfilled: 1) the movements include nothing in excess or non-productive; 2) the movements are rhythmic; 3) the worker has found the right balance for the body; and 4) the movements are strong (Meyerhold 1981, 104). Words in theater are mere decoration in the web of plastic movements (Ibid. [1913], 75). When the actor finds the key to his or her inner bodily 'resonance,' it will contaminate the spectator with the same resonance, resulting in a similar state of awareness to what the actor is experiencing (Ibid. [1922], 106).

Meyerhold viewed music as the closest art form to theater; this came to be one of Eisenstein's main instruments in modeling cinema. The seed for Eisenstein's musical treatment of overtone may lurk here. Meyerhold's speech ["Teacher Puputti"] (1925) credits Richard Wagner's invention of juxtaposing words and music in a contrapuntal manner: the melody carries on the emotional or associative line, which may be added to any moment of the spoken performance, thus coloring the thoughts in the spectator's brain with certain types of associations (Ibid. 118). Has anybody returned to discuss Scriabin's elements of music, sound, and light, Meyerhold continues, challenging his audience. Then he discusses Prokofiev's consonants (Ibid. 122). 'On theater's history and its techniques' suggests a two-fold relation to the spoken words and plastic gestures and expressions of the staged event: in new theater the plasticity and the words are dependent on their own intrinsic rhythms, which do not always coincide (Ibid. 53). Eisenstein's contrapuntal montage standpoint on sound cinema (e.g. 'Statement on sound' 1928 with Gregory Alexandrov and Vsevolod Pudovkin; 'Unexpected juncture' 1929), and later vertical montage suggest a similar independent but inter-related interaction between the principal domains of vision, sound, and color.

In 1929 Eisenstein planned to dedicate his *Spherical book* to his teacher Meyerhold and to the founder of the Munich School of Expressive Gymnastics Rudolf Bode, follower of philosopher Ludwig Klages, whom Eisenstein also credits together with Griffith's actor Richard Barthelmess – and his students from GIK (Bulgakowa 1998, 87).

4.3.2.3 Biodynamics

With the notion of *biodynamics* Eisenstein (1924) moved away from the more mechanical practices of Meyerhold (ESW1, 53). Only the first and last thesis were useful, as Eisenstein's diary note argues: [1st thesis] "The whole biomechanics is based on the following: even if only the tip of the nose is active, then the whole body is active. If even the most insignificant organ functions, the whole body feels it," and [16th thesis] "Gesture is the result of the whole body working" (IP4, 751 in Khopkar 1993, 157).

In his rejection of biomechanics, Eisenstein's 'biodynamic' method still embedded Meyerhold's biomechanical 'movement of refusal' (Khopkar 1993, 157). Yet this 'denial', argued Eisenstein (1924), originates from early 17th century theater theories and their implementation of Newtonian physical inertia, and as such are not an original invention of Meyerhold (Vsevolodsky-Gerngross 1913; ESW1, 53).

However strong Eisenstein's public need to deviate from biomechanics, it was Meyerhold who initiated Eisenstein's first moves in his 'biodynamic' study of emotional expressiveness. In his course of 1922 Meyerhold nominated Eisenstein as leader of the Theater encyclopedia team. Eisenstein was to "adapt Japanese theater terminology and write an essay on expressive movement" (Bulgakowa 1998, 27). Eisenstein invited his friend Sergei Tretyakov to co-write the essay (Bulgakowa 1996). Meyerhold's biomechanical teaching provided the starting point for the essay, which was also based on observational facts of physiological processes in the objective spirit of the reflexology

of Pavlov and Bekhterev (Meyerhold 1981, 106).

Meyerhold had developed biomechanics as a Russian version of the theories of rhythm by Isadora Duncan and Emile Jacques-Dalcroze's rhythmic gymnastics (Meyerhold 1981, 83; Bulgakowa 1998, 27). The latter exercised awareness gained through all the senses, transgressing borders of art forms. The French commedia dell'arte actor Benoit-Constant Coquelin's method of acting and his Molière characters also inspired Meyerhold (eds. in Meyerhold 1981, 97). In his books, for example, *L'Art et le comédien* (1880) and *Les Comédiens, par un comédien* (1882), Coquelin emphasized "simulated rather than real emotions" (*The Columbia Encyclopedia* 2004).

Eisenstein and Tretyakov's essay expanded the role of Aristotelian expressive persuasion further, arguing that to gain full control over the spectator's emotional responses mere emotional expressiveness was not enough: in addition, one must harness exaggerated, shocking 'attractions' and eccentric grotesque (Bordwell 1993, 118). The study leaned on Rudolf Bode's 'expressive gymnastics' (*Ausdrucksgymnastik* 1922) and on the philosopher Ludwig Klages, Bode's source of inspiration (Bulgakowa 1996, 88–89; Khopkar 1993, 153, 163–164).²⁷ Klages will be discussed in a later section. In a symbolic manner, while Eisenstein was to react against Meyerhold's views, Bode had also reacted against his teacher Jacques-Dalcroze's rhythmic gymnastics, which in turn had inspired Meyerhold (Taylor in ESW2, 366n10). Yet, in Eisenstein and Tretyakov's dialectical adaptation based on their own translations of Bode, Eisenstein and Tretyakov continued in the spirit of the psychoengineering of the era: an actor who is trained to consciously coordinate his reflex-bound activities is able to elicit genuine emotions in the spectator (Bordwell 1993, 118; Bulgakowa 1996, 88).

Completed in 1923 the collaboration of Eisenstein and Tretyakov in writing the essay on 'shocking attractions' created the foundation for Eisenstein's psychophysiological considerations of 'montage of attractions' (1923/1924). The same essay may have also formulated "Tretyakov's insistence that art must organize the human psyche through the emotions" (Bordwell 1993, 116). In his later treatment on the emotionally engaged spectator Tretyakov was also influenced by Bogdanov's science of organization (Tretyakov 1923, 216; Bordwell 1993, 136). This is assumed to be the case with Eisenstein as well, and also suggested by Bordwell in *The Cinema of Eisenstein*.

4.3.2.4 Expression theories

In 'Montage of Film Attractions' (1924) Eisenstein boldly stated his own contribution to physiological studies: "The norms of organicism (the laws of organic process and mechanical interaction) for motor processes have been established partly by French and German theoreticians of movement (investigating kinetics in order to establish

²⁷ While the German name Rudolf Bode in Bulgakowa's German text is in the form Bode (rather than Bode in Bordwell 1993) the first form is applied here.

motor primitives) and partly by me (kinetics in its application to complex expressive movements – and dynamics of both: see below) in my laboratory work at the Proletkult Theatre” (ESW1, 51).

Eisenstein’s (1924) mathematically calculated psychological effect draws from Soviet Taylorism and the dominating reflexology paradigms of Pavlov and Bekhterev. Yet, Eisenstein’s (1923) insistence on calculated, controlled, conditioned, or automated responses converged with the unconscious, emotion-driven expressiveness of Ludwig Klages, Bode, Hermann Krukenberg, and William James.

“An attraction (in our diagnosis of theatre) is any aggressive moment in theatre, i.e. any element that subjects the audience to emotional or psychological influence, verified by experience and mathematically calculated to produce specific emotional shocks in the spectator in their proper order within the whole. These shocks provide the only opportunity of perceiving the ideological aspect of what is being shown, the final ideological conclusion. (The path to knowledge encapsulated in the phrase, ‘through the living play of the passions’, is specific to theatre)” (ESW1, 34; italics by S.E.).

Bode’s ‘expressive gymnastics’ harness the automated nature of the most economic and functionally unfolding of movements (ESW1, 57); later, in ‘The Dramaturgy of Film Form’ (1929) the organic-rhythmic Bode school is contrasted with the mechanical school of the Mensendick system (ESW1, 163).

The organic unity of expressive movement in perceptual duration is discussed in ‘Laocoön’ (1937), in linkage to the French neurologist and father of electro-therapeutics Guillaume Benjamin Amand Duchenne (1806–1875) (ESW3, 86; 368n30). Eisenstein listed him as essential reading in his director’s program in VGIK (1936). Already in ‘The Montage of Film Attractions’ (1924) Eisenstein relied on Duchenne’s idea that “a particular muscular action with no connection with the muscular system as a whole is not characteristic of nature” (ESW1, 51; 306n16). Later in his dialectical interpretation Eisenstein (1929) finds dialectics exemplified in Duchenne’s²⁸ study of a two-fold synthesis between muscular and expressive movements, and in Kenyon’s proposition that expressive movement is constituted of an inseparable union of opposite reactions to the same stimuli – the movement and its denial.

In his 1937 essay on the statue of Laocoön Eisenstein described how a set of isolated moments of expressive movements of a muscular body, when represented simultaneously in a work of art such as a painting or a statue, created an impression of emotional movement on a temporal scale (ESW2, 114). “It is his work on the study of the individual activity of each single muscle that we owe a maxim that describes a fundamental characteristic of expressive movement: ‘L’action musculaire isolée n’est pas dans la nature’ [isolated muscular action does not exist in nature] (1858),” Eisen-

²⁸ In the mid–1970’s the facial expression and emotion research of Paul Ekman and his colleagues acknowledged Duchenne’s discussion (Mona-Lisa smile). Eisenstein’s essay ‘Montage of Film Attractions’ (1924) and ‘Laocoön’ (1937) refer to Duchenne, the author of *The Mechanism of Human Physiognomy or Electro-Physiological Analysis of the Expression of the Passion* (Taylor in ESW3, 368n30).

stein noted. His reference to Duchenne’s “electrical stimulation of separate muscles” related to his discussion of the impossible simultaneity of different phases of emotional expression depicted in ‘still’ objects such as the statue of Laocoön; according to Eisenstein, the anatomically corrected reproduction of Laocoön in Duchenne’s study lacked all emotional appeal (ESW2, 114). In Eisenstein’s study, in turn, the reproduction represents “the juxtaposition of the phases of an action instead of the depiction of a process” (ESW2, 116). This happens, for example, when distinct expressions of sorrow (comparable to the linked fragments of film) merge into “a general impression of grief (a ‘symphony of sorrow’)” (ESW2, 116).

4.3.2.5 Biocentric Characterology

Ludwig Klages’s expression-theory (*Ausdruckskunde und Gestaltungskraft* 1913), the concept of actuality of images (*Heidnische Feuerzeichen* 1913), and his psychological study of handwriting (*Prinzipien der Charakterologie* 1910) inspired Eisenstein’s theory of human expressiveness.

John C. Cartney in his essay ‘On The Biocentric Metaphysics of Ludwig Klages’ (2001) remarks that Klages represented the German vitalist movement, which was associated with such holistic thinkers as Henri Bergson (élan vital) and Hans Driesch (whose neo-Kantian approach to organicism is discussed in Cassirer’s *The Problem of Knowledge* 1950). In particular Klages’s source of inspiration was Melchior Palágyi, whose theory of the évirtual movement²⁹ of celestial objects anticipated the theory of relativity (Cartney 2001).²⁹ Though a significant source of inspiration for Eisenstein (Bohn 2003; Bulgakowa 1996), Klages is excluded from Bordwell’s treatment (1993).

Klagesian biocentric characterology as “the indispensable structural component of the biocentric scheme of metaphysics” supported the empirical research of human expression, and vice versa (Cartney 2001). Echoing in Eisenstein’s descriptions of expressive movement, Klages’s expressive movements are characterized as follows: “Volitional movements cannot exist without impulse movements, but the impulse movement can exist without the volitional one. Every state of the body expresses an impulse system, and every attitude finds its appropriate expression. Every movement of the body is a vital movement that has two constituent parts, the impulse and the expressive. Therefore, an expressive movement is the visible manifestation of the impulses and affects that are symbolically represented in the vital movement of which it is a component part. The expression manifests the pattern of a psychic movement as to its strength, duration, and direction” (Ibid.).

²⁹ Amusingly, some expressions in Cartney’s essay do not necessarily suit an academic context: “and even the invertebrate American ochlocracy lent its cacophonous warblings to the philosophical choir when William James proclaimed his soothing doctrine of ‘Pragmatism,’ with which salesmen, journalists, and other uncritical blockheads have stupefied themselves ever since” (Cartney 2001). This style is comparable to V. I. Lenin’s attacks against his political rivals in his philosophical texts noted earlier. In other respects the essay is informative.

According to Cartney, the concept of the “Id” was not introduced by Sigmund Freud, but in *Prinzipien der Charakterologie* (1910), based on Klages’s lectures (Cartney 2001). Klages (1913) also scrutinizes consciousness as ‘effect and never cause,’ based on conscious feelings, while, in turn, reality comes into being in the ‘actuality of the images’ [Wirklichkeit der Bilder], not in feelings (Ibid.). Indeed, such Klagesian conceptualizations as *Vom kosmogonischen Eros* (1922), the ecstatic nature of the ‘erotic rapture’, and ‘other condition’ or ‘other state’ [andere Zustand] must have appeared appealing to Eisenstein, who elaborated his own version of being ‘outside’ of oneself in ‘ex-stasis’, comparable to a religious, narcotic, or – reading between the lines – erotic trance (e.g. NIN 177).

Eisenstein’s elaboration of *pathos* composition and leap into ecstasy may echo Klages’s dynamical views to a great extent, if one follows Cartney’s interpretation: for Klages, “the capacity for expression is coordinated with the human being’s capacity for impression. Impression is split into two functions: a passive (‘pathic’) one, which receives the impression; and an active one, which makes it possible for one to become aware of one’s own nature as well as that of others” (Cartney 2001). It is this shared domain of awareness that enables one to scrutinize the ‘objective’ meaning of expression as an organic whole, instead of focusing on isolated segments or qualitative details of this organic matrix. In Klages’s view, any graphological theory of ‘isolated signs’ fails to recognize the global structure of personality. (Ibid.)

Curiously, in ‘The Music of Landscape...’ Eisenstein describes Klages’s approach to features of handwriting as such an analytical theory of ‘isolated signs’; it *fails* to recognize the global structure of personality (NIN, 340). In fact, Eisenstein’s description allows the assumption that Klages’s method draws from *Gestalt* principles, in this case, particularly Wolfgang Köhler’s experiment with the psychological correlation of graphic shapes and words (see page 109). According to Eisenstein, Klages analyzed the elements of handwriting so that *straight*, *angular*, and *sharp* elements relate to the logical, conscious domain of thinking, while *rounded*, *smooth*, *flowing* elements describe emotional instincts (NIN 340). In a later section, this discourse will be extrapolated to the recent hypothesis of creativity, synesthesia, metaphors and the mutual origin of language in overlapping bodily domains of perception and action (section 5.3.1.2).

In 1945, when writing his essay, Eisenstein’s holistic ideas had reached their most mature level, in terms of his understanding of how mind and body relate to each other in an inseparable manner. This is why, instead of Klages’s deductive, top-down approach, Eisenstein preferred a bottom-up, inductive approach of another graphologist, Raphael Sherman, whom he had met in 1929 in Berlin. Sherman reproduced Eisenstein’s signature at their first meeting only by looking at him. He also produced artists’ signatures by looking at their paintings (NIN 341). Eisenstein’s explanation is based on the degree of *imitation*, similar to any plastic imitation or mimicry, which captures *the rhythmic characterization*, the basic ‘tonality’ of the person, as “the external imprint of the *characterization of inner relationships and conflicts* in the ‘inner system’ – in the person’s psyche” (NIN 342). This is also a topic for later elaboration when the most recent discoveries of an innate imitation system will be discussed in the next chapter, ‘Eisenstein extrapolated’ (section 5.3.2.4).

4.3.2.6 Perception and action

Eisenstein developed a kind of expression-act/perception-act theory, which integrated in a reciprocal relationship the perception of the expressive gesture with the action of the expressive man. Retrospectively speaking it resembles the 21st century discussion on the relation between direct perception and actions, to be addressed in the next chapter (section 5.2.3.4). It seems that imitation becomes a repetitive keyword for Eisenstein as he depicts the psychophysiological relationship between the cinema author and the spectator.

Already in 1928 Eisenstein seemed to take the standpoint that the process of expressive manifestation is neither a static ‘sign’ of action as in Klages’s representation in the mind, nor an ‘assimilation’ with action, as in Bekhterev’s collective reflexology. Instead, it is “the process of the action itself” (TsGALI, 1932/2; in ESW3, 369n32).

In 1945 Eisenstein retrospectively reflected William James’s formula in ‘How I Became a Director’, which states that “we are not crying because we are sad; but we are sad because we are crying” (ESW3, 286, 368n34). While James’s sensorimotor emotion theory will be discussed later in more detail, here in the connection to expressiveness as a process, James seemed to support the views expressed in Klages’s biocentric psychology. As Bulgakowa suggests, these two theories intertwined in Eisenstein’s conceptualization of expressive manifestation (Bulgakowa 1988, 178–80, in Manovich 1993, 27).

Lev Manovich in *Engineering Vision* (1993) followed Bulgakowa’s Russian language article ‘Sergei Eisenstein and his Psychological Berlin: Between psychoanalysis and structural psychology’ (1988): “According to Klages, in a human being emotional states are expressed through bodily movements (...) the muscular contractions of one person are involuntarily repeated by the observer. James’ theory was related to Klages’ but causally reversed. He postulated that emotions were the effect of muscular contractions – one does not cry because he is sad, but one becomes sad due to crying” (Manovich 1993, 27). Manovich notes that Eisenstein’s intellectual montage and montage of attractions revealed the two distinct modes affecting the viewer, the first arising from the mind and the second from the body (Ibid. 28). These two complementary forces are also discovered as two separate approaches to practical montage composition, when Bordwell suggests that in *Battleship Potemkin* (1925) strong metaphors maximized emotional intensity and expressed ‘emotions of the masses’ while *October* (1928) maximized ‘intellectual attractions’ (Bordwell 1993, 11, 36).

In Eisenstein’s later essay ‘The Psychology of Composition’ the two opposing dimensions of human nature, the unconscious, hidden, emotional sphere and the intellectual goal-oriented activity, continue to form the interactive basis of the expression/perception system (ECOL 276–278). Eisenstein seems to model this ‘imitation’ process as cognitive complexities, in which the top-down processes converge with the bottom-up processes of the mind. In the book *The Psychology of Art*, which Eisenstein had carefully studied, Lev Vygotsky used the expression of the aesthetic from above and the aesthetics from below, a conception repeatedly applied in Eisenstein’s psy-

chophysiological or organic-dynamic conceptualizations of cinematic processes.

In the 21st century neuroscientific context one could posit that Eisenstein had acquired the view of a kind of bodily imitation, which assumes that the spectator's brain system simulates or mirrors the actor's emotional expressions in such a manner that one may claim the two experiences reciprocally isomorphic with each other in terms of the sensorimotor activities regulated by cortical system (see page 240). For example, in 1936 in Eisenstein's study program for the State Film Institute (VGIK), the actor's expressive movements could affect the viewers in a mathematically calculated manner, due to an involuntary imitation process (ESW3, 87–88).

According to Manovich, the psycho-engineer Eisenstein is confident of discovering a set of emotional stimuli, which applied as a montage of attractions would correlate with “a script of the emotional responses of viewers” (Manovich 1993, 27–28). Indeed, it appears Eisenstein's systemic treatment of montage of attractions explicates a parametric systems thinking, where any phenomenon as a whole is constituted on a complex interaction of its integral parts. He views the organization of montage attractions as a kind of miniature model, or “a molecular (i.e. compound) unity of the *effectiveness* of the theatre and of *theatre as a whole*” (ESW1, 34). People, objects, and themes are constituted of a multiplicity of features, which also involve an interplay of conflicting or opposing moral, emotional, or perceptual forces. The dynamic aspects of the different features that characterize Eisenstein's hero in his essay ‘Montage of attractions’ (1923) are described as *not distinguishable*. This means that the features that make someone appear, for example, ‘noble’, are inevitably dissolved into other features such as erotic behavior, thus to some extent morally ambivalent effects, of the character (ESW1, 33–38).

While dynamic, ‘natural’ complexities are generally recognized in prevailing systems thinking as difficult to differentiate from the whole, here Eisenstein may be argued to echo also Klages. Cartney's interpretation is the following: “The constellation of the driving-forces constitutes the personality, and these driving forces are as diverse and multiform as life. The drive is manifest as an urge that issues in a movement, and that movement is generated under the influence of the non-conceptual, vital experience of a power to which Klages has given the name symbol. The driving-forces are polarized, for a drive that has its source in an excess of energy (thus entailing an impulse to discharge energy) must be contrasted with the drive that arises out of a lack of energy (which will give rise to the attempt to recoup energy)” (Cartney 2001). Yet again the Hegelian dialectics of opposing forces, the Bergsonian *élan vital*, the German organicism, and the Eastern philosophy of Yin and Yang mix into a complex philosophical worldview, the ingredients of which may also be traced in Bogdanov's tektology of harmony-driven general systems.

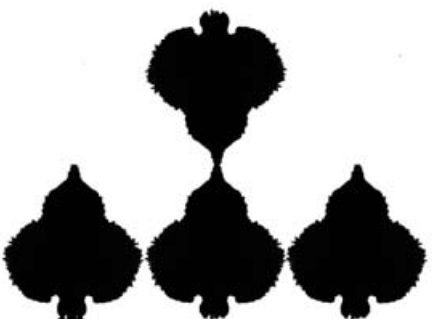
4.3.2.7 Creative thought and laughter

In the early twenties Eisenstein was influenced by the mystically-oriented view that art, and thus also laughter, functioned “as a mediator between life and higher spheres” (Bulgakowa 1998, 33). These mystical views were advocated amongst the Freemasons and Rosicrucian members, for example, Arensky and the Proletkult theater director Valentin Smyshlyaev (Ibid. 17). This thinking seems to surface in Eisenstein's later studies on primitive thinking and art as a mediator between sensuous and logical thought (ESW3, 38; ECOL, 278). It is also in accordance with Vygotsky's idea of a dialectical interaction of polarities, which found their embodiment in the works of art (section 4.3.3.2).

In 1920 Eisenstein first attended secret meetings of a forbidden Masonic lodge and then joined a secret group of the Rosicrucian order (Bulgakowa 1998, 15). Its archbishop Boris Zubakin, in his civil appearances, lectured in the army clubs about many subjects, including the French philosopher Henri Bergson (1859–1941) and his theory of laughter (Ibid.). Bergson's ideas on ‘movement as heterogeneous and indivisible’ were described in *Matter and Memory* (1896) and on the experience of real movement as a process through the body in *Creative Evolution* (1907) (Widdis 2003, 70–71). His writings, which had been published in Russia during the two first decades of the century, influenced the intellectuals of the avant-garde and formalist movements (Ibid. 70, 210n50), among them Eisenstein.

In *Laughter* (1900) Bergson emphasized comic experience emerging as a physiological relief from automated routines or material causalities (the man-automaton, or the puppet on strings). Furthermore, “a situation is invariably comic when it belongs simultaneously to two altogether independent series of events and is capable of being interpreted in two entirely different meanings at the same time” (Bergson 1900, 18). Noel Carroll lists the earlier release/relief theories of laughter in his essay ‘On Jokes’ (2001). Bergson's ideas of creative evolution and his interest in the phenomenon of laughter may arise from Herbert Spencer's earlier contribution to the field with his book *The Physiology of Laughter* (1860) (Carroll 2001, 327). Laughter was also discussed in Theodore Lipps's *Komik und Humor* (1898) and J. C. Gregory's *The Nature of Laughter* (1924) (in Carroll 2001, 434n4). An important figure in Eisenstein's life since his teens, Sigmund Freud advocated laughter as a physiological relief in *Wit and its Relations to the Unconscious* (1916). According to Carroll, Freud's relief theory of comedy suggests that “the energy that would have been spent inhibiting, thinking, and emoting in certain context is freed or released by the devices of jokes, comic, and humor, respectively” (Ibid. 318).

Bergson's organic philosophy remained popular in artistic circles, even though it was considered a philosophical rival to Hegel, this perhaps due to similarities in organic holism ideas, as suggested in Keith Pearson's *Philosophy and the Adventure of the Virtual* (2002, 17, 99). Pearson's research points out that “the (internal) difference” within the One, which Gilles Deleuze (1999, 51, 53) reads in Bergson's philosophy, is also found in Hegel (Pearson 2002, 99). It may be remarked that this Hegelian “com-



prehension of how the One came to the decision to determine itself” (Hegel 1995, 416 in Pearson 2002, 99) also constitutes the principle of Bogdanov’s self-regulating complexities.

In Eisenstein’s era, Bergson’s laughter in particular lingered. It may be traced to the former Commissar of Enlightenment, A. V. Lunacharsky’s article (1931) on the Soviet humorists Il’f and Petrov: “Laughter can be extremely serious, because at the same time as it amuses, it destroys (...) Not for nothing the French say that laughter is murder” (Lunacharsky in Nesbet 2003, 165). Nesbet draws a link to Eisenstein’s manuscript of 1935, which confirmed the power of laughter as a tool for fighting State enemies: “Laughter is simply a light weapon whose strike is as deadly and which can be deployed where there is no sense in bringing in the all-crushing tanks of social wrath” (Eisenstein in Nesbet 2003, 165).

The principal metaphor of the stream of thought connected Bergson’s ‘intuitionism’ with James’s later ‘radical empiricism’ also in their contemporary academic environment; for example, Walter B. Pitkin in his essay ‘James and Bergson: Or, Who is Against Intellect?’ wrote: “Professor James can find much in Bergson’s pages echoing his own sentiments. Like him, Bergson opposes every static view of reality, stands out for genuine freedom and continuous creation in a flowing world” (Pitkin 1910, 225). In *Time and Free Will* (1889) Bergson argued that flow of thought is recognized as being continuous, which resists mathematical reduction and may only be accessed “by intuition, not through separate operations of instinct and the intellect” (Bergson 1889). When discussing his ideas on the inner monologue, Eisenstein pointed out that, for example, the founder and stage director of the Moscow Art Theatre Konstantin Stanislavsky (1888–1999, VI, 543) drew his discussion about the ‘mind’s inner seeing processes as a film’ actually from Bergson. Eisenstein continues with a citation from another unidentified³⁰ author: “Bergson has described the stream of consciousness as an interior cinema” (in Bohn 2003, 287). Bergson explicitly did not appreciate the flow of cinematic narrative, considering it a mere artificial or false movement that could not provoke the real, bodily perception of duration (Widdis 2003, 70–71). Yet, according to Eisenstein’s note from 1939, it is Eisenstein alone who realized that this may be revised: the construction of a film is an act of copying this inner stream of consciousness (RGALI 1923–2–1159, 9, in Bohn 2003, 286–287).

The Bergsonian views on time and movement were recycled amongst the Soviet filmmakers and critics (Widdis 2003, 70–71). However, the systemic thinker in Eisenstein never surrendered to the pure ‘intuition’ suggested in the Bergsonian line of thinking. Instead, Eisenstein relied on formal (calculated) montage composition as the key to the domain of emotional experience.

It may be sensed that Bergson’s idea about the separated domains of art as practice and science as general, which was similar to the aesthetic view of Hugo Münsterberg, for instance, (Carroll 1996, 297) was rejected by Eisenstein. Bergson’s theory of laughter does not offer an objective view to what is funny in all plausible times and

³⁰ According to Bohn, the original reference is unreadable in Eisenstein’s note dated March 18, 1939.

places, Eisenstein argues in his essay on Chaplin’s method of comedy ‘Charlie the Kid’ (ESW3, 246). According to Eisenstein, philosophers like Kant and Bergson and their works were interesting as “personally and socially grounded documents of an epoch” but not as objective descriptions of the fundamentals of particular aspects of human life, such as “hilariously tiny areas of discussion” (ESW3, 246). This perhaps relates to Eisenstein’s idea about art as a scientific instrument for scrutinizing the unconscious, emotional aspects of life. On the contrary, Kant, Bergson, and particularly Münsterberg considered art as an isolated domain, outside of space, time and causality (Carroll 1996, 297–298).³¹ Eisenstein, in turn, grew together with the Proletkult’s ideological message of art as the creative force of participation and a means of changing the world. When Eisenstein titled his mature holistic essay of 1945 as *Nonindifferent Nature*, he may have wanted to contrast this dichotomy between art and world that was explicated in the Kantian notion of aesthetic disinterestedness. This concept is discussed in Noel Carroll’s essay on ‘Film/Mind Analogies: The Case of Hugo Münsterberg’ (1996, 300). According to Richard Taylor, Eisenstein rejected the idealistic views of Kant and Bergson in his book on *Direction* (‘The Soldier’s Return from the Front’) (Taylor in ESW3, 87n11).

Eisenstein’s later apparently anti-Bergsonian attitude is consistent with Marxist-Leninist dialectical practice: the objective dimensions of philosophical views have to be applicable to pragmatic purposes at any time. More particularly, he is in accordance with Lev Vygotsky, who seemingly rejects Bergsonism due to its strong emphasis on the preconceptual automatics of the biological body as the basis for aesthetic experience (Vygotsky 1971). Vygotsky’s dialectical focus argues for a socially conditioned emotional experience, based on interaction dynamics between the individual’s development and her historico-cultural environment. In fact, Vygotsky divides the field of psychology into two camps. The one heads towards subjectivism and Bergsonism, while the other, which Vygotsky prefers, emphasizes the objective psychology exemplified in American behaviorism, German *Gestalt* psychology, reflexology, and Marxist psychology (Ibid. 19). This is also the path Eisenstein follows, naturally flavored by his interest in Freudian psychoanalysis and the unconscious dimensions of the mind.

4.3.2.8 Towards the realm of the image

The lectures that Eisenstein held in Europe on his way to the USA (with the purpose of studying the most recent sound technology) may summarize the theoretical foundations laid during the twenties. They also indicate Eisenstein’s orientation towards the

³¹ Interestingly, the philosophical discussion in Kant (*apprehensio and comprehensio*) about the domains of imagination and rationality extends, via Bergsonism and the brain as a ‘pure interval’ or ‘gap’, to Deleuze, who continues it in his reinterpretation of Eisenstein’s thinking (see e.g., Lambert 2000, 263). The latter discourse involves a conceptualization of formlessness, sensory-motor unity, subject as whole, the intercerebral interval between stimulus and response, etc.

artistic image, not as a mere material of pictures but as “material into which the inner stage of expressive movement is inserted – not as a motor process, but as the process of interaction between layers of consciousness” as Eisenstein in 1947 retrospectively described in ‘*Conspectus of Lectures on the Psychology of Art*’ (ECOL, 230).

In October 1929 Eisenstein lectured in the Berlin Psychoanalytic Institute, invited by Hanns Sachs. The lecture handled ‘Expressive movement’. Alas, Eisenstein revived his theoretical considerations introduced in the 1923 essay for Meyerhold, and which were further elaborated in ‘montage of film attractions’ in 1924 (Bulgakowa 1996, 87).³² Characteristic to Eisenstein was that he returned to the same issues from different perspectives; here also Eisenstein must have had reason to renew his interest in an issue he had not touched for a while, as noted by Bulgakowa (Ibid. 87–88). Among others, the *Gestalt* psychologist Kurt Lewin attended Eisenstein’s lecture; soon Eisenstein received an invitation from Wolfgang Köhler to lecture in the Berlin Psychological Institute (Ibid. 85–86). Lewin posited Eisenstein amongst the scientists of psychology, regarding his “theory of expression in higher esteem than any psychologist’s work on the subject” (Eisenstein Archive, 1923–1–1908,1; cited in Bulgakowa 1998, 99, 249n134) (see page 26; section 4.3.5).

In November 1929 Eisenstein held another lecture at another Film Society, this one in London. Basil Wright, as with the rest of the audience, was surprised at the theoretical content of the lecture (Seton 1974, 143).³³ Cinema corresponds to science based on philosophic and higher mathematical considerations (Wright and Isaacs in Seton 1978, 143). “He talked about the Japanese kabuki plays, about William James, Darwin, [Ludwig Klages], Toulouse-Lautrec, Daumier; About Kenyon’s proposition that two opposite reactions can be provoked by the same stimulus; about Duchenne’s conclusion of the muscular movements, ‘L’action musculaire *isole* n’existe pas dans l’expression humaine’; about du Terrail’s *Rocambole*, le Blanc’s *Arsène Lupin*, about Stefan Zweig, Zola, [Ben Jonson] and James Joyce” (Wright in Seton 1978, 143).

Consequently, only a fraction of Eisenstein’s arsenal of cinematic thinking could be brought to light during the lecture. Even so, the list reveals Eisenstein’s momentary emphasis: the keys to the method of picturization are reached through a dialectical reinterpretation of logical and emotional. Eisenstein’s dialectical synthesis of art and science comes into being in his theory of a new form, *picturization* – “not symbolic but vital and picturesque”.

“The method of expression purely dynamic, like music, but not so impressionistic as music (...) Sound will enter in as one of the elements of the new montage system. The different elements of art are not opposite; the essential thing is to find out the law belonging to ALL forms of impression and expression, and to demonstrate how they change their aspects only from one aspect to another. Montage in all its aspects

³² According to Bulgakowa (1996), up to the present no written document on the lecture held in the Psychoanalytical Institute in Berlin has been found.

³³ ‘Eisenstein’s Lectures in London’ is a reconstruction by Basil Wright and Jack Isaacs, B.B.C., Third Programme, 17 December 1949. (Seton 1978, 143n1)

is derived from one and the same principle...” concludes Eisenstein’s lecture, according to the reconstruction of Basil Wright and Jack Isaacs’s lecture notes (in Seton 1978 Appendix 2, 485).

Yet another lecture at the University of Cambridge covered the topic of *Psychology of Art*. It becomes clear that in 1929 Eisenstein is in the process of depicting a unified systemic whole, the synthesis of art and science, or that of impression and expression; he is set to research and discover the organizational principles and laws that define the dynamic relations of the psychophysiological oneness of experience – in the formal composition of cinema montage as an artistic image.

4.3.3 DIALECTICS IN PSYCHOLOGY

In line with the implementation of Marxist dialectics in the field of psychology, and, in the wider scope, of building all Soviet sciences anew according to Marx’s social systemic ideas, body-based reflexology was eventually challenged (Manovich 1993; Bordwell 1993, 128).

The head of the 1923-founded Psychological Institute of Moscow and a leading figure of the ‘Dialecticians’, Konstantin Kornilov outlined a “Marxist dialectical psychology as a synthesis of consciousness and reflexology” (Janousek & Sirotkina 2003, 440–41; Bordwell 1993, 128; Cole 2000). The following year in the Second Russian Psychoneurological Congress (1924), the former schoolteacher Lev Vygotsky argued “human consciousness to be a fundamental problem in the psychology of behavior, claiming that it cannot be understood through the study of reflexes” (Manovich 1993, 25–26). This was in agreement with Kornilov’s apparently energetics-inspired ‘reactology’, in which the invested mental effort was assumed to correlate in reverse to the strength and time spent on the simple motor response (Luria 1979, 30).

The approach to the human mind in the twenties has been shown above to draw from the systemic thinking of the era. Thinking retrospectively, Lev Manovich in *Engineering Vision* portrays Vygotsky as one of the forerunners of modern cognitive psychology (Manovich 1993, 25–26).

Around 1925–26 Eisenstein met Luria (Bulgakowa 1996, 258n189). As a frequent visitor to the Moscow Neurophysiological Clinic, Eisenstein witnessed, and one may argue also participated, in the intellectual process where Luria’s experimental work and Vygotsky’s socio-cultural dialectics gradually merged. Vygotsky and Luria with their colleague Alexei Leontyev set out to explore the new kind of ‘cultural’, ‘historical’, or ‘instrumental’ psychology (Luria 1979, 44). In Luria’s own words, the ‘troika’ sought to discover “the way natural processes such as physical maturation and sensory mechanisms become intertwined with culturally determined processes to produce the psychological functions of adults” (Ibid. 43).

Established in the three principles of Engels’s philosophical dialectics, “the transfor-

mation of quantity to quality, the interpenetration and struggle of opposites, and the negation of the negation”, Marxist consciousness studies described “a ‘property’ of the most highly organized matter known to science, the human brain” (Bordwell 1993, 128). Consciousness represented the internalized modes of behavior from one’s social environment (Cole 1979). Marxist discourse brought into focus also the topics of motives, personality, and socially and culturally determined human nature (Janousek & Sirotkina 2003, 440–441).

Vygotsky outlined the dialectics of Marxist psychology in his article ‘The Historical Meaning of the Crisis in Psychology: A Methodological Investigation’ (1927) as calling for dialogue between the empirical and phenomenological, or the ontological and epistemological methodologies: “Dialectics covers nature, thinking, history – it is the most general, maximally universal science. The theory of the psychological materialism or dialectics of psychology is what I call general psychology. In order to create such intermediate theories – methodologies, general sciences – we must reveal the *essence* of the given area of phenomena, the laws of their change, their qualitative and quantitative characteristics, their causality, we must create categories and concepts appropriate to it, in short, we must create our *own Das Kapital*” (Vygotsky 1927, Ch. 13; emphasis by L.V.). If aesthetics belongs to the domain of psychology, then one may link Eisenstein taking up the project of filming Marx’s *Das Kapital* to Vygotsky’s (1927) challenge to Marxist psychology to write the *Das Kapital* of psychology.

4.3.3.1 Psychology of Art

When Eisenstein met Vygotsky around the year of his *Battleship Potemkin* (1925), his theoretical outlines of expressive movement had already appeared in the article ‘Montage of Film Attractions’ (1924). The two men remained friends until Vygotsky’s death in 1934.

Vygotsky’s sociocultural theory also shaped Eisenstein’s conception of cinema as the psychological laboratory of an emotional mind. The margins of Eisenstein’s personal copy of Vygotsky’s manuscript *The Psychology of Art* was filled with Eisenstein’s remarks, and all sentences that discussed the conflict of form and content were underlined (Bohn 2003, 68–69). As a personal friend Eisenstein had a private window into the processes Vygotsky went through when developing his ideas on aesthetics and arts. It is known that Vygotsky reworked the manuscript during 1925–1928, but it was published only posthumously forty years after its completion.

Ivanov in his commentary on *The Psychology of Art* notes that by integrating the knowledge of the methods of contemporary science, Vygotsky as well as Eisenstein “succeeded in avoiding involvement with the purely syntactic side of a work of art (i.e., the side that characterizes only its inner structure), which was characteristic of many theoretical and practical experiments in various art forms in the twenties” (Ivanov 1971, 275n15). Vygotsky’s systemic view was exposed, for example, in his interpretation of narratives in the early 1915 draft for *The Tragedy of Hamlet, Prince of Denmark*,

by *W. Shakespeare* (1916), which suggested that instead of the main character being in control of his own decisions (good or bad) it was in fact the plot (the authored system) that executed control over the fate of the main character (Ibid. 270n1).

Ivanov’s early article on semiotics and human sciences in 1964 had already noted that Vygotsky in *The Evolution of the Higher Mental Processes* “coincided with the contemporary ideas on the role of semiotics (sign systems) in human culture. But even in contemporary semiotics and cybernetics, despite the interest in problems of control and self-governing, no one understood the leading role of sign systems with as much emphasis as did Vygotsky” (Ibid. 270n2). This linkage to later cybernetic studies on creativity is also of interest to this treatment. Ivanov further refers for example to the cybernetic studies of A. N. Kolmogorov’s essay *Automata and Life* (1963). Vygotsky’s ideas on the interaction between the subconscious and conscious domains to feedback and control are expressed in the relationship between the conscious and the subconscious: “material from natural language and other higher forms of mental activity, which first became automatic (subconscious) and then can again be recognized (in other words, the possibility of controlling these subconscious behavioral programs appears)” (Ivanov 1971, 295n56).

Vygotsky also argued that “the higher cognitive functions are qualitatively different from the lower physiological processes and require different investigative approaches” (Manovich 1993, 25–26). In 1947 Eisenstein in his essay ‘The Psychology of Composition’ echoes this when he emphasized the ‘well known fact’ in psychophysiology that the qualitative differences between individuals, such as the healthy-abnormal dichotomy, can be observed in *quantitative* differences such as exaggerated behavior in comparison to normal behavior (ECOL, 273–274). Eisenstein deliberately draws his psychopathological example from the domain of cinema; he celebrates the film *Spellbound* (1945) by Alfred Hitchcock as excellently depicting “the story of a man controlled by obsessive ideas” – a film that reconstructs the abnormal inner state of psychosis (ECOL, 274). This is here viewed as relating to Eisenstein’s general idea of film as a model or analysis method of mental processes comparative to the means of psychology.

Vygotsky devoted a great part of his work to studying the dialectical relationship of intellect and emotion, and later he studied especially Spinoza’s approach to passions (Ivanov 1971, 268, 270n4). In his organic dynamics of the arts he enjoyed harnessing Spinoza’s lines: “That of which the body is capable has not yet been determined” (Vygotsky 1971, 259). Vygotsky’s systemic approach to human psychology thereby influenced Eisenstein’s own elaborations, as he constructed the theory of embodiment of emotional theme as the core of the authoring process (ECOL, 262).



4.3.3.2 Dynamical elements of the arts

In Vygotsky's psychological dialectics, art (experience) as a socio-cultural and biological system enables an individual subject to systemically organize emergent conflicts with the world (1971, 258). This requires active construction: in the process of experiencing the artwork "one must creatively overcome one's own feeling and find one's own catharsis" (Ibid. 248). The notion of *catharsis*, adapted from Aristotle, implies that the artistic experience relates to everyday perception, emotion, and imagination.

For Vygotsky there always exists a dominant, which structures the artistic whole of a narrative, painting, or poem. Eisenstein on the other hand seems to have abandoned this notion in favor of his organic methods of montage in 'The Fourth Dimension in Cinema' (1929). He reflects upon the dynamic, multidimensional spatial organization of montage composition: "The 'aristocracy' of unambiguous dominants was replaced by the method of 'democratic' equal rights for all the stimulants, viewed together as a complex" (ESW1, 182). Eisenstein continues highlighting that the dominant, though being the most powerful element, is accompanied by a range of other stimulants, such as texture, light, race and nation, and social class, all having an affect on the cinematic complexity (ESW1, 182).

The notion of *dominant* is indebted to the dominant in structural linguistics, philology and Russian Formalism (Vygotsky 1971, 157; Ivanov 1971, 279n35). For example, in Boris Eikhenbaum's *The Melody of Verses* published in 1922 or in his essay published around 1926 on 'Theory of formalism', the notion of dominant describes the principle of stylistic organization of the rhythmic-syntactic poetics of melody (Ivanov 1971, 279n35; Eikhenbaum in Pesonen & Suni 2001, 80).

Vygotsky's genetic law of cultural development argued for two simultaneous development phases of a psychological function: the social 'outer' intersubjective domain and the psychological 'inner' domain (Janousek & Sirotkina, 442). The dialectical dualism of art means a simultaneous contemplation of the true situation and deviation from it (Vygotsky 1971, 258). Catharsis involves both the processes of perceptions of pleasure and pain, contrasting the reality-based situatedness with its deviations. Vygotsky adopts the view that, for example, comedy and tragedy are not aesthetic elements, but psychological ones – they belong to the sphere of life in general (Ibid. 233). This idea is echoed in Eisenstein's thinking as discussed earlier. While Vygotsky also rejected Bergson's widely circulated theory of laughter, the two do share some common ground. Vygotsky apparently accords with Bergson in confirming that it is the differentiation from the conventional ways of social life that makes something that happens to "the *dramatis personae*" funny and aesthetic as an experience (Volken-shteyn 1923, 153–156; in Vygotsky 1971, 233). This may relate to Freud's theory of laughter, and earlier classical theories of art, as suggested in Carroll (2001, 327).

"By analyzing the structure of the stimuli we reconstruct the structure of the reaction" (Vygotsky 1971, 24). Vygotsky summarized the following formula: "from the form of the art work through the functional analysis of its elements and structure to the reconstruction of the aesthetic reaction and the discovery of its general laws" (Vy-

gotsky 1968, 39–41; in Manovich 1933, 25–26). This penetrates the whole execution of Eisenstein's psychological method as well. According to Manovich, "the given was the existing works of art and the unknown was the laws of aesthetic reaction. As we have already seen, for the artists, designers, and film directors of the time the formula was reversed. If for the psychologist Vygotsky, visual works represented a reservoir of knowledge about the human mind, artists, on the contrary, were hoping to utilize the objective psychological knowledge in order to create visual works which would produce predetermined responses in the viewer" (1993, 25–26). Eisenstein exemplified one of these psychoengineering artists.

Vygotsky recognized the correspondence to Sigmund Freud's *Fundamental Psychological Theories in Psychoanalysis*, which promoted the idea of art as mediating between the principle of reality and that of pleasure, as well as to other theoretical standpoints as suggested earlier (Vygotsky 1971, 247). Freud's emphasis on not differentiating the individual psychology from the social is also adopted by Vygotsky (1971, 17). However, in clarification, Vygotsky argues the social aspect of human individuality must be separated from the collective psychology (Ibid.). In this connection he also refers to the study *General and Experimental Psychology* by A. F. Lazursky (1925, 240) (Ibid. 247). According to Gloveli, Bogdanov also acknowledged the classification of personalities of this disciple of Bekhterev (Gloveli 1998, 90).

N. F. Chuzhak's popular concept of 'life-building', which was applied in the manifestos of the Leftist movement (Manovich 1993), seems to be in accordance with Vygotsky's dialectical psychology of art. He cites Chuzhak (1923): "reality is forged from the establishment and destruction of contradictions" (Vygotsky 1971, 259). "By making opposite impulses collide, [the artwork] destroys the affect of content and form, and initiates an explosive discharge of nervous energy" (Vygotsky 1971, 215; cited in Bordwell 1993, 128).

Higher nervous energy was one of the key words in the biopsychology discourse of the twenties. In 'The Dramaturgy of Film Form' (1929) Eisenstein's montage cell, which breaks out of its rectangular prison, followed the prevailing pattern of biophraseology (ESW1, 166), which drew also from the organic cell metaphor applied in Engels and Lenin (Bordwell 1993).

The mature Eisenstein echoed Vygotsky's dynamical dialectics of art, when his essay 'The music of landscape' in *Nonindifferent Nature* (1945) discussed the social usefulness of art: "while appearing as forms of harmony, they incandesce the striving inherent in the people to create a similar harmony in the actual reality of their social existence and environment" (NIN, 369). Moreover, the mature Eisenstein seems also to have returned to Bogdanov's general science of organization and his idea of social equilibrium: "However, their final social value is determined by whether they summon such creations to an immersion in the contemplation of possible harmony and inactive dreaming about it, or they summon them to 'establishing,' really and actively, a harmony of social justice where there is a chaos of social contradictions" (NIN, 369).



4.3.3.3 Action theory

The developmental psychology of Vygotsky argued that any individual experience could not be separated from the social experience. His emphasis on socially conditioned intersubjectivity affected Eisenstein's montage considerations. While a kind of *shared, socially conditioned* psychophysiology of cinema emerged, which was constituted on the embodiment of intersubjectively recognized emotional themes, Eisenstein's focus remained that of an author. Cognitive interaction with the social environment of, firstly, the author, and secondly, the spectator, seemed to follow, each in their own right: the same yet undefined organic-dynamic formula of emotional embodiment. However, while the author carried the responsibility of selecting the theme, it was always socially conditioned.

When Vygotsky in *Psychology of Art* emphasized *social and collective* psychology, as opposed to *social and individual*, he also referred to Hugo Münsterberg (1863–1916) and his *Grundzüge der Psychotechnik* (1920). While Vygotsky's aesthetic approach acknowledged Münsterberg, it is not known if Eisenstein had read Münsterberg's *Photoplay: a psychological study* (1916). This work argued for a two-directional approach to film, that of aesthetics and of psychology: "*the photoplay tells us the human story by overcoming the forks of outer worlds, namely, space, time, and causality, and by adjusting the events to the forms of the inner worlds, namely, attention, memory, imagination, and emotion*" (Münsterberg 2002, 129; *italics by H.M.*). For Münsterberg photoplay appeared as a kind of interface or liminal space between the inner domain and outer domain, where these otherwise incommensurable domains could converge into oneness in the aesthetic experience of an art object. At least for Münsterberg they remained incommensurable, while for Eisenstein and Vygotsky, the unknowable sensuous domain could be studied using scientific methods because of their mutual grounding in the work of art.

In Allan Langdale's introductory interpretation of Münsterberg's *The Photoplay*, the physiology, perception, and mental functioning of the spectator belong to the psychological order, while the intrinsic formal, emotional and moral qualities of the artwork deal with the aesthetic aspects of cinema viewing (in Münsterberg 2002, 14). Vygotsky is more radical in his juxtaposition of *aesthetics from above* and *aesthetics from below*: the reciprocal interplay represents the two-directional processing of art, towards and from the body, as well as outwards and from the social and intellectual environment. Yet, Vygotsky accorded with Münsterberg's *Grundzüge der Psychotechnik* (1920), which had influenced also Soviet psychology, that historical aesthetics were connected with social psychology, and normative concerning the individual (Vygotsky 1971, 17–18, 25n19).

In *Psychologie der Kunst* (1923) R. Müller-Freienfels stated that even though a powerful artistic effect does not necessarily trigger action, it may elicit a high intensity of feeling (Vygotsky 1971, 211). Vygotsky links this with Münsterberg's idea that "isolation is an indispensable condition for aesthetic experience" (Ibid.). Isolation refers to a condition that emerges within the focusing of attention, voluntarily or involuntarily,

on the aesthetic stimulus alone, but does not lead to action (Ibid.). However, human action is the principal means of change in 'life-building', and Vygotsky together with the other Marxist dialecticians preferred to replace the passive elitist approach to aesthetics with an active psychological inquiry into creative processes. Vygotsky argued for the systemic features of art: "the Marxist approach to art, especially in its more complex forms, necessarily involves the study of the psychophysical effect of artistic creation. (...) Art systematizes a very special sphere in the psyche of social man – his emotions" (Ibid.). Vygotsky suggests a new method of art psychology, which he terms in Richard Müller-Freienfels's classification in *Psychologie der Kunst* (1923, 210)³⁴ 'an objective-analytic method': "the work of art, rather than its creator or its audience, should be taken as the basis for analysis (...) Here is the formula of this method: from the form of the work of art, via the functional analysis of its elements and structure, recreate the aesthetic reaction and establish its general laws" (Ibid.). Vygotsky's (1971, 24) objective-analytic method means that studying the laws governing the material system of the artwork enables the psychologist to infer the corresponding psychological laws. A sufficiently objective view of the artwork is thus gained by studying the functional relations between the elements and overall structure of the work; no involvement of the individual differences or particular psychological descriptions is needed.

Ivanov notes that Vygotsky's idea of the function of the sign system, especially that of language, as a *control system for behavior* is years ahead of its time, and may be seen as signaling the emerging new discipline of cybernetics (the science of control, communication and information) (1971, 266). In his later writings Vygotsky strongly emphasized that it is the social and historical aspects of the human aesthetic experience which has to be studied, not the biological (Vygotsky 1971, x; referring to Vygotsky [ed. Jakobson] 1936).

4.3.3.4 Emotions

"From image to emotions, from emotions to thesis," Eisenstein wrote in his 1930 essay 'The principles of New Russian Cinema' (ESW1, 199; in Bordwell 1993, 14). In 1947 Eisenstein's three-fold figurative formula, from the subconscious via the pre-logical to the logical domain, was indebted to many of his sources such as William James, Ludvig Klages, and the practitioners of Freudian psychoanalysis. Below is provided an overview of Vygotsky's approach to emotion. Vygotsky emphasized an active subject in interaction with the surrounding environment, thus rejecting the idea that art affects a passively responding subject.

³⁴ "In his systematic psychology of art, Müller-Freienfels closes his theory of aesthetic response with the remark that the position of the psychologist in this case resembles that of the biologist who can decompose an organic substance into its chemical components but is unable to reproduce the whole from its parts" (Vygotsky 1925).

For example, Christiansen's theory of art is limited because the subject is assumed one-directionally to be affected by external emotional stimuli: "The aesthetic response therefore reminds us of piano-playing: each element of a work of art strikes a corresponding emotional key in our organism which produces a tone. And the entire aesthetic reaction is made up of emotional impressions arising in response to the 'keys'" (Vygotsky 1971, 206). This argument also relates to the early synesthetic theories of artistic experience (e.g. Vasily Kandinsky 1911, as discussed in section 4.3.4.3).

While Christiansen fails to explain how these elements produce the psychic reaction, instead, the theory of *Einfühlung* (empathy) developed by Theodore Lipps, who influenced also William James, reverses the process: the subject introduces the emotional tone to the artwork (Vygotsky 1971, 207). According to Vygotsky, Lipps augmented the emotional experience by juxtaposing the domain of symbolic or mental forms and bodily expressions: Lipps's theory shows how "we rise with an ascending line, fall with a descending line, bend with a circle, and so on" (Ibid.). These ideas accord with Eisenstein's ideas on embodiment of form in the plasticity of movements.

Vygotsky argues that one of the fundamental problems in the psychology of art is "whether emotion is only a waste of psychic energy or whether it has some value in an individual's psychic life" (Ibid. 202). The art psychologist Dmitri N. Ovsianiko-Kulikovsky argues that emotions conflict with the principle of economy of energy (Ibid.). He differentiates between feeling and thought, and Vygotsky links him to William James. Interestingly, for Vygotsky, feelings cannot be unconscious, but thought can. This means that feeling is recognized and acknowledged as a particular kind of feeling in the conscious attention of the bodily experience (Ibid. 201). Vygotsky's objective was to describe emotions as dynamical aspects of nervous processes (Ibid.). If so, Vygotsky also follows James's differentiation between 'emotions' and 'feelings' of these bodily emotions: if 'feeling' is described as conscious, then perhaps the notion of 'emotions' or 'emotional thought' is to be understood as a Jamesian conceptualization of an unconscious, sensorimotor mapping of body states.

Towards concluding *The Psychology of Art* (1925) Vygotsky sounds much like Bogdanov in his analysis of dialectical forces in a continuous striving towards equilibrium. The text is cited in sufficient length in order to show the intrinsic systemic logic in Vygotsky's text. "Apparently the possibility of releasing into art powerful passions which cannot find expression in normal, everyday life is the biological basis of art. The purpose of our behavior is to keep our organism in balance with the environment (...). The more subtle and complex the interaction between organism and environment, the more devious and intricate the balancing process. Obviously this process cannot continue smoothly toward equilibrium. There will always be a certain imbalance in favor of the environment or the organism. No machine can work toward equilibrium using

all its energy efficiently. There are always states of excitation, which cannot result in an efficient use of energy. This is why a need arises from time to time to discharge the unused energy and give it free rein in order to reestablish our equilibrium with the rest of the world" (Vygotsky 1971, 246). As with I. Orshansky (1907, 102) on artistic creativity, feelings 'are the pluses and minuses of our equilibrium', and "these discharges and expenditures of unused energy", Vygotsky adds, "are the biological function of art" (Ibid.).

Vygotsky's 'cathartic' effect of art relates the above views on the physiology and psychology of labor with the economist and anthropologist Karl Bücher's (1847–1930) *Work and Rhythm* published in 1923 (Vygotsky 1971, 245). Bücher, who is often referred to by the Marxist theoreticians and was also Bogdanov's source of reference, studied the meaning of rhythm in the work process by analyzing work songs. He established the interdependence and common origin of music and poetry in heavy physical labor (Ibid.).

To some extent Vygotsky's description of the dynamical meaning of art in the social context may be seen to reflect the Bogdanovian kind of systems equilibrium, as well as the related thermodynamics and energetics. As discussed earlier (section 4.2.2), systems theoretical views are fundamentally embedded in the Marxist ideology of building a New Soviet Man.

4.3.4 UNCONSCIOUSNESS

4.3.4.1 Psychoanalysis

Sigmund Freud (1856–1939) and his theory of psychoanalysis had a great influence on Eisenstein's intellectual era. It also fundamentally shaped Eisenstein's thinking.

Freud's essay *Leonardo da Vinci and Memory of his Childhood* (1910) captivated the twenty-year-old Eisenstein, himself also a 'motherless' and inhibited child, raised by his 'dominating father' — for the rest of his life (Bulgakowa 1998, 11). According to Bohn (2003), Bulgakowa (1998) and Nesbet (2003), Eisenstein's diaries explore Freud's ideas on bisexuality and the unconscious. Comics, cartoons, and caricatures, which had fascinated Eisenstein since his childhood acquaintance with Honoré Daumier's drawings and circus, had to also surrender to the psychoanalytical point of view. Eisenstein's exhibitionistic ego caught himself often entertaining his friends with his humoristic drawings, jokes, eccentric clown-like gestures and playfulness. Yet, his humor was often dark and sexually provocative, characterized by perverse or sadomasochistic aspects. A customs officer once opened Eisenstein's bag in a routine check and



encountered a quantity of erotic and pornographic material, “the vilest stuff they’d ever seen,” according to Upton Sinclair’s correspondence in 1950 with Marie Seton (Seton 1978, 516). Eisenstein was also familiar with Eduard Fuchs’s study *The Erotic Element in Caricature: An Essay on the History of Public Morality* (1904). The researchers report on details such as the first impressions from the books and illustrations in his parent’s library, e.g. the Marquis de Sade; the fascination Eisenstein had with the guillotine since reading at the childhood a historical description of the French revolution; and so on.

According to Bohn, the main characteristics of Eisenstein’s method was to adapt predetermined cultural elements or forms to his aesthetic or artistic works by re-formulating them in terms of the prevailing theoretical views, for example, psychoanalysis and evolution theory (Bohn 2003, 252). Freud’s *Beyond the Pleasure Principle*³⁵ published in 1923 thus served as a guide to the unconscious, grotesque, and weird pleasures. Found (and in this aspect predetermined) objects functioned as intellectual stimulants for Eisenstein’s figurative philosophy. The category of found objects involved everything that had inspired Eisenstein, “not only objects *per se*, but also memories, texts and images form all kinds of sources, ranging from medieval manuscripts to advertisements in *Life* magazine” (Nesbet 2003, 14). Yet, it was the active process of modifying and re-formulating the existing elements that fascinated Eisenstein, not only in his personal life but also in his artistic work and in theory construction. In a public meeting with a French audience, Eisenstein defined the difference between the surrealists’ scientific project of ‘exposing’ the subconscious and his method of ‘exploiting’ the subconscious (Nesbet 2003, 13; Bordwell 1993, 119). In his scientific work Eisenstein was not only a discoverer but always embodied an active re-creator of the issues under scrutiny.

Freud’s theoretical approach seemingly applied the dynamical dialectics that had characterized more widely the early Soviet scientific field and fascinated, among others, Eisenstein, Vygotsky, Luria, and Bogdanov. The dialectics is exemplified by Freud’s argument in his lecture on ‘Psychology of Errors’: the purpose of a “dynamic conception of mental phenomena” is not “to describe and classify the phenomena, but to conceive them as brought about by the play of forces in the mind, as expressions of tendencies striving towards a goal, which work together or against one another” (Freud 1938, 60).

Christfried Tögel’s article ‘Lenin und Freud: Zur Frühgeschichte der Psychoanalyse in der Sowjetunion’ (1988) suggests that the situation of the proponents of psychoanalytic theory became worse only after Lenin’s death, because for Lenin psychoanalysis

35 “In so far as conscious impulses always have some relation to pleasure or unpleasure, pleasure and unpleasure too can be regarded as having a psycho-physical relation to conditions of stability and instability. This provides a basis for a hypothesis into which I propose to enter in greater detail elsewhere. According to this hypothesis, every psycho-physical emotion rising above the threshold of consciousness is attended by pleasure in proportion as, beyond a certain limit, it approximates to complete stability, and is attended by unpleasure in proportion as, beyond a certain limit, it deviates from complete stability; while between the two limits, which may be described as qualitative thresholds of pleasure and unpleasure, there is a certain margin of aesthetic indifference. . . .” (Fechner 1873; in Freud 1920, 5)

seemingly represented one phenomenon amongst many in Lenin’s scientifico-cultural pluralism. A Soviet alternative to Freud was Dmitri N. Usznadze (1886–1950), who proposed a theory of unconscious attitude [*ustanovka*] (Janousek & Sirotkina 2003, 441).³⁶ Wolfgang Köhler in *The Gestalt Psychology* (1929) refers to Usznadze’s *Psychologische Forschung* in connection with the discussion on the similarities between the experiences perceived through different sense organs (Usznadze 1924, 24; Köhler 1929, 186). Both researchers assume that the features of subjective experience expose the correlation between the multisensory, unconscious experience and the ‘objective’ features, as shown in Köhler’s experiment with the nonsense words ‘takete’ and ‘maluma’, to be discussed later in this chapter (section 4.3.5.2).

Later, political hostility increased towards non-Marxist, alien, ‘bourgeois’ phenomena such as psychoanalysis, *Gestalt* psychology, or the Shpilreinian psychotechnics. In particular Freudian-oriented psychologists used reflexological views as an official shield, meaning they advocated their Freudian views as monistic, materialist, and dialectic (as discussed by the philosopher Bernard Bychowski) (Bohn 2003, 66–67; indebted to Etkind 1996, 284). In this hostile environment Luria camouflaged his psychoanalytical model upon which was built a materialist psychology (Cole 2000). Eisenstein also ceased to use psychoanalytical terminology and applied a ‘veil’ of reflexology (Bohn 2003, 66–67), while still in the twenties Eisenstein had publicly discussed his objective “to integrate Freud’s and Pavlov’s doctrines” (Bordwell 1993, 116n1). In 1929 Eisenstein’s diary notes three points of interest: “Dialectics, Reflexology, Freud” (Eisenstein RGALI 1923–2–1114. 62 in Bohn 2003, 65). The influence of psychoanalysis lingered in Eisenstein’s aesthetic ideas about the spiral structure of progression and regression (this was further developed in *Grundproblem* and in *Method* (Bohn 2003, 161).

Freud’s approach to jokes also inspired Eisenstein. Vygotsky considered Freud’s study that compared humor and wit (as a *social* phenomenon) with dreams (as *asocial* products of the mind) to be one of the best examples of psychoanalysis (Vygotsky 1971, 84). In Freud’s theory of laughter amusement emerges in three categories: “Jokes represent a saving of energy required for mobilizing and sustaining psychic inhibitions. The comic releases the energy that is saved by foregoing some process of thought. And, lastly, humor is defined in terms of saving of energy that would otherwise be expended in the exercise of the emotions” (Carroll 2001, 318). Here, the theory of the cognitive economy of emotions seems to play a role.

C. G. Jung’s *Psychologische Typen* (1912) also influenced Soviet psychology. As a reminder, Bogdanov had also studied Jung when developing his version of characterology (Gloveli 1998). Jung’s introverted and extroverted temperament types in humans were inspired by Pavlov’s research on conditional reflexes and on temperament types

36 The so-called ‘Freudomarxism’ combined Sigmund Freud with Marxism (Etkind 1996; in Bohn 2003, 66). The ‘Austromarxism’ of Otto Bauer (1882–1938), Max Adler (1873–1937), and others was explicated in Alfred Adler’s lecture ‘On Psychology and Marxism’ (1909), and the Freudian theorists Paul Federn (1871–1950), Wilhelm Reich (1897–1957) and Otto Fenichel (1898–1946) openly converged psychoanalysis with Marxism (Cassirer 1981, 260; Janousek & Sirotkina 2003, 444).

in animals. Jung's discussion (e.g. in *Wandlungen und Symbole der Libido* 1912) on archetypes, Mother's love and rebirth influenced Eisenstein (Bohn 2003, 235). His male and female concepts of Anima and Animus evoked Eisenstein's interest in Chinese Tao (Ibid. 135, 151). Eisenstein also studied Marcel Granet's *La Pensée Chinoise* (1934) (Ibid. 151). From 1935 Eisenstein elaborated on his idea of dual-unity, which consisted of female and male polarities, similar to those of Yin and Yang (original sources in Tao and The Upanishads) (Ibid. 181).

In *Ivan the Terrible* Eisenstein explicitly elaborated the bi-polarity of female and male elements (Ibid. 181). Androgyny, bisexuality, and hermaphrodites had inspired Eisenstein since his youth. In the United States Eisenstein became familiar with Walt Whitman, a controversial homosexual poet, whose (retrospectively) American transcendental philosophy was influenced by cosmology and unity of the sexes (Ibid. 184).

Eisenstein developed his ideas on creativity, arts, and myths, and the discussion on the relationship between art and prenatal traumatic experiences (Bohn 2003, 129). In Bohn's analysis of Eisenstein's aesthetic theory formation, Freud's student and collaborator Otto Rank's psychoanalytical ideas about the "pre-Oedipal" complex (challenging Freud with the term) and the regression related to the mother-child relationship had an important influence on Eisenstein's thinking. Rank's *The Trauma of Birth* was first published in Germany in 1924 (Ibid. 136). Rank suggested that art functions as an instrument to fight traumatic experiences and the fear of death. Psychoanalytical theorizing on a mother's love and birth trauma thereby constituted one of the principal themes for Eisenstein (Ibid.). He continued developing his idea of ecstasy as a return to the unifying oneness and nonindifferent nature of a mother's love (Ibid.).

In 1932/33 diary notes Eisenstein decided to change or camouflage his theoretical construction of 'art as regression' to that of 'art as synthesis': "instead of regression, regression of components, or spiral movements" (RGALI 1923–2–231, 5 in Bohn 2003, 110–111). Eisenstein also noted that neither Vygotsky nor Luria considered regression a fruitful elaboration (Eisenstein 1997/98, 24 in Bohn 2003, 110).

According to Bulgakowa's biographical account, Eisenstein met with the vice president of the French Psychoanalytic Society René Allendy, who had published an essay on the psychological values of the image in *L'Art cinématographique* (Bulgakowa 1998, 104). Allendy's interests being those of the subconscious, dreams and early forms of thinking, the conversations touched on French mysticism, and art as a form of ecstasy (Ibid.). For Eisenstein "art was a transitional stage that would only be necessary until the social body had secured its biological paradise" (Ibid.).

During his visit to America Luria wrote to Eisenstein having discussed Eisenstein's concept of 'Spiral' with Kurt Lewin: that is, experiments on behavior during crises in hypnoses that Eisenstein and Luria had conducted (Dec 3, 1928) with the help of the hypnotist and last president of the Soviet Psychoanalytical Society Yury Kannabikh (Bulgakowa 1996, 259n189). Eisenstein attended several

of Kannabikh's hypnosis treatments³⁷ (Bulgakowa 1998, 78–79). In the late twenties Eisenstein had also experimented with 'écriture automatique' (Bohn 2003, 66) and attended sessions with the psychoanalyst Aaron Zalkind (1888–1936) (Ibid. 119).

In the mid-twenties, Luria's article *Psychoanalysis as a System of Monistic Psychology* elaborated his experimental materialistic version of Marxist psychoanalysis. In the Introduction to Luria's *The Making of Mind*, Michael Cole notes that Luria's discussion is "clearly prophetic of both his own later work and those influential movements in psychology that attempted to incorporate psychoanalytic notions of motivation into experimental psychology" (Cole 2000). This attempt in 1925 to juxtapose Marxist psychology and psychoanalytical views, argues Vygotsky in 'The Historical Meaning of the Crisis in Psychology', failed, because Luria, paradoxically, tried to expel sexuality from Freud's views (Vygotsky 1927).

Vygotsky (1925) considered the study of the subconscious an important task for a new approach to a psychology of art. The subconscious and conscious exist in a continuous, lively, and dynamic interaction: "The objective facts (in which the subconscious reveals itself most clearly) are the works of art themselves" (Vygotsky 1971, 72). Yet, in order to gain a position as an objective scientific method, the psychology of art had to avoid the flaws of psychoanalytical theory. Vygotsky's critical comments in his *Psychology of Art* may here serve as an analysis of the positive and negative sides of psychoanalysis, this assuming that Vygotsky had an influence on Eisenstein's thinking. For Freud (*Psychological Essays* 1964) children's games and daydreaming fantasies were the two forms of subconscious manifestation that approached art and poetic creativity more closely than either dream or neurosis, as suggested by Otto Rank's *Der Künstler: Ansätze zu Einer Sexualpsychologie* (1918) (Vygotsky 1971, 73–85).

Vygotsky also cited Rank and Sachs from their *Significance of Psychoanalysis to the Mental Sciences* (1916): "A work of art is capable of performing this complex task, because at its incept it played the same role in the psyche of the artist that it played for the listener; i.e., it afforded the possibility of challenge and a fantastic satisfaction of the subconscious desires they share" (in Vygotsky 1971, 75). A mutual grounding is established in the creative process by consciously involving selected elements, which elicit "a sufficient number of associations with typical subconscious complexes of affects" – and function as associative mediators, bridging the subconscious and conscious (Rank and Sachs 1916; in Vygotsky 1971, 75). In Vygotsky's words, this happens "by means of the mechanism of transfer, or substitution, by associating earlier affects with new concepts" (Vygotsky 1971, 75). Vygotsky concludes thus: "Sexual impulses, according to psychoanalysts, are the main reservoir of the subconscious, and the transfer of psychic energy performed in art is principally the sublimation of sexual energy, that is, a deviation from direct sexual aims and a transformation into creativity" (Ibid. 76).

With Freud's psychoanalyses the domination of the unconscious or subconscious

³⁷ This may have related to the psychological pressure Eisenstein experienced due to the national failure of *October* (1928), which was followed by a betrayal by his friends and Eisenstein's break with the LEF group (e.g. Tretyakov, Brik, and Shklovsky) (Bulgakowa 1998, 78–79).

domain of the mind–body system over the conscious entered the psychological discussion. Vygotsky argued however that psychoanalysts did not have a sufficient definition for artistic form, which they described merely as a disguise for infantile sexual drives, reducing the creative process to a mere sublimation of childhood’s Oedipus complex (Ibid. 76–78). The problem with psychoanalytical interpretation was that “[t]he effect of a work of art and of the creativity of the poet is drawn entirely from ancient instincts which remain unchanged over the entire duration of a culture, and the effect of art itself is entirely limited by the narrow sphere of individual perception” (Ibid. 79).

If the psychoanalytical approach to art was to serve the proper psychology of art, according to Vygotsky (1925), the following issues must be taken into consideration [loosely cited]: (1) if, along with the subconscious, it will also consider the conscious not as a purely passive but as an independently active factor; (2) if it will explain the effect of the artistic form not as a façade but as an extremely important mechanism and technique of art; (3) if, giving up pansexualism and infantilism, it will include in the sphere of its investigation the sum total of human life and not just its primary and schematic conflicts; and (4) if it will give a correct sociopsychological interpretation of the symbolism of art and its historical evolution, and instead of dwelling in the limited viewpoint of one’s own life, offers a wider approach to social life (Vygotsky 1971, 84–85).

Ivanov notes that Vygotsky’s criticism of the Freudian psychology of art was similar to that of, for example, C. G. Jung (Ivanov 1971, 277n23). The criticism resulted in many psychoanalytical theorists substituting the theory of the collective subconscious for Freudian pansexualism (Ibid.).

Eisenstein was also aware of Vygotsky’s total disapproval of Freud’s treatment of Leonardo da Vinci (Vygotsky 1971, 81–82). However, this study assumes that Eisenstein’s first love affair with Leonardo da Vinci in a Moscow streetcar never left Eisenstein’s mind–body system: twenty-five years later, his last film production may be featured as a psychological reconstruction of Freud’s Leonardo in a pseudo-character of Eisenstein himself – in the portrait of the tyrant *Ivan the Terrible* (Nesbet 2003, 197, 205). At any rate, the psychoanalytical approach is acknowledged as one of many disciplines that Eisenstein’s eclectic multidisciplinary orientation embraced.

4.3.4.2 Stream of thought

Everyone knew James’s famous formula “we are not crying because we are sad, but we are sad because we are crying,” Eisenstein (1945) recalls in his essay ‘How I Became a Director’ (ESW3, 286, 392n34; James 1936 n30; James 1890, URL; James 1892, 376). James’s paradoxical statement appealed both aesthetically and scientifically to the psycho-engineer Eisenstein (1945): “the corresponding emotion may be born out of particular, correctly recreated, expressive phenomenon” (ESW3, 286).

Interestingly, Bulgakowa (1996) is one of the few scholars who links James to Eisenstein’s ideas of emotions as sensorimotor-based, synesthetic, overtone aspects

of montage (see James 1890, 258; Bulgakowa 1996, 52, 246n92). The psychoanalytically-oriented treatment of Eisenstein’s aesthetic theory in Bohn (2003) does not refer to James at all. Bordwell notes that because James rejected materialism [in his later empirical radicalism] (James 1892, 376), Eisenstein preferred to turn to Soviet reflexology (Bordwell 1993, 116). More than James’s influence, Bordwell emphasizes Leo Tolstoy’s views on empathy and Bukharin’s views of art ‘infecting’ the spectator with emotions (Ibid.). Due to Bogdanov’s influence on Bukharin’s theoretical views, this is here taken as an indirect reference to Bogdanov’s tektological studies on hedonism and the bodily system of pain and pleasure. James, in turn, was influenced by the empathy theory of Theodore Lipps (James 1892, 376; in Bordwell 1993, 116), and by Ernst Mach’s ideas of empirical knowledge and trust in sensations, as mentioned in Garth Kemerling’s article in the philosophy pages of *Britannica* (2006). It is also mentioned that Mach was an important source for Bogdanov and discredited in the Soviet Union.

According to Bulgakowa (1986) Eisenstein’s discussion on the notion of overtone is indebted to James. In addition Hermann von Helmholtz’s original studies, for example, *On the Sensations of Tone as a Physiological Basis for the Theory of Music* (1863), on acoustics and perception as well as that on synesthesia were also available to Eisenstein. In the following James in *The Principles of Psychology* (1890) and Hermann von Helmholtz in ‘The Facts of Perception’ (1878) are cited at length to compare their definitions of overtone. First, Helmholtz’s acoustic theory states as follows: “Each fibre among the auditory nerves is sensitive to only a single tone from a narrow interval of the scale, so that in general only tones lying close together can interact with one another, while those at a distance cannot. If the latter do interact, they produce not beats but an overtone or some combination tone. It is in connection with these, as you know, that the difference between harmonic and non-harmonic intervals, that is, between consonance and dissonance, makes its appearance” (Helmholtz 1878).

James applied Helmholtz’s acoustic theory metaphor of overtone to describe the holistic integration of sensuous aspects in perception: “It is just like the ‘overtone’ in music. Different instruments give the ‘same note,’ but each in a different voice, because each gives more than that note, namely, various upper harmonics of it which differ from one instrument to another. They are not separately heard by the ear; they blend with the fundamental note, and suffuse it, and alter it; (...). Let us use the words psychic overtone, suffusion, or fringe, to designate the influence of a faint brain-process upon our thought, as it makes it aware of relations and objects but dimly perceived” (James 1890). In a footnote to the above section James defines fringe: it “is part of the *object cognized*, – substantive *qualities* and *things* appearing to the mind in a *fringe of relations*. Some parts – the transitive parts – of our stream of thought cognize the relations rather than the things; but both the transitive and the substantive parts form one continuous stream, with no discrete ‘sensations’ in it” (James 1890, 258n20). The above definitions are further assumed to be reflected in Eisenstein’s idea that vertical cinema as an externalization of stream of consciousness was based on the integration of the senses, or what he discussed as ‘synesthesia’ (ESW1, 339).

In his early essays written in 1929 Eisenstein also applied the popularized ‘fourth

dimension', speculated by Charles Hinton in *What Is the Fourth Dimension?* (1884), in exercising one's ability to imagine an object from all three dimensions simultaneously (Clair 2002). Perceiving the fourth dimension may be compared to a leap, in Hegelian terms, to a higher level of consciousness. The overtone quality, Eisenstein wrote, when perceived in the psychophysiological process of viewing a film, allowed a leap to another – fourth – dimension, perhaps even the fifth dimension (ESW1 [1929], 185). 'The Fourth Dimension in Cinema' (1929) links feelings to cinematic audiovisual (Jamesian) overtones: "For the musical overtones (a beat) the term 'I hear' is no longer strictly appropriate. Nor 'I see' for the visual. For both we introduce a new uniform formula; 'I feel'" (ESW1, 186). This is the common denominator in Eisenstein's 'cross-modal physiological sensation' (Bordwell 1993, 133).

Musical or acoustic metaphors were commonly applied: as noted in Bordwell, of the Russian Formalists, Boris Eikhenbaum compared montage to musical phrasing with its 'accentual nucleus' (Eikhenbaum 1927; 1927b, 22), and Yuri Tynyanov applied meter and rhythm in his montage analysis 'The Fundamentals of Cinema' (1927) (Bordwell 1993, 133). For Eisenstein, concepts and analysis methods borrowed from music and acoustic theories served his idea to distill the universal laws that transcended the borders of different art forms (Ibid.). Some of these laws and organizational relations of a multisensory cinema were perhaps more easily traced in music, while others Eisenstein intended to discover in classical art, literature, but also in the scientific findings of psychology.

The Soviet poet, rector of Meyerhold's school (GVYRM) and Eisenstein's biographer³⁸ Ivan Axyonov linked Eisenstein's concept of overtone to the music theory of the synesthetic composer Scriabin (Bulgakowa 1996, 246n92). According to Bulgakowa Eisenstein employed overtone as a metaphor and was most probably *not* directly influenced by the physical overtones of music theories, such as the mathematical constructions of counterpoint and harmony advocated in the second Vienna school and Arnold Schönberg (Ibid. 52, 246n92). Instead, Axyonov suggested that because, in his view, Eisenstein reflected the twelve-tone conceptualizations of Arnold Schönberg and Alban Berg (whose opera *Wozzeck* had performed in Moscow in 1929) in his theory of overtone, Eisenstein should further support his theory with 'tone' or 'tonics' – thus replacing the notion of 'dominant' (Axyonov in Bulgakowa 1996, 51–52).

Music expresses emotionally what is inexpressible by other means, argues Eisenstein in 1945 in his essay 'The music of landscape...' (NIN, 217). He refers to both Richard Wagner's *Opera I Drama* and Arnold Schönberg's essay published in 1912 in *The Blaue Reiter Almanac*, when discussing the emotion-loaded difference between *spoken* words and *tonal* speech: for Schönberg the lyrics of Schubert's songs did not touch him but instead, in his own words cited in Eisenstein, Schönberg "grasped the content, the real content, perhaps even better than if [he] had clung to the surface of the actual verbal ideas" (Schönberg 1912, 31; in NIN, 217).

³⁸ In an attempt to bring Eisenstein back to public acknowledgment, Axyonov wrote a monograph on Eisenstein in 1934, published posthumously only in 1991 (Bulgakowa 1996, 246n92).

While the dominant for Eisenstein was mainly visual device, the concept of overtone links to the sensuous sources of understanding, which he preferred to describe in acoustic analogues, as in 'The Fourth Dimension in Cinema' (1929) (Bulgakowa 1996, 52; ESW1, 182). Literary studies applied the notion of 'dominant', which originated from Tynyanov and his concepts of 'secondary semantic markers' or marking of culmination points (Tynyanov 1927, 93–94). Eisenstein applied the Jamesian musical metaphor of dominant as a fundamental note to which the 'overtone' fringes relate (ESW1, 344; Bulgakowa 1996, 51, 55). Eisenstein's footnote draws support from the psychoanalytical studies of 'anxiety states': "Here it is a question of the same kind of de-individualisation of the *character* of a category of feeling as you find, for instance, in a different 'psychological' phenomenon: when you feel the *pleasure* that derives from extreme *suffering* (ESW1, 186*). Eisenstein continues with a quotation that perhaps originates from a German psychologist and psychoanalyst of the Freudian school, W. Stekel (Taylor in ESW1, 319n77): "In cases of affective hypertension pain ceases to be regarded as pain, but is felt as nervous tensions... But any powerful nervous tension has a tonic effect, and the heightening tone provokes a feeling of satisfaction and pleasure" (Stekel 1921 in ESW1, 186*). Eisenstein argues that a similar effect of physiological quality has been intentionally applied in the montage of *The General Line* (1929), using the principle of visual overtone (ESW1, 182).

4.3.4.3 Synesthesia

Eisenstein was particularly interested in Luria's studies on synesthesia. He also followed the treatment of a synesthetic *and* mnemonist journalist, S, whom Luria in fact studied for over thirty years. Eisenstein got familiar with Luria's patient in 1938 (Seton 1978, 328). One of Eisenstein's last articles, 'On Colour' which he completed in 1948, discusses a particular comrade S, who "cannot walk across a multicolored carpet without stumbling" (ESW2, 259–260). Eisenstein's 'Vertical Montage' describes S's ability "to see sounds as colours, and to hear colours as sounds" (ESW2, 368), as discussed also in Bordwell (1993, 185). Sonic and chromatic oscillation peculiarly for S produced perceptions of vowels as gradations of light, while consonants emerged as colors (ESW2, 368).

Luria's *The Mind of a Mnemonist: A Little Book about a Vast Memory* (1968) describes how mnemonist S could memorize long strings of numbers and recall them even years afterwards. He had to develop a special method for forgetting [sic] because his visual memory landscape did not allow him to forget. S had problems with understanding metaphors: "S found that when he tried to read poetry the obstacles to his understanding were overwhelming: each expression gave rise to an image; this, in turn, would conflict with another image that had been evoked" (Luria 1968, 120). This extraordinary case is referred to in current neuroscientific research and noted also in Antonio Damasio's book *The Feeling of What Happens: Body, Emotion and the Making of Consciousness* (2000, 348n8).

The idea of a complex integration of the senses, or synesthetics, may be traced throughout Eisenstein's figurative thinking. When Bordwell assigns three cognitive models as the Joycean inner monologue, Lévy-Bruhl's primitive thinking or sensuous thought, and the dyadic depiction/image or representation and image (Bordwell 1993, 169, 185; Bohn 2003, 271), the integration of the senses may be discovered as the structuring principle in all of them. According to Bohn, Eisenstein returned to elaborate the notion of inner monologue in his later synesthetic texts of 1944 (2003, 270).

According to Eisenstein in 'Magic of Art' (1944), synesthetic perception is the only plausible explanation for sensuous thought and its magic correlation with nature. In a regressive manner, an ecstatic experience takes one back to the early evolutionary phases of sensuous thought, where no differentiation of perception yet exists. Though in the artistic experience cognition and emotions intertwine in a similar manner as in any primitive trance, the latter is described in Eisenstein as a passive magic of participation, while the first is described as active magic, controlled by a creator-magician (the author) (Eisenstein 1944; in Bohn 2003, 268–269). According to Bohn, in this 1944 description Eisenstein seems to return to Lévy-Bruhl's concept of 'participation mystique' (Bohn 2003, 269).

In the 1941 text 'On Disney' Eisenstein notes that he prefers the ideas that correlate with Lévy-Bruhl's 'participational', which assume that "a non-differentiated consciousness reflects a non-differentiated social environment" (ECOL, 138). Here again, the mature Eisenstein seems to apply a developmental view familiar from Vygotsky (and others)³⁹; which posits that individual development phases correlate to human evolution in socio-historical terms.⁴⁰ In the essay 'On Disney' Eisenstein writes that "in the infinite spirals of cultural progress, every time a certain creative cycle finds itself on the threshold of evolution, there occurs an analogous phenomenon with its own qualitative peculiarities" (ECOL, 145). What is remarkable is that this emergent cultural phenomenon is organized according to "those very same laws, which are characteristic of the structure of primitive and sensuous thinking" (ECOL, 145).

The idea of integration of the senses had emerged already in the Kabuki monistic ensemble of 'An Unexpected Juncture' (1928) (ESW1, 119). Eisenstein's essay 'On Colour' concludes with "the most subtle nuances of the internal synchronicity of depiction, colour and sound" (ESW2, 267).

The theme of animated characteristics in symbols, words, concepts, and objects constitutes Eisenstein's main interest, and his texts are loaded with examples of metaphoric expressions discovered in classical literature. In accordance with the

³⁹ As a reminder, Vygotsky's work had been banned since his death in 1934, and no references are found in Eisenstein's later texts. Yet, on the basis of the friendship between Vygotsky, Luria, and Eisenstein, both Vygotsky's and Luria's theoretical influence on Eisenstein may be considered undeniable.

⁴⁰ From the bio-cultural perspective Vygotsky's view is comparable to developmental correlations between ontogenetic and phylogenetic evolution, for example, in Haeckel's evolutionary views, which were briefly discussed earlier (see page 73).

dynamical descriptions of systems thinking, the meaning of an object cannot be extracted from the individual parametric details but emerges in their complex multisensory interaction. Synesthesia seemed to link to Eisenstein's montage method in a fundamental way: understanding its psychophysiological basis could provide a multisensory tool for constructing *pathos* compositions.

Exhaustive references to the history of art, music and literature follow in Eisenstein's 'Vertical montage', to exemplify how the idea of correspondence between sound and color are witnessed in the various experiments and descriptions (ESW2, 33–349). For example, Eisenstein studied early notes on harmony of the senses in his personal volume of Karl von Eckarhausen's (1788–1792) four volumes of *Aufschlüsse zur Magie aus geprüften Erfahrungen über verborgene philosophische Wissenschaften und verdeckte Geheimnisse der Natur* (1791), on magic, philosophical knowledge and hidden secrets of nature (Bohn 2003, 269–270). Also, a letter written to a friend by the Japan and Far East expert Lafcadio Hearn (1891), apparently a synesthetic, is quoted in Eisenstein's 'Vertical Montage' as follows: "If you allow ugliness in words, you must at the same time also admit to the beauty of their physiognomy. To me words have colour, shape, character; they have faces, postures, gestures; they have moods and eccentricities; they have nuances, tones, individualities" (Hearn 14 June, 1893; in ESW2, 339–340).

In Eisenstein's essay 'The Fourth Dimension in Cinema' a holistic organic unity seems to link the space-time descriptions to synesthesia. 'Feeling' may reveal the fourth dimension. Each shot is composed of a range of stimulants, and from the dynamics of the shot involving a combination and collision of the stimulants, emerges the 'feeling' of the shot. The 'feeling' is the embodiment of the 'sign' of the shot: "the 'psychic' in perception is merely the physiological process of a *higher nervous activity*" (ESW1, 183).

Comparably, earlier, Richard Wagner had introduced in *The Art-Work of the Future* (1849) his idea of *Gesamtkunstwerke*, the synthesis of all the poetic, visual, musical and dramatic arts. Scientific theories of perception had evoked interest in synesthesia during the first decades of the century amongst avant-garde artists (van Campen 2008, 57; Bohn 2003, 269). This idea of a 'total work of art' was expressed by the German artist group *der Blaue Reiter* (The Blue Rider), proposing three principles which were, according to *The Hidden Sense* by Cretien van Campen, (1) unifying all arts into the same framework, (2) freedom of expression through abstraction, and (3) expression of spirituality as the ideal of an immaterial art (van Campen 2008, 55).

Later in October 1944, Eisenstein refers to this early discourse when he argues in 'Magic of Art' that cinema as a synthesis of dialectical dynamics represents a one-hundred-percent synesthetic art form (Bohn 2003, 268–269). In contrast, the synesthetic views of Expressionism and Surrealism represented a kind of zero point, as a pure regression to being 'as such'. Regarding this, Eisenstein refers to Paul Klee (1879–1940), who applied musical composition in paintings; Wilhelm Hausenstein, a Marxist art theoretician; drawings and music by Mikalojus Ciurlionis (1875–1911) (NIN 234), a Lithuanian symbolist painter and composer; and Vasily Kandinsky

(1866–1944), who used color to associate tone with timbre, hue with pitch, and saturation with the volume of sound.⁴¹

Kandinsky proposed in his *Über das geistigen in der Kunst (On the Spiritual in Art)* (1910) that synesthesia is “a phenomenon of transposition of experience from one sense modality to another, as in unisonous musical tones” (van Campen 2008, 56). In Kandinsky’s theory this was comparable to a phenomenon where a string instrument will resonate in selected frequencies with a note played with another instrument (Ibid.). Kandinsky was interested in the temporal interplay of dissonance and consonance as well as of the juxtaposing of different forms of art (dance, film, music) (Ibid.). His friend Austrian composer Arnold Schönberg published an atonal theory of dissonant harmony in 1911 (Ibid. 57).⁴²

Eisenstein noted that particularly notable in acoustics and optics is that “alongside the resonance of the basic dominant tone, there is a whole series of secondary resonances, the so-called overtones and undertones. Their collision with one another and with the basic tone, etc., envelops the basic tone with a whole host of secondary resonances” (ESW1, 182). He assumed that these secondary resonances, which are based on pure physiological qualities, are applied, for example, in the compositions of Claude Debussy and Alexander N. Scriabin (ESW1, 183).

Particularly Scriabin’s synesthetic musical ideas influenced Eisenstein, who had a personal copy of Leonid Sabaneev’s biography *Skrjabin* (1916) (Bohn 2003). Curiously, Scriabin had played a mediating part in Eisenstein applying to begin Japanese language studies in Moscow, because the source of information for this study option came from professor Nikolai Popov-Tativa, whom Eisenstein’s Masonic order fellow Paul Arensky had met in Scriabin’s home at some earlier point (Bulgakowa 2003, 16). It is noted that Scriabin died in 1915. Van Campen (2008) also discusses Scriabin’s color-key correspondences, which were influenced by the discourse of Russian mystics circles (familiar also to Eisenstein). The composer Nikolai Rimsky-Korsakov (1844–1908) shared Scriabin’s interest in color and music (van Campen 2008, 52). Madame Helena Blavatsky (1831–1891), the founder of the theosophical society in 1875, is also pointed as a source of inspiration for Scriabin (Ibid.).

Scriabin discussed three aspects of his synesthetic experience: (1) the reciprocal simultaneous affect. When the tonality of the piece changes, the color changes; Scriabin asserts: “The color underlines the tonality; it makes the tonality more evident”; (2) emotions elicited by the music affect the intensity of the color experience; and (3) not all music evokes color; if the music is too intellectual, the color experience may be non-existent (in van Campen 2008, 52).

Scriabin’s idea of the light-symphony of *Prometheus, Poem of Fire* (1909/1910/1913) involved a musical sequence in which a featured ‘orchestrated’ composition for

⁴¹ The summary of the synesthetic artists is partly extracted from the ‘Visual music’ exhibition at the Museum of Contemporary Art, Los Angeles 2005.

⁴² Later in the 1960’s Arnold Schönberg inspired the theoretical and cinematic works of the French New Wave and Noel Burch, whose idea of serial or parametric cinema was mainly inspired by Eisenstein (Burch 1973, xix–xx; Bordwell 1985, 274–310).

keyboards of light were designed to throw colors on a screen (Taylor in ESW3, 399n118). According to van Campen, Alexander Wallace Rimington’s (1854–1918) ‘Color-Organ’ (1893) was inspired by Newton: it “divided the color spectrum into intervals analogous to musical octaves and attributed colors to notes; the same notes in a higher octave produced the same color tone but in a lighter value” (Ibid. 49–50). Scriabin however applied a different method. Instead of a Rimington-type of note-color correspondence, he used a musical key-color correspondence; this allowed keeping a steady color in one tonality resulting in subtle performances (Ibid. 53). Instead of mere imitation of the musical movement, Scriabin gave “the color organ an autonomous role so that color changes pointed and counter-pointed at the changes in the musical movement” (Ibid.).

A similar contrapuntal strategy is echoed also in the sound-cinema manifesto of Eisenstein, Pudovkin, and Alexandrov in 1928: in his essay ‘*The music of landscape...*’ Eisenstein recalls that sound should not imitate image but establish its position as an autonomous, sharply divergent counterpart for image (NIN, 283). In the same essay Eisenstein identifies an ongoing evolution towards “*the unity and harmony of expressive means*” (NIN, 282).

Eisenstein emphasizes the significance of the authored/controlled structure over the totally dissolved unity of the senses. According to his polyphonic scheme, the author is also present in the polyphonic montage orchestration of Chaplin’s comical scenes. The science of organization surfaces again in ‘On Disney’ (1941) when Eisenstein writes, “a picture, formally and mechanically, in stasis, reproducing the dialectical idea of the unity of oppositions, in which ‘each by itself’ opposition at the same time coexists in unity, which is possible only on a process, in movement, in dynamics” (Eisenstein 2006, 143). Comical aspects emerge when the representational co-membership is emphasized. Yet, the plasticity of the representational lines is another discussion, correlating with the sound, or landscape in its abstract, linear, rhythmical, ‘seismographic’ movements, as “the graphic equivalents of Scriabin’s colour dreams” (Eisenstein 2006, 143).

Eisenstein researched the historical roots of synesthesia (Bohn 2003, 269); he also acknowledged Denis Diderot’s (1713–1784) treatment of the inter-connection of all processes of Nature and eternal change of form, a materialist view of the relation of thought and matter, of the interconnection of living and inorganic matter, and of the evolution of the Universe. Curiously, Diderot was one of Karl Marx’s favorite philosophers: a piece of paper documents that in 1865 Marx listed Diderot as his favorite writer in a semi-jocular questionnaire *Confession*, which he played in the home of his uncle Lion Philips (Online Archive of Marxist Writers). In 1947’s ‘The Psychology of Composition’ Eisenstein returns to Diderot’s correspondence with Sophie Volland in 1760: Diderot describes in his letter how the color yellow for instance may serve as the only ‘logical’ link for a (mad)man, who instead of associating things in a logical manner, grabs the sensuous aspect of the yellow as the constitutive object of his stream of thought, rather than subordinating it to the actual object or thing it describes (ECOL, 277; ESW2, 362–363, 420n407). In Eisenstein’s 1947 essay this perceptual phenomenon links to similar holistic phe-

nomena as shown in the earlier discussed Hitchcock's film *Spellbound*, where an emotional theme is embedded in the visual patterns of the montage composition (ECOL, 274–277).

In his article 'An Unexpected Juncture' (1928), instead of sound cinema as "the contemporary stage of theatre" (ESW1, 116n†), montage cinema equals a *monism of ensemble* exemplified in Kabuki (ESW1, 117). 'The Fourth Dimension in Cinema' (1929) discusses multisensory expressiveness: "Addressing himself to the sensual organs, [the Japanese] bases his calculations on the final *sum* of stimulants to the brain, ignoring *which* path that stimulation takes." In a similar manner, as the separate units of hieroglyphs or actors' expressions in Kabuki, a shot maintains its ambiguity; only in the combination of other shots next to it does the specific meaning or emotional emphasis of a particular shot emerge (ESW1, 183).

To exemplify his case, Eisenstein (ESW2, 329) extracted the polyphonic dimensions of human sensory perception from a literary description of a wrestling ring in the Goncourt brothers' *Journal* (1867):

(1) *Tactile* (the feel of sweat streaming down wet backs); (2) *Olfactory* (the smell of sweat, like the reek of wild animals); (3) *Visual: Light and Shade* (deep shadow and the glistening limbs of the wrestlers as they stride into the bright light; the policemen's buttons and sword-hilts glittering out of the darkness); *Colour* (pale faces, ash-blond moustaches, bodies turning pink under blows); (4) *Auditory* (the slap of hands on bodies); (5) *Mobility* (the wrestlers' movements on their knees, or pirouetting on their heads); (6) *Emotional-'Dramatic'* (challenging glances, etc.). (ESW2, 329) The diversity of the internal lines of movements in vertical montage is fully authored, or one may say, orchestrated.

In 'Vertical Montage' Eisenstein discusses the intuitive synesthesia studies of the French Symbolist poet Arthur Rimbaud (1854–1891) and French Symbolist and theorist René Ghil in the late 1800's (Marwick 1999). The two men independently each suggested a different kind of universal system of correspondences between vowels and colors (ESW2, 339).

These drew on the study by Hermann von Helmholtz (1821–94) on the correspondence between vocal and instrumental sounds in 1913 published as *Die Lehre von den Tonempfindungen [The Theory of Sound Perceptions]* (ESW2, 339, 418n356). Yet, as in his late essay 'On Colour' Eisenstein notes, instead of vowels, he is interested in studying the synesthetic descriptions of consonants, provided by Luria's patient S (see page 115) (ESW2, 260). Eisenstein's essay on Prokofiev appears of particular interest in this connection, because it discussed extensively Prokofiev's consonants, an interest of Vsevolod Meyerhold as well (see page 88).

4.3.5 GESTALT PSYCHOLOGY

After discussing Eisenstein's ideas with the German *Gestalt* psychologist Kurt Lewin in America, Alexander Luria arranged the first meeting of Eisenstein and Lewin in Berlin in 1929 (Bulgakowa 1998a, 92). Eisenstein also met Wolfgang Köhler, one of the founders of *Gestalt* psychology and the leader of the Berlin Psychological Institute. Later, in 1934 at Luria's Moscow home Eisenstein had the opportunity to exchange ideas with the *Gestalt* psychologist Kurt Koffka (Bulgakowa 1996). These German scholars were influential amongst the early Soviet intellectuals.

Lewin developed a dynamical field theory in his *Principles of Topological Psychology* (1936) and in *Conceptual Representation and the Measurement of Psychological Forces* (1938). Köhler advocated an interdisciplinary approach to psychology that would apply knowledge particularly from the field of biology in his *Dynamics in Psychology* (1940). Eisenstein had in his personal library Köhler's *The Gestalt Psychology* (1929), and Lewin's *Die Entwicklung der Experimentellen Willenpsychologie und Psychotherapie* (1929) (Bulgakowa 1996, 257n183). In 1943 in *Film Sense* he cited Koffka's *Principles of Gestalt Psychology*: "It has been said: The whole is more than the sum of its parts. It is more correct today that the whole is something else than the sum of its parts, because summing is a meaningless procedure, whereas the whole-part relationship is meaningful" (Koffka 1935, 176; in FS, 17). And 'a third something' emerges as meaningful (FS, 19). In *The Growth of the Mind* (1921) Koffka advocated the idea that a child initially experiences a whole, complex but non-differentiated world, an idea that seems repetitively emerging in Eisenstein's texts.

The following section on the early *Gestalt* theorists is extensive, due to their significant influence not only on Eisenstein's figurative thinking (Bulgakowa 1996), but also on the evolution of 20th century psychology and particularly what was to become the ecological approach to perception, as pointed out in Barry Smith's essay 'Husserlian Ecology' (2001). The German *Gestalt* psychologists' interest in the field dynamics of the mind and the assumption of an isomorphism between mental and physiological functions has been recognized again in the later cybernetic line of thinking. These issues will be discussed in a later section.

A great part of Eisenstein's holistic terminology (e.g. wholeness, closedness, fullness, dynamical symmetry) appears adopted from *Gestalt* principles (Bulgakowa 1996, 142). Holistic terminology however also characterized the wider discourses of early systems thinking and biological organicism. In general, many ideas were recycled, modified, and shared. *Gestalt* psychology itself also drew upon the methods of Edmund Husserl, the ideas of Ernst Mach and the Vienna Circle, and its philosophical roots may be traced back to Hegel's organic-systemic views.

The experimental background of *Gestalt* psychology emerged with the structural psychology of Wilhelm Wundt (his first laboratory was in Leipzig, founded in 1879), who viewed perceptions as direct reactions to a combination of primitive sensory stimuli (sensations) (Goldstein 2002, 146–147). Reacting against Wundt's associationism, the Würzburg School of structural psychology favored experimental research on



complex mental phenomena (Hoffman & Stock 2005, 27). The new concepts of the Würzburg school may be seen to pioneer the later cognitive psychology: the *imageless thought* by a student and assistant of Wilhelm Wundt, Oswald Külpe (1862–1915), which referred to thoughts without a particular sensory or imaginal content; the state of consciousness (Karl Marbe); thoughts (Karl Bühler) and determining tendencies (Narziss Ach); and schematic anticipation (Otto Selz) (Ibid.).

Külpe's idea of the *imageless thought*, which emerges independently from associations, inner images, or sensory stimuli, is also discussed in one of Eisenstein's major influences, Vygotsky's *The Psychology of Art*. Vygotsky argued that the graphic character of a poetic image collapses after this discovery (1971, 43). In *Outlines of Psychology* Külpe describes aesthetics as aesthetic behavior: "We must regard aesthetics as the psychology of aesthetic enjoyment and artistic creativity" (Külpe 1893 in Vygotsky 1925). An earlier study on aesthetic systems by Johannes Volkelt (1905) focused on perceptual sense experiences: "An aesthetic object acquires its specific aesthetic character only through the perception, feeling, and imagination of the person perceiving it" (Volkelt 1905 in Vygotsky 1925). One may also ponder how Eisenstein considered the notion of imageless thought, knowing that he was inspired by Ludvig Klages's expression theory, which in turn argued for mental images as effects in consciousness (section 4.3.2.5).

The two of three founders of *Gestalt* psychology, Max Wertheim and Kurt Koffka, were Külpe's students (Hoffman and Stock 2005, 7). Together with Wolfgang Köhler they confronted Wundtian structuralism (Goldstein 2002, 147). The *Gestalt* psychologists replaced introspection and behaviorism with an interest in the correlation between the physiological brain processes and phenomenal experience. For example, "meaning transforms sensations into 'things'" (Köhler 1929, 64).

The *Gestalt* psychology of the 1920's followed the tradition of *Gestalt* theory founded on the work of Christian von Ehrenfels (1890), who in turn was guided by "some casual observations" of Ernst Mach (Köhler 1929, 144). From von Ehrenfels originates the rejection of low-level sensory stimuli as the direct cause of mental representation of the object. Instead, von Ehrenfels complemented the sensory-stimuli with an aspect of higher psychological 'production' in the perceptual phenomena, thus resulting in what he called the '*gestaltqualität*'. The *Gestalt* quality is founded on the complexity of independently presentable properties, which enable the actual perceptual product to emerge in the mind (Ehrenfels 1890/1988, 93; Mulligan & Smith 1988; Koffka 1935, 559; Köhler 1929, 144). In the Soviet Union the *Gestalt* theoretical views were banned in the late-twenties.

4.3.5.1 Isomorphism and emotions

The 'isomorphism' argument of the *Gestalt* psychologists proved inspiring for Eisenstein's era and contributed also to the research on the neural correlations of con-

sciousness in the latter half of the century as well. However, today one may accord with Nigel Thomas's argument in 'The Banishment of the Mental Image from Experimental Psychology: The Gestalt Imagination' that the *Gestalt* theorists' isomorphism was based on a 'false' interpretation of physiological processes (Thomas 1987, 71–93) (section 5.2.3.4). Despite the experimental holism the *Gestalt* theorists seemed to advocate, to some extent, they continued to be burdened by the Cartesian mind-world dichotomy, that is, separating the internal and the external domains of experience (Smith 2001).⁴³

For Eisenstein the cinema author's emotional experience within the creative process correlates to the spectator's emotional experience when viewing the author's cinematic end product. Early biomechanical views are assumed to relate to the one-directional and one-to-one communication models ('from sender to receiver' and 'empathy as contamination'). For example, J. S. Mill's (1869) classical theory about 'reading' another person's mental states relies on an assumed analogue between the two mental states (Gordon 1995, 53, 64n1). If, on the one hand, Eisenstein's historical situatedness is taken to suggest isomorphism, which is based on this classical one-to-one mechanistic communication model, this would as such demolish any attempts to argue for a more dynamic interaction in the sense of currently accepted views. On the other hand, if considering Eisenstein's organic-dynamic views and relation to dynamical theories of the mind, such as the *Gestalt* psychologists, the Soviet psychoengineering views, and Vygotsky's socio-emotional systemicity, his views may be argued to anticipate the bio-cybernetics of the second half of the 20th century.

Koffka's (1935) formulation of isomorphism, according to Wertheimer's lecture series in 1937–38, was as follows: "The same stimulus array that gives rise to seeing a face may contain the sadness that one sees in it. Isomorphism is a thesis that the Gestalt quality of psychological events is similar to the quality of the physical world. The old view held that if certain psychological feelings and certain physiological movements seem to be related, it is because they have been associated together in the past" (Wertheimer 1937–38 in Luchins & Luchins 1999). Wertheimer further emphasized the following difference between himself and Köhler: While the latter views *Gestalt* isomorphism as a correspondence between how a stimulus is and how it appears in the brain, Wertheimer himself views isomorphism as how behavior is and how it appears (Ibid.).

On emotions Köhler argued thus: "Of course, if the so-called emotional aspect of subjective experience is sensory experience issuing from our muscles, viscera, and so forth, it will be truism that emotional experiences are 'similar' to certain 'sensory' experiences, since they are declared even to be identical by [the James-Lange hypothesis]" (Köhler 1929, 189). Instead, he widens the emotion approach to involve, in addition to the interoceptive sensory experiences, also the sensory experiences of vi-

⁴³ The burden of the Cartesian mind-world dichotomy was inherent in the early James J. Gibson's ecological theory of perception, while the question is better resolved in the cognitive interaction ecology developed by Ulric Neisser (1976) (Smith 2001) (see page 181–182).

sion and hearing (Ibid.). Koffka agrees with Köhler regarding the James-Lange theory: emotional behavior involves the whole organism (Koffka 1935, 401, 414). One may argue that with Koffka's work, the *Gestalt* theorists moved closer to the regime of holistic embodiment, seemingly grounding ideas similar to those of Merleau-Ponty (1962).

4.3.5.2 Gestalts of words 'takete' and 'maluma'

As the *Gestalt* psychologist Wolfgang Köhler (1929, 148) noted, the concept of *Gestalt* in German has two meanings. Firstly, it carries the connotation of 'shape' or 'form' as a property of things. Secondly, it relates to a *thing itself*, which has a shape or form as one of its attributes. In Köhler's words, "wherever a process dynamically distributes and regulates itself, determined by the actual situation in the whole field, this process is said to follow principles of *gestalttheorie*" (Ibid.). Köhler's views combined psychology with physics and his tutor of post-doctoral studies was Max Planck (Schultz & Schultz 2004, 363–378).

Köhler discussed ideas about the constitutive dynamics of self-distribution and self-regulation, which affect the *Gestalt* in the mind (1929, 149). The most general definition of *Gestalt* connects the psychological processes of learning, reproduction, emotional attitude, thinking, acting, and so forth, to the cross-disciplinary domain of other scientific phenomena. Such are, for example, ontogenetic development or other biological events (Ibid.). Köhler argued that animals (apes or chickens) were able to infer relationships and applied 'insight' to problem-solving tasks. Vygotsky's unique reference to the *Gestalt* psychologists in *The Psychology of Art* is to Köhler, and this is mediated by Bühler's book *The Mental Development of the Child* (1924) (Vygotsky 1971, 60n20). Köhler's experiment with chickens showed, in Vygotsky's words, that "the perception of forms and relations appears to be quite an elementary, and possibly even a primordial, act of the animal psyche, proving that not every perception of form need necessarily be artistic" (Ibid. 60).

The experiment of 'takete' versus 'maluma' links the integration of the senses to conceptualization (Köhler 1929, 186–187). The experiment shows that people tend to link nonsense names like 'takete' or 'maluma' with objects, drawings, or other shapes according to their perceived features, i.e., 'takete' was linked with hard, sharp-edged features, and 'maluma' with soft organic features. At the turn of the millennium this experiment was repeated in the synesthesia research of V. S. Ramachandran and E. M. Hubbard (2001). Their results allow assuming that "there may be natural constraints on the ways in which sounds are mapped on to objects" (Ibid. 19).

As discussed earlier, according to Eisenstein's description, Ludvig Klages's analysis methods applied the *Gestalt* logic of 'takete' versus 'maluma' when the elements of handwriting seemed to be categorized such that *straight*, *angular*, and *sharp* elements related to the 'exact', rational, conscious domain of thinking, while *rounded*, *smooth*, *flowing* elements described 'fuzzy' emotional instincts (NIN 340).

4.3.5.3 Apparent movement

One of the principal problems, Max Wertheimer argued, that was not convincingly explained by mere sensations was that of *apparent movement*, demonstrated, for example, by the Austrian scientist Siegmund Exner (1846–1926) in 1875 (Goldstein 2002, 147, 272; Langdale 2002, 161n10). The problem of the illusion of movement was evoked in 1911, when Wertheimer played with a toy stroboscope (Boring 1942; in Goldstein 2002, 147). Later he experimented with apparent movement, or *phi* phenomenon. This occurs when two stationary light stimuli are flashed rapidly at a certain speed, creating the perceptual illusion of a light moving back and forth in the space between the two light locations. As early as in 1916 Hugo Münsterberg approached this phenomenon in relation to cinema, rejecting the after-image explanation for the illusion of movement and instead suggesting an explanation based on cognitive 'filling-in' processes (Münsterberg 2002, 76–77; Anderson & Anderson 1993).

Wertheimer (1924) raised as his main focus the relation between the subject and the environment. Stimulus-sensation alone cannot explain the quality of perception in the mind; changes in the situation of an Ego in the world fundamentally affect perception. In *Gestalt Theory* Wertheimer thus reformulated the relation between the organism and environment: "The stimulus-sensation connection must be replaced by a connection between alteration in the field conditions, the vital situation, and the total reaction of the organism by a change in its attitude, striving, and feeling" (Wertheimer 1924). Furthermore, Gestalt theory is set to determine "wholes, the behavior of which is not determined by that of their individual elements, but where the part-processes are themselves determined by the intrinsic nature of the whole" (Ibid.). Wertheimer was a personal friend of Albert Einstein (1879–1955), and discovered that the resolution to Einstein's problem had emerged through a *gestalt switch*: by organizing and re-organizing in the mind the spatial constellation of the parameters 'time', 'space', and 'velocity', a novel meaning suddenly appeared to Einstein in this mental visualization (van Campen 2008, 86).

4.3.5.4 Dynamical perception

Eisenstein's (1934) article 'Eh! On the Purity of Film Language' was influenced by discussions with Koffka, who had arrived in Moscow to participate in Luria's Asian expedition (Eisenstein 1934/35, IP4, 174; Bulgakowa 1996, 142; 1998, 150). Koffka's book *Grundlagen der psychologischen Entwicklungen* had been translated into Russian in 1934 (Bulgakowa 1996, 270n272). *The Principles of Gestalt Psychology* was published later in 1935.

In "Eh! On the Purity of Film Language" Eisenstein (1934) adopts the *Gestalt* principles, particularly that of figure and ground, in order to show the compositional interdependence of film shots as a whole (Bulgakowa 1998, 150). The essay defends

the method of montage against accusations of ‘formalism’ by showing, in its analyses of fourteen shots from *Potemkin*, that the method serves practical analysis (ESW1, 285–295, 326n18; Bulgakowa 1998, 150). In emphasizing film as language Eisenstein aimed to reply to Maxim Gorky’s recently published essay ‘On language’, which promoted Socialist Realism (Taylor in ESW1, 326n18). To Eisenstein, the necessity of organic plasticity was the guiding principle of pure film language; the internal processes of the whole montage composition were more important than the internal compositional principles of each individual shot.

According to Koffka the dynamics of figure-ground perception prefer vertical and horizontal orientations (1955, 190). One is reminded that the horizontal and vertical were always Eisenstein’s favorite theoretical tools — as they were of Kuleshov’s compositional web (Levaco 1974, 10).

In 1934 Eisenstein explained how the composition was constructed: “(1) on the plastic interaction between both planes (within the shot), (2) on the change in line and form on each plane from shot to shot (by montage). In the second case the compositional play is formed from the interaction of the plastic impressions of the previous shot in collision or interaction with the succeeding one” (ESW1, 290).

Koffka appears to echo the need for a truly dynamic, Bogdanovian-Eisensteinian kind of theory “in which the processes organize themselves under the prevailing dynamic and constraining conditions” (Koffka 1935, 105). Here, the experience is described as an *inner condition* of the process of perception, and it defines the truth condition of the other elements of perception as well. Thus, there is no necessity to differentiate the experiential perception and the objective perceptual field of multiple stimuli (Ibid.).

As Koffka stated the apparent dualism between a man and the behavioral environment will be avoided if this behavioral system (man and his environment) is treated as “the psychophysical field and its field properties” (Ibid. 680). This field fundamentally involves distinct perceptual stimuli and proximal stimuli, the latter providing the *Ego*, i.e. the behaving subject, with a direct causal connection to the environment — more precisely, between the perceived and the action taken (Ibid.). *Gestalt* emerges in — and is — the process of organization, and in accordance with the principles of organization (Ibid. 682–683). Koffka introduced the principle of perceptual organization and discussed how the perceptual field directly affects the motor system (Ibid. 681). The principle of organization starting from the micro-scale elements of the phenomenon, which hierarchically constitute the macro-scale phenomena, was thereby present in the work of the *Gestalt* theorists.

The trace hypothesis suggests that the traces of events in the memory hold the properties of the actual event memorized: in Koffka’s words, those “dynamic properties from which their function is deducible.” Interestingly he calls memory “the continuity of behaviour” (Ibid. 681).

The complex dynamics between the object and the Ego as discussed in Koffka drew from Lewin’s (1926) theory of reciprocity of *demand* and *need* characters (Ibid. 333, 354). In Koffka’s example, a mailbox carries a demand character for someone who wants to mail a letter (Ibid. 354). Preceding J. J. Gibson’s notion of affordance, this

Gestalt discourse suggests a dynamic interaction between a surfaced need of the Ego and some particular properties of an environmental object, which emerge as ‘mirroring’ this particular need. Koffka explicitly juxtaposes facts and significance to the same realm; while coherence of a system apparently enables the realization of significance, no fact can exist outside of “an intrinsically coherent whole” (Ibid. 176).

In accordance with his collaborators Wertheimer and Köhler, he posits that *Gestalt* psychology may provide tools to discover the isomorphic connections between the organic mind and physical phenomena (Ibid. 684). This train of thought is reminiscent of Eisenstein when Koffka concludes: “If a thought process that leads to a new logically valid insight has its isomorphic counterpart in physiological events, does it thereby lose its logical stringency and become just a mechanical process of nature, or does not the physiological process, by being isomorphic to the thought, have to be regarded as sharing the thought’s intrinsic necessity?” (Ibid.)

4.3.5.5 Field theory

Eisenstein shared the Northern-European intellectual circuit with Kurt Lewin, a circle that also included the neo-Kantian philosopher Ernst Cassirer, an influential character in the Soviet Russia of the early twenties (e.g. Bakhtin Circle) (section 4.3.7). With his systemic field theory Lewin is also associated with the later cybernetics and ecological system views emerging during the second half of the 20th century.

The tradition of using films in scientific and psychological experiments had been provisioned already by Ernst Mach, who was inspired by Muybridge’s series of images (Tosi 2005, 68). Mach had proposed a photographic study following the development of a child to adulthood using Plateau’s Phenakistiscope the individual’s entire lifespan could be compressed to a few seconds (Marey 1894, 305; Tosi 2005, 171–172). The Phenakistiscope was a scientific instrument for observation of visual movements that could not be studied with the naked eye; its developer Joseph-Antoine-Ferdinand Plateau (1801–1883) has been lauded as the father of cinematography (Tosi 2005, 21–22).

Lewin had already since 1923/1924 used cinema images in his own research experiments with children before meeting Eisenstein (Bulgakowa 1996, 87). He had realized that the temporal aspects of emotional behavior were best captured on film for the purposes of scientific analysis. Lewin’s films recorded behaviors of mainly children, their facial expressions, emotions, bodily movements, problem solving and other types of situated actions (Ibid. 98–99, 262n213). On February 6, 1930 he sent Eisenstein his 1928 article ‘Kindlicher Ausdruck’ (Ibid. 262n215) and consulted Eisenstein about his psychology experiments with films (Ibid. 87). Eisenstein is remembered by Lewin’s assistant Bljuma Sejgarnik to have seen Lewin’s film *Hannah setzt sich an den Stein*, also named as *Das Kind und die Welt* (1931) (Ibid. 87, 258n187–189).

One of these experiments, which Koffka described as “Lewin’s beautiful film” (1935, 414), studies the increasing bodily restlessness of a child, whose task in the



experiment has been made difficult in order to elicit growing tension, in this case via frustration. In the film, a child circulates around an enclosed area, inside which a lure is located, or in the reverse situation, will indecisively sway between various action options, perhaps running from one side to the other. This is when the child is inside the circular pen and the attractive object is outside (Ibid.).⁴⁴

In his films Lewin elaborated further his field theory. He had published an essay relating to the development of his field theory of behavior, already in 1917, when he analyzed the war landscape in terms of polarities of forces. According to Koffka, “the vectorial property is a primary characteristic and determines the entire field, no other characteristic being entirely free from it” (Ibid. 44). Later, Lewin also discussed action and emotions in terms of ‘force’ as a constituting power, this in respect to the principles of his field theory (Ibid. 46). Drawing, for example, from Lewin’s ‘Psychological Ecology’ (1943) the ongoing dynamics in psychological field theory did not need an abstract entity of Mind (Ibid. 48).

In addition to his collaboration with Alexander Luria, Lewin was closely connected to the Russian scientists’ domain, for example, supervising the thesis ‘Der Ärger als dynamisches Problem’ by Tamara Dembo (1931), which applied Lewin’s field theory to psychological experiments with young children and their emotional tension in frustrating situations. The work is discussed in Koffka (1955, 407).

Gestalt psychology’s application of field theory to social psychology is of particular interest, because it lays a basis for understanding Eisenstein’s approach to emotional forces. It also echoes Vygotsky’s systemic thinking, as well as Bogdanov’s discipline in organizing complexities. In this respect, similarities between Eisenstein’s conceptualization of montage dynamics and Lewin’s field dynamics can be assumed.

4.3.6 SOCIO-LINGUISTIC PSYCHOLOGY

The social psychology of the early part of the century had developed as a branch of the emerging science of psychology. In Tsarist Russia, Bekhterev’s *Collective Reflexology* (1921) had discussed mass suggestion and crowd psychology in terms of associated reflexes, while the philologist Alexander A. Potebnya (1835–1891) distinguished between the individual act of speech and language as a historical phenomenon (Janousek & Sirotkina 2003, 440). Only later in the new Soviet state was it enforced with Marxist ideas, an approach exemplified by Vygotsky at its best (Ibid.).

⁴⁴ The original film described in Koffka (1935) was not available for this study.

4.3.6.1 Tools and language as social action

The title ‘The Mozart of Psychology: Lev Semenovich Vygotsky’ emphasizes the theoretical meta-psychological approach of the former schoolteacher. The online archive composed by L. Offord owes its title to Stephen Toulmin’s 1978 review of Vygotsky’s *Mind in Society* (Offord 2005). Vygotsky developed the psychology of learning (‘psycho-pedagogy’) and the psychology of handicapped children (‘defectology’), which led him to found the “Laboratory of Psychology for Abnormal Childhood” in Moscow in 1925 (Ibid.). His developmental psychology was constituted on his three principle concepts of ‘internalization’, ‘semiotic mediation’, and ‘the zone of proximal development’ (Vygotsky, 1978; 1981; 1986; in Offord 2005). Vygotsky also highlighted the circular connection between trial and feedback in the development of young children.

Vygotsky’s theoretical views may be divided as follows: 1) the use of a genetic or developmental method; 2) the claim that higher mental functioning in the individual emerges out of social processes; and 3) the claim that human social and psychological processes are fundamentally shaped by cultural tools, or mediational means (Lock 2005). The idea of external signs gradually transformed into internal signs (e.g. ‘inner speech’) in *Thought and Language* (Vygotsky 1934).

Retrospectively, Vygotsky may be considered one of the fathers of contemporary cybernetics as well as that of semiotics in regards to his discussion on the roles of signs in behavioral control (Ivanov 1971, 266). His theory of scaffolding, i.e., the instructor providing supports to facilitate the learner’s development, has re-emerged, for example, in the discussion of Francisco Varela and Jonathan Shear when they introduce *second-person* perspective as a tutoring and mediating level between the first and the third-person perspectives in ‘First-person Methodologies: What, Why, How?’ (Varela & Shear 1999).⁴⁵

Eisenstein is assumed to have been aware of the ideas introduced in the ‘activity theory’ founded by Soviet psychologist Alexei Leontyev, who collaborated with Vygotsky and Luria in the twenties. From 1931 Leontyev’s activity research became a leading discipline in Marxist psychology, while Vygotsky’s fate was to become officially banned.

In Vygotsky’s cultural-historical interpretation of Marxist dialectics, the meaningfulness of an artwork relies on its function as a mediating domain in-between the perceptual world of sensory stimuli and the world of intellectual interpretation. In principle, the tools and other instrumental extensions of human action (signs, objects, words, etc.) reveal the structural dynamics of thought processes. The distinguished facets of natural acts (psychological tools) and artificial acts (technical tools) intertwine

⁴⁵ In Vygotsky’s idea of scaffolding the zone of proximal development means “the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance, or in collaboration with more capable peers” (Vygotsky, 1978, 86; Lipscomb et al. 2004).

in a complex manner (Vygotsky 1930, 137–138; in Rissom 1979, 11; see Nöth 1995, 82).⁴⁶

Vygotsky introduced a systemic view to the reciprocal interaction between an individual and her social environment, suggesting that a psychological subject is fundamentally embedded in the social system. Rather than separating social and individual psychology, he emphasized the difference between *social* and *collective* psychology. While a social psychology of art focuses on the interaction between an individual creator and her socio-historical environment (cultural conventions, myths, ideologies), the collective seems to describe the shared system of *generally* recognized individual properties in a particular group.

The Psychology of Art (1925) advocated the idea that the subject of social psychology ought to be the psyche of an individual. Vygotsky argued that collective activity (society) is not a domain of accessory activity for an individual, but instead, the whole psyche of an individual is social and socially conditioned. Part of the individual's subjective experience remains a mystery even to the experimenting subject herself, but according to Vygotsky, a significant part of the individuality is *shared* with other group members. This aspect belongs to the research domain of collective psychology and applies the mathematical method of differential psychology (Vygotsky 1971, 17). This idea foreshadows the discipline of cybernetics (Ivanov 1971, 266).

4.3.6.2 Inner speech

In *Thought and Language* (1934) Vygotsky discussed 'preverbal' thought (ontogenetically preceding his 'inner speech') which corresponds to Eisenstein's term 'sensuous thought' (Bordwell 1993, 171). Eisenstein however rejected Vygotsky's use of 'inner speech' in linguistic terms as a synonym for mental (verbal) thought, emerging in the process of 'ingrowth' of the child's egocentric speech (Ibid. 172). In Eisenstein's procedural transposition of stream of thought his Joycean inner monologue, as "generalized, and 'deverbalized,' becomes inner speech" (Ibid. 176). Indeed, Eisenstein's continuous revision of his terminology seems to fit with Vygotsky's dialectical views on the evolution of language from primitive thought as well as Cassirer's ideas on the evolution of concepts.

Vygotsky's *method of inner reconstruction* assumes that the ability to utilize external sign systems have enabled human beings to extend their mental capacity to higher forms of behavior (e.g. counting with fingers) (Ivanov 1971, 266). The ability to recycle existing signs and expand their functions to new domains of behavior can be seen

⁴⁶ In Vygotsky, natural acts involve a "direct associative (conditioned reflex) connection between a stimulus A and response B". These are forms of nonsemiotic behavior (Nöth 1995, 82). In contrast, in artificial acts, citing Vygotsky, "two new connections, A–X and B–X, are established with the help of the psychological tool X" (Vygotsky 1930, 137–138). Continuing with Vygotsky, Nöth argues that the mediating psychological tool X is a stimulus (sign) functioning "as a means of influencing the mind and behavior" (Vygotsky 1930, 141 in Nöth 1995, 82).

to have enabled the evolution of the socio-cultural mind. In the process of learning the environmentally established signs gradually transform into internal signs, enabling, for example, the egocentric phenomenon of inner speech. According to Ivanov, this can be understood as 'the formation of a program within a person' (Ibid. 267), and is thus directly related to the comparison of mind and machine.

4.3.6.3 Eisenstein and inner speech

As typical for Eisenstein's eclectic interdisciplinary research, his linguistic orientation relates to divergent sources: in addition to Marr, Vygotsky, and Luria, sources of inspiration are James Joyce's inner monologue, Lévy-Bruhl's sensuous thought, Cassirer's idea of symbolic pregnancy, etc. (Bordwell 1993, 172; Bulgakowa 1996, 1998). In Bordwell's interpretation, the Joycean inner monologue was instrumental for Eisenstein to deviate from the abstractions of intellectual montage, but this soon gave way to Lévy-Bruhl's more scientific ideas on primitive thinking (1993, 170). James Joyce's texts were incidentally discredited as decadent in the 1934 Writer's Conference (Ibid.).

Eisenstein embeds into his notion of inner speech his idea of figurative emotional thinking, *sensuous thought*, thus paralleling Vygotsky's *preverbal thought* (Bordwell 1993, 172; Bohn 2003, 35n52). However, on the one hand, with its figurative conceptual blending, pregnant with sensuous aspects, Eisenstein's inner speech may be suggested also to draw from Cassirer's *Philosophy of Symbolic Forms* (1923–1929). On the other, Eisenstein's notion of inner speech seems to conflict with prevailing ideas of V. N. Voloshinov (1929) and Vygotsky (1934, 212–214), as remarked in Bordwell (1993, 172). Voloshinov's *Marxism and the Philosophy of Language* (1929) discussed a form of 'internalized dialogue' of socially contextualized words and intonations (Ibid.). Vygotsky, in *Thought and Language* (1934), defines "inner speech as the 'ingrowth' of the child's egocentric speech" (Ibid.), as previously mentioned. In addition, though Boris Eikhenbaum's essay 'Problems of Cinema Stylistics' (1927) introduced the notion of 'internal speech', in 'Notes for a Film of *Capital*' (1927) Eisenstein notes that it simultaneously neutralized the same notion to describe mere mental (verbal) inference the spectator conducts when seeing a silent film and chaining its individual shots together; this *cine-speech* substitutes the rejected notion of 'literariness' (see Eagle 1981, 62; Eisenstein 1927, 11–12; in Bordwell 1993, 171).

As Bordwell points out, Eisenstein's idea of *sensuous thought* as an emotional understanding of 'magical' is embedded in his use of 'inner speech' (1993, 171). Eisenstein formulated his concept differently (resembling more Vygotsky's concept of 'preverbal thought') (Ibid.). Eisenstein expands the laws of sensual and imagist thought processes and the principle of *pars pro toto* to the domains of form creation and art practice (Ibid.).

4.3.6.4 Protolanguage

Eisenstein recalled having first considered the Japhetic ideas of the Russian Orientalist and linguistic theorist Nikolai Marr (1864–1934) more like an amusing game, but as soon as he had realized he could use etymology as his theoretical instrument, it soon became his passion (BTS; Bulgakowa 1996, 197). Collaborative research projects among Eisenstein, Luria, Vygotsky and Marr were planned around 1928–29. In 1931, as a representative of the more general objective of replacing the previous, often Western-origin, scientific views with completely new Marxist research programs, Marr's original research in the 'Institute of Language and Thought' became the leading Marxist linguistic research program. Marr argued for a theory of 'Japhetic' language that he had developed, representing a kind of 'proto-language of all the world's languages. For Marr, all traditional and Indo-European linguistics were in conflict with Marxism (Taylor in ESW2, 361n51).

Eisenstein attended Marr's lectures during the years 1933–34 (Bulgakowa 1996, 199). Marr's hypothesis on gestural language argued that "kinetic speech" based on gestures and motor movements preceded the development of vocal speech. This bodily-based framework of language and thought enabled Marr to build a bridge between the origin of speech and the development of work processes (Bordwell 1993, 172). This approach was also in agreement with the Pavlovian line of research described earlier in this volume. Marr's ideas supported Eisenstein's theory construction on the isomorphic relation between bodily movements and modes of expressiveness. Eisenstein shared with Marr interest in Lévy-Bruhl's theory: as expressed by Marr in his introduction to Lévy-Bruhl's *Primitive Thought*, it seemed to confirm that "thought and language were brother and sister, children of the same parents, industry and social structure" (Marr 1930, 19; in Bordwell 1993, 172, 301). Marr's research objective was to discover in contemporary languages the principles of earlier thinking, non-differentiation, the pars-pro-toto principle, the I-concept, and no separation of subjective and objective (Bulgakowa 1996, 199).

Eisenstein refers to Marr's teaching in his 1935 speech, pointing out that Marr's Japhetic theory, after going through Marxist revisionism, was born anew to be applied to practice as "a generalized method for the study of language and thought" (ESW3, 40). Eisenstein in 1935 applied a modified Marr, when stating that everyday customs and beliefs [i.e., "routine logic" in ESW3, 40] "remain tied to the 'earlier forms of thinking' that are 'sensual-imagistic' in nature" (Bordwell 1993, 172). Furthermore, in his curriculum for the film institute Eisenstein listed in his studies of the image, the link between plastic imagery and 'linear speech' (a term used by Academician Marr).

4.3.6.5 Primitive thought and participation

In his 1935 speech Eisenstein, to emphasize the significance of his theoretical sensuous thought in cinema research, drew an example from Sir James George Frazer (1854–1941).⁴⁷ 'Knots and Rings tabooed' in *The Golden Bough* (1922) is cited at length in order to show the kind of phenomenon the British anthropologist Frazer considered primitive but also universal: "The same train of thought underlies a practice observed by some peoples of opening all locks, doors, and so on, while a birth is taking place in the house. (...) Among the Mandelings of Sumatra the lids of all chests, boxes, pans, and so forth are opened; and if this does not produce the desired effect, the anxious husband has to strike the projecting ends of some of the house-beams in order to loosen them; for they think that 'everything must be open and loose' to facilitate the delivery. (...) In Chittagong, when a woman cannot bring her child to the birth, the midwife gives orders to throw all doors and windows wide open, to uncork all bottles, to remove the bungs from all casks, to unloose the cows in the stall, the horses in the stable, the watchdog in his kennel, to set free sheep, fowls, ducks, and so forth. This universal liberty accorded to the animals and even to inanimate things is, according to the people, an infallible means of ensuring the woman's delivery and allowing the babe to be born" (Frazer 1922, Ch 11).

The idea of art and music originating from primitive social rituals and ecstasy as the principal constituent of participation circulated amongst the Russian intellectuals before the revolution, and re-emerged in Eisenstein's ethnographic studies (e.g., Lévy-Bruhl, Frazer, and Cassirer). For example, during the revolutionary years the Proletkult's ideological architects Bogdanov and Lunacharsky, and the theater director Meyerhold promoted Russian carnivals as socially 'healthy' mass rituals (Geldern 1993, 7). Participation was also emphasized in Karl Bücher's economic anthropology *Work and Rhythm* (1923), which, according to Vygotsky, "established that music and poetry have a common origin in heavy physical labor" (Vygotsky 1971, 245). This idea was present also in Meyerhold's discussion on 'Stylistic Theatre' (1908) as the Dionysian chorus drama, which was born from a ritual offering conducted in an ecstatic state. Meyerhold's essay 'On performing theater and masks' refers to the idea of classical scholar and poet of the Symbolist movement Vyacheslav Ivanov (1866–1949), which argues that drama was born "from the spirit of music and choral hymns of dithyrambs, the energy of which was dynamic by nature" (Meyerhold [1908] 1981, 54; transl. PT).

Eisenstein bought anthropologist Lucien Lévy-Bruhl's (1857–1939) books in 1930. He studied the Russian edition of Lévy-Bruhl's *How Natives Think* (1930) in Mexico

⁴⁷ *The Golden Bough: A Study In Comparative Religion* traced the evolution of human behavior, ancient and primitive myth, magic, religion, ritual, and taboo. His work *Totemism and Exogamy* (1910) was a primary source for Freud's *Totem und Taboo*.

in 1932 (Bulgakowa 1998, 131).⁴⁸ His notes in the margins of the last chapter, which discusses how primitive forms are embedded in higher cultural forms of thinking, show that Eisenstein went through a critical re-evaluation of Lévy-Bruhl's argumentation in terms of his own dialectical view (Bohn 2003, 106–107). The notes show that Eisenstein insisted the shift empowered by conflict from prelogical to logical thinking leans on the logic of qualitative leaps progressing towards higher levels of development, but which – particularly in regression – eventually return to the old (Eisenstein 1932, RGALI 1923–2–231, 4; Bohn 2003, 107). The German translation is 'Bei Prälogik muss es Logik und Dialektik geben Etappenhaftigkeit, Widerspruch und Aufhebung' (in Bohn 2003, 107). Here Vygotsky's influence is also traceable (Ivanov 1985, 179; Bohn 2003, 107). Again the more general Marxist-Leninist interpretation of Hegelian systemic teleology converges with Eisenstein's unveiled psychoanalytical views of unavoidable regression.

Lévy-Bruhl's 'law of participation' introduced the idea of dual unity. It became one of the main models that Eisenstein discussed in his 1935 speech, when he spoke about the Bororo Indians in Brazil who identified themselves simultaneously as men and as parrots (ESW3, 32; in Bordwell 1993, 171). Eisenstein's mature concept of 'ecstasy' is also indebted to Lévy-Bruhl's theory on 'participation' (Bordwell 1993, 173).

Collective representations as "images fused with emotional and motor elements" were also emphasized by the editors of the Russian collection of Lévy-Bruhl's works (1930), as remarked by Bordwell (1993, 171). Lévy-Bruhl "examined missionary reports, ethnographic literature, and travelers' accounts dealing with the mental functions of tribal peoples and concluded that mysticism pervaded all of their perceptions (...) [including] the primitive notion of cause, and (...) the idea of the soul or individual. Later works extended his method to the supernatural, myth, symbols, rituals, and related topics among tribal people" (Nielsen & Glazier 1998).

Bordwell cites Lévy-Bruhl's introduction translated for the Russian edition (1930), which suggest a dual-unity model of cognition: "There are not two forms of thinking for mankind, one logical, the other prelogical, separated from each other by an impenetrable wall. They are different thought structures that exist in the same society and often, perhaps always, in one and the same mind" (Tul'viste 1987, 14; in Bordwell 1993, 171).⁴⁹ Lévy-Bruhl writes thus: "In effect, the essence of every mystical experience is the feeling (accompanied by a characteristic emotion *sui generis*) of the presence, and often of the action of an invisible power, the feeling of contact, most often unforeseen, with the reality other than the reality given in the surrounding milieu" (Lévy-Bruhl [1938] 1975, 102).

⁴⁸ Primitive forms of thinking were advocated in the works of Frazer (*The Golden Bough*, 1907–1915), Lévy-Bruhl (*La Mentalité primitive*, 1922 with Russian translation 1930), Granet (*La Pensée Chinoise*, 1934), Wilhelm Wundt (*Elemente der Völkerpsychologie*, 1912), and Heinz Werner (*Einführung in die Entwicklungspsychologie*, 1926) (Bulgakowa 1998, 170).

⁴⁹ Also noted in Bordwell is the resemblance of Eisenstein's discussion on the monistic ensemble embodied in Kabuki (1929), which "reflected a precapitalist lack of differentiation in Japanese culture" (1993, 171).

Lévy-Bruhl's posthumously-published private notebooks from 1938/1939 ponder whether it is possible to study the phenomena of 'participation' and 'mystery' at all.⁵⁰ In August 1938 he marked in his diary "the abandonment of 'prelogical'" and the 'law of participation' (Ibid. 99). This shift was due to the necessity to change the strategy. According to Lévy-Bruhl, it may be that all efforts to understand primitive sensuous thought are in vain, because conceptual or causal logic has no access to the domain of sensuous thought. The only access is through 'feeling' or "from the viewpoint of the knowledge of objects, and of their understanding – while recognizing that this understanding, when it concerns participations, entails an important part of affective, not cognitive, elements" (Ibid. 100).

More clearly Lévy-Bruhl wrote in 1938 the following: "In other words, let us expressly rectify what I believed correct in 1910: there is not a primitive mentality distinguishable from the other [logical] by *two* characteristics which are peculiar to it (mystical and prelogical). There is a mystical mentality which is more marked and more easily observable among 'primitive peoples' than in our own society, but it is present in every human mind" (Ibid. 100–101).

Eisenstein takes Lévy-Bruhl's non-differentiation between concepts, feelings, and actions, or subject and object, or a fusion of self with other, further, to combining sensuous thinking with a logical organization of artistic activities (Bordwell 1993, 171). Yet, Eisenstein seems to elaborate these aspects from the point of view of dialectics and his idea of regressions as the moving force of evolution, the return to the old, construct the spiral-like progression that Eisenstein emphasizes throughout his texts.

4.3.6.6 Depiction/image conception of mind

For Eisenstein from 1937 onwards, image is depicted as an active and dynamic entity, empowered with the function to "synthesize isolated sensations" (Bordwell 1993, 175). Bordwell defines this as Eisenstein's third model of thought: a depiction/image conception of mind [*obraznost/obraz*] (Ibid. 175–176). Eisenstein's contemporary aesthetic playground had thus far been established on classical ideas that the 'artist thinks in images' and that 'the external form allows the spectator (and the artist) to understand the true image in its meaningfulness' (Ibid. 175).

Eisenstein emphasized emotional aspects in the historical views of the Marxist-Leninist school of literary theory, particularly those he acknowledged in Vissarion Belinsky's⁵¹ (1811–1848) early conceptualizations of 'image of form and content' and

⁵⁰ *The Notebooks on Primitive Mentality* (1938/1939), which were published posthumously in 1975, give insight to Lévy-Bruhl's ongoing reconsiderations of his theoretical apparatus. The vivid language is reminiscent of similarly vivid expressions of Eisenstein, and many issues discussed in the mature Eisenstein may be argued to arise from Lévy-Bruhl.

⁵¹ "In his essay *The Idea of Art* (1841) Belinskii saw art and literature as primarily utilitarian (...) Under the influence of Hegel and Romanticism, Belinskii emphasized the historical context of literature. Later he approached Utopian socialism ideologically and rejected Hegelian conservatism" (Liukkonen 2002).

the notion of ‘pathos’ [*paŋos*] (Ibid. 176). A utopian socialist, who was characterized as ‘furious Vissarion,’ Belinsky rejected the aesthetic function of the arts and argued that art should serve the revolution and change society (Liukkonen 2002).

The leading figure in the Russian Symbolist School of poets and critics Alexander Potebnya (1835–1891) also discussed the ‘artistic image’ [*khudozhestvennyi obraz*], which converged form and content. Potebnya suggested that an ‘external’ perceptual form elicits an ‘internal’ generative, procedural image pregnant with emotional significance (Bordwell 1993, 175). From Potebnya Eisenstein draws support for “showing that the origins of language are themselves figurative” (Ibid. 177). In the 1934 Soviet Writer’s conference, where the doctrine of Socialist Realism was debated, the architect of the Marxist economic system Nikolai Bukharin “cited Potebnya to support the idea that art reflects objective reality through symbols imbued with emotion” (Bukharin 1934, 192; in Bordwell 1993, 176). The views of Belinsky and Potebnya were further embodied in the core aesthetic ideas of Socialist Realism, in the notions of concreteness, expressivity, and ‘magicity’ (Bordwell 1993, 175–176).

4.3.7 PHILOSOPHY OF SYMBOLIC FORMS

One of Eisenstein’s most important sources in the philosophy of theoretical knowledge, as previously mentioned, was the neo-Kantian theorist Ernst Cassirer (Bulgakowa 1998; Bohn 2003). In this study, Cassirer will be given a special position as a reflector of the interdisciplinary tendencies of Eisenstein’s era. Drawing equally from the natural sciences as from philosophical inferences, Cassirer had great influence not only on Eisenstein (Bulgakowa 1998), but on the whole intellectual circle of early Soviet Russia. For example, the Bakhtin circle studied his works, as suggested in Craig Brandist’s essay ‘Bakhtin, Cassirer and symbolic forms’ (1997).

The search for a unifying theory of philosophy and natural sciences can be viewed as an essential part of the intellectual atmosphere of Eisenstein’s era. As discussed above, Bogdanov’s ‘violently silenced’ tektology exemplified this kind of universalist tendency in the Soviet Russia. Also, the German history of science embeds ‘forgotten’ scholars (particularly from the 21st century point of view), such as Hermann Friedmann, who grew up in Eisenstein’s Riga. Mauri Ylä-Kotola’s pioneering research ‘Evolution or Degree Zero?’ portrays Friedmann as rooting in the empirical physiology of the 1900’s and the romantic philosophy of nature, which emphasized experience as the basis of knowledge (Ylä-Kotola 1997, 61). Friedmann’s *Die Welt der Formen. System eines morphologischen Idealismus* (1925) constructs a systemic view to the categorization of forms in terms of a Lamarckian interpretation of evolution (Ylä-Kotola 1998, 212).

The intellectual environment of his era, Friedmann describes as inseparably related to Kant: “One may think for or against Kant, but not without him” (Friedmann 1925,

42). In similar manner, for Cassirer, whose philosophy mediated between the natural sciences (*Naturwissenschaften*) and cultural domains (*Geisteswissenschaften*), Kant constituted the basis of philosophical inquiry (Friedman 2004 *SEP*). Cassirer’s *The Philosophy of Symbolic Forms* (1923–1929) has been viewed here as the continuation of Kant’s treatment of the rational and sensuous dimensions of human knowledge.

Though he was an important source of inspiration, Eisenstein does not refer directly to Cassirer by name but once.⁵² Consequently, Bordwell’s (1993) study *The Cinema of Eisenstein* refers neither to Cassirer nor Kant. In addition, in Bordwell’s view “Eisenstein’s 1930’s speculations about psychological processes do not ground a theory of knowledge. His version of associationism, for instance, is vulnerable to the objections that associations alone cannot yield reliable knowledge of causation” (1993, 177). However, Eisenstein’s figurative philosophy appears more than mere layman’s speculation. Curiously, according to an anecdotal expression by an unidentified contemporary, the film theoretician Béla Balázs referred to Eisenstein’s theoretical views as those of a ‘hopeless neo-Kantian’. Indeed, absorbing Cassirer’s way of thinking, as suggested in Bulgakowa (1998), seems to have equipped Eisenstein’s figurative thinking with both conceptual tools and explorative courage. It shows in Eisenstein’s act of ‘naturalizing’ *phenomena of the world* as his 1935 speech declared (ESW3).

The *Gestalt* theorists’ perceptual pregnancy may be reflected in Cassirer’s selection of his notion of symbolic pregnancy. Cassirer was in personal contact with the Berlin *Gestalt* psychologists, who, in turn, were inspired by Husserl, and indirectly linked to William James and Ernst Mach. On the one hand, Cassirer exercised a philosophical dialogue with the Vienna Circle’s active member Moritz Schlick (teacher of von Bertalanffy, the inventor of General System Theory) on non-Euclidian geometrics and Einstein’s general theory of relativity. On the other, he challenged Husserl’s rebellious disciple Martin Heidegger (Freidman 2004, *SEP*). Cassirer also promoted the ideas of Jakob von Uexküll, the pioneer of biosemiotics, and has himself been, in retrospect, mentioned as the forerunner of ecological views to perception at least by Gerald Balzano and Viki McCabe (‘An ecological perspective on concepts and cognition’ 1986).

Cassirer’s influence is immanent. Eisenstein’s argumentation in the essay ‘Superconcreteness’ concludes that in fact, by studying oneself, one can take hold of the actual universal laws of the objective world, because these universal laws penetrate the subjective individual to the same extent as they penetrate the rest of the unified reality (NIN, 175–178).

Bulgakowa suggests that Ernst Cassirer’s universalist ideas on the new ontology presented in *The Philosophy of Symbolic Forms* became an important guideline for Eisenstein’s development of the notions of image and organic unity (Bulgakowa 1998, 194). Cassirer argued for a change to the traditional system of ontology with his ontology of symbols (Bohn 2003, 229–230). Cassirer’s discussion on concept and symbolic

⁵² According to Bulgakowa (p.c. 2007), Eisenstein only mentioned Cassirer by name in a second-hand citation from him. This is so in the German translation (transl. Bulgakowa & Dietmar Hochmuth) of ‘Perspectives’ (1929), while Taylor’s translation of the essay has excluded Cassirer’s name (ESW1988).

form (or 'image') was appealing to Eisenstein. This must have been because Cassirer suggested that the world of signs converged into a dual unity the sensorial and intellectual domains of human knowledge, embracing all human activity, language, myth, art, religion, science, and history (Nöth 1995, 36). He saw the roots of language in the communicative expressions of emotions (Cassirer 1962, 114; in Grodal 1997, 72). Eisenstein adapted Cassirer's inference concerning symbols to that of image [*obraz*], but transforming the dialectical conflict of *Potemkin* to the holism of organic unity (Bulgakowa 1998, 194). The conceptualization of [*obraznost*] and [*obraz*] in Eisenstein's text and diary is argued in Bohn (2003) to draw from Cassirer's notion of the symbolic; this discussion was however also conducted amongst the Russian Formalists (Bohn 2003, 65, 314).

Cassirer's paths of thinking led him to an investigation into language (1923) as a symbolic form, through the realm of mythical thought (1925), back to the 'problem of knowledge' of his philosophy taking the form of a 'phenomenology' (In introductory note 1957/1967, 3rd ed. ix). Cassirer's (1929) phenomenology is indebted to that of Hegel: "For Hegel, phenomenology became the basis of all philosophical knowledge, since he insisted that philosophical knowledge must encompass the totality of cultural forms and since in his view this totality can be made visible only in transitions from one form to another. The truth is the whole – yet this whole cannot be presented all at once but must be unfolded progressively by thought in its own autonomous movement and rhythm. (...) The element of thought, in which science is and lives, is consequently fulfilled and made intelligible only through the movement of its becoming" (Cassirer 1957, xiv). In his 'Preface' to *Philosophy of Symbolic Form* written in 1929 Cassirer cites Hegel's *Phänomenologie des Geistes*: "regardless what the content may be, it is absolute form – that is, it is the immediate certainty of itself and, if this term is preferred, it is their absolute being" (Hegel 1949 in Cassirer 1957, xiv). The return to origins, the spiral and recursive movement that formed the foundation of Eisenstein's thinking, were also fundamental to Cassirer: it is not the *telos* as an independent abstract end of process, the purpose of the human linear search for knowledge, but instead, it is the simultaneous coexistence of the end, the middle, and the beginning in the procedure itself (Cassirer 1957, xv).

A neo-Kantian Cassirer refers to Kant thus: "Kant strives to show how the various basic forms of knowledge, sensation, and pure intuition, the categories of the pure understanding and the ideas of pure reason, intermesh – and how by their reciprocal relation and mutual determination they define the theoretical form of reality. This definition is not taken over from the object but involves a 'spontaneous' act of understanding" (Cassirer 1957, 5). For Kant it is in the exact sciences and mathematics that the theory of knowledge is linked to its self-realization, while the rest, the intuitive understanding of the wholeness, remains as formless matter (Ibid. 6). However, Cassirer's interest is to bring this formless 'mere' matter and 'pure' form into dialectical reflection (Ibid. 7). "(...) [W]ithout the synthesis of apprehension, reproduction, and recognition" there would be "neither a perceiving nor thinking ego" and "an object neither of pure thought nor of empirical perception" (Ibid. 8). "Now an uninterrupted path leads from the mere 'affection' of the senses, with which the critique of reason

begins, to the forms of pure intuition – and from these in turn to the productive imagination and the unity of action expressed in the judgment of the pure understanding" (Ibid. 9).

The existence of a scientifically objective world was for Eisenstein, as to his many contemporary thinkers, an *a priori* condition. Bordwell tracks in Eisenstein's views "Lenin's copy theory of perception, according to which percepts are 'images' of the external worlds" (Bordwell 1993, 175). As put into words in Eisenstein's ideological 'bible' – the *Philosophical Notes* of Lenin – knowing is limited to analyzing one's sensory experience (a copy of the world) in relation to the real world.

Eisenstein's discussion seems to follow the footsteps of Cassirer in 'Superconcreteness': the epistemological philosophers such as Kant and Berkeley deny objective knowability of the sensuous nature of things in themselves, because one cannot abstract them in a mathematically exact sense, while, to the contrary, the artist may have more tools hidden up his sleeves than the philosophers, in terms of emotions and figurative thinking (NIN, 176).

Cassirer's *Philosophy of Symbolic Forms* (1929) is to take Kantian thinking further, to expand it to the domain of mythical thought and language. His principle assumption is that these domains have their own laws and structures, as does the domain of exact sciences, such as logic and mathematics. Yet all these laws, which constitute and are constituted by the particular specificity of each domain, will eventually be shown to share a mutual grounding in some unifying system of understanding, constituted by ultimate universal laws (Cassirer 1957). The laws penetrating nature are grounded on the same general laws that penetrate and constitute the rest of the universe, even the artificial laws of Eisenstein's montage composition.

When Eisenstein in 'The music of landscape and the fate of montage counterpoint at a new stage' (1945) writes about different stages in the development of thought, he may be seen to reflect Cassirer: the initial stage "of undifferentiated consciousness has been left behind" and "the following stage of diffuse separation and isolation of each distinct phenomenon of the world in it has been accomplished ([...as in] Kant's metaphysics, in its own way repeating more ancient analogous theoretical positions.)" Eisenstein describes the end-stage as one to which "montage counterpoint as a form seems to correspond", that is, "that fascinating stage of the evolution of consciousness, when both preceding stages have been overcome, and the universe, dissected by analyses, is recreated once again into a single whole, revives by means of the connections and interactions of separate parts, and appears as an excited perception of the fullness of the world perceived synthetically" (NIN, 286–287). Cassirer's objectives of *the Philosophy of Symbolic Forms* have thus found their reflection in the domain of arts, in Eisenstein's figurative philosophy of montage.

In the essay 'Pathos', completed in 1947, Eisenstein seems to reflect Cassirer's neo-Kantian, or one could say post-Kantian, thinking: as Cassirer takes his inquiry past Kant's position to the domains of a natural, perceptual, sensuous world as a unified whole, so does Eisenstein. Eisenstein notes that the unknowability of the nature of things "in themselves," as in Kant, or Berkeley, can be overcome through sensuous participation in the natural order of things (NIN, 175). For Eisenstein "it is clear that in the

area of sensation it is possible to penetrate, more than is usually thought, those laws of movement in which our ‘material essence’ manifests itself, that is, we as ‘bundles’ of thinking material” (NIN, 177). And further, for this is needed “a certain release from the generally accepted psychic state – a certain degree of liberation from superstructural layers of figurative presentations and ideas; that is, that primeval, purely sensual state into which a ‘patient’ [‘participator’] is plunged by the whole invented system of ‘exercises’ leading to a state of ecstasy” (NIN, 177). Here Cassirer’s ideas on mythical thinking seem to converge with Lévy-Bruhl’s ideas on participation as a primitive form of thinking, as an expression of the socio-emotional order of things.

Considering Cassirer’s later formulation on *The Problem of Knowledge*, “The categories on which the system of mathematical and physical cognition is founded are accordingly the same as those on which our concept of the natural worlds rests” (Cassirer 1957, 11). This is echoed in Eisenstein’s phraseology about how the complex laws of the natural physical world are the same laws that penetrate also the phenomenal world of artworks and the mind that creates those artworks.

4.3.8 SUMMARY

This section depicted Eisenstein’s intellectual landscape in a broad, interdisciplinary context. Empowered by what may be characterized as Eisensteinian universalism, it provided *Simulacrum Eisensteinense* with a preliminary framing for the scientific research topics that will later be extrapolated to the 21st century. It also showed that Eisenstein ought to be portrayed, not as a semiotician, aesthetician, formalist, or a mere psycho-engineer employed by the Soviet dictatorship, but as a Hegelian philosopher-scientist, who argued for cinema the position as a universal laboratory for studying the complexities of human mind.

Briefly looking back, the chapter has presented Eisenstein as a child of the euphoric era of the revolution, trusting in human control over the natural world, and this in all domains of human activity (social, cultural, political, economic, etc). At that time European societies were more or less confident in the human ability to govern complexities, as Eisenstein’s Soviet Russia exemplified in its own right. The early systemic theories emerged and were recycled widely during that era, and in Russia they were particularly involved in building new visions for the organization and management of a new kind of communist society.

The above exploration of Eisenstein’s scientific landscape suggests a summing up: an interdisciplinary synthesis that integrates Eisenstein’s creative plasticity of thinking with Ernst Cassirer’s neo-Kantian epistemology, Kurt Lewin’s dynamical *Gestalt* psychology, William James’s holistic emotion views, Nicholas Marr’s pre-linguistics, Lucien Lévy-Bruhl’s anthropology of participation, Alexander Luria’s synesthesia research, Lev Vygotsky’s socio-cultural psychology, and Alexander Bogdanov’s gen-

eral science of organization, amongst many others.

Though many of Eisenstein’s early direct and indirect theoretical sources of inspiration later became officially banned (Freud, Bogdanov, Vygotsky, Lévy-Bruhl, the *Gestalt* psychologists, to name only a few), particularly from the 1930’s onwards, they are retrospectively recognized as the profound grounding for the mature Eisenstein’s holistic views. It has been noted by many film history researchers that Eisenstein’s references and sources of inspiration are not always properly marked. Often the researchers seem to assume that this imprecision in Eisenstein’s reference practice was simply due to his artistic character (e.g., Bulgakowa 1998; Brandist 2008, n.d.). Based on the understanding of today of the unpredictable and unstable ideological environment of Soviet Russia, one may assume an explanation for Eisenstein sparingly mentioning his sources of both inspiration and grounding theories: a politically non-acceptable name mentioned in some publication may lead the researcher, even several years after publishing, to face a political trial or execution – the then prevailing terms of academic standards.

The mind map of Eisenstein’s psychological ‘laboratory’ of cinema exposed his interest in the linkage between the physiology of the body and experiential mind phenomena. In the following section, Eisenstein’s descriptions of world, body, brain, and emotions, involving the psychology of art, the physiological homeostasis of expressiveness, and the common ground of image and language in experiential metaphors and primitive thinking should be reflected against his theoretical background, as depicted above.

4.4 EVOLUTION OF CORE IDEAS

4.3.1 SPEECH OF 1935

The expression ‘a point of no return’ could describe Eisenstein’s speech at the fifteenth anniversary of Soviet Cinema at the All-Union Creative Conference of Soviet Filmworkers. This event in January 1935 is regarded as one of Eisenstein’s most important theoretical milestones (Bordwell 1993, 1974; Bulgakowa 1998).

Eisenstein had recently held another speech entitled ‘GTK-GIK-VGIK; Past-Present-Future’ at another occasion, the fifteenth jubilee of the Cinema Institute (1934). The jubilee celebrated the announcement of the practice-based film school GIK’s leap to a higher rank of educational institutes, now renamed as VGIK (Leyda in FEL, 66). Eisenstein’s jubilee speech presented the two-fold objective of, firstly, providing new

talents for Soviet cinema, and secondly, supervising research in the recently established Scientific Research department (NIS). "It is only on the basis of the closest contact with the culture of literature, theatre, painting and music, only in the most serious examination of the newest scientific disclosures in reflexes and psychology and related sciences, that the study of cinema specifics can be co-ordinated in some constructive and workable system of instruction and perception" (FEL, 71).

In turn, the All-Union Creative Conference of Soviet Filmworkers brought forward the "correlation between the logico-rational and the sensory of art, in the creative act, in the structure of a work and in the process of its perception" (Kleiman cited in Grossi 1993, 245n38). The main themes of Eisenstein's 1935 speech are extracted below, loosely following Bulgakowa's analysis (1998, 169). Eisenstein elaborated the themes also in the 1940 essay 'The Psychology of Composition': these basic methods of such authors as Leo Tolstoy, Alexander Pushkin, Nikolai Gogol, or John Steinbeck are loosely cited from the essay (ECOL 216–218).

- (1) To equate a part with a whole (Bulgakowa). In 1935, according to Eisenstein, *pars pro toto* "is not individual devices, peculiar to this or that area of art, but rather the specific progress and condition of thinking, for which the given condition is one of the laws" (ESW3, 31). In 1940: an author may discard the whole (the doctor) and in its place present a part (the pince-nez) (ECOL 217).
- (2) To attribute a human state to nature (Bulgakowa). Exemplified in Eisenstein's citation in 1935: "If a dramatic scene 'resonates' in a certain key, then all elements that embody it must resonate in that same key. [In the example of] *King Lear* (...) The storm on the heath, raging about him on stage, echoes his inner storm" (ESW3, 31). Eisenstein in 1940: the author may compel the entire surroundings of a man (Lear) to take on the form of that man's state (the storm) (ECOL 217).
- (3) To equate a thing with a concept (Bulgakowa). Eisenstein, with respect to his example of the doctor's pince-nez in *The Battleship Potemkin*, having "used a construction of emotional thinking, and consequently obtained a sensory emotional effect, instead of a 'logically informative' one" (ESW3, 30). Eisenstein in 1940: the author may equate an object of actual trade with an invisible object – labor (ECOL 217).
- (4) To elevate the act of movement over the object in movement (Bulgakowa). "So, such a juxtaposition of words, where the description of movement and action (the verb) precedes the description of who is moving or acting (the noun), corresponds more closely to the primeval structure" (ESW3, 35). Eisenstein in 1940: an author may slightly re-arrange the words, switching the positions of the predicate and subject, i.e., mentioning the fact of movement before describing *who* moves (ECOL 217).
- (5) To compare primitive, habitual logic to modern man's 'conceptual logic' (Bulgakowa). Eisenstein looks for support for his idea of the structure of the compositional elements in montage from the example from primitive people's behavior in Polynesia. This is directly comparative to Frazer (1922) (see page 133). "When any

Polynesian woman goes into confinement, it is an iron rule that all the village gates be opened, all the doors thrown open, all the inhabitants (including the men) take off their sashes, aprons, headbands; all knots that are tied must be untied, and so on; that is, every circumstance, all concomitant details, must accord with, correspond to, the fundamental theme of what is happening: everything must be opened, untied, to give the greatest assistance to the newborn child's entry into the world!" (ESW3, 31–32; Bulgakowa 1998, 169) Eisenstein in 1940: the author may take the quiet phenomena of nature (stars, poplars) and personify them as whispering judges (the poplars) or winking (the stars) at the accused (ECOL 217).

- (6) In 1940 Eisenstein adds the sixth, final method: the author may take ordinary, fine Russian words, strip away the relative meaning given them by an explorative society over the centuries, and give back their original form of a concrete, objective fact (Communion) (ECOL 217). This he sees as a kind of 'incorporation' or 'partaking' of primitive totemism (Taylor in ECOL, 227n13).

Exhaustive research had preceded Eisenstein's presentation of 1935 and his fully accumulated theoretical repertoire is in use. For example, Engels's dialectical principles are applied, as well as the ideas of the leap from quantity to a new level of quality, the struggle of the opposites and negation of negation. The same holds for Hegel's views on the discipline of the Arts, Vygotsky's psychology of arts (1925), Cassirer's concept of universalism, among other key ideas. The concept of qualitative leaps from one montage method to another is assumed to hold. Whatever Eisenstein's polyphonic montage does not explicitly cover is handled more implicitly in the holistic principle of negation of negation – while being depicted in the dyadic movement in Yin and Yang. Moreover, all physiological and expressive elements of the montage of attractions are recycled in intellectual cinema. In a similar manner as the overtone montage embeds the metric, rhythmic, and tonal montage, intellectual cinema, in its turn, fertilizes the soil of Eisenstein's multisensory vertical montage.

Eisenstein's embryo of theoretical considerations had proceeded from intellectual cinema onwards to primitive thinking, inner speech, and preconceptual figurativeness. The discussions on the roots of language and figurative thinking with Luria, Vygotsky, and Marr had influenced Eisenstein's dialectical view on the aesthetic experience and forms of art (Bulgakowa 1998, 168–170).

Cassirer's ideas on symbolic forms assured Eisenstein that a scientific method could be established to examine repetitive patterns of thought (Ibid. 168). In his Mexican years Eisenstein had studied primitive cultures in Lévy-Bruhl and Frazer (Ibid. 170). In 1935 Eisenstein seemed to return to these primitive forms of thought processes, characterized by totemism, animism, isomorphism of macro- and microscopic worlds, identity of part and whole, of subject and object (Ibid. 169–170). Bordwell, on the other hand, emphasizes in Eisenstein's speech the triadic interplay of three epistemological "models of mind": Joycean inner monologue, Lévy-Bruhl's concept of sensuous thought, and the depiction/image model; in the polyphonic elaboration of color, sound, and image, all three models surface in linkage to synesthesia (Bordwell 1993, 185).

In the eyes of the participants of the All-Union Creative Conference of Soviet Filmworkers Eisenstein carried the burden of his earlier orientation, as described in the personal account of Marie Seton in *Sergei M. Eisenstein: A Biography*. Lebedev criticized Eisenstein for being involved with “the theories of Freud, Marinetti [the Futurist], Pavlov, the physiologist, Bogdanov of the Proletcult and many bourgeois psychologists and philologists” (Seton 1978, 340). Now, Lebedev had continued, Eisenstein’s recently begun studies on Marxism could be considered as proof that Eisenstein had started off on the path towards becoming a true Marxist theoretician (Ibid.).

4.4.2 EMBODIMENT OF EMOTIONAL THEME

This section of ‘Eisenstein revisited’ extracts the dominating dynamical or organic principles of the mature Eisenstein’s figurative thinking, which will later be extrapolated to the recent findings of 21st century cognitive sciences and neurosciences. The results of the exploration will perhaps further allow re-formatting of canonical cultural perspectives on cinema from their particularly biological and organic-systemic points of view. Eisenstein seemingly implies that the process of authoring cinema is not so much about ‘creating a product’ as it is about ‘authoring the underpinning unconscious emotion dynamics of the cinematic experience itself’.

The forbidden tektological influences surface in the mature Eisenstein’s descriptions of vertical montage. According to Bogdanov complex systemic development, be it that of an organism, a psyche, or a collective, is regulated by the dynamics of tektological selection, which modifies the earlier structures of the organism (or here montage). In evolutionary terms, the continuous interaction of the system with the surrounding context generates a series of sequential layers, in which “some layers were created earlier while others later ‘superimposing’ themselves (in the organizational sense) on the earlier layers” (Bogdanov 1980, 285).

In Eisenstein’s montage organization “the *simultaneous movement* of a number of motifs advances through a succession of sequences, each motif having its own rate of compositional progression, while being at the same time inseparable from the overall compositional progression as a whole” (ESW2, 333). Eisenstein stated that while cinematic form or representation as such is one issue, the author and his attitude towards what is represented is another in its own right. Another guiding principle was that the filmmaker must study herself in the process of creating. *Simulatorium Eisensteinense*, in fact, could argue that these later synesthetic developments of vertical montage of the 1940s should be described as the beginning of a new phase of Eisenstein’s montage development, that of *holistic montage*, or *montage of embodiment*.

4.4.2.1 Isomorphism claim – pathos

In Eisenstein’s view, a *pathos* composition is considered a montage formulation of a particular emotional theme, which has emerged from the author’s emotional experience. Respectively, the *pathos* composition of the author provokes *ecstasy* when the pathos re-emerges in the embodiment of the spectator, thus defining the spectator’s experience.

The essay ‘Superconcreteness’ (1947) portrays an author who operates in the strong, subjective domain of knowing the world in feelings, in a sensuous, lyrical manner of *pathos*. Eisenstein highlights that in the process of creation the author has to study himself, because only through introspection does the author gain access to knowing the others around him (NIN, 176). Furthermore, Eisenstein assumes that the similar kinds of feelings one experiences in the creative moment of *pathos* are familiar to the experiencing spectator due to the shared characteristic of being humans: “the manifestation of those same feelings in others are analogous and exist objectively” (NIN, 176).

Eisenstein thus equated the author’s psychological experience of the organic-dynamic montage composition with the psychological impact of it on the spectator’s experience. The *pathos* composition ‘automatically’ embodies the author’s attitude or relationship to its thematic content, which, in turn, is recognized in the experience of the viewer: the viewer is induced with the same pathos that inspired the author’s process of creation (NIN, 28). The two experiences could be argued procedurally isomorphic, *because* of the natural principles governing the authoring process were assumed to be the same that were governing the experiential process of the spectator.

The assumption of psychological isomorphism allowed Eisenstein to argue that by studying and developing the method of authoring cinema montage, this from the smallest detail (montage cell) to the management of the most complex orchestration of cinema experience, one could actually gain access to the psychological domain of the spectator experience. The procedural structure of Eisenstein’s isomorphic author-spectator mapping thereby comes into being in his formal compositions of cinema montage. While cinematographic expertise was a must for making films, it was not enough for Eisenstein: the author had to show expertise in the psychological domain as well.

The psychophysiological isomorphism assumption turned towards the author’s subjective interests, attitudes, and emotional motivations. The author who learns to recognize and analyze throughout her own subjective, emotionally-loaded experiences, Eisenstein argued, has a powerful method in her hands. In reflecting her own bodily experiences in the montage process, an author can gain emotional access to the embodied domain of the spectator. Eisenstein’s author (be it Pushkin, Tolstoy, or Dostoyevsky) possesses the capability to formulate an objective view on the world in “description, structure, images, and the *recreated law* of the process of the analogous experience” (NIN, 176). The embodiment of the emotional theme enables the author to make such decisions in the construction of the cinematic work that the emotional theme naturally becomes embedded in the montage structure.

The methodological keyword to managing psychology was not only introspection but also having access to the psychophysiological knowledge gained by the most recent research conducted in the Soviet laboratories. Alongside these holistic pathos principles, cinema was equipped with the power of educating the spectator to reach the analogue, ideological mode of thinking that the author embodied at the moment of creation. As explicated in the GIK film school manifesto of Eisenstein and Alexandrov (1928), by expanding to the domain of psychology and physiology, cinema could claim its integral position in the Soviet ideological system, fully contributing to the engineering of a New Soviet Man.

4.4.2.2 Model of represented and representation

The dyadic of 'representation' and 'image' posits two different aspects of the authoring process: the main issue regarding the montage compositions is "*the problem of representation and the relationship to what is being represented*" (NIN, 3). This relationship links (in isomorphic manner) the feeling of the author to the feeling of the spectator (NIN, 3). The relationship between the represented and the representation is also reciprocal, meaning that the composition's structure is defined by the structure of the phenomenon it represents. The montage composition must embody the author's emotional experience in order to exhibit the desired effect of cinematic representation. In addition, the relationship between the perceived structure of the phenomenon and the perception of the creator of the representation must be taken into account as well. Yet, according to Eisenstein, both the object as representation and the object of perception, on the one hand, and the biological creator and the perceiver, on the other, are structured according to the same unifying law, which applies to the rest of the natural world as well (NIN, 4).

One could apply a simple communication model as follows: the emotional-intellectual experience, *pathos*, of the author (message) is communicated in its original form to the spectator in the montage composition. The viewing process of the spectator (receiver of the message) extracts the emotional-intellectual content from the audiovisual material (vehicle). Due to the author's powerful pathos re-lived in the process of decoding the message out of the montage composition, the spectator experiences ecstasy.

Conceptualized as above, the process appears as a one-directional communication model. However, if one acknowledges Eisenstein's organic-dynamic orientation and the systemic environment of his lifetime, the same phenomenon may be analyzed from the point of view of Eisenstein's *biodynamics*, or in the wider scientific context of the holistic organicism of Eisenstein's era.

Though Eisenstein discusses montage composition as a concrete instrument of mediation, he assumes that the



pathos process is plausible only because both the sender and receiver embody the same organic laws of nature. Due to the underpinning biological similarities of cognitive processes, the sharing between the author and the spectator becomes possible. The organicistic communication model, which Eisenstein is here argued to relate to, is similar to Cannon's homeostasis but also has its roots in Hegelian systemicity. The model will be discussed later in terms of the more recent holistic views in the next major Eisenstein Extrapolated. It will function as a basic assumption, which resurges later in connection to the 21st century approaches to the neural simulation processes and particularly in the interpretative context of the authoring mind.

4.4.2.3 Pathos composition

'On the structure of things' (1939) describes the holism Eisenstein assigns to the Greek word *pathos*: "A production will become organic and achieve the highest organic unity – in the sphere of *pathos* as we understand it – only when the theme of the work, in its content and its ideas become an organically inseparable whole with the thoughts, feelings, the very being and existence of the author" (NIN, 36). A *pathos* composition means that "for each element of a work, the condition of 'being beside oneself' and a transition to a new quality must be observed" (NIN, 208). The *pathos* principle indicates a dialectical change from one state to another; this leap into a new experiential quality — often the opposite one — is the basic formula for ecstasy (NIN, 35). For the author, pathos composition is an instrument for organizing the spectator's augmented experience of 'being aside oneself' — not mere 'resonance' felt in the composition but a force that drives one to 'ex stasis' (NIN, 27).

The pathos may be depicted in different levels. Categorized into the organic unity of *general order*, the 'prototype' of pathos is imitation of the character (NIN, 11). The figurative form of the actor's behavior on the screen will depict the leap 'outside of oneself' (ex-stasis), and the viewer identifies with the perceived behavior loaded with *pathos* (NIN, 28–29). In the complex stage of pathos composition everything in the image will acquire the same level of pathos: the environment of the character together with its nonliving elements are loaded with pathos, e.g. landscape, elements depicted by cinematographic means such as lighting, focus, framing, camera movements, etc. This depicts the organic unity of *a particular of exceptional order* (NIN, 11).

For example, Eisenstein argues, in *Chapayev* (1934), a Mosfilm Studio production by Georgy and Sergei Vasiliev, "*the leap of pathos composition into composition of opposites*" characterizes the whole film; in other words, "a leap from one opposite to another *within the very method of pathos composition*, arranged according to these opposites" (NIN, 212; *italics by S.E.*). This kind of *culmination* is recognized in the moment one feels a behavioral change from one kind of emotional state to another, often opposing, one (NIN, 36).

4.4.2.4 Experience embedded in metaphoric structures

The power of composition emerges from the cinematographic embodiment of human emotional experience, and in a reciprocal manner, the composition always has its metaphoric roots in the subjective experience of the composer. Curiously, Eisenstein's own language projects metaphorically the experiential bodily features of the phenomena he describes, as the following expressions from 'On the Structure of Things' (1939) show: "the 'bouncing' rhythm of the structure of cheerful episodes, the 'monotonously drawn-out quality' of the editing of a sad scene, or the 'glittering with joy' lighting resolution of a shot" (NIN, 4).

The correlation between the structures of emotional experience and those of montage composition is argued to be isomorphic: by nature, "*The composition takes structural elements of the represented phenomenon and from them it creates the law of the structure of things*" – corresponding to the structure of the "*emotional behavior of the human being in relation to the experience of the content*" (NIN, 4; italics by S.E.).

Yet, the composition may be created with more or less complexity: either drawing simple analogies on the basis of similarities ('grievous grief'), or constructing complex metaphoric structures based on more profound knowledge and *pathos*. The simplest case is when the law of structuring corresponds to the object of representation, e.g. 'grievous grief' (NIN, 4). The complexity of the compositional emotive graph increases, according to Eisenstein, when the emotions involved do not exclusively accompany the object represented (e.g. 'joyful joy'), but relate to "the emotional *relationship to the object represented*" (NIN, 5). This kind of case, in Eisenstein's thinking, links to those complicated moments where, for example, the joy experienced relates to the dying grief of a cruel enemy, just hit by an arrow at the moment of slaying one of the sympathetic characters of the film.

Further, more complexity is added when the author's emotional relationship to the phenomena represented is depicted in the artistic decisions of the composition, this happening most often by analogical structures. Eisenstein's example in his essay 'On the Structure of Things' (1939) is 'adultery' in the novel by Leo Tolstoy (1828–1910), *Anna Karenina* (1970, part 2, Ch. XI, 135): the whole scene is depicted through literal imagery of murder, arising from the author's relationship to adultery (NIN, 6). The analogy of adultery to murder determines every compositional element of Tolstoy's scene, that is, instead of depicting the actual passionate feelings of the two parties in the act itself (NIN, 6). According to Eisenstein's study, Tolstoy repeatedly applies his compositional method of analogue, thus enabling "immeasurable enriched significance and emotion" (NIN, 8).

In addition, Eisenstein discusses the compositional structure used by Maupassant in his story 'Mademoiselle Fifi', where the stereotypical characteristics of the two characters, the German officer and the French prostitute, are exchanged. The prostitute is presented as a noble person in contrast to the *prostitute-like nature* of the German officer (NIN, 9; italics by S.E.). This method, as analyzed by Eisenstein, is used to compose every aspect of Maupassant's work. Naturally, this contrasting method is familiar in Eisenstein's thinking already from his early eccentric theater years.

4.4.2.5 'Feel' for Organic composition

It seems that for Eisenstein, there is no other way to create compositions but the embodied one. In a lecture given to the students at the film school VGIK in 1946, Eisenstein discusses in length 'Problems of Composition' (NFD, 155–183). Eisenstein's advice to the students, whenever they are faced with "a chaotic agglomeration of pieces" is to study carefully each individual montage piece, in order to figure out in them "the embryos of the future structure and, proceeding from these, to set down the compositional form into which the pieces will fit organically" (FEL, 182).

The compositional element in each montage piece must be perceived, not in rational manner, but by emotionally feeling the "inner harmony" of the piece. Without each montage piece supporting the compositional whole, no unity can be delivered. Eisenstein's 'fractal-like' dynamism penetrates the whole hierarchical structure of the film work, supporting unity even in the complex and multidimensional structures: the only method for remaining in control over the creative process.

In his lecture 'Problems of Composition' Eisenstein also quotes his not-yet-published essay 'P-R-K-F-V' (FEL, 187n4). 'P-R-K-F-V' (1946) discusses composition also from the point of view of audiovisual composition, this actualizing in his essay about his musical collaborator Prokofiev in *Alexander Nevsky* (1938) and *Ivan the Terrible* (1944) (NFD, 156). In Prokofiev's portrayal Eisenstein (1946) writes: "(...) what a convincing 'relief' musical image – of, say, an ocean, a fire, a storm, an impassable forest or majestic mountain peaks – arises in our senses when the melody is built on that same principle of unity through multiformity which underlies not only plastic relief in montage but also the complex montage image" (NFD, 161).

The prospective organic growth of a montage composition, as in 'Problems of Composition' (1946), is based on continuous awareness of the montage pieces as open, organic cells, each embedding infinite compositional potentialities (FEL, 162). This contrasts the method of building on a predetermined, mechanical (metric) composition, which eventually ignores the author's emotional 'feel' for the organic structure of the selected and genuinely important theme (FEL, 162). Any existing phenomena may function as a organic structure for montage composition, for example, the intonation and spacing of human speech⁵³ and conversation could work as a model for audiovisual composition, because they have apparently worked for musical compositions (according to Eisenstein, referring to J. S. Bach's teaching to his pupils (NIN, 4; See also 397n1). Eisenstein continues emphasizing that it is "(...) in the process of work an understanding and a vital perception of the idea gradually begin to enter the material and determine the work's own compositional proportions" (FEL, 162).

53 This links to Bakhtin, Vsevolod and their study on human speech and ethymemic structure.

4.4.2.6 Participation – ecstasy

In ‘The Audience as Creator’ in November 1947 Eisenstein appraised the Soviet audience as “a creator-audience, sharing with the film-makers the creative authorship of the constellation of glorious films” (ESW3, 397n93). In this short text the participation of the Soviet people in the construction of the country is projected to the authoring process of Soviet films. Eisenstein once again leans on his dynamical imagery, which enables him to depict the interdependent nature of Soviet society as a dynamical system. Due to the reciprocal nature of this interdependence, the audience, whose life with its everyday interests, goals, and struggle forms the subject matter of the films, is seen as co-authors of the Soviet film imagery.

‘Superconcreteness’ (1946–47) discusses the sensuous experience of unity in participation, outside of rational or logical understanding: “Participation is understood as a feeling of general unison, as leading to a ‘reality of feeling’ of these same permeating and universal laws in oneself, within oneself” (*Pathos* NIN, 178). The viewer participates “in the operating of the norms of motion of the whole existing order of things, and, experiencing it in dizzy ecstasy, participates in the state of being possessed by *pathos*” (NIN, 169).

Religious ecstasy in its purest form can bring one into the state where complete unification with the natural world, being and becoming, can be experienced (NIN, 177). A state similar to any religious ecstasy can be purely physical like that of whirling Dervishes, psychic in terms of the exercises of St. Ignatius, or reached through the use of narcotics (NIN, 177). Lévy-Bruhl, Freud, and James, among others, also discussed the hallucinatory form of holistic experience.

The state of ecstasy appears omniscient, embedding simultaneously all the possible knowledge or understanding of universal laws, thus embedding also all the possible explanations, perspectives, and attitudes in a prelogical manner. The sensuous aspects of experience are shared in the experience of participation, while the rational is shared in objective conceptualizations. Alas, while the ecstatic state may be shared with all humans as an organic whole, a descriptive conceptualization of the same state fragments it into a multiplicity of different conceptualizations. Depending on the social, ideological, and historical conditions and constraints of a particular individual, the same sunset may blend into completely different contextual frameworks, e.g. divine mystery play or scientific weather forecast (NIN, 179). The experiential phenomena of the world constitute a raw essence, which the attitudes and ideologies of the perceiver may filter and frame to appear suitable and tangibly real, this through an omniscience of possible perspectives (NIN, 179).

In this manner, Eisenstein’s notion of participation as a conceptual tool extends gradually from the experiential centre outwards, enclosing all plausible art forms in an explanatory circle of one unity. The greatness of an artwork is not only in the skillful mastery of the craftsmanship. It is as much due to the embodiment of the intellectual and emotional attitude of the author towards her theme, this being simultaneously the theme of others. This is, in Eisenstein’s terminology, the theme of the social masses.

4.4.3 SUMMARY

This section summarizes the mature Eisenstein as an interdisciplinary dynamist and holist in terms of his own scientific era. Cinema as a psychological laboratory for modeling the dynamics of the human mind and the embodiment of an emotional theme are the most challenging of Eisenstein’s many ideas for the later elaborations of *Simulatorium Eisensteinense*.

The available scientific understanding seemingly supported Eisenstein’s own theory developments on the interplay between the experiential mind–body system and cinema montage. The question of how to gain control over the complex, unconscious dynamics of the mind particularly haunted Eisenstein. Perhaps the answer to the unknown underpinning bodily dynamics could be found in human expressiveness.

In approaching his mature years, Eisenstein takes distance from his earlier conflict-oriented, eccentric point of view. Stepping beside himself, from 1935 onwards, Eisenstein now observes his montage method with different eyes. Eisenstein’s personal transposition as a montage theoretician corresponds to his theoretical inference of holistic experience in terms of ‘*ex-stasis*’. The ecstatic ‘stepping outside of oneself’ resembles a kind of ritual or religious access to emotional participation in holistic oneness. As the previous pages have shown, the experience may be elicited through a cinematic *pathos* composition. In the personal case of Eisenstein himself, his inspiring scientific environment obviously led the mature Eisenstein to a kind of theoretical state of ecstasy.

The following pages of *Simulatorium Eisensteinense* will consider cinema as a form of figurative thinking, as suggested in Eisenstein’s writings. Eisenstein’s conceptual models of cinematic form were shown to apply complex multidimensional, simultaneous, multi-layered, web-like, and ‘spherical’ forms. His keywords for describing montage as method include holism, pathos, ecstasy, organic unity, synesthesia, sensuous thought, image, plasticity, dynamical, systemic, and psychoanalytical concepts such as regression, androgyny, etc. Eisenstein’s theoretical elaborations seem to correlate with the modern keywords of embodied mind, participation, dynamical systems, and radical holism. It is argued that Eisenstein may be regarded as a pioneer of the 21st century embodied mind views.



4.5 IMPLICATIONS FOR RESEARCH FRAMING

The year 1948 witnessed Eisenstein's death in Moscow. Despite hard and extensive work, Eisenstein's lifetime was too short, and the final answers to explaining the governing physiology of emotions and bodily movements in the repetitive organic forms of cinematic expressiveness, conceptualization, and imagination remained veiled. Today, from the point of view of 21st century cinema practice, the sophistication of the mature Eisenstein's figurative thinking and the strength of his cinematic expressions seem to cry for a line of continuation.

Enthusiastic about Alexander Luria's neurophysiological studies on the phenomenon of synesthesia, Eisenstein had no doubt that external stimuli and bodily responses, or intellectual thought and the neural and humoral homeostatic system, were inseparably integrated and interdependent. In addition, the socio-emotional basis of learning via imitation had been suggested in developmental psychology (Vygotsky). However, it took half a century after Eisenstein's death before advanced neuroimaging technology, e.g. magnetoencephalography (MEG) and functional magnetic resonance imaging (fMRI), and the discovery of neural mirroring networks provided evidence of an unconscious sensorimotor system of imitation. Eisenstein's discussion on embodiment of an emotional theme may now be reflected in new scientific light, a socio-emotional understanding of otherness. Perhaps neural imitation may provide a new understanding of — in Eisenstein's contemporary terminology — social mass consciousness. Eisenstein's own research focus on the intrinsic emotional dynamics of the authoring process will serve as a guideline for a reformulation of the idea about cinema as a psychological laboratory for a modeling mind. This kept in mind, the treatment at hand will proceed towards the sciences of the 21st century.

In Eisenstein's era psychophysiological research had already delineated many functional and dynamical aspects of the human mind, which still hold in today's scientific views of the mind. For example, the bodily imitation or mirroring of another's emotions or intentions has been hypothesized since Aristotle's time. However, only recently, as will be discussed in the next chapter, has related neural mirror activation been discovered due to new real-time neuroimaging technologies. The key assumption is that *if* Eisenstein had had access to these technologies and the resulting findings (e.g. mirror neuron networks, synesthesia, or emotion system), his cinematic research on a mutual grounding of the emotional dynamics of the mind, on the one hand, and cinema, on the other, would have reached a completely new level.

The challenge of the parachronic reading here will be in the further elaboration of Eisenstein's organic-dynamical thinking in terms of the holism of the 21st century embodied mind views. His questions reiterate. How may the scientific, psychophysiological understanding of human emotions and expressiveness be encoded as the author's methodological instruments for montage composition? What is the most effective way

for the author to study one's proper emotional bodily experience? How can it be accomplished such that the very same experience could be encoded into the cinematic practice, to elicit in the spectator the same emotional bodily experience in a kind of dynamically isomorphic manner?

The following claims are put forward:

- (1) Cinema as an authored product (of a certain audiovisual duration) may serve as a creative laboratory for describing the experiential basis of the emotional dynamics in the mind. This implies inductive, bottom-up reasoning from experience to description.
- (2) Cognitive models of the mind (as conceptual or symbolic descriptions) may serve as montage models for the creative processes of the cinema author. This implies deductive, top-down reasoning from description to experience.

In the next chapter Eisenstein's scientific framework is *historically extrapolated* to contemporary neuroscientific understanding. Inspired by Eisenstein's universalism, the coming pages are intended as an exhaustive and heuristically interdisciplinary compilation of scientific and philosophical understanding on the dynamics of the mind. The ploy and outcome aims to consolidate these views into one holistic framework, which simultaneously allows a multiplicity of perspectival approaches. In addition, the prevailing contradiction between the domains of arts and cognitive sciences will be explicitly rejected. One of the principal aims of *Simulatorium Eisensteinense* is to equip cinema with a methodological toolbox for meeting in practice the emergent challenges of the 21st century interactive media environment.



Life quitting body for ever (Eisenstein 1939)

5 EISENSTEIN EXTRAPOLATED

In its *parachronic* approach, this chapter will celebrate recent neuroscientific discoveries on determining the biological-emotional basis of intersubjectivity and the new 'naturalizing' steps that modern cross-disciplinary cognitive sciences have taken in modeling dynamical complex systems such as the human mind.

A psychological, biological, and dynamical line of inquiry, which the previous chapter 'Eisenstein Revisited' showed to have started from Eisenstein and his contemporary sciences, will in the following pages reach the sciences of the latter half of the 20th century. The objective is to stay in the organic-dynamical course defined by Eisenstein's cinematic approach and head towards the present 21st century cinema research.

In his *Memoirs* from the late 1940s Eisenstein described his mind map as a metaphoric synaptic web generated within the repetitive structures of his own experience and thought. When one's cognitive web is laid on top of any momentarily presented phenomenal structure (task or object of study), some aspects of the two different structural layers meet while others do not. What must be done, in order to resolve the case creatively, is either to modify the structures of the task object or to modify one's own thinking structures. There are no cases Eisenstein would remember concerning the latter, but several cases of the first (BTS, 784–795). In a similar manner, from this point onwards the re-constructed system of Eisenstein's interdisciplinary universe will function both as an ontological premise of similarity selection and as an epistemological instrument for framing the theoretical discussion of today.

Despite the more limited technologies of networking in Eisenstein's time, in comparison to such technological possibilities of today as elec-

tronic mail and internet, the most fashionable ideas seemed to circulate very effectively in the early European cultural-scientific context both amongst artists and scientists. The recycling of ideas is exemplified in the following interpretation of Ernst Cassirer's methods by Michael Friedman (2004): "although every 'cultural object' (a text, a work of art, a monument, and so on) has its own individual place in (historical) time and (geographical-cultural) space, it nevertheless has a trans-historical and trans-local cultural meaning that emerges precisely as it is continually and successively *interpreted* and *reinterpreted* at other such times and places. The truly universal cultural meaning of such an object only emerges asymptotically, as it were, as the never to be fully completed limit of such a sequence" (Friedman 2004). Amongst the active cultural thinkers, the ideas 'in the air' were in a continuous process of modification, asymptotically approaching their universal definitions, yet never reaching their final formulations.

Recent views on the embodied mind mark an epistemological shift from the Cartesian mind-body dualism towards holistic views of the mind. In cognitive processes, cultural aspects interact with the biological aspects, the rational with the emotional, the body-brain system with the world, and so on.

Eisenstein is conceived of as one of the many creative researchers at the edge of the emerging new era of computerized sciences. His task was to prepare new generations with a new kind of cinematic vision. Unfortunately, Eisenstein's premature death prevented him from practically realizing these visions of the future cinema. The parachronic reading of the treatment at hand is inspired by the idea that if Eisenstein had had access to the topics of this chapter, i.e., the recent neuroscientific discoveries in emotion studies, dynamical consciousness research, and radical embodiment views that have been enabled by the advanced neuroimaging technology of today, he could have experimented with many of his hypothetical ideas also in the concrete practice of cinema montage.

5.1 SYSTEMIC THEORIES

The idea of the world being governed according to a limited set of self-organizing dynamical laws has sustained throughout the techno-cultural evolution. Though having been encoded in Eastern philosophy since the beginning of time, in the Western scientific worldview the shift from the causal framework to that of spirals and feedback loops may be argued to be a major epistemological shift.

There are meta-level systems theories that apply to complex systems in general, regardless of the application domain. Extrapolated from Eisenstein's era, Tektology represents such a meta-theory (section 4.2.2.1). As Alexander Ogurtsov in the essay 'Bogdanov and the idea of co-evolution' notes, after the revolution the language of Tektology, "of the management and organization of different systems (living and non-

living, of man-machine, of man-nature, of various levels of ecosystems and so forth) entered the consciousness of scientists and of managers. Organizational theories were applied to the reconstruction of industrial output, of scientific work, and of the arts, whose function was deemed to be the production of artistic values" (Ogurtsov 1998, 263). The similarities between tektology and the later cybernetics and general systems theory are retrospectively acknowledged by many researchers, for example in *Alexander Bogdanov and the origins of systems thinking in Russia* (Biggart et al. 1998). This supports the present argument that systemic thinking fundamentally characterizes Eisenstein's work. Furthermore, it constitutes a linkage between the scientific era of Eisenstein and 21st century systemic thinking.

Ralph Abraham in his essay 'The Genesis of Complexity' (2002) juxtaposes the views of general systems theory, cybernetics, and dynamical systems approach under an umbrella of complexity theories. These sciences of sciences describe the coupling of complex self-organizational systems and their environments (Pangaro 2006). Below, the extrapolation line will continue penetrating early systems theory from Wiener to von Bertalanffy. It will pass by the 'meta' or 'second-order cybernetics' or 'the cybernetics of observing systems' initiated by Heinz von Foerster in *Cybernetics of Cybernetics* (1974) to the *autopoiesis* theory of Maturana and Varela (1973, 1980) and the all-embracing descriptions of complex, dynamical non-equilibrium systems, such as the 'metastable' dynamic coordination hypothesis of Kelso (1995, 2002).

5.1.1 CYBERNETICS AND SYSTEMS THEORIES

The year of Eisenstein's death also established the 'art of steering', the Greek meaning for cybernetics, in Norbert Wiener's *Cybernetics, or control and communication in the animal and the machine* (1948). In the same year, neurophysiologist William Gray Walter introduced his two robot 'tortoises' *Elsie* (Electro Light Sensitive with Internal and External Stability) and *Elmer* (Electro-Mechanical Robot), which applied cybernetic ideas of systemic self-regulation and self-control within a simple electric circuit, documented in Gray Walter's article 'An Imitation of Life' (1950) and his book *The Living Brain* (1963). A whole new domain emerged related to the creation of artificial intelligence, cybernetic models of the mind, control over complex natural systems, holistic systemicity of biological organisms, and so on.

As discussed in 'Eisenstein Revisited', cybernetic ideas were developed already in Eisenstein's lifetime. For example, Ernst Cassirer's favorite biologist Jakob von Uexküll's biosemiotic functional circle (1940, 8) suggested feedback as a self-regulatory aspect of any biological organism (Rüting 2004a, 50; Thure von Uexküll 1981b, 14; Nöth 1995, 180). In contrast, for example, their contemporary Claude Shannon's influential article 'A Mathematical Theory of Communication' published in 1948 may be argued to suggest a linear polarity in the transmission of information and thus

embedded a subject-object dualism in paralleling the psychological and technological dimensions of transmission (Nöth 1995, 175).⁵⁴ In fact, Ashby in *An Introduction to Cybernetics* (1957) proposed extending Shannon's theory with cybernetics. In addition, he argued that the homeostasis of body introduced in Walter Cannon's *Wisdom of the Body* (1934), which belonged also to Eisenstein's readings, needed a complementary discussion on the mind's self-regulatory organization: an "organism's exteriorly-directed activities – its 'higher' activities – are all similarly regulatory, i.e. homeostatic" (Ashby 1957, 195–196).

Ludwig von Bertalanffy's interest was first in theoretical biology within the logical positivism of the Vienna Circle in the twenties, as also discussed earlier in relation to the emerging discipline of German organicism (section 4.2.2.2). From the 1950's onwards von Bertalanffy developed his *General System Theory* (1968), an effort towards an interdisciplinary theory of systemic, goal-driven self-organization, which today is in the midst of speculation due to its similarities with Alexander Bogdanov's tektological 'science of general organization' (section 4.4.2.1). Indeed, he seems to echo the Bogdanovian science of organization: "Concepts like those of organization, wholeness, directiveness, teleology, and differentiation are alien to conventional physics. However, they pop up everywhere in the biological, behavioral and social sciences, and are, in fact, indispensable for dealing with living organisms or social groups" (von Bertalanffy 1968, 34).

Von Bertalanffy's model of *man as an active personality system* (1968, 192) is perhaps in some debt to the Soviet activity theoreticians Alexei Leontyev or Lev Vygotsky, whose work has been discussed earlier. Sergei Rubinstein in his essay 'Principle of Creative Self-Activity' (1922) also suggested that creative and spontaneous activity is the organizing force that enables individuals to constitute their own personalities (Janousek & Sirotkina 2003, 442). "In contrast to the model of the reactive organism expressed by the S-R [stimulus-response] scheme – behavior as gratification of needs, relaxation of tensions, reestablishment of homeostatic equilibrium, its utilitarian and environmentalistic interpretations, etc." (von Bertalanffy 1968, 193), von Bertalanffy points out similarities with his conceptualization of active personality system and the holistic orientation of other disciplines. As examples of this he mentions developmental psychology after Piaget and Werner, various neo-Freudian schools, ego psychology, Cassirer's symbolic forms and culture-dependent categories, and von Uexküll's species-specific *Umwelt* (Ibid. 193–194).

Today, the inherently transdisciplinary systemic approach is applied in describing all types of physical, technological, biological, ecological, psychological, or social complexities (e.g. Heylighen & Joslyn 2001; Van Gelder 1999; Susiluoto 1982).

⁵⁴ In addition, Ferdinand de Saussure's (1916, 28; in Nöth 1995, 176) circular model for speech processing may be interpreted as either representing a linear model or "the simultaneous process of feedback, where the outgoing signal is checked by its sender for accuracy and efficiency" (Nöth 1995, 178).

5.1.2 AUTOPOIESIS

The original notion of autopoiesis is credited to the Chilean biologist Humberto Maturana. An anecdote of how Maturana was inspired by his friend J. Bulnes's essay "about Don Quixote de la Mancha's dilemma of whether to follow the path of arms (praxis, action) or the path of letters (poiesis, creation). He recognized that the autonomous quality of the living cell or organism was captured by the term: self-creation, self-making or self-producing", cited here from Lloyd Fell's informal Australian site *Autopoiesis plus...* (2008). The Spanish language article 'De Máquinas y Seres Vivos: Una teoría sobre la organización biológica' introduced in 1973 the autopoietic system developed in the collaboration between Maturana and Varela: "We claim that *the notion of autopoiesis is necessary and sufficient to define the organization of the living being*" (Maturana & Varela 1973; in Rudrauf et al. 2003). According to them, the constitutive, co-dependent biophysical components and subsystems create themselves as autopoietic living organisms and further sustain their homeostatic being in the continuous process of closed, recursive self-organization (Maturana & Varela 1980). This implies "a special case of homeostasis in which the critical variable of the system that is held constant is that system's own organisation", as interpreted in the *Fontana Dictionary of Modern Thought* (Fell 2006).

Maturana and Varela (1973, 1980) recognize their debt to their research collaboration with Warren McCulloch.⁵⁵ McCulloch had argued for cybernetics the status of an experimental epistemology, emphasizing the recursion of the influence of a (human) second-order observer observing an active system, which constitutes a first-order observer in the interactive process with the system observed (Heylighen & Joslyn 2001, 159). This idea of observer being observed as the study object for second-order cybernetics has been discussed in von Foerster's *Cybernetics of Cybernetics* (1974). Eisenstein may be argued to have practiced second-order observation when he emphasized the idea of the author being aware of her own attitude towards what is represented. The idea can be found also in the writings of Ernst Cassirer, for example, in the *Philosophy of Symbolic Forms* (1929), this assumably to some extent in debt to von Uexküll's organicism.

The basic ideas of second-order cybernetics are reflected in Maturana and Varela's definition of an autopoietic machine: "a machine organized (defined as a unity) as a network of processes of production (transformation and destruction) of components which: (i) through their interactions and transformations continuously regenerate and realize the network of processes (relations) that produced them; and (ii) constitute

⁵⁵ "Inspired with the ideas of cybernetics and neural network modeling, the team showed selective activation for patterns in the receptors of a frog's eye, suggesting that the perception was partly analyzed and 'interpreted' already in the retina" (McCulloch et al. 1965, 230–255). The frog's eye evidence corresponded to the findings of David Hubel and Torsten Wiesel (1959), whose research shortly revealed that in the cat's cortical visual system groups of neurons activated only in correlation to a certain kind of visual pattern, e.g. horizontal lines, or movements from left to right. Correlation is pointed out by Jean-Pierre Dupuy (1999, 555).

it (the machine) as a concrete unity in space in which they (the components) exist by specifying the topological domain of its realization as such a network" (Maturana & Varela 1973, 78). When the observer describes her proper interactions with a self-contained autopoietic system, the description is perhaps faithful to the observer's conceptualizations but remains incommensurable outside of the closed domain of the observer (Ibid. 89).

In 'Biology of Language: The Epistemology of Reality (1978a) Maturana describes 'creativity' and 'choice' as features of living systems that are unexpected for an observer. Creativity corresponds to the unpredictability of the observed system's interaction with other autonomous systems. "Since the structure of an organism (its nervous system included) is under continuous change as a result of its autopoiesis in an operationally independent medium, organisms are, at least potentially, in the position of undergoing a continuous change in their structural couplings and hence, of continuously encountering independent systems and thus of undergoing continuous changes of state unpredictable from their perspective alone" (Maturana 1978a, 62).

As a biological theory of communication, autopoiesis rejects the paradigms of linear and circular communication, as Maturana's essay *Biology of Language* (1978a) implies. Instead, the interaction between the closed, self-regulating autonomies is novel, anti-communicative, and it emerges as 'consensus' or 'mutual orientation' between the 'emitter' and the 'receiver' of the information. "If this process leads to a consensual domain, it is, in the strict sense, a conversation, a turning around together in such a manner that all participants undergo nontrivial structural changes until a behavioral homomorphism [i.e. matching with the structure of the medium in which an autopoietic system interacts] is established and communication takes place" (Ibid. 54–55). Later, in 'Ontology of observing: The biological foundations of self-consciousness and the physical domain of existence' Maturana applies the active notion of 'linguaging' constituted in the social recursive coordinations of actions: "As the body changes, languaging changes; and as languaging changes, the body changes" (Maturana 1988b, Ch. 9).

In *Autopoiesis and Cognition* (1980) Maturana and Varela contrast an organic non-equilibrium system of autopoiesis with an *allopoietic* system, which they describe to resemble an assembly line. An allopoietic system generates from raw materials (components) a product (an organized structure), which is something external to the system itself (a factor). There is a temptation to compare an autopoietic process to that of Eisenstein's description of the authoring process: an autopoietic author creates a montage composition by exploiting his own emotive-cognitive resources, the end product being an independent allopoietic film.

Maturana has later elaborated the autopoietic views 'outwards' towards a kind of cybernetic universalism, which describes the evolution, social organizations, human co-existence, and the biology of love as the basis of humanness in *Origins of Humanness in the Biology of Love* (2008). Varela, on his side, further developed the autopoietic systems theory in what appears as an 'inwards' tendency, introducing enactive cognitive views and an embodied mind hypothesis, for example, in *Embodied Mind* (Varela et al. 1991) and in 'Neurophenomenology: A Methodological Remedy for the Hard

Problem' (Varela 1996). After Varela's premature death in 2001 his collaborators David Rudrauf and others have written an article entitled 'From autopoiesis to neurophenomenology: Francisco Varela's exploration of the biophysics of being' (2003), which gives an overview of his theoretical development.

Milan Zeleny, whose research expertise relates to studying the enterprise organization, infrastructures and global management systems, has recently in his article 'Ecosocieties: Societal Aspects of Biological Self-Production' (1995) interpreted Alexander Bogdanov's Tektology as pioneering the holism of complex natural systems similar to that of the autopoiesis of Maturana and Varela: "Organisms cannot be separated (except through artificial cleavage) from their economic, ecological, or social environments which they themselves co-produce and mutually provide to each other. Only a temporarily disembodied human mind can imagine removing itself, temporarily, from its social surroundings – from its life base" (Zeleny 1995).

Both Varela and Maturana's thinking re-emerge in the following pages as the modern equivalents to Bogdanov's organizational sciences, which was in the previous chapter argued to have influenced Eisenstein's theoretical thinking. A potential new cinema theory might gain new insight from the complex organizational system of autopoiesis, for example, in a reinterpretation of Eisenstein's descriptions of polyphonic montage orchestration, this in terms of multiple dimensions of the senses. Moreover, if one considers the controversial psychophysiological isomorphism assumption between the author and the spectator, characteristic to the psychological theories of Eisenstein's era and harnessed also by Eisenstein, the concept of mutual consensus suggested by Maturana and Varela stands out as a novel kind of framework. Further elaboration of this idea is left to the latter part of this treatment.

5.1.3 DYNAMIC PATTERN THEORY

While the autopoietic theory offers a meta-model for self-organizing living systems, J. A. Scott Kelso's theory of *Dynamic Patterns: The Self-Organization of Brain and Behaviour* (1995) stands as a meta-model for describing its functional organizational patterns. The universal nature of Kelso's theory provides a toolset for describing aspects of functional self-organization in time (entrainment). A number of enactive and radical dynamical approaches to the mind rely on his concepts, e.g., van Tim van Gelder, Francisco Varela, Andy Clark, and Evan Thompson. It provides also the present discussion with an explanatory framework for how biophysical micro-level events enable emergent macro-scale events, such as conscious thoughts, or closer to the topic, the author's ability to simulate her main character's behavior in relation to other cinematic events.

In his 2002 article 'The Complementary Nature of Coordination Dynamics: Self-organization and Agency' Kelso leans to the discipline of brain research and on the

recent interpretation of quantum measurement theory by Herbert S. Greene (2000). According to his view, the *stability of information over time* enables activities of an organism. In the underlying coordination dynamics of the organism the so-called metastable regime “is crucial for the creation and annihilation of meaningful information” (Kelso 2002, 364). The distinct cortical systems show coexisting tendencies to express their own autonomy and to work together. According to Kelso, this relates to conflicting neuroscientific views about “whether the brain is functionally integrated as a whole or functionally segregated into specialized neural regions (modules) that are highly localized and independent” (Ibid. 369). The quantum measurement theory allows assuming “the creation of new information in the process of measurement and observation” (Ibid.).

Kelso’s coordination dynamics can be interpreted as a functional analogue to Eisenstein’s simultaneously existing dimensions of cinematic experience, the dyads of image/depiction, or montage as experience/montage as form. Kelso emphasizes that “as far as coordination is concerned the coupling among oscillatory processes always reflects meaningful information” (Ibid. 367). Retrospectively speaking, Eisenstein’s discussion on the dynamics of montage composition might have related well to Kelso’s dynamical views, if the latter theory had been available to him. However, acknowledging Bogdanov’s influence on Eisenstein’s systemic thinking, on one hand, and on the other, the apparent similarity of modern complex systems theory with Bogdanov’s tektology, perhaps Eisenstein’s *pathos* composition is not far from Kelso’s dynamic patterns theory, particularly as an explanation of the emergence of meaningful information within the perceptual process.

In relation to Eisenstein’s thinking, it is reminded that the psychoengineering of Eisenstein’s era relied on the early thermodynamics, energetics, and non-linear abstractions. These aspects are also embedded in the contemporary physics on which Kelso constructs his dynamical patterns theory. The qualitative leaps of Eisenstein’s dialectical systems, for example, may be seen to correlate to bifurcations of a dynamical system from one state to another, as described by Kelso (1995).

While the present study could dive deep into analyzing the Eisensteinian dialectics of montage compositions according to *Gestalt* dynamics, which were actively present in his contemporary psychological research, *Gestalt* dynamics also play an important role in Kelso’s pattern coordination dynamics. However, from the contemporary dynamical point of view, and as stated by Kelso himself, the *Gestalt* dynamics should be adjusted to self-organizational principles (Kelso 1995, 5, 224–225, 309).

Kelso’s approach is, in turn, in debt to the interdisciplinary field of *synergetics* originated by Hermann Haken in 1969 (Haken & Graham 1971; Haken 2007). Characterized with the strong interplay between experiment and theory, synergetics is a meta-theory, which “may take place between parts of a system, between systems or even between scientific disciplines” (Haken 2007). According to Haken, synergetics, which means in Greek ‘working together,’ studies the general principles of self-organization of structures, processes or functions that show emergent qualitative changes on macroscopic spatio-temporal scales.

In the present usage synergetics refers to the coordination dynamics of nonequilib-

rium systems, which harness self-organized pattern formation and non-linear dynamics. Andy Clark in *Mindware: An Introduction to the Philosophy of Cognitive Science* credits the Haken–Kelso–Bunz model with providing a new perspective on the continuously unfolding behavior of different natural phenomena (Haken, Kelso & Bunz 1985; Kelso 1995, 54–61; Clark 2001, 122).⁵⁶ For example, an analogous experiment on the HKB model by Robert F. Port and Mauri Kaipainen (‘Temporal Attractors in Timing: Applying the HKB Model to Speech’, 2002) showed that the behavior of the speech motor system (a simple utterance performed inphase and antiphase with a metronome) resembles motor behavior (e.g. the wagging fingers in the original HKB test). The researchers concluded that simple physical mechanics could not explain the similarity of the results: “The only thing that could be actually cycling at the metronome frequency is a neural oscillation somewhere in the brain” (Port & Kaipainen 2002). The synergetic principle describes this self-organizing tendency tracked in the dynamics of oscillation to all combinations of natural complexities. One is to be reminded that the first and most important principle of Bogdanov’s tektology is the notion of oscillation: without oscillation living systems cease to exist.

The brain is an example of a natural complexity, an open *living* system, which maintains its metabolism or homeostasis by interacting with the environment (Kelso 1995, 4). Following Kelso’s description, the aspects of a system’s *stability/instability*, as well as that of *adaptability*, plus the interplay of *cooperation* and *competition* between different subsystems, add to the complexity of any natural system. In systems with momentary, simultaneous, competitive dynamics in some point close to instability, one of the dynamics becomes stronger than others, *slaving* them, even those of complex systems governed by few variables only. This implies a necessity for order, which serves as a *selection mechanism* for self-organizing systems. (Ibid. 5–9)

Summarizing the terminology in Kelso, dynamical systems involve *necessity*, an ordered, coordinated pattern formed by the mutual interdependent behavior of the subdynamics, termed as an *order parameter* or *collective variable*, which implies ‘relevant degrees of freedom’. “Order parameters are found near nonequilibrium phase transitions, where loss of stability gives rise to new or different patterns and/or switching between patterns. *Control parameters* are not typically dependent on the patterns themselves. Alas, the system is created in cooperation of its individual parts, but at the same the system as an order parameter controls and constrains the behavior of the individual parts.” (Kelso 1995, 16) Instead of discussing feedback loops, Kelso introduces *circular causality* as characteristic to cooperation of dynamic subsystems. Fur-

⁵⁶ The Haken-Kelso-Bunz model describes the spatio-temporal interaction of rhythmically coordinated movements (Haken, Kelso & Bunz 1985; Schöner, Haken & Kelso 1986; in notes Kelso 1995, 296). Andy Clark’s *Mindware* follows Kelso (1995, 54–61) in describing how the Haken-Kelso-Bunz model could provide a novel perspective on the continuously unfolding behavior of different natural phenomena (such as changes in finger movements). Thus, the model was shown “capable of 1) accounting for the observed phase transitions without positing any special ‘switching mechanism’ – instead, the switching emerges as a natural product of the normal self-organizing evolution of the system, 2) predicting and explaining the results of selective interface with the system (as when one finger is temporarily forced out of its stable phase relation), and 3) generating accurate predictions of, e.g., the time taken to switch from anti-phase to phase” (Clark 2001, 122).

ther, Kelso describes the functions of the human mind (brain) within the framework of multistability, bifurcation, hysteresis, abrupt phase transitions, crises, and intermittency, all generally established concepts of the dynamical or self-organizing systems research (e.g. Heylighen 2003; Haken 2007)

What explains the qualitative changes from one phase to another are termed *symmetry breaking fluctuations* and *bifurcations*. These phenomena cause abrupt changes of direction or state in metastable systems (Kelso 1995, 10). “Fluctuations are continuously probing the system, allowing it to feel its stability and providing an opportunity to discover new patterns” (Ibid. 16). The coordinated motion of system is in conflict with Newtonian linear causality. In the order parameter dynamics “the motion of the whole is not only greater than, but *different* from the sum of the motions of the parts, due to nonlinear interaction among the parts or between the parts and the environment” (Ibid.).

Absolute coordination is represented, as Kelso notes, in the 300-year-old classical example of the pendulum clocks in the clock shop: the clocks showed a tendency to end up swinging in a phase locked synchrony, due to the vibrations transmitted through the walls (Ibid. 100). In living matter, *relative coordination* is in play instead, as noted by physiologist Erich von Holst (1939) (Ibid. 98). Relative coordination means that the system balances between changes in the coexisting, potentially competitive or repulsive intrinsic and extrinsic states of the system. The *becoming* as a process of change from one order-phase to another is also emphasized rather than the disorder-order transition (Ibid. 5).

The phenomena of *intermittency* may enable the quick, moment-to-moment adaptations to changes, preserving the flexibility and the (meta) stability, for ‘just in case’. Intermittency refers to the state of the system that is about to reach stability, but ‘resists’ the attraction of the phase transition point to enter ‘mechanistically’ (via an external parameter change or fluctuation) into the stable mode. Instead the system preference appears to be an open or free ‘choice’, meaning that the system has been shown (e.g., the Haken–Kelso–Bunz model) in the state of intermittency to switch in and out from potential order to the other spontaneously (Ibid. 99).

Relative coordination and the state of intermittency may explain how living systems maintain anticipatory tendencies. Kelso (Ibid. 133) describes the *anticipatory dynamical system* (ADS). Evidence has been shown for the effect of ‘slowing down’ when the system approaches a critical point. This represents the mode of predicting future moves or changes.

Hysteresis is described as a form of primitive memory (Kelso 2007). According to Kelso (1995), the living organism’s *metastable* regime of coordination dynamics (Kelso 2002, 369) functions on the interplay of conflicting forces, such as phase synchronization and phase scattering. This means that the attraction (stabilizing) and repulsion (destabilizing) functions coexist, keeping the cognitive higher-level systems of action planning and perception in ‘natural’ balance. (Kelso 1995, 225)

Relating to J. J. Gibson’s idea in *The Ecological Approach to Visual Perception* that the perceptual system “*resonates* to invariant structure [of the optic array] or is *attuned* to it” (Gibson 1986, 247), Kelso suggests a description according to which the neurobe-

havioral dynamics are constituted by the functional properties of settling, resonating, and twinkling (Kelso 1995, 224). The ambiguous Kanizsa figures of the psychologist Gaetano Kanizsa may serve as an example of Kelso’s idea of a twinkling metastable phase of perception. In the classic vase – face illusion created by the Danish psychologist Edgar Rubin (1915) a viewer perceives either a vase centered in the image, or a-profile-mirroring-another-profile. In Kelso’s words, the human brain lives fundamentally “on the brink of instability”, as all nonequilibrium ecosystems (1995, 200).

In a parachronic reading, Kelso’s dynamic descriptions appear retrospectively to repeat core ideas of Bogdanov’s tektology, which influenced, together with the *Gestalt* dynamical views, Eisenstein’s descriptions of the dynamic-organic structures of montage composition. Although plunging deeper into differential equations of coordination dynamics is not within the scope of this study, one is reminded that Eisenstein frequently discussed the issue of rhythmic coordination of movements in terms of a psychophysiological interplay between mind and body. Indeed, Eisenstein at his time, and Kelso recently, seem to elaborate a general holistic modeling approach that would serve as an explanatory framework for very different kinds of phenomena. Changes in emotional moods, unfolding of events, or *Gestalt* perceptions can be described as bifurcations, fluctuations, oscillations, hysteresis, and coordination (Kelso 2008). The linkage to the dynamical *Gestalt* views can be identified in both theorists. Similarity in terms of representations should also be noted. For Eisenstein mental images served as the most natural organic-dynamical forms of mediating between the emotional theme and its practical depiction in montage composition. Kelso, though being an adherent of J. J. Gibson’s view of the ecology of the perception system advocating direct, non-mediated perception, does not fully reject representations, as most dynamists do. Instead, he refers to dynamic patterns that emerge in the self-organization processes of living organisms as kinds of universal *Gestalts* capable of describing any dynamical phenomenon.

5.1.4 SUMMARY

In the previous section, two meta-theoretical approaches to complex dynamical systems as well as their grounding in early cybernetics and complex systems views have been reviewed. The theory of *autopoiesis* describes recursive systems that are open to energy exchange but closed to self-organizational information manipulation and self-control. As a general systemic model for emergent self-organization, autopoietic principles may be expanded from biological organisms to socio-cultural and economic systems. In a similar manner, the dynamic patterns hypothesis advocated by Kelso (1995) proposes a general functional model for any self-organizational system (e.g. thermodynamics). Here, however, the metastable coordination dynamics enable one to explain how autopoietic, living nonequilibrium systems recognize, modify, and feed

back ‘knowledge’ from life-sustaining emergent processes (Kelso 1995; Pangaro 2006). Perhaps Eisenstein’s holistic idea of organic participation in the unity of the phenomenal world in *ecstasy* could be described within the autopoietic framework, and the universal dynamics of Eisenstein’s embodiment of emotional theme in montage’s *pathos* structure could be revisited in terms of dynamical coordination patterns.

Before reviewing the selected views on the dynamics of the mind, which provide the present treatment with a neuroscientific framework for further elaboration, it is necessary to explicate a particular approach to what has come to be called the tendency to naturalize the mind. Here it will be suggested that many if not all of the approaches to explain the mind are representatives of one of the two complementary lines of the naturalizing tendency, the dynamical or the organic naturalizing tendency.

5.2 NATURALIZATION OF THE MIND

This research into the author’s mind can be identified as part of the ongoing general tendency of the naturalization of the mind. Naturalization programs converge into a broad interdisciplinary frontier in search of filling what is often referred to as the ‘*explanatory gap*’ between mind and body, mental and material. However, an adequate scientific framework for juxtaposing the domains of phenomenal (e.g. consciousness, imagination, feelings) and that of physical (e.g. brain–body apparatus, cortical activities, homeostasis) is still lacking.

As the previous chapter showed, the philosophical naturalizing tendency of Eisenstein’s era gained strength from the contemporary natural sciences. Having evolved throughout the second half of the computerized and digitalized 20th century, the recent techno-scientific discoveries in the neurosciences are now empowering the naturalizing tendencies of the 21st century with new insights into the human mind. The roots of modern naturalization could be argued to reach back to the earliest written pre-history of cognitive sensemaking. Before defining the standpoint of the contemporary discussion on the mind, however, some historico-philosophical outlines for the modern naturalizing project must be provided.

Around the beginning of the twentieth century, the two lines of naturalization, which are here described as the philosophical and psychological lines, radically emphasized the introspective observation of the mind and its perceptions of the intersubjectively shared world. William James applied the introspective method to his pragmatic psychological study of stream of thought. Edmund Husserl took distance to psychology by the method of phenomenological reduction, which ‘put into brackets’ one’s *a priori* knowledge about the state of things in favor of a pure perceptual analysis of the phenomena of the world. Here, the line of thinking that got its start from James’s pragmatism is preferred to that of Husserlian phenomenology, as will become

evident in the coming pages. From the particularly Jamesian standpoint it follows that the cinema author’s unique, experiential, emotional, survival-based interaction with the world allows a description of the author’s mind as biophysical, ecological, dynamical, and embodied.

5.2.1 PHILOSOPHICAL ROOTS OF NATURALIZATION

The roots of the naturalizing project are here traced back to the philosophies of David Hume (1711–1776), Immanuel Kant (1724–1804), and G. W. F. Hegel (1770–1831), who shaped the 20th century intellectual discourses and also provided important philosophical background to Eisenstein’s holistic considerations. This brief review supports a parochronic reading of the tendencies of Eisenstein’s era in the wider context of the evolution of the sciences.

Acknowledged “as a precursor of contemporary cognitive science, as well as one of the most thoroughgoing exponents of philosophical naturalism,” Hume influenced, amongst others, Immanuel Kant and Charles Darwin (Morris 2007, *SEP*). In *A Treatise of Human Nature* (1739–40) Hume introduces the universe of imagination. In a parochronic reading, the idea is here viewed as preceding the aforementioned cybernetic idea of autopoietic closure, an autonomous, self-regulating system that is not fully closed due to its interaction with the surrounding world. What is here called Hume’s ‘cognitive closure’ suggests that emergence of imagination is fully dependent on the interplay of previous experience provided in perception and other senses. He writes thus: “we never really advance a step beyond ourselves, nor can conceive any kind of existence, but those perceptions, which have appear’d in that narrow compass” (Hume *Treatise*, 67–68). The cognitive closure of the universe of imagination is even more apparent because one has to rely on “the coherence of our perceptions, whether they be true or false; whether they represent nature justly, or be mere illusions of the senses” (Hume *Treatise*, 84 in Morris 2007, *SEP*).

Kant’s idea of ‘general phenomenology’ was to set the constraints and conditions for further elaboration of the dyadic dialect between “the ‘phenomena’ known through the faculty of sensibility” and “the ‘noumena’ known purely conceptually” (Redding 2006, *SEP* Ch. 2.2).⁵⁷ Yet Kant abandoned the notion of phenomenology, and his thoughts gradually evolved into the critique of pure reason (Ibid.). Perhaps Kant’s reluctance to develop further his transcendental approach to the phenomenal world is based on his fear of endangering the very grounding of his philosophical dualism, as suggested in neo-Kantian Ernst Cassirer (1929), and later in Mark Johnson

⁵⁷ The notion of phenomenology first appeared in the work of German scientist and mathematician (and Kant correspondent) J. H. Lambert (1728–1777) (Redding 2006).

(1987). These two historically distant thinkers both declare their aim to go beyond Kant's transcendental dualism in order to gain access to the unconscious bodily dimensions of the mind. Curiously, a linkage between Cassirer and Johnson turns out to be philosopher Susanne Langer, who as a discipline of Cassirer translated many of his works, the most important being *The Philosophy of Symbolic Forms*. Though often ignored in later reviews of the history of philosophy, Langer is well present in Johnson's *The Meaning of the Body*, with such issues as expressive form, feeling as part of meaning, and vital import (Johnson 2007, 238–239, 226, 44). These topics seem to suggest an almost direct linkage to Eisenstein's neo-Kantian universe of human expressiveness and the embodiment of emotional theme.

The challenges of naturalizing tendencies in Kant were realized by Hegel in his dialectical inquiries in *Phenomenology of Spirit* (1807). In accordance with the modern revisionist, non-traditionalist interpretation, Hegel is in this treatment regarded as a post-Kantian philosopher. Against the claimed misinterpretation of Hegel as an idealist who rejected Kant, Hegel is argued to have extended Kant's formal conditions of the rational human mind "to include aspects of historically and socially determined forms of embodied human existence" (Redding 2006, *SEP* Ch. 2.2). This is assumed to have also been the standpoint of Eisenstein, taken that he was also greatly influenced by Cassirer who combined the Marburg school interpretation of Kant with the phenomenology of Hegel.

Interestingly, the naturalization discourse already emerged in Hegel's *Lectures on the History of Philosophy* section of 'The Metaphysics of the Understanding' credits Christian Wolff (1679–1717) with pioneering the tendency to naturalize German philosophy in terms of common-sense inference. The Wolffian kind of philosophy, which Hegel names as a philosophy of understanding, "became the ordinary culture of the day; in it, determinate, intelligent thought is the fundamental principle, and it extends over the whole circle of objects which fall within the region of knowledge" (Hegel *Lectures*, Ch 1.). Yet, according to Hegel, the early naturalization tendency of Wolff exceeded the borderline of non-sense, in such propositions based on common sense inference, for example, in the domain of warfare, that the enemy's threat increases the closer the enemy gets to the gates of the threatened fortress (Hegel *Lectures*, Ch 1 & 2). It is also possible to interpret Wolff's inference as an attempt to track the continuous change of situations and their momentarily differentiating perspectives in his description. In passing, Wolff also coined the term 'ontology', which talks of possible things, as complementary to metaphysics, which talks of actual things, in *First Philosophy or Ontology* (1730) (Hettche *SEP* 2006).

The term 'ontology' has recently been applied to the domain of computer and information sciences as 'a specification of a conceptualization' (Gruber 1993, 1995, 2008). In the later stage of the present work the notion of *soft ontology* (Aviles *et al.* 2003), or *ontospace*, as defined by Mauri Kaipainen and others in 'Soft ontologies, spatial representations and multi-perspective explorability' (2008, in press), will be applied in the new context of interactive media environments. Soft ontology refers to a new spatial approach, with a close relation to fuzzy set theory introduced by Loft A. Zadeh in 1965 (Aviles *et al.* 2003; Kaipainen *et al.* 2008).

Inspired by Hegel's systemicity, Ernst Cassirer in *The Problem of Knowledge: Philosophy, Science, and History since Hegel* (1950) points out its relation to the practical world as explicit in Hegel's *Wissenschaft der Logik* (1841): "Hegel's system does not stay in the empty spaces of metaphysics. Its intention is to open the way to a very definite and concrete undertaking of scientific knowledge. Its aim is not only to win for history its rightful place at the side of sciences; it sees in history the realization and true expression of all the knowledge that the mind possesses from its own nature and resources" (Cassirer 1950, 3). Despite the apparent differences "between Hegel's dialectic, where reality is derived from 'thought thinking about itself' and the method employed by Darwin in propounding and establishing his theory", they both promote "the idea of historicism", or "the idea of world development" as in Kuno Fischer's *Hegels Leben, Werke, und Lehre* (1901) (Ibid. 171). "The historical, barely tolerated previously, was not actually to *supplant* the rational, for there is no rational explanation of the organic world save that which shows its origins. The laws of the *real* nature are historical laws, and only through their discovery is it possible to escape a bare logical schematism and get back to the actual causes of phenomena" (Ibid. 173). The systemic view of history as evolution, which characterizes Cassirer's (1950) philosophical approach, may be also traced in the scientific constructions of his era. The early systemic theorists Alexander Bogdanov and Nikolai Bukharin argued for the naturalization of the historico-philosophical interpretation of Marxism in order to meet the scientific knowledge of their present day, and this was also the purpose of the systemicity of Lev Vygotsky's socio-cultural psychology.

Today, naturalization is often related to the domain of exclusive scientific knowledge or methodologies of expertise that are out of the reach of common sense practitioners. Contrary to the 'naturalizing' conception in Hegel, or what he referred to as application of common sense knowledge about the world, many contemporary researchers argue that the scientific evidence that forms the basis of any naturalizing program of today often seems to work *against* the common sense inference. This is so, as the scientific conceptualizations, for example, quantum phenomena, seem to fall outside of the conceptual scope of the layman's everyday experience. In this sense naturalization appears in conflict with any common sense inference, of which continental phenomenology with its *anti-naturalizing* tendencies (e.g. Husserl, Heidegger) may be claimed to represent a 'methodological disciplined' paradigm (Roy *et al.* 1999, Ch. 2.2.).

As to phenomenological aspects of experience, this study follows David Woodruff Smith's somewhat 'wider' definition. "Phenomenology came into its own with Husserl, much as epistemology came into its own with Descartes, and ontology or metaphysics came into its own with Aristotle on the heels of Plato" (Smith 2003 *SEP*). While in the framework of continental philosophy not every approach concerned with the mind and its experiential nature qualifies as phenomenology, the phenomenological practice has been rooted firmly in human history: "When Hindu and Buddhist philosophers reflected on states of consciousness achieved in a variety of meditative states, they were practicing phenomenology. When Descartes, Hume, and Kant characterized states of perception, thought, and imagination, they were

practicing phenomenology. When Brentano classified varieties of mental phenomena (defined by the directedness of consciousness), he was practicing phenomenology. When William James appraised kinds of mental activity in the stream of consciousness (including their embodiment and their dependence on habit), he too was practicing phenomenology" (Ibid.).

With the views above, the phenomenological inquiries into the missing link between mind and body, or conceptual knowledge and sensuous understanding, were inherited by the 20th century. Cassirer's third volume, subtitled *Phenomenology of Knowledge* (1929), constituted the playground of the concluding treatment for Cassirer's *Philosophy of Symbolic Forms*, the three volumes of which greatly influenced his Russian 'disciples' in the twenties (Brandist 1997; Bulgakowa 1998), and, mediated by Susanne Langer, also the recent work of Mark Johnson.

For the present, we may remind ourselves of the filmmaker-researcher Eisenstein on the stage of 1935 defending his study of "*questions of the nature of phenomena*" (ESW1, 40). Together with his research on the psychophysiological foundations of embodiment of emotional theme, Eisenstein emphasized dyadic organic unity with 'image-sensuous' and 'thematic-logical' dimensions of experience. The first notion relates to the Kantian idea that one may gain understanding beyond the rational via sensuous aspects of experience, while its polar notion relates to the domain of exact sciences. It is relevant also to consider J. C. Cartney's notion in his essay 'On The Biocentric Metaphysics of Ludwig Klages' (2001), who was in the earlier part of 'Eisenstein Revisited' presented as one of the principal influences of Eisenstein. Cartney states that the German concepts of *des Geist* ('spirit') and *der Seele* ('soul') originally referred to different domains of the mind, the first to the 'rational' and the latter to the 'sensuous' aspects of mental experience. This brings forth the fact that even though the holistic perspective on the body-mind system was emerging, the Cartesian dualism continued to dominate the intellectual environment of the early 20th century.

The analytical synthesizing mode of today's naturalization project seems to correspond not only superficially with the research objectives of the early phases of the naturalization program, a program with which Eisenstein was fundamentally involved, as it appears in retrospect. However, within the scientific domain of Marxist-Leninist dialectical materialism, Eisenstein created his own original synthesizing method. As the previous chapter showed, the intellectual syntheses of Hegelian systemicity, Marxist-Leninist dialectical materialism, Ernst Cassirer's symbolic pregnancy, William James's radical pragmatism, Alexander Bogdanov's general science of organization, and the *pars pro toto* of *Gestalt* psychology provided the mature Eisenstein with his methodological instruments. The extrapolating line will project Eisenstein's figurative thinking via the 20th century research programs of neuroscientific and cognitive sciences up to the dawn of the 21st century naturalizing mind program.

5.2.2 COMMON GROUNDS OF THE NATURALIZATION APPROACHES

At the beginning of the 20th century Husserl's phenomenology and James's psychological pragmatism took up different paths to building the explanatory bridge between physical and mental phenomena that the 19th century had failed to provide. Both views seemingly support the historical line of naturalization of the mind. In a similar manner, both James and Husserl radically emphasized the scientific validity of introspective observation and analysis of experiences, based on sensorimotor perceptions about the surrounding world.

The modern program oriented to a naturalization of Husserl's phenomenology emphasizes first-person experience, embodiment, and emotions, as stated by the philosopher Evan Thompson (1999). Instead, the research at hand prefers to follow James's organic line of naturalization to the line of Husserl. This is because a study on emotions falls in favor of James, who had already explicitly highlighted the visceral body and its *system of emotions* as the functional basis of all cognition. This preceded Walter Cannon's 1934 description of *homeostasis*, which however explicitly rejected James's idea that emotions originate from the body, relating them instead to higher cognitive activities of the mind (Damasio 2000, 291).

A parachronic reading allows suggesting an ongoing convergence of these two historically different lines of the naturalization of phenomenology. They are consistent with the less orthodox definition for phenomenological practice: "when recent analytic philosophers of mind have addressed issues of consciousness and intentionality, they have often been practicing phenomenology" (Smith 2003 *SEP*). The phenomenologist Nathalie Depraz in her presentation *Phenomenology and Enaction* (2007) tracks the following generic field of the practice of naturalization: it may happen according to the practice of enactive cognitive sciences (biological epistemology), practical reasoning (philosophy), social praxis (Marx), pragmatism (Peirce, James), and practitioners of psychotherapy or religion (Depraz *et al.* 2003 in Depraz 2007, 27).

The possibility for this convergence may be detected in the shared 'background' of the pragmatics of both phenomenology and enactive cognitive sciences. Common background seems to unite, for example, the ecological psychologist J. J. Gibson with his bodily recurrent patterns creating the living being, the developmental psychologist Jean Piaget and child's learning, the cognitive semantics of Mark Johnson and George Lakoff and basic categorization in humans, or Eve Sweetzer's idea of bodily linguistic schemes (Depraz 2007, 17). Lev Vygotsky is also comparative to Piaget's account, as well as the precedents on ecological views in *Gestalt* psychologists Kurt Lewin and Kurt Koffka, Ernst Cassirer, the biosemiotics of Jakob von Uexküll, and so on. The continental phenomenology of Maurice Merleau-Ponty and the Ameri-

can pragmatism of John Dewey (1859–1952), with whom James⁵⁸ is associated, are also brought together within Lakoff and Johnson's *Philosophy in the Flesh* (1999). *The Meaning of the Body* of Johnson published in 2007 particularly seems to advocate a similar kind of view to naturalization of the mind as outlined in the present work.

Johnson's approach, which relies on the pragmatism of James and Dewey, may be considered an alternative but not conflicting manifestation of the naturalization of the mind, equivalent to that of the project of naturalizing phenomenology relying on Husserlian inquiries. In another view provided by Dewey (1925/1981, 135), mind emerged as socio-emotional active cognition (Johnson 2007, 151). In addition, Johnson explicitly relates his line to recent cognitive sciences, as advocated in the views of Francisco Varela, Humberto Maturana, Gerald Edelman, Edwin Hutchins, George Lakoff and Vittorio Gallese, and Rodney Brooks (Ibid. 117). These researchers share with Johnson the view that the key to eliminating mind/body dualism is "to stop treating percepts, concepts, propositions, and thoughts as quasi-objects (mental entities or abstract structures) and to see them instead as patterns of experiential interaction" (Ibid.).

Johnson writes thus about what is needed: "(1) a profound, nonreductionist respect for the richness, depth, and complexity of human experience and cognition; (2) an evolutionary perspective that appreciates the role of dynamic change in all development (as opposed to fixity and finality); (3) a commitment to the embodiment of meaning, tied to the continuity of body and mind; and (4) recognition that human cognition and creativity arise in response to problematic situations that involve values, interests, and social interaction" (Ibid. 152). This discussion is familiar to Eisenstein (see page 99), as Johnson also refers back to James for whom "the music of meaning-making is both thought *and* feeling at once, and its notes are the rhythms and tone qualities of our bodily processes" (Ibid. 175).

Embodiment, as emphasized by the phenomenological tradition, later becomes the keyword of enactive cognitive scientists (Varela *et al.* 1991). Antonio Damasio's neuroscience-based views on creativity and consciousness may also be associated with the naturalization of phenomenology. One may moreover associate the present mind naturalization project with other researchers within the cognitive sciences and neurosciences who deliberately keep distance from the phenomenological paradigm. Such views include the representational, external realist account of Fred Dretske, whose reference to *Naturalizing the Mind* (1995) identifies itself as being concerned with equaling such perceptual experiences as what-it-is-like-to-be-a-bat, a request originating from Thomas Nagel (1974), with the experience based on the interaction with the 'real' world. His approach seems to advocate combining the dualism of internal and external perceptions into a unity of constructed experiential oneness. Furthermore, *Naturalizing Consciousness* (2003) by Gerald M. Edelman, a kind of experiential interaction account, rejects extra-physical tenets that support the mind-body dualism.

⁵⁸ William James preferred the American *pragmatist* John Dewey (1859–1952) to Charles Sanders Peirce's logico-philosophical pragmatism while, vice versa, the latter disapproved of James's 'popular' version of pragmatism.

Edelman refers to *Writings of William James* (1977), which had already highlighted the procedural character of the radically embodied emergence of consciousness. A group of cognitive scientists, including David Galin, Russell Epstein, and Bruce Mangan, amongst others, study the structure of the Jamesian stream of consciousness and particularly his notion of 'fringe' in terms of mental representation, particularly emphasizing the interaction between neurosciences and phenomenological inquiries.

As Rudrauf and others in their collaborative essay 'From autopoiesis to neurophenomenology: Francisco Varela's exploration of the biophysics of being' (2003) suggest, Varela's research exemplifies the domain of *biophysics*. In addition, Varela's manifesto in the essay 'Neurophenomenology: A Methodological Remedy for the Hard Problem' (1996) predicted the integration between the biophysical and phenomenological domains. The eventual resolution of the explanatory gap between the physical and the mental, as well as between the objective and subjective perspectives, corresponds to Eisenstein's favorite teleology of convergences of the sensuous and the logical – in the holistic unity of man and nature.

Curiously, in terms of the tektological thinking of Eisenstein's time, as Simona Poustilnik notes in her essay 'Biological Ideas in Tektology' (1998), Bogdanov did not use the modern Russian word as applied to Darwin's 'natural selection as a competition or struggle' [*otbor*], but instead he used the word [*podbor*], which the early Russian Darwinists used (slightly mistakenly) and which may be described as "a kind of 'reciprocal fine-tuning'" (Poustilnik 1998, 114–115). According to Poustilnik Bogdanov's word [*podbor*], which is often translated as 'selection', could better be translated into English as 'assemblage' (Ibid.). This is particularly noteworthy here, remembering that it is Eisenstein, the montage theoretician, whose considerations on the cinematic 'assembly line' led the mechanistic conceptualization of cinema montage towards a more holistic organic-dynamic direction.

5.2.3 DYNAMICAL LINE OF NATURALIZATION

The dynamical line of naturalization is promoted by a group of cognitive scientists, neuroscientists, and philosophers who describe mind in terms of dynamical systems theory. The interdisciplinary manifesto of *Naturalizing Phenomenology* (Petitot *et al.* 1999) combines neuroscientific views with the phenomenological praxis (Depraz *et al.* 2003; Depraz 2007). Recent neuroimaging technologies and the real-time recordings of brain dynamics have encouraged research with the objective of finding some correlation between consciousness and the biological brain-body system. The contributors to the naturalizing phenomenology project particularly point out that an adequate method for interpreting the captured temporal dynamics of experience calls for a re-evaluation of Husserl's analysis of the structure of temporality (van Gelder 1999; Varela 1999).

5.2.3.1 The structure of human experience itself

The re-interpretation of Husserl's anti-naturalistic account in terms of the naturalization program challenges the orthodox interpretations of the 20th century phenomenological paradigms, established around Husserl and his disciples Heidegger, Merleau-Ponty, *et alie* (Depraz 2007)⁵⁹. According to Depraz, the historical steps of a pragmatic phenomenology were the following: (1) Doing Phenomenology (Herbert Spiegelberg) 1975; (2) Experimental Phenomenology (Don Ihde) 1977; (3) Transformative Phenomenology (Bernhard Waldenfels) 1993–2002; (4) Imagining, remembering, placing, glancing (Edward S. Casey) 1976–2006 (Depraz 2007, 52).

For Varela 'voluntary action is preeminently a lived experience' as in Merleau-Ponty's notion of lived body (*corps propre*) in *Phenomenology of Perception* (1945) (Varela 1996). The same idea is in Husserl's discussion on the interdependence between the lived body and its world 'present in the flesh', which Elisabeth Pacherie's essay *Leibhaftigkeit in Ding und Raum* (§4, 14–15) scrutinizes in order to find a Husserlian means of analysis for dynamical representation in perception (1999, 148–160).

In terms of a proponent of phenomenology, Husserl's phenomenology offers an appropriate scientific framework for the following reasons: (1) His interest in a careful, detailed and disciplined description of a first-person experience; (2) His claim for situated and framed experiments (visual perception, lived time consciousness), and (3) His rigorous method of reduction as a gesture of suspending prejudices, of reflexive conversion and of eidetic variation [(1)–(3) cited from Depraz 2007, 31].

With its focus on the structure of human experience the project of naturalizing phenomenology is also in accordance with the *neurophenomenology* of Francisco Varela (1996, 1999). Varela elaborates further the description of consciousness of time by Husserl (and Merleau-Ponty) in terms of three neurophenomenological components: (1) the neurobiological basis, (2) the formal descriptive tools mostly derived from nonlinear dynamics, and (3) the nature of lived temporal experience studied under reduction (Varela 1999, 306).⁶⁰ Husserl's method of phenomenological reduction means putting into brackets one's *a priori* knowledge and experiential attitudes about the state of things. Phenomenological reduction allows "a fresh look at phenomena" via a "disciplined suspension of one's habitual attitudes, a bracketing of what we seem to

⁵⁹ Husserl's (1859–1938) phenomenology as 'science of consciousness' was extended to human experience in actions, perceptions, and emotions by his 'experiential-hermeneutical' disciple Martin Heidegger (1889–1976) and later Maurice Merleau-Ponty (1908–1961). Heidegger had published his *Sein und Zeit* (1927), challenging with his radical phenomenology for example the historico-cultural epistemology of Cassirer. Merleau-Ponty (1908–1961) published during Eisenstein's later life the following works: *La Structure du Comportement*, Paris: Presses Universitaires de France, 1942; *Phénoménologie de la Perception*, Paris: Gallimard, 1945. The first book was influenced by Hegel's works (and *Gestalt* psychology), but in the latter Husserl's thinking gradually replaced that of Hegel (Flynn 2004).

⁶⁰ All theorists are directly or indirectly indebted to the elaboration of time and consciousness in Hegel's *Phenomenology of Spirit* (1807). While the notion of 'specious present' of James (1890) has inspired Varela's neurophenomenological concept of 'nowness', in turn, it has inspired the parachronic reading of 'nowness' as a momentary presence 'outside of time' introduced in this study at hand.

know" (Ibid. 267), or via "the suspension of habitual beliefs" (Roy *et al.* 1999, 26).

The neurophenomenologist Evan Thompson focuses on the meeting point between "the intersubjectivity of human consciousness (the relation between self and other), and the place of empathy in human experience, both key themes of Husserlian phenomenology and of recent cognitive science" (Thompson 1999). According to Thompson the *core dyad* of a new kind of study of consciousness is that empathy is recognized as (1) the precondition (the condition of possibility) for the science of consciousness; and as (2) an evolved, biological capacity of the human and other mammalian species (such as the apes) (Thompson 1999; 2001, 2). However, Husserl's phenomenological account as a 'scientific objective discipline' turns out problematic when discussing emotions. In his time Husserl was not an exception; 20th century scientific research in general regarded emotions as too fuzzy and undetermined to be extracted from physical causalities with proper scientific methods. Husserl also took distance from psychology and William James's interest in emotions, in favor of a 'pure' logical analysis based on freestanding 'objective' perceptions of the phenomena under scrutiny. Quentin Smith in his essay 'Husserl and the Inner Structure of Feeling-Acts' states: "Despite the fact that Husserl conceived of the objectification of feeling-sensations to be a presentative objectification, his recognition that these sensations are objectified into properties of presented objects and into emotions of the ego remains a decisive one" (Smith 1976). While he finds Husserl's theory of feeling as "one of the most innovative aspects of his philosophy" it is relatively unknown because "an extremely small portion of his published writings have been concerned with feelings" (Ibid. Ch.4.).⁶¹ Deviating towards the existentialist interpretations of embodiment and subjective experience, Husserl's disciples Heidegger and Merleau-Ponty may reflect their concern with Husserl's insufficient treatment of emotions. To summarize, due to Husserl dismissing the significance of emotional experience as a potential basis of 'pure' intellectual reduction, the present treatment prefers maintaining a cautious distance to the program of naturalizing, particularly concerning Husserlian phenomenology.

As a representative of the radical dynamical systems approach to the mind, which advocates a transgression of all borders between mind, body, and world, the philosopher Alva Noë supports this study's view in his 'The critique of pure phenomenology' (2007). However, it has to be admitted that also Noë seems to be as sparing in emotion words as Husserl. Here it is assumed that what Noë refers to as "matters of significance" (Ibid. 238) implicitly relate to emotional evaluations about the state of things. This is also implied in *Embodied Mind*, which defines feeling as "an omnipresent factor" (Varela *et al.* 1991, 113). Noë assigns to 'experience' the meaning that is inherited from the wider phenomenological tradition as opposed to that of the orthodox

⁶¹ In Smith's 'Husserl and the Inner Structure of Feeling-Acts' (1976) in footnote [1] the following works are mentioned: Husserl, E. Among the published and translated works, the sections devoted to the description of feelings are ten in number. Cf. *Logical Investigations*, transl. J. N. Findlay, (London: Routledge and Kegan Paul, 1970), Investigation V, section 15, and Investigation VI, section 70; *Ideas I*, transl. W. R. Boyce Gibson, (New York: Macmillan, 1931), sections 37, 95, 116, 117, 121 and 127; *Formal and Transcendental Logic*, transl. Dorion Cairns, (The Hague: Martinus Nijhoff, 1969), section 50; *Experience and Judgement*, transl. J. Churchill and K. Ameriks, (Evanston: Northwestern University Press, 1973), section 48.

continental paradigm. However, he rejects interoception as a view into once private, experiential space. For Noë experience is not private or internal but emerges in continuous interaction with the world. This is here interpreted to reflect the autopoietic idea of mutual consensus or mutual orientation within the act of interacting with the others. Alas, experiences are not literally shared, but they are more or less ‘lived in’. “The sort of phenomenological knowledge about experience to which I am alluding is in fact very familiar and always has been to those who have had an interest in paying attention to it, like magicians and theater directors” (Noë 2007, 242).

In their essay ‘Enacting Emotions: Somato-sensorimotor knowledge’ of 2007, Anthony Morse and Robert Lowe state that “Noë’s enactive approach (2004) remains silent about the perception of our own emotional / bodily states and how they influence and change the contents of our perceptions” (Morse & Lowe 2007). However, another option could be, if the researcher accepts emotions as the basis of all conceptualization and abstract thinking and particularly if the researcher is a proponent of the enactive or embodied approach to the mind, that then perhaps there is no need to talk about emotions at all.

The enactive naturalization of phenomenology applies two distinct methodological frames for developing a mind-modeling praxis: (1) advanced neuroimaging technologies that enable real-time recording and observation of the mind’s neurobiological dynamics, and (2) phenomenological reduction that enables collaboration with test persons in their experientially meaningful, subjective framings. The neurophenomenological approach, which combines the inheritance of phenomenology with cognitive neurosciences, particularly emphasizes introspection as the most direct access to the psychological domain of experience (Varela 1996; Lutz & Thompson, 2003).

The enactive naturalizing approach can be explicated as Depraz does: “The three ‘persons’ of the phenomenological practice: 1. Reduction: method of exploration and cultivation of first-person lived experiences; 2. Description: disciplined, shared (intravariability and inter-variability) second-person accounts; 3. Scientificity: cross-disciplinary social and historical third-person exchanges” (2007, 54). This analysis seemingly follows the approach explicated in Varela and Shear’s essay ‘*First-person Methodologies: What, Why, How?*’ (1999).

5.2.3.2 Enactive cognitive approach

Using the notion of enactment Francisco Varela, Evan Thompson, and Eleanor Rosch in *The Embodied Mind: Cognitive Science and Human Experience* (1991) imply that the subject interacts with the environment in an inseparable, embodied way, based on the subject’s multisensory experience and understanding of the phenomenal world. The researchers define the notion of enactive as emphasizing “that cognition is not the representation of a pregiven world by a pregiven mind but is rather the enactment of a world and a mind on the basis of a history of the variety of actions that a being in the world performs” (Varela *et al.* 1991, 9). Enactive, embodied cognition emerges in the

interplay between unconscious, emotion-driven cognition and conscious cognition. The enactive mind comes into being in embodied acts, not in mental representations. In the most radical holism, the embodied mind transgresses the brain–body system and swallows the world as it is conceived of by that proper mind. The world comes into being in the processes of enactment, and vice versa, the enactive mind comes into being through its continuously changing situatedness in the world. The guiding metaphor for the enactive cognitive scientists is that “path exists only in walking” (Ibid. 239).

In his *Moving Pictures* Torben Grodal’s notion of ‘enactive’ explicitly leans on the term introduced already in 1966 by the psychologists Jerome Bruner and elaborated in M. J. Horowitz’s *Image Formation and Cognition* (1980, 70; in Grodal 1997, 48). Bruner’s notion of ‘enaction’ is one of three modes of hierarchical knowledge organization: the new category of *enactive* (action-based) is intended to challenge *iconic* (image-based) and *symbolic* (language-based) representation systems of traditional computer sciences (Bruner 1966). However, Ulric Neisser’s (1967) constructivist approach to cognitive psychology argues that Bruner’s (1966) use of terms is confusing. In acquiring the term ‘iconic memory’ to describe transient visual memory, Neisser notes that ordinary psychological practices “commonly speak of images as being ‘symbolic’ [instead of Bruner’s ‘iconic’] while verbal activity has a substantial motor or ‘enactive’ component of its own [conflicting with Bruner’s ‘symbolic’ for words]” (Ibid. 20). In addition, this ‘enactive’ component is involved with “the most visual of representations” (Ibid.).

Also for Grodal, the notion of enactive describes the bodily pattern of signification or a ‘subliminal’ level of ‘motor meaning’ (Grodal 1997, 48). Furthermore, in passive viewing situations, physiological responses such as shivering, crying, and blushing may be characterized as enactive, due to the subject’s bodily activity in order to ‘control her condition’ (Ibid.). “This enactive meaning is somehow fused with visual and verbal levels of meaning, and is especially connected with meaning’s vectorization, its directness, the telic, sequential schemata diminishing arousal. (In contradistinction to meaning as perception and differential sets of perception creating clusters of associations, as in the connectedness of memory and non-narrative ‘fiction’ [...])” (Ibid.). Thus Grodal’s enactive is to be interpreted as an attribute of a conscious, controlled, goal-oriented act towards the phenomenal world and seemingly as a realistic physical counterpart to metaphoric-saturated aspects of representation. For example, “a full enactive identification with the fictive phenomena”, that is, the sensations projected by enaction into the deep space of action and object gratification, becomes *disturbed* when a ‘shallow’, ‘lyrical’, ‘timeless’, ‘saturated’ slow motion effect is introduced” (Ibid. 47; *emphasis added by PT*). A duality of repetition and enactive freedom implies that “an activation of the repetitive aspect in the addressee will activate paratelic or autonomic experiences, whereas an activation of enactive freedom will activate telic or goal directed experiences” (Ibid. 124).

Bruner’s concept of enactive seems to dominate the research domain of human–computer interfaces, as well as the analysis of knowledge organization in artificial intelligence research. This becomes apparent in the 2003–established Enactive Network portal for a European multidisciplinary research community of enactive human–

computer interfaces, where enactive refers to ‘knowledge stored in the form of motor responses and acquired by the act of doing’.

From the perspective of the present study, Bruner’s concept of ‘enactive’ is restricted, in comparison to the embodied mind approach, which applies the concept in the holistic terms of one’s interaction with the world. This most critical notion relates to the classical hierarchy in Bruner’s categorization, where enactive represents the most primitive cognitive level. The two other levels involve respectively more detailed knowledge and are identified as higher cognitive levels. This three-fold hierarchy also dominated, for example, Lev Vygotsky and Alexander Luria’s categorization of the evolution of man from the primitive level towards the level of higher consciousness. This prevailing hierarchy of Eisenstein’s era was reflected throughout Eisenstein’s writings as well. The modern enactive cognitive approach, as outlined by the theoreticians of *Embodied Mind*, is however understood here to reject this kind of hierarchy and to start off from a non-hierarchical dynamical organization of the embodied mind. The enactive approach makes a leap along the path initiated with the first-generation *cognitivism* advocating the digital computer as a metaphor for the mind, and further bypassing the second-generation *connectionism*, which promotes emergence of the mind in parallel, widely distributed networks (Varela *et al.* 1991, 7 Figure 1.1.).

Curiously, Grodal in *Moving Pictures* does not mention the enactive cognitive approach nor the autopoiesis theory of Varela and Maturana, even though the latter links directly to Grodal’s domain of interests, the bodily autonomous self-regulation dynamics in cinema viewing. In addition, instead of referring to Eleanor Rosch’s research as an important landmark in the development of the ‘prototype’ theory (Rosch 1978; Lakoff 1987, 1987a), Grodal mentions Ludwig Wittgenstein’s preceding concept of ‘family resemblance’ (1997, 163n3). Rosch is mentioned in connection with her color categorization experiments (Grodal 1997, 23). Perhaps this apparent willingness to bypass the enactive cognitive approach established in *Embodied Mind* (Varela *et al.* 1991) relates to Grodal’s explicit ‘cognitivist’ standpoint (Grodal 1997, 13).

How then do the ‘Cognitivist’ and ‘Enactivist’ perspectives differ? The philosopher Daniel Dennett in his ‘Review of F. Varela, E. Thompson and E. Rosch, *The Embodied Mind*’ compares what he calls the Enactivist views against the traditional Cognitivist views in three questions:

Question 1: What is cognition? Cognitivist answer: Information processing as symbolic computation – rule-based manipulation of symbols. Enactivist answer: Enaction. A history of structural coupling that brings forth a world.

Question 2: How does it work? Cognitivist answer: Through any device that can support and manipulate discrete functional elements – the symbols. The system interacts only with the form of the symbols (their physical attributes), not their meaning. Enactivist answer: Through a network consisting of multiple levels of interconnected, sensorimotor subnetworks.

Question 3: How do I know when a cognitive system is functioning adequately? Cognitivist answer: When the symbols appropriately represent some aspect of the real world, and the information processing leads to a successful solution to the problem given to the system. Enactivist answer: When it becomes part of an ongoing existing

world (as the young of every species do) or shapes a new one (as happens in evolutionary history). (Dennett 1993, referring to Varela *et al.* 1991, 42–3, 206–7)

5.2.3.3 Radical embodiment views

The *radical embodiment* view makes the even bolder claim that cognition is *situated* in and not detachable from the world at all. Embodied dynamics thus extend over the traditional brain–body borders to the environment.

Andy Clark defines the doctrines of ‘radical embodiment’ in his article ‘Embodiment: From Fish to Fantasy’ (1999) as follows:

- 1) Understanding the complex interplay of brain, body and world requires new analytic tools and methods, such as those of dynamical systems theory (Thelen and Smith 1994; Kelso 1995; van Gelder 1995);
- 2) Traditional notions such as internal representation and computation are inadequate and unnecessary (Thelen & Smith 1994; Turvey & Carello 1995; van Gelder); and
- 3) The typical decomposition of the cognitive system into a variety of inner neural or functional subsystems is often misleading, and blinds us to the possibility of alternative, and more explanatory, decompositions which cross-cut the traditional brain–body–world divisions (Hurley 1998; Haugeland 1998; Thelen & Smith 1994; Hutchins 1995) (Clark 1999, 11–12).

According to Clark, a radically embodied cognitive system expands to include not only advanced theoretical tools but also those of everyday life (pen and paper). Moreover, “as basic forms of real-world success turn on the interplay between neural, bodily and environmental factors, so advanced cognition turns – in crucial respects – upon the complex interplay between individual reason, artifact and culture” (Clark 1999, 13). This idea is proposed for example in Clark’s own essay ‘The Dynamical Challenge’ (1997), E. Hutchins *Cognition in the Wild* (1995), Lev Vygotsky’s *Thought and Language* (1986), Jerome Bruner’s *Acts of Meaning* (1990), and Daniel Dennett’s *Kinds of Minds* (1996) (Ibid.).

The radical embodiment view strongly rejects the assumption of *inner representations* as conceived of in the representationalist and cognitivist views of the mind. Instead, perception, memory, and imagination are understood as ongoing dynamical activity systems. The dynamical imagery is ‘represented’ in the whole mind–body–world system as a sensorimotor-based cognitive activity, that is, as orientation towards and interaction with and within the world. For example, Ester Thelen and Linda B. Smith (1994) define their non-representational point clearly, saying that *explanations in terms of structure in the head*, such as beliefs, rules, concepts and schemata, *are not acceptable*. Instead, they suggest a new set of explanatory concepts that are based on complex systems, including: nonlinearity, re-entrance, coupling heterochronicity, at-

tractors, momentum, state spaces, intrinsic dynamics and forces. They also highlight that these concepts are not reducible to the old. (Thelen & Smith 1994, 339; Clark 2001, 129; Clark's *emphasis*; see Smith 2005)

As an exception to the general line of dynamicists, Kelso (1995) assumes that principles of self-organization form the basis of all structure and pattern formation in nature. Even the emergence of a conscious mind involves some kind of dynamical *pattern-formation* (Kelso 1995, 2; Clark 2001).

All conceptual and technological tools are described as embodied extensions of cognition, transgressing the traditional borderline between the separate body-brain system and the environment. In 'Cognition as a Dynamic System: Principles from Embodiment' (2005), Smith suggests that instead of inhabiting the brain with loads of memory representations, the intelligent mind harnesses the world as a kind of *work-space*. Adding to the workspace metaphor, cognition is viewed as an interface connecting the 'external' world context and the 'internal' bodily aspects. As she puts it: "The intelligence that makes alternating leg movements is not strictly in the brain, not the body, nor the world but in the interaction of a particularly structured body in a particularly structured world" (Smith 2005).⁶²

Clark, in turn, suggests a mediating space that could provide the intrinsic cognitive dynamics with the natural playground (Clark 1997; in 2001, 129–133). This would involve some kind of off-line, rule-based dynamic mode (imagination, simulation) that is directly attached neither to the action-execution nor to the goings-on of the environment. The space could involve 'partial programs', which stand for "minimal instruction sets that maximally exploit the inherent (bodily and environmental) dynamics of the controlled system" (Clark 2001, 133).

However, it has to be noted that in formulating theoretical views, even the most radical dynamist is incapable of escaping the artifacts of sciences (concepts, representations, models, etc.). Eisenstein was interested in discovering this dynamical interplay of word and image that would support the holistic oneness of experience. He also saw form and content in reciprocal relation, in a similar manner as in the metaphor of eggs and hens. It is impossible to say which one is the origin of the other; neither one can come into being without the other.

The ideas discussed above in comparison to the *Gestalt* ideas of *pars pro toto* and the organic unity of composition harnessed in Eisenstein's holistic montage theory leads to the topic of active perception. As discussed earlier, Eisenstein conceived of the act of perception as a dynamic superimposition in duration, where the whole is more than the sum of its parts (FS, 17).

62 "This is dramatically illustrated by passive walkers. Knowledge of the alternating limb movement of bipedal locomotion—knowledge traditionally attributed to a central pattern generator—appears to reside in the dynamics of two coupled pendulums, gravity, and an inclined plane (McGeer, 1990)" (Smith 2005).

5.2.3.4 Active perception

Active perception was discussed in Eisenstein's era, for example, in dynamical views of *Gestalt* psychology (section 4.3.5.4) and in Marxist activity theory (section 4.3.3.3.). In the present context it is linked to a survival-driven or goal-driven exploration of the environment. This section focuses on the perceptual imagery theories that relate to the enactive cognitive approach and the related radical embodied mind approach.

The research program of proponents of the radical organic unity of body–mind–world, J. Kevin O'Regan and Alva Noë (2001, 2002), propose that seeing is a way of acting. Imagination or mental imagery does not involve seeing. Instead, active perception explains the notion of visual consciousness, i.e., exploring the environment in terms of "the governing laws of sensorimotor contingency" (O'Regan & Noë 2001, 939). The researchers rely on experimental evidence around such topics as sensorimotor adaptation, visual 'filling in,' visual stability despite eye movements, change blindness, sensory substitution, and color perception (Ibid.).

Another approach is N. J. T. Thomas's Perceptual Activity Theory of Imagery, which he later, in debt to Alva Noë (2004), starts to refer to as 'enactive theory' (Thomas 2007). His essay 'Are theories of imagery theories of imagination? An active perception approach to conscious mental content' (1999) aims to model mental imagery as guided exploratory activity rather than as emergent mental representations. In his earlier study on 'perceptual activity' and 'interactive representation', entitled *Psychological Theories of Perception, Imagination and Mental Representation, and Twentieth Century Philosophies of Science* (1987), Thomas advocates 'theoretical relativism' and 'entity realism', which means that established theoretical entities and mechanisms should be considered as *real* (Ibid. 442–447). He associates with Nancy Cartwright's *How the Laws of Physics Lie* (1983) and Ian Hacking's *Representing and Intervening* (1983) (Ibid.). The approach suggests combining epistemological inquiries of perceptual experience with the science of psychology as opposed to trying to combine rivaling philosophical accounts (Ibid.). This recalls Vygotsky's earlier discussion on aesthetics as a subdomain of psychology instead of philosophy (see page 93–104, 107).

The ecologist studies of the perceptual process of cinema and the corresponding theory of the moving image (in Anderson & Anderson 2005) seem to rely on James J. Gibson's view of when the subject (unconsciously or consciously) picks up the information afforded in the environment. The Gibsonian line of ecological perception assumes *affordances* to be attached to real existing features of the entities or objects in the world, such that an individual only picks up when needed, for example, the 'sitability of a stone' or 'stepability of a stone'. Note that this concept refers to the interaction between two assumably inter-related but independently existing domains of the human mind and the physical existing world.

In contrast, the Neisserian line of cognitive interaction ecology emphasizes the holistic, cyclic and iterative dynamics, referred to as the triadic perceptual cycle,

where the schema directs *exploration*, which samples the *object*, which modifies the *schema* (Neisser 1976, 112). In the Neisserian conceptualization, the world and anything like Gibson's affordances would not 'exist' in the world but only come into being in an active cognitive construction. Due to this assumption, the Neisserian line of thinking has rejected the notion of affordances. Neisser's notion of schema is not to be interpreted as a representation, but rather as an emergent outcome of the perceptual dynamics.

The model of cognitive interaction ecology (Neisser 1976) and its later adaptations in Mauri Kaipainen (1996, 1994) have provided a theoretical starting point for this treatment. The conceptual idea of dividing the holistic interaction dynamics into outer and inner interaction loops, as suggested by Kaipainen in 'Prospects for Ecomusicology: Inner and Outer Loops of the Musical Mind-Environment System' (1996), will also support the idea of dividing perception in a similar manner: perception outwards to the external world and perception inwards to the inner bodily world of homeostasis. Still in this chapter, this conceptual division based on an intuitive idea of inner and outer worlds will gain support from Antonio Damasio's discussion on interoception and exteroception (see page 206). My earlier elaborations on *enactive cinema as emotion ecology* (Tikka 2004, 2005), in turn, acknowledged the embodied simulation as a neural grounding for enactment. The present treatment deepens these hypothetical treatments with the further elaboration of the embodied simulation in the next major chapter 'Simulatorium Eisensteinense'.

Experience-based anticipation of the meaningfulness of the goal reached empowers the initiation of conscious voluntary actions (Neisser 1976). Moreover, an interesting dimension may be discovered in the unconscious neural domain of cognition, which, in accordance with the enactive account of Varela (1996), is regarded as active, explorative and goal-driven as the conscious cognition.

Thomas's approach is inspired by the 'perceptual activity' theory of Ulric Neisser and the 'direct realist' perception theory of J. J. Gibson (Thomas 1987, 22), which, he argues, have been ignored by most of the theoretical developments on imagination and imagery (Ibid. 23). This is in comparison with the 'quasi-pictorial' theories of 'seeing' pictures 'in the mind's eye', as described by, e.g., Aristotle or Kosslyn (1980) as well as the 'descriptive' theories according to which mental images are computer-inspired propositions or language, e.g., Zenon Pylyshyn (Thomas 1987, 20). Thomas takes distance to Kosslyn's work, which suggests a kind of photomontage model, meaning that the mental imagery is constituted of pre-existing, interpreted perceptual 'blocks' of sub-images or schemas (Ibid. 272). Kosslyn and Pomerantz's *Imagery, Propositions and the Form of Internal Representations* (1977) is also a representative of the quasi-pictorial theory (Ibid. 19–20, 442–447). Due to the enactive and holistic framing and correlation with the discussion in Thomas (Ibid. 19–20), Kosslyn's work on mental imagery, for instance, will not be included in this treatment.

Thomas argues for the explanatory potential of Perceptual Activity Theory as a general theory of creative thought in comparison to the prevailing quasi-pictorial and description views of mental imagery, this particularly in terms of three related

key aspects of imagination (non-discursiveness, creativity, and seeing as) (Thomas 1999, 2007). Rejecting the 'traditional' symbolic computational view of mental representations, his theory is "compatible with recent *situated cognition* and *active vision* approaches in robotics" (Ibid.).

In his doctoral thesis 'A Computer Model of Creativity Based on Perceptual Activity Theory' (2007) Peter Blain refers to 'as if behavior' originally suggested in Sarbin and Juhasz (1970, 65), and further, to 'seeing as' as it originates from Wittgenstein and is applied in Thomas (1999) (Blain 2007, 30).

Basing it on dynamical *Gestalts*, Steven Lehar proposes a *Gestalt Bubble model*: "The subjective experience of visual perception is of a world composed of solid volumes, bounded by colored surfaces, embedded in a spatial void. These properties are difficult to relate to our neurophysiological understanding of the visual cortex. I propose therefore a *perceptual modeling* approach, to model the information manifest in the subjective experience of perception, as opposed to the neurophysiological mechanism by which that experience is supposedly subserved. A Gestalt Bubble model is presented to demonstrate how the dimensions of conscious experience can be expressed in a quantitative model of the perceptual experience that exhibits Gestalt properties" (2004, 375).

Joseph and Barbara Anderson note in 'The Myth of Persistence of Vision Revisited' (1993) that already Münsterberg had noticed that the mere *phi* phenomenon does not exhaust the impression of movement in cinema. Münsterberg also "proposed a central 'filling-in' or impletion process. In the traditional two-element display, he would argue, the two stimuli are perceived at different locations at different times, and the observer's mind fills in the gap: movement is 'not seen from without, but is superadded, by the action of the mind' [Münsterberg 2002, 29]" (Anderson & Anderson 1993). This is interesting in connection to Eisenstein's idea that instead of brick-on-brick montage (Kuleshov – Pudovkin), organic montage emerged in the mind due to the dynamic superimposition of its spatio-temporal flow). The approach to active perception carries significant similarities with Eisenstein's discussion on the movement of eye in the Laocoön essay (see page 90).

The *uncanny valley* concept introduced in 1970 by Masahiro Mori is here interpreted to describe survival-oriented cognitive dynamics. It also describes the notion of meaningfulness. The critical point of a kind of mental 'bifurcation' takes place when cinema as an artificial model of the world becomes too obvious (the uncanny valley of 'minimum effort') or when it demands too much effort to construct internal coherence (the uncanny valley of 'maximum effort'). The uncanny valley phenomenon shows drastic change in an observer's psychophysiological experience when an artificial human-like entity becomes 'almost human *but* not yet human' (Mori 1970, 33–35). Curiously, as is evident in practical work with any cinematic artifact, if the organization of the system is 'too complete' or 'too open' it often happens that the spectator loses interest. Meaningfulness emerges in the organizational unity of the whole. The underpinning logic is similar to that of cognitive organization, as emphasized in the universal organizational science of Bogdanov when he writes thus: The meaningful case implies *organization*, when the whole turns out

to be *practically greater* than the sum of its parts. The case of ‘too complete’ or ‘too open’ implies in turn *disorganization*: the organization of experience “is practically less than this sum” (Bogdanov 1980, 39).

Interpretations of the uncanny valley phenomenon suggest that the system of the human unconscious has been evolved in order to recognize micro-scale differences in the global organization of how a living being moves and behaves. From the biological or evolution-related point of view, this orientation is likely to be focused on anticipating friendly or hostile behavior of the other, detecting signs of strangeness, contamination, diseases, or other abnormalities such as ‘death-like’ (Mori 1970, 35). Now, the almost-human artificial entity (as an authored system) most probably has some flaws in these micro-scale global dynamics, which due to its otherwise perfect appearance elicit strong alarm signals in the unconscious system of the observer – the unconscious cognitive system warns the organism of a perceived deviation from the usual repetitive patterns of behavior.

5.2.3.5 Dynamical hypotheses of the mind

Eisenstein’s dynamical views on the mind were linked to the scientific discourses on energetics and thermodynamics, and he applied physical metaphors (engines, atom explosions, etc.) to describe the mental effects of dynamically empowered montage compositions.

Philosophers and cognitive scientists often discuss the notion of cognition as a synonym for consciousness, or conscious cognition. However, it is to be remembered that in the present treatment cognition is understood to involve both conscious and unconscious states of the body–mind system (Damasio 2000; Lakoff & Johnson 1999). This augmented definition allows assuming cognition as a synonym for the notion of mind, and, particularly, mind as radically embodied.

The dynamist and philosopher Tim Van Gelder in his philosophical essay ‘Beyond the mind–body problem’ (2004) argues that cognition is *not* a synonym for mind phenomena, as many cognitive scientists seemingly assume. Van Gelder notes that this was already pointed out in the early philosophical works of Gilbert Ryle: for example, his book *The Concept of Mind* (1949) criticized Cartesian dualism and coined the notion of ‘ghost in the machine’, arguing against “the ontological identification of mind and cognition” (Ibid.).⁶³ “Cognition is an essential ontological constituent of mind. Rather than thinking of mind as the inner engine of behavior,

⁶³ Daniel C. Dennett points out in ‘Re-Introducing The Concept of Mind’ (2002) the resemblance between the ideas of Gilbert Ryle’s ‘logical behaviorism’ and the recent embodied mind approach: “In fact I have recently been struck by a pattern: many of the themes that are emerging as hot new directions in up-to-the-minute cognitive science bear a striking resemblance to long-disregarded Rylean themes: embodied and ‘situated’ cognition; your mind is not in your brain; skill is not represented; intelligence without representation—to name only the most obvious” (Dennett 2002).

we should think of cognition as the inner engine of mind” (Ibid.). In other words, instead of arguing cognition as behaving computer-like in the classical cognitivist views, for example, in ‘Connectionism and Cognitive Architecture’ published in 1988 by Jerry Fodor and Zenon Pylyshyn, the dynamical approach assumes a kind of state-space evolution of mind as a dynamical system (e.g. neural networks) (van Gelder 1999, 251–52). The naturalization program as outlined earlier may allow keeping the exhaustive scientific debate on cognition, or mind/brain system (e.g. experimental, dynamical, and neurophysiological) out of the frame.

As a philosopher, van Gelder contributes to the metaphysical discussion on mind and cognition in ‘Beyond the mind–body problem’ (2004). With the notion of *pluralism* van Gelder aims beyond the philosophical debate over the mind–body problem. It is to a great extent due to language, the variant ways philosophers use their concepts, which feeds the debate. His pluralism claims to be “consistent with a hard-nosed realism which divorces the question of what kinds of mental entities in fact exist from the question of how we talk about people and what concepts we may have” (Ibid.).⁶⁴ Van Gelder deviates from what he calls the discourse pluralism of Richard Rorty’s essay ‘Non-reductive physicalism’ (1991) (Ibid.)

The pluralist approach argues that the debate between different ‘isms’ is generally inadequate in describing the ontological complexity of mental reality. According to van Gelder the dominating (false) assumptions that distort the debate are the following: (1) Ontological relations of identity, reduction, realization, supervenience and causation are collectively adequate for a metaphysical account of the mind–body relationship; (2) Mental is relationally homogeneous with respect to the physis; (3) Mental entities are ontologically homogeneous; and (4) Mental entities are ontological simples (van Gelder 2004). By elaborating a case that “beliefs are ontological complexes involving commitments, which are abstract instituted objects”, van Gelder defends his argument that more ontological complexity should be induced in the mind–body relation (Ibid.). This is preferred to maintaining a false kind of generic stance where mental entities ought to be at least, to some extent, “identical with, reducible to, realized by, supervenient upon and in causal interaction with physical entities” (Ibid.).

However, van Gelder views cognition as a physical entity, and as such it may be studied as a dynamical system. “Any phenomenon that can be rigorously described in terms of the coupled interaction of a range of quantitative variables is automatically counted as physical, whatever else might be known or not known about its relationship to sub-atomic particles or anything else in the inventory of respectable physical entities” (van Gelder 2004).

⁶⁴ Van Gelder’s pluralism ‘Beyond the mind-body problem’, put in his own words, “simply allows for a multiplicity of entities in the vicinity of the mental, and is not committed in advance to any theses about the number of different discourses, the connection between discourse and reality (between how we talk and what there is), or any form of anti-realism. Indeed, pluralism is perfectly consistent with a hard-nosed realism which divorces the question of what kinds of mental entities in fact exist from the question of how we talk about people and what concepts we may have” (van Gelder 2004).

According to the *dynamical hypothesis* (van Gelder 1998, 1999a) all emergent physical phenomena, such as mind, are best understood in terms of dynamical systems theory. In 'Revisiting Dynamical Hypothesis' van Gelder points out two sub-hypotheses, the first one enabling ontological analyses of dynamical systems and the latter allowing epistemological questioning: (1) The Nature Hypothesis: For every kind of cognitive performance exhibited by a natural cognitive agent, there is some quantitative system instantiated by the agent at the highest relevant level of causal organization, such that performances of that kind are behaviors of that system; (2) The Knowledge Hypothesis: Causal organization can and should be understood by producing dynamical models, using the theoretical resources of dynamics, and adopting a broadly dynamical perspective (van Gelder 1999a, 9).

"Roughly speaking, you can tell dynamicists in cognitive science by the fact that their models are specified by differential or difference equations rather than by algorithms" (van Gelder 1999a, 2). 'Dynamic approaches to cognition' (1999b) describes a dynamical system as "a set of quantitative variables changing continually, concurrently, and interdependently over quantitative time in accordance with dynamical laws described by some set of equations" (Ibid. 244). This offers dynamicists the toolset of a geometrical phase space, where different states of a particular system are described according to a temporally-related variation of positions, and a set of "attractors, transients, stability, coupling, bifurcations, chaos, and so forth" (Ibid.).

The dynamic systems theory assumes a state-determined temporal system "with numerical phase space and a *rule of evolutions* (including differential equations and discrete maps) specifying trajectories in this space" (Port & van Gelder 1995, 9; *emphasis added*). Following Andy Clark, dynamic systems theory relies on the following aspects: 1) the discovery of powerful but low-dimensional descriptions of systemic unfolding, 2) the provision of intuitive, geometric images of the state space of the system, 3) the (closely related) practice of isolating *control parameters* and defining *collective variables*, and 4) the use of the technical notion of *coupling* to model and track processes involving continuous circular causal influence among multiple subsystems. (Clark 2001, 121) (For a broader introduction to the dynamical approach see Port and van Gelder 1995, 1–39; for dynamical patterns theory see Kelso 1995.)

Daniel Hsi-wen Liu (2003) expresses his concern "that the full-scale application of the DST [dynamic systems theory] resources to cognition, even simply limited to embodied cognition, remains lacking in evidence but it really needs evidence (of equation-governed modeling). Without the approval of DST's equation-governed modeling, the conception of cognitive nature on grounds of DST resources is likely to be fragile in its empirical validity" (Hsi-wen Liu 2003, 723; Thelen *et al.* 2001).

THELEN'S MODEL OF ONTOGENETIC LANDSCAPE

In her article 'Motor development: A new synthesis' (1995) Esther Thelen introduces the *ontogenetic landscape* model. It has inspired the elaboration of the idea of cinema as a dynamical system, described in the later phase of this study. In retrospect, it appears as a plausible model for Eisenstein's reworked polyphonic montage structure. Particularly due to the experiential dynamics depicted in a kind of 'nowness'

window, which is emphasized in both historically distinct approaches of Thelen and Eisenstein, the resemblance is apparent.

According to Thelen, behavioral patterns on the macro level emerge in reduction from continuous real-time interaction of micro level subsystems. Despite their multidimensionality, complexity, and high degrees of freedom, behavioral patterns can be modeled as an ontogenetic landscape (Thelen 1995, 76). In her view, the overlapping motor solutions when learning to use force in different tasks gradually create an abstract space of force embodiment, a kind of superordinate category of force: "The seamless web of time and process gives bodily foundations to emergent, high-order abstracts" (Ibid. 97). Thelen's motor learning of action and bodily control of force in infants draws from the cognitive semantics of George Lakoff (1987), Mark Johnson (1987), Ronald Langacker (1988), and Leonard Talmy (1988) (Ibid. 96–97).

In Thelen's metaphor, learning happens in a similar manner as a mountain stream finds its way running down a mountainside. The mountainside is the context, or situatedness, and the flow of the river is life itself, emergent and forceful (Ibid. 79). The self-organizing patterns of actions, decisions, as well as thoughts, take their paths in the time-related flow of living – happening every moment, unless fatally disrupted (Ibid.). Certain patterns become more attractive (evolutionary or otherwise advantageous), the channels in the landscape become more stable, meaning that they become deeper and wider as well. The gradually established stability of learned behavior is represented as 'deeper channels for the water to flow' (Ibid.).

The landscape metaphor has been applied also earlier, as described by Denis Mareschal and others in the collaborative framework of 'Neuroconstructivism: How the Brain Constructs Cognition'. The developmental systems biologist Conrad H. Waddington in *The Strategy of the Genes* (1957) introduced an epigenetic landscape, in which "development is like a ball rolling down an uneven surface, able to take different directions as a function of its direction, inertia, and the landscape. Typical development would see most balls end up in the same general area of the landscape, and atypical development would see balls end up in different areas because of changes to initial direction, inertia, or landscape" (Mareschal *et al.* 2007, 11).⁶⁵

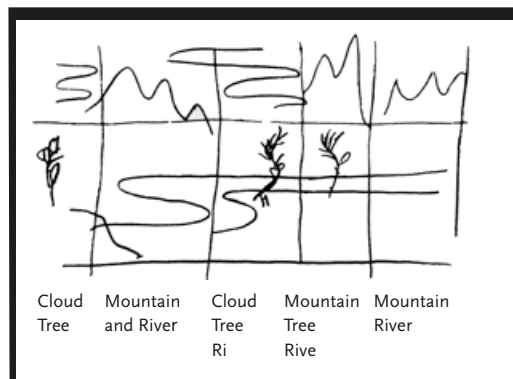
Thelen and others in 'The Dynamics of Embodiment: A Field Theory of Infant Perseverative Reaching' (2000) have created a dynamical systems model that, instead of using concepts or knowledge representations of the classical 'A not B' task, applies 'truly' embodied conditions. As van Gelder in 'Revisiting the Dynamical Hypothesis' emphasizes, for dynamists the idea of behavioral space is spatio-temporal and less metaphoric: "a system that is quantitative in state is one whose states form a space, in a more than merely metaphorical sense; states are positions in that space, and behaviors are paths or trajectories" (1999a, 10). In their field theory Thelen's research group has managed to numerically model the behavior of

⁶⁵ Mareschal *et al.* (2007) 'Neuroconstructivism: How the Brain Constructs Cognition: This framework is derived by examining development at the level of single neurons, brain systems, and whole organisms. We use the terms *encellment*, *embrainment*, and *embodiment* to describe the higher-level contextual influences that act at each of these levels of organization' (Ibid.).

some natural systems to the extent that the model (of differential equations) itself enables predictions of the future changes in the behavior of *real* natural systems, not only hypothesized systems. They conclude their model reveals even a deeper sense of embodiment: the robots (and the simulations) may be seen as models for embodiment. In the words of Andy Clark, “the dynamic field acts to simultaneously describe aspects of the world and prescribe possible actions” (1997, 49; in Thelen et al. 2000). In other words, when the external world and the memory of previous actions converge, “no other stored maps or central controllers need intervene” but, instead, “the world and experiences in the world are the both controller and the controlled” (Thelen et al. 2000).

The researchers return to William James, for whom, they argue, thinking was not about ideas but about dynamics (James 1890, 236; in Thelen et al. 2000). James, one of the principal figures in this study (who enters the stage in the next section on naturalization of emotions) is cited at length from the research paper’s conclusion: “For there it is obvious and palpable that our state of mind is never precisely the same. Every thought we have of a given fact, is, strictly speaking, unique, and only bears a resemblance of a kind with our other thoughts of the same fact.... Often we are ourselves struck at the strange differences in our successive views of the same thing.... But what here strikes us so forcibly on the flagrant scale exists on every scale, down the imperceptible transition from one hour’s outlook to that of the next. Experience is remoulding us every moment, and our mental reaction on every given thing is really a resultant of our experience of the whole world up to that date” (James 1890, 233–234; in Thelen et al. 2000).

How this type of model could be implemented in the domain of cinema will be



Eisenstein introduces the emotional theme “by the inclusion of a consecutive combination of the sounds of aspects of the various ‘natural elements’ composing it. Now the water of the river plays the theme of the landscape, then the river and clouds together, now a mountain chain, then the combination of mountains, water, and mist. etc.” (NIN 233-234).

discussed in the next major chapter. Perhaps Eisenstein in his essay ‘The music of landscape and the fate of montage counterpoint at a new stage’ (1945), when describing the landscapes of his cinematic imageries, had similar kinds of dynamical models in mind, not least due to the exchange of field theoretical ideas with the *Gestalt* dynamist Kurt Lewin. However, it should be remembered that all conceptualizations of dynamical mind phenomena inevitably require explanation frameworks, metaphors or other mind-friendly representations (at least when they are shared in scientific articles with other scholars). These descriptive metaphors from the domain of dynamical systems thinking have also been adapted to the fictional domain in analyses of linguistic and artistic forms of artworks.

In *The Body in the Mind* (1987) Mark Johnson recognizes similarities between his approach and the idea of virtual motion, which Leonard Talmy developed since the early 1980s (‘Fictive Motion of Language and “Ception”’ 2000b). He and other proponents of cognitive semantics share the interest to demonstrate how the dynamical *Gestalt principle of force* shapes the conceptualization of embodied meaningfulness: the experiential characteristics of physical force, e.g. using force to reach a goal (up-hill), being confronted with external force (wind), physical forces holding entities together (glue), and ‘force majeure’, suggest experiential examples *ad infinitum*. The force schemata not only structure the non-propositional aspects of being in the world, but it penetrates all cultural knowledge environments, language use, logical abstractions, etc. and can be extracted from the meanings of actuality, potentiality, and necessity in the use of modal verbs, e.g. ‘may’, ‘can’, and ‘must’ (Johnson 1987, 49).

MANUSCAPE AS MEDIA ECOLOGY

Dynamical systems theory has inspired a hypothetical model of *Manuscape* for script-writing interactive generative media environments. ‘Manuscapes as Media Ecologies’ (Tikka & Kaipainen 2003) introduced the metaphor and model of *manuscape*, referring to an interactive extension of the conventional linear manuscript and assuming a form of a digitally manufactured landscape.⁶⁶ The purpose of this section is to play with the idea of creating a new kind of dynamical model for enabling emotion-driven spectator interaction with a cinematic system. The approach assumes an embodied experience of emotional effort typically assigned to cinema, but particularly to game playing as, for example, in Grodal’s ‘Video Games and the Pleasure of Control’ (2000).

Manuscape is a digital artefact driving the narrative in a manner that gives the participant a degree of freedom. The freedom ranges from none, equal to a conventional manuscript in which the narrative follows a conventional, authored script, to large, allowing free navigation within a continuous narrative landscape. Each experience of the narrative is realized as a *path* through a continuous, spatially structured narrative landscape model, or *manuscape*. Here *scape* refers to the extensive *view* on the range

⁶⁶ As pointed out by Martin Rieser, in the conference paper ‘Narrative as Landscape’ (1997) Bob Hughes suggests that computer-driven hypertext narratives should take a form of three-dimensional spaces, or landscapes, through which one can take paths. However, only few projects, according to Hughes’s account, have attempted to create computer-driven nonlinear narrative structures.

of narrative possibilities and anticipations at each situation along the path, while *manu* is associated with the extension of the media in a manner that allows directing and experiencing one's actions in bodily manners.

In addition to being a concept and a metaphor, *manuscape* is also elaborated as a computational model, based on the assumption that attributes of the narrative can be represented as series of vectors, each having values of low-level attributes as their components, and each corresponding to some elementary bodily, spatial, or experiential parameter. Computer games, with characters controllable in terms of parameters for behavioral attributes such as aggressiveness, are taken as evidence that this may be possible also with the photographed moving image.

If this way of representation is possible, and it can capture at least some significant aspects of the narrative, then it will be possible to accumulate examples of good narrative sequences to be represented as series of such vectors. There exists a repertoire of computational methods, such as recent developments in self-organizing maps (Kohonen 1982), that can be used to form a digital mountain landscape in which each position represents a narrative situation characterized by certain values of narrative attributes, and which adopts the metaphor of gravitation as a model of anticipation and/or manuscripted tendency. Thus, in a manuscape there is always a gravitational pull downwards that prefers steep slopes, representing manuscript-like tendencies designed by the author. A manuscape also determines a downhill view ahead, i.e. a vision towards future events of the narrative. The role of the participant in interaction with a manuscape can be described as like that of a hiker in the mountain landscape, negotiating with the geographical constraints of the natural environment and putting an amount of bodily effort to reach her goal, visible from above. Here a participant navigates the past and through the offered emotional and narrative affordances, choosing her experiential path by putting an amount of holistic involvement into play. As a mountain landscape, the manuscape also offers many alternative narrative paths. The participant is not forced to follow any of them but can find her own, even going uphill, perhaps in order to change to another path to avoid something that can be predicted downhill. Tikka and Kaipainen also vision a set of physical-emotional interfaces, such as clothes to press, or bikes to pedal, to allow such effort concretely.

Lance Strate (2002) has described, in McLuhanian spirit, media as environments that “do not determine our actions” but “define the range of possible actions we can take”. This is what *manuscape* realizes in a particular, concrete sense. It is a *mediarium*, a manuscripted miniature environment, determining a range of possibilities for interaction with the participant and the montage composition (Tikka & Kaipainen 2003).

The idea of authoring cinema as a spatially defined dynamical system will be elaborated further within a particular Eisensteinian framework in the next principal chapter ‘Simulatorium Eisensteinense’.



5.2.4 NATURALIZATION OF EMOTIONS

What is here termed the organic line of naturalization emerged in the 19th century but radicalized significantly in William James's pragmatism. James's psychological line of thinking forms a complementary or parallel line to the naturalization line of Husserlian 'pure' reduction. This is in 'naturalizing' terms of the biological body and its relation to the experience of emotions and consciousness. As discussed in the chapter 'Eisenstein revisited', James influenced the psychological views of Eisenstein's era and his holistic montage considerations, which assumed unconscious, multisensory thinking, i.e., integration of the senses and Jamesian overtones as the principal constituents of emotion-driven, polyphonic montage orchestration. Here, in similar manner, further emphasis is placed on the Jamesian approach to emotions and integrated senses within an updated framework of the recent neuroscientific understanding of the emotion system, as exemplified in the research of Antonio Damasio. Perhaps Damasio may help to describe how the hedonism embedded in evolutionary theory could explain why the art of persuasion dating back to Aristotle still makes sense.

5.2.4.1 'What is an Emotion?'

James in his early path-finding essay 'What is an Emotion?' argued that experience should be understood as a unique organic whole, which the dynamical cognition 'grasps' in perception and shares with others in concepts (James 1884). "Our natural way of thinking about these standard emotions is that the mental perception of some fact excites the mental affection called the emotion, and that this latter state of mind gives rise to the bodily expression. My thesis on the contrary is that *the bodily changes follow directly the PERCEPTION of the exciting fact, and that our feeling of the same changes as they occur IS the emotion*" (James 1884, 190; in Cacioppo *et al.* 1992, 64; emphasis as in original).

According to James's theory, at the physiological level, emotions most likely correspond to processes occurring in the motor and sensory centers (James 1884, 188–189). The radical aspect of James's theory was that he considered emotions to emerge within the bodily sensorimotor dynamics and neurochemistry, and to be the elementary, fundamental constituents of individual experience, behavior, and social consciousness.⁶⁷ As one of the early exceptions to the Cartesian consensus that the mind works independently apart from the body, James in *Principles of Psychology* proposed

⁶⁷ The James-Lange view carries the names of American pragmatist William James, *Principles of Psychology* (1884/1890), and the Danish Carle Lange (1885). The latter independently published in Europe a similar kind of theory on emotions to that of James's (Oatley and Jenkins 1996, 5–6). Lange (1885) emphasized the affect of the autonomic nervous system as causing the bodily changes in connection to emotional states, and [note] excluded the feedback from peripheral muscles and skin, particularly stating that vasomotor changes are emotions (Ibid. 113).

that emotions are the perception of the bodily reactions to emotion-eliciting situations (James 1890). The Jamesian approach suggests that emotional processing is an end-state of an unconscious bodily process, which, when eliciting perceptual bodily changes, becomes cognized as an emotional state.

Discussing in his essay ‘A World of Pure Experience’ (1912) the skeptical empiricism of Hume, which influenced Immanuel Kant as well as Charles Darwin (Morris 2007), James differentiates it from his radical version of empiricism: “To be radical, an empiricism must neither admit into its constructions any element that is not directly experienced, nor exclude from them any element that is directly experienced. For such a philosophy, *the relations that connect experiences must themselves be experienced relations, and any kind of relation experienced must be accounted as ‘real’ as anything else in the system.* Elements may indeed be redistributed, the original placing of things getting corrected, but a real place must be found for every kind of thing experienced, whether term or relation, in the final philosophic arrangement” (James 1912, Ch. 2, 42).

A hundred years passed with emotions being pushed to the margins of academic discussion after the 20th century scientific positivism replaced the 19th century nature romanticism. It is only during recent decades, at the turn of the 21st century, that a new kind of interest has been directed to the study of emotions as a proper scientific object of scrutiny. Still, not every scientist is willing to equate the significance of the emotional brain system to that of ‘higher-level cognition’, and emotions remain a marginal interest; even fewer are willing to assign a leading cognitive role to emotions.

New methods are needed to study the brain and its role in giving rise to conscious experience. The questions posed by the Husserl-oriented Nathalie Depraz do not seemingly differ from the related questions in James (1890): “What is the mode of givenness of the sensorial organs to consciousness?” or “What subjective experiences do I have (...)?” (Depraz 1999, 470) James already emphasized the emotional dimensions of experience *as complementary* to scientific knowledge about the experience proper. Whether Husserl’s disciplined first-person approach to analysis of emotions proves fruitful to the enactive naturalizing phenomenology program is, in the end, for the future to reveal.

5.2.4.2 Consciousness as a perspective on self

The neuroscientist Antonio Damasio seems to continue the Jamesian program of ‘naturalizing’ emotions in *The Feeling of What Happens: Body and Emotion in the Making of Consciousness*. Damasio argues that the emotion research of the cognitive sciences and neurosciences of the 20th century has suffered from ignorance of the following aspects: (1) the evolutionary perspective, (2) homeostasis, and (3) the organism (Damasio 2000, 39–40). In the following pages, Damasio takes the challenge to ‘update’ the path-finding views of James to meet the standards of 21st century neuroscientific emotion research (Damasio 1994, 130–131).

Damasio’s metaphor of ‘*movie-in-the-brain*’ continues the discussion on the stream of consciousness that James initiated in his essay ‘Does Consciousness Exist?’ (1912). James’s essay suggested abandoning the notion of consciousness and replacing it with the pragmatic equivalent in realities of experience (James 1912, Ch 1, C2). With Damasio’s updated version of the Jamesian stream of thought, the theoretical background of Eisenstein’s montage considerations is also linked and updated to the present day.

With the ‘movie-in-the-brain’ metaphor Damasio means to illustrate a human mind that has “as many sensory-based tracks as our nervous system has sensory portals – sight, sound, taste, and olfaction, touch, inner senses, and so on” (Damasio 2000, 9). According to Damasio, the juxtaposition of different moving images exemplifies that movies are the most accurate external representation of the continuous, wordless narrative in the core consciousness, or the phenomenon ‘mind’ (2000, 171; 2003, 198). He uses this also in the event reviewed by Adam Benson in the *Daily Utah Chronicle* (Oct 2003): Damasio widens his metaphor to the editing techniques when he describes that something is going on in everybody’s mind, which “resembles a film and the editing process... the movie in the mind is shot differently through our own perspectives” (Damasio 2003a).

Consciousness corresponds to the organism’s recursive dynamics of *recognizing oneself in the act of interacting with the world* (Damasio 2000). The genetic and cultural converge in Damasio’s consciousness study into the two fundamental levels of self. The core self is a non-cognitive, subliminal entity in continuous recreation dynamics, interacting with the environment and recognized in the feeling of bodily changes (core consciousness). The autobiographic self, based on the core self, is related to identity, personality, past and future experiences, needs and goals, conceptual and cultural contexts, socio-emotional interaction with others – and is recognized from the subjective point of view. (Ibid. 172–176)

The metaphor of movie-in-the-brain describes this lived-by-story of the *core consciousness*, i.e., the moment-to-moment awareness of maintaining continuous check-up and modification processes in the bodily system of the living *proto-self* (Ibid. 172). However, the organism is not a narrator of any story; instead, it lives the story: “The core *you* is born only when the story is told, *within the story itself*” (Ibid. 170). Along the story lived by, the *autobiographic self* emerges with extended self-consciousness. The conscious perspective-to-self in the midst of ongoing events enables the compositions of naturally emerging narratives; there is only a short step from the bodily spatio-temporal (image) schemas in the mind to narratives uttered in words (Damasio 2003, 242–243).

Combining Damasio’s ‘movie-in-the-brain’ metaphor with his idea about two selves allows a tentative explanation for the double viewing phenomenon familiar to any film spectator: the conscious oscillation between emotional immersion (core consciousness) and back-to-reality (expanded consciousness). The oscillation also occurs in the process of authoring cinema. The author’s ability to shift between the design-oriented production phase and the emotive-cognitive simulation phase becomes a valuable tool in order to “feel” the “meaningfulness” of the practical decisions made

(Tikka 2005, 116).

Following the dynamical systems approach discussed earlier, here all models of mind, metaphors of stream of thought, or other emergent cognitive 'forms' of 'movie-in-the-brain' are understood as *dynamical systems*, meaning that dynamicity is infused in the system in the temporal duration of the experienced nowness of a perceiver. This is in terms of the enactive approach introduced in *Embodied Mind* (Varela *et al.* 1991). While radical dynamical views reject the idea of mental representations, the present treatment assumes that the dynamists' rejection is directed towards a *conceptual description* of the phenomenon, that is, a paradigmatic use of language. From the neural organismic point of view whatever is referred to as 'mental representations' means patterns emerging from the dynamical system of the biological mind, regardless of the conceptual structures applied to describe them. The experiential phenomenon of individuals being able to imagine things, or exploring non-existent imagined objects in the mind, only occurs in this experiential duration. However, such patterns should not to be understood as traditional representationalist 'imagery' but as dynamical descriptions of the continuously unfolding, emergent Jamesian-Damasian stream of consciousness.

When interpreted in terms of Damasian consciousness, or what he describes as 'feeling of what happens', a primitive narrative may describe the smallest meaningful narrative unit of the conscious experience of 'nowness' – and as such it embodies meaningfulness through an emotional understanding of a conscious self in relation to the external world and/or internal representations. The authored montage refers to a kind of mental map that changes in relation to the point of view, perspective, or other momentary, emotionally-characterized dimension (Tikka 2005, 116).

For Damasio, cinema is "the closest external representation of the prevailing storytelling that goes on in our minds. What goes on within each shot, the different framing of a subject that the movement of the camera can accomplish, what goes on in the transition of shots achieved by editing, and what goes on in the narrative constructed by a particular juxtaposition of shots is comparable in some respects to what is going on in the mind, thanks to the machinery in charge of making visual and auditory images, and to devices such as the many levels of attention and working memory" (Damasio 2000, 188).

The Gestalt theorist Kurt Koffka could be here re-contextualized to the discussion on the authoring process and the emergent form of 'movie-in-the-brain', when he ponders: "If a thought process that leads to a new logically valid insight has its isomorphic counterpart in physiological events, does it thereby lose its logical stringency and become just a mechanical process of nature, or does not the physiological process, by being isomorphic to the thought, have to be regarded as sharing the thought's intrinsic necessity?" (Koffka 1935, 684) Eisenstein can also be traced here, with his idea of cinema as inner speech. The psychological process of artistic creation, Lev Vygotsky argued, systemizes "a very special sphere in the psyche of social man – his emotions" (Vygotsky 1971, 13). Following the *Gestalt* psychologists and Vygotsky, for Eisenstein cinema studies became a branch of psychology specialized in studying the stream of creative processes, a form that Eisenstein discussed as figurative thinking.

5.2.4.3 Emotions as the basis of embodied mind

Following Damasio, and in accordance with the naturalizing mind program, this chapter discusses emotions as the fundamental basis of all cognition (Damasio 2000, 40–42). The emotive-cognitive processes are also conceived of as correlating to the holism of the autopoietic organism, as described by Maturana and Varela (1980). The homeostasis of the body is in control of temporally varying emotional states, that is, momentary *feelings* of e.g. sadness or anger, or *emotional modes* of longer duration (Damasio 2000, 341n10).

For Damasio consciousness of bodily changes and emotional expressiveness emerges in the neocortical environment as an extension of an organism's survival-oriented unconscious awareness (2000, 54–56). The unconscious anticipation in time (future events) and in space (danger hidden from direct perception) precedes the conscious evaluation of situatedness and its potential advantages or disadvantages. The involuntary actions characterized as approach or withdrawal correlate to embodied pain and pleasure perceptions and anticipatory processes, manifesting in drives and motivations (Damasio 2003, 208). Any change in the environmental situation or in the behavior of other entities reinforces the organism's awareness (Damasio 2000, 54–56).

The emotional (neurochemical and hormonal) survival kit provides the conscious mind with an *understanding* of consequences of ongoing events and those events about to happen. This critical basis of survival orientation enables an immediate response to the changes in the surrounding environment, guiding the organism towards wellbeing (Damasio 1994, 2000, 2003). In addition to Damasio's own work, the research of Edelman (1989), Bullock (1977), MacLean (1970), and Churchland (1986) provide exceptions in their effort to describe emotions as a form of innate survival logic (Damasio 2000, 339n2). Nico Frijda in *The Emotions* (1986), from whose approach Torben Grodal's homeostasis theory of emotions (1997) draws, assigns emotions with the bodily basis of a survival-oriented action tendency.

Emotions expressed and feelings felt seem to correlate to interoceptive sensations, arising from the visceral and internal body environment, plus those of musculoskeletal and vestibular systems (Damasio 2003, 107). Damasio can be argued to support *sui generis* the parachronic reading of bio-cultural evolution, as proposed in this treatment. "Although the precise composition and dynamics of the emotional responses are shaped in each individual by a unique development and environment, the evidence suggest that most, if not all, emotional responses are the result of a long history of evolutionary fine-tuning" (Damasio 2000, 53). The similarity of emotions across the cultural borders of humanity, and as suggested for example in the research on the facial expressions of emotions by Paul Ekman is certainly remarkable (Damasio 2000, 53; Ekman 1992, 34–38). Indeed, particularly in the cinema research context the Facial Action Coding System (FACS) (Ekman & Friesen 1978; EM-FACS Ekman & Friesen 1984), which is generally used in analysis of facial expressions and related emotions, provides a means to make sense of the emotional responses of the spectator to the cinematic content.

The understanding of the psychophysiological dynamics of embodied simulation could enable discovering those aspects of the human perception-action system that are automated, or hardwired to the human emotive-cognitive system, and may thereby function as the cinema media author's toolbox. For example, emotional expressions are generally acknowledged to elicit in the viewer a similar kind of emotional 'feeling', the bodily dynamics of which are discussed below in the linkage to the notion of embodied simulation (section 5.3.2.1). The cinema author may harness facial close-ups in order to enforce a particular kind of psychophysiological response, which helps to 'direct' or 'sustain' the spectator within the desired mood.

EMOTION SYSTEM IN THE TRIUNE BRAIN

This section describes Paul MacLean's model of the 'triune' brain, which is interesting for the present parachronic approach because it supports simultaneously existing *but evolutionary distinct* brain systems. In his 'triune' hypothesis, as MacLean describes in 'Cerebral evolution of emotion', the dynamic coordination of the multiplicity of evolutionarily 'older' and 'younger' brain circuits provide oneness of global behavior. This behavior appears 'externally' as in momentary synchrony, while, simultaneously, 'internal' differentiated systems function (and further evolve) according to evolutionarily 'desynchronized' phases of organism-environment-interaction (MacLean 1993, 67).

The conceptual models of the evolutionary or other interrelatedness, which involve more complexity than mere reciprocity, typically represent a 'triune' order. Any combination of three represents most economically the smallest plausible unit of development or dynamical interrelation (for example, C. S. Peirce's conceptualizations into groups of three, of trichotomies, and of triadic relations principles (Burch 2008 SEP Ch. 9), Sigmund Freud's triadic 'Id', 'Ego', and 'Superego', or consider the triangle relation between system, object, and model).

In regards to bio-cultural development, Lev Vygotsky's *Mind in society: the development of higher psychological processes* (1930) argued that the biological evolution of an individual from the lower cognitive level to the higher was identical with the three phases of dialectical evolution of historico-cultural mankind, as discussed earlier (section 4.3.6.1). Eisenstein's intellectual montage also adopted this triune pattern to describe the cognitive leaps from the lower developmental phases of the human mind-body system towards higher consciousness. This was in accordance with the early 20th century researchers, who often accorded human cultural evolution as well as the development of each individual a teleological, 'positively' evolving tendency, comparable, for example, to the utopian level of mass consciousness and social wellbeing in Marxist 'life-building'.

Today, many physiologists and neuroscientists assign the foundation of 'higher cognition' and socio-emotional functions to the evolutionarily old and relatively un-

changeable *limbic system*. This term was coined by Paul MacLean (1952)⁶⁸ and inspired by the idea of the 'Papez circuit'. James Papez had published his article 'A proposed mechanism of emotion' (1937) around the active era of the mature Eisenstein. The organic holism of the 'Papez circuit' suggests a kind of 'functional' dualism between the understanding of the limbic brain body and knowing mind, an idea that is 'naturally' advocated by many if not all contemporary biologists and physiologists.

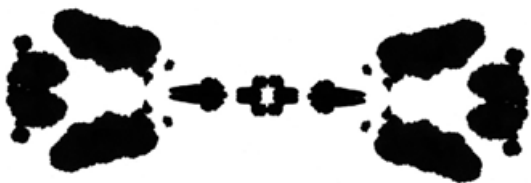
Stemming from the proposed emotional system of the 'Papez circuit', MacLean (1949) suggested two kinds of 'brains' side by side: the visceral circuit that allows one to 'feel' and the verbally equipped one that allows one to 'know' (MacLean 1949, 351; in MacLean 1993, 76). As MacLean refers to the epistemological aspects of 'feeling' and 'knowing' his dyadic brain structure may also be regarded as implying some kind of physiological correlation to the neo-Kantian notions of 'understanding' and 'knowing'.

In addition to the separated feel/know brain dynamics, MacLean (1949, 1970, 1993) further suggested that the brain system embedded different evolutionary phases. This was inspired by Papez's (1939) further assumption that there exist three pathways to the brain: the stream of movement, the stream of feeling, and the stream of thought. In 1949 MacLean suggested that these pathways developed in distinct phases of brain evolution, reptilian, paleomammalian and neomammalian (Oatley & Jenkins 1996, 137). The 'triune brain' had evolved from the reptile to that of mammals, and further, to the neocortical expansion resulting in the present genetic brain system: "In evolving to its great size, the human forebrain has retained the anatomical organization and chemistry of three formations that reflect a respective relationship to reptiles, early mammals, and late mammals" (MacLean 1993, 67; see discussion in Gazzaniga 2002, 545).

The kind of evolutionary model suggested in the present treatment is *cyclic*. Inspired here by the MacLeanian triune brain, the hypothetical model returns the guiding power to the older emotional system, which during the development of each individual guides the neo-cortical cognitive activity in its learning processes. Each individual is born with the old ancestral, socio-emotional (limbic system) environment, but it has to start learning the ways of the new (neo-cortical) environment from a cultural *tabula rasa*. A cyclic bio-cultural model emphasizes survival-based knowledge, the evolution of which is determined by the emotion-driven interaction of the action-perception system with its environment – and this acquired information becomes embedded in the system (via slow genetic mutations). This idea already in the embryonic state seems to throw new insight into the ongoing elaboration at hand.

The significance of the triune brain and multiscaled duration is in facilitating the conceptualization of the notion of time as a multidimensional dynamical variable, instead of assuming its mechanistic oneness.

68 MacLean (1952) termed the emotional system as the "limbic system" drawing from a discovery by Paul Broca (1878) that the limbic lobe is a "common denominator in all brains of mammals". Because they were mainly linked with the olfactory sense of 'low importance' for functions of higher human cognition, Broca's findings attracted little interest for decades (MacLean 1993, 74).



The present treatment proposes that Eisenstein's "polyphonic" idea about cinema correlates with these neuroscientific ideas. In other words, montage as a kind of dynamical field of superimposed images that enables the global oneness of cinematic experience correlates with the ideas about the global experience of temporality as emerging within the multiplicity of different self-organizational modules or metastable phases. The latter approach has been described in Kelso's article 'The complementary nature of coordination dynamics: Self-organization and agency' (2002). If one considers the idea of multiple, independent temporality phases in terms of cinema montage, this leads the discussion to so-called non-linear cinema. Below, in this spirit, the triune model is developed in the Damasian framework towards a multi-level model of emotions.

TRIUNE SYSTEM FOR SOCIO-EMOTIONAL SIMULATION

When Damasio in *Looking for Spinoza: Joy, Sorrow, and the Feeling Brain* (2003) suggests three categories for emotional functions, in the present context it is assumed to correlate to the innate evolutionary 'triune' order that underpins the human socio-emotional simulation system. The 'triune' is here viewed as *conceptual* descriptions of interaction between the embodied subpersonal, subjective, and the interpersonal emotion dynamics, while the *biological* interaction occurs in an emergent 'levelless' manner.

The *subpersonal* frame of *homeostasis* for regulating the neurochemical body states and autonomic nervous system, e.g. breathing and heart rate. The free-floating moody *background emotions* describe homeostatic states of being (Damasio 2003, 43–44).⁶⁹ Background emotions such as 'fatigue, energy, excitement, wellness, sickness, tension, relaxation, surging, dragging, stability, instability, balance, imbalance, harmony and discord relate to the so-called vitality affects (Langer 1942; Stern 1985; Damasio 2000, 286). Here, a connection to Eisenstein's influence is evident, because Ernst Cassirer's *Philosophy of Symbolic Forms* (1923–1929) influenced Susanne Langer's aesthetic-semantic philosophy. However, Damasio credits her as a student of the philosopher Alfred North Whitehead, who, for example, in *Process and Reality* (1929) discusses the constraint or limitations of conscious processes (Damasio 2000, 226, 287).

The *intrapersonal* frame, where *feelings* are perceptions, i.e. within the first-person experience only and not perceptually sharable. *Primary emotions* (amygdala-related) are innate, preorganized, and do not necessarily involve goals or objects (Damasio 1994, 133–134). Damasian-Jamesian primary emotions add disgust and surprise to the basic emotions of happiness, sadness, anger, and fear (Damasio 2003, 44). For example, the following description seemingly relates to the intrapersonal frame: "Whether you are immobile from curarization or quietly daydreaming in the darkness [in a cinema theater, perhaps], the images you form in your mind *always* signal to the organism

⁶⁹ For example, in an attentive emotional stage the heartbeat slows down and secretion of sweat increases – an alarming signal of the necessity to stop action, to alter the plan, to modify behavior (Oatley and Jenkins 1996, 257–258).

its own engagement with the business of making images and evoke some emotional reactions" (Damasio 2000, 148). The intrapersonal frame is in the present treatment related to Damasio's consciousness metaphor of 'movie-in-the-brain'.

The *interpersonal* frame, where emotional *expressions* of e.g. fear, anger, joy, or shame, constitute social patterns. Linking primary emotions with complex social situatedness, the feelings of "sympathy, embarrassment, shame, guilt, pride, jealousy, envy, gratitude, admiration, indignation, and contempt" only make sense when contextualized (Damasio 2003, 45). Situations involve objects or entities to reject or to be attracted to. Dealing with wellbeing in social groups, they also embody a survival-based purposefulness (Ibid. 48). In this updated version of emotion categories Damasio discusses *social emotions* (Ibid. 45–49), rather than secondary emotions (in Damasio 1994, 134).

The Damasian social emotions correlate with Oatley-Johnson-Laird's (1995) object-related emotions (object of love or object of rejection): attachment love, caregiving love, sexual love, disgust, and contempt all reflect evolutionary significance (e.g. reproduction and fitness) and socio-emotional behavior (in Oatley & Jenkins 1996, 261–262). In addition, Oatley and Johnson-Laird (1995) propose *basic emotions* as regulators of action-management: happiness, sadness, anger, and fear may also occur as *free-floating* (non-intentional) emotions, such as "moody" enjoyment, depression, irritability, and anxiety (in Oatley & Jenkins 1996, 259–260).

In comparison, in MacLean the most primitive evolutionary form of the triune brain is about family ties and caretaking of the nearest and dearest, while in the highest culturally-evolved form it is about a global family and ethical concern about all living beings (MacLean 1993, 82). In the later phases of cortical evolution, the intersubjectivity of the emotional system perhaps transformed first into phonetic speech, and further evolved into higher-order complex conceptual systems (Ibid.). Following this logic, and as suggested, for example, in Lakoff and Johnson's *Philosophy in the Flesh* (1999), emotion-driven expressiveness and metaphors form the basis of concepts, tools, and other constructions of normative cultural systems, such as languages, philosophies, or theories. The bodily basis of emotions is not seen to be in conflict with the cultural approach to emotions, as exemplified by Ronald de Sousa in *The Rationality of Emotion* (1987), or Amélie Rorty in *Explaining Emotions* (1980). As elicitors of conscious activities and involuntary yet expressive processes (bursting into tears, or voice shaking due to anxiety), the bodily basis of emotions may be described with the particular meaning of *ways of seeing*. Yet each paradigm defines its own use of terminology, and thus the Jamesian-Damasian description that 'body-mapping of emotions causes the feelings to emerge in consciousness' is often mixed with the cultural constructivist articulation that 'emotions are expressions of a cultural, social, or historical context'.

Perhaps the 'movie-in-the-brain' of Damasio plays a role as a kind of 'ancestral' schematic script for emotion-driven enactment in the modern social context. In reciprocal manner, emotions both shape the socio-cultural environment and are shaped by it (de Sousa 2003 *SEP*). In this way, continuous survival-based self-reflection (as promoted by the MacLeanian limbic system) and the neocortical logic connected to socio-cultural networking converge in an inseparable manner in the modern (wo)man.

This kept in mind, the present treatment continues on its selected path. Turning its back momentarily on cultural discourses, it takes its direction towards the dynamics of the organic mind.

5.3 DYNAMICS OF THE ORGANIC MIND

This chapter proposes a consensual ground for both dynamical and organic lines of the naturalization program, which, despite their differentiated research methods, presume complex bio-dynamics of an organic mind. The purpose is to find new visions and perhaps new methods for understanding the embodied authoring processes. If the phenomenal world comes into being on the functional basis of the biological body, the recent neuroscientific issues discussed in the following pages form the fundamental grounding for any further studies about the embodied dynamics of the authoring process. Diving into organic and synesthetic sensemaking and intersubjectivity will contribute directly to the further elaborations of the Eisensteinian embodiment of emotional theme in the next chapter ‘Simulatorium Eisensteinense’. The new theoretical insights provided here in ‘Dynamics of the organic mind’ aim to enable the authoring of a new kind of cinema driven by the unconscious emotional experience of the spectator.

5.3.1 ORGANIC ‘SYNESTHETIC’ SENSEMAKING

Eisenstein’s organic holism presumed that the author’s cinematic expressiveness relies on the same organic laws governing all aspects of the natural world. This section studies how contemporary findings about the organic body–mind system may explain the interdependence of different senses, organismic iteration of dynamical patterns, and the functional synchronization of the body and mind as a whole.

5.3.1.1 Neural workspaces

Accepting the idea of consciousness as a particular mental state involves awareness of oneself as an experiencing bodily subject in a particular kind of relation to the surrounding world. This relationship of the conscious mind to the perceived state of

things provokes such mind models as Damasio’s *movie-in-the-brain*, the *global neural workspace hypothesis* introduced in the article ‘Neuronal mechanisms of consciousness: A Relational Global Workspace framework’ (1998) by Bernard J. Baars, J. Newman, and J. G. Taylor, and the *multiple draft model* discussed in Daniel Dennett and Marcel Kinsbourne’s article ‘Time and the Observer: the Where and When of Consciousness in the Brain’ (1992) (Damasio 2000, 314).

In Dennett and Kinsbourne’s metaphor of ‘multiple drafts’, parallel, functionally independent neural processes compete with each other in order to lead to action (Dennett & Kinsbourne 1992). Later, Dennett’s 2001 article ‘Are We Explaining Consciousness Yet?’ replaces the multiple-draft idea with the metaphor of *fame in the brain*. With this move, Dennett seems to avoid directly addressing the mind’s hidden organism basis and suggests that consciousness only comes into being in executive actualization within social interaction. In this aspect, as stated by Damasio, the experience of stream-of-consciousness that Dennett calls a Joycean virtual machine differs from Damasio’s neurological approach to understanding subjectivity (1994, 244).

5.3.1.2 Neural basis of concepts

Eisenstein’s interest in the biological roots of language re-vibrate in the neural model of concepts suggested in the collaborative project of neuroscientist Vittorio Gallese and cognitive linguist George Lakoff. Pioneering in the field, their article ‘The Brain’s Concepts: The role of the sensory-motor system in conceptual knowledge’ proposes a neurocomputational model, which suggests how conceptual and metaphoric understanding emerges within the neural sensorimotor system (Gallese & Lakoff 2005, 19). The researchers reject the prevailing paradigm of two parallel systems: one for action and perception of, for instance, *grasping*, and another for processing the linguistic notion of the same act of grasping (Ibid.).

The conceptualization process in the neural level involves specialized neural networks, which are characterized by multimodality, functional clusters, simulation, and parameters (Ibid. 3–4). Concept-related neural networks are the *Cogs* (*cogito*; in Latin ‘to know’) (Ibid. 17). According to the researchers, cogs combine interactivities of the mirror neuron networks and sensorimotor systems, as will be discussed in more detail in a later section. Gallese and Lakoff concentrate on the premotor areas of the brain and do not discuss the roles of brain areas such as basal ganglia, cerebellum, thalamus, and somato-sensory cortices (Ibid. 4). If the Damasian view to emotions as the basis of cognition would be applied to this model, research on the neural concepts and their semantic values should expand to the emotion-related brain regions (e.g. Damasio 2000, 51–52, 59–62). The neuroscientific collaboration of Gallese and Lakoff is a natural continuation of the semantic elaboration of the metaphor theory by Lakoff and Johnson in *Metaphors We Live By* (1980) and *Philosophy in the Flesh: The Embodied Mind and its Challenge to Western Thought* (1999).

The *broad-scale conceptual isomorphism* in ‘Dynamic Emotion ecologies of Cinema’

(Tikka 2005) links physiological events to conceptual expressiveness as in the metaphor theory of Lakoff and Johnson (1980, 1999): “The integration of various modularly processed sensuous experiences forms the plausible basis also for imagining in the brain. Based on this holistic idea, my view of a *broad-scale conceptual isomorphism* suggests relative structural analogues between understanding and discussing different disciplines, e.g. socio-emotional behavior, neurobiological dynamic systems, and creative processes extending to the products of the mind” (Tikka 2005, 120). The concept describes how, on the one hand, all conceptual sign systems acquire meaningfulness from the resources of embodied situatedness, and reciprocally, on the other hand, the basic sensorimotor experiences are projected to the conceptual level of cultural knowledge environments (Ibid.). The integration of sensemaking in ‘human scale’ events and intersubjective conceptualizations (language, signs, images, gestures, *Gestalts*) are not restricted to the conscious cognitive levels of experience, but must also penetrate the *experiential oneness* of all imaginable scales of the embodied ‘bio-being’. Ranging from neural micro scales to world-embracing macro scales of techno-cultural extensions, a broad-scale conceptual isomorphism juxtaposes into the same conceptual framework also apparently incommensurable explanandum structures, e.g. abstract, visual, heuristic, and scientific descriptions (Ibid.).

5.3.1.3 Neural interpretation as storytelling

In Michael Gazzaniga’s book *The Social Brain: Discovering the Networks of the Mind* the coherence of storytelling can be seen as a universal, emotionally-motivated expression of an ‘interpreting’ module in the brain (Gazzaniga 1985, 5–6, 135). In ‘*The Neuronal Platonist*’ Shaun Gallagher interviews Gazzaniga about his later book *The Mind’s Past* (1998), which proposed a fictional brain of a fictional self. Gazzaniga notes that the self is not fiction. Instead, “the interpreter calls upon all kinds of information to build that narrative. So the construct that is derived comes from true facts of one’s life as well as false facts that we believe to be true. The resulting spin that comes out as our personal narrative is, as a result, a bit fictional, like the idea we are in control of our behaviour” (Gazzaniga & Gallagher 1998). Gallagher points out that already Hume proposed “the self as a product of an overworked imagination”, while also Dennett (1991) has worked out “a theory of the self as a centre of narrative gravity, that is, as an abstract construct located at the intersection of the various tales we tell about ourselves” (Gazzaniga & Gallagher 1998).

Most neuroscientists relate speech production, comprehension, and conceptual categorization to the human brain’s left hemisphere, mainly Broca’s area (speech production) and Wernicke’s area (language comprehension) (Gazzaniga *et al.* 2002,

386–387).⁷⁰ Gazzaniga has gone further and claims the left hemisphere position as ‘the interpreter’ between embodied experience and the *socially coherent* descriptions about those experiences. Already in the early split-brain studies (Gazzaniga *et al.* 1965; Sperry *et al.* 1969), Gazzaniga and others discovered that the left hemisphere has the ability to produce conceptual (verbal) explanations for spatio-visual problems, which are intelligible – but not always ‘truthful’ (Damasio 2000, 187).

Gazzaniga’s interpreter appears as a storyteller whose supplies of the narrative are embedded in the brain. The metaphor of *homuncular* interpreter describes the language-related skill to fill in gaps for ‘missing parts’ in the causal chain of events. It associates, invents metaphors, tells lies to enhance positively its own first-person view, but also reads minds (Gazzaniga 1998, 24). Gazzaniga’s functional interpreter in the brain may be retrospectively argued to have produced Aristotle’s mind with the idea of a coherent narrative pattern including a beginning, middle and end, and which also today provides the main doctrines of any storyteller’s narrative coherence.

“Telling stories, in the sense of registering what happens in the form of brain maps, is probably a brain *obsession* and probably begins relatively early in terms of evolution and in terms of the complexity of the neural structures required to create narratives. Telling stories precedes language, since it is, in fact, a condition for language, and it is based not just in the cerebral cortex but elsewhere in the brain and in the right hemisphere as well as the left” (Damasio 2000, 189). All scientific attempts to produce Artificial Intelligence involve coherence. For example, schema and script theories are based on an intelligible unfolding of sequential units, be it that of a natural event or cultural conventions; for example, the arch of coherence seems to guide the growing of a tree from a seed as well as the behavioral script of ‘having dinner in a restaurant’, a case study by Roger Schank and Roger Abelson in *Scripts, Plans, Goals and Understanding: An Inquiry into Human Knowledge Structures* (1977).⁷¹

The perceptual and propositional coherence of figures, events, or other organic unities accords with the *Gestalt* principles, particularly that of figure-background, this understanding well present in Eisenstein’s figurative thinking as well. The human expressiveness that Eisenstein conceived emerging as a psychophysiological interplay, involving the unconscious and conscious mind–body system, is according to today’s neuroscientific interpretations argued to prefer coherence, networking organization,

⁷⁰ Consensus among neuroscientists assumes the left hemisphere as associated with the approaching or outward tendencies. The right frontal cortex, in turn, is associated with the withdrawal or inward tendencies. It is devoted to recognizing emotions and socially relevant information in the expressions of others (Adolphs *et al.* 2000), and seems to understand “anomalies via irony, jokes and other emotionally sophisticated strategies” (Baars 2003, 6). The right somatosensory cortices carry the task of creating the body state mapping: if damaged, the subject is not able to simulate the body states of other people properly, and no empathy in the phenomenal level of experience occurs (Damasio 2003, 117).

⁷¹ Schank and Abelson discuss perspectives on event structures that involve anticipation based on previous knowledge structures. Their approach to building behavioral scripts may be regarded to some extent outdated as supporting the idea of mind-as-universal-script-based-computer’ – this at least from the point of view of the more organic views of AI and cognitive sciences. However, Schank and Abelson’s (1977) idea of breaking meaningful conceptualizations into action– or state-related primitives supports the hypothetical idea put forward later in the present treatment of describing narrative in terms of feature dimensions in the parametric montage composition.

similarity categorization, and filling in the gaps, i.e., inventing or inferring the lacking information favored over a coherent explanation of understanding world events.

As Gazzaniga points out, the interpreting module of the brain provides the conscious mind with a control, planning, and management instrument: “The montage of conditioned responses that had governed biological creatures for all of time now dwelt in a brain system capable of thwarting their power” (Gazzaniga 1985, 99). This seems to suggest that it could be possible to discover physiology-based ‘narrative’ tools to go beyond mere reflexes to the higher levels of social consciousness, and this is here recognized as the main concern of Eisenstein’s montage considerations. In fact, if one may provoke a revolutionary overturn, Gazzaniga’s interpreter seems to promote the mind’s unknown, unconscious, or subconscious regions, classically attributed as the ‘irrational’ system of the mind, as the new proponent of ‘rational’. This means that the underpinning innate coherence-generator takes the position of those parts of brain that typically have been related to ‘rational’, mainly conscious, activities. The underpinning inference system thus ‘makes decisions’ that affect the global scale of human behavior and inference; it is the system that provides the narratives the conscious mind finds logical and believable. However, because in terms of natural cognitive systems, the mind’s processes are seen to function in a complex dynamical manner, and no fixed or one-directional hierarchies are accepted, the above-presented revolutionary overturn must be taken as a playful hypothesis, in a similar manner as one takes the Gazzanigan narrative interpreter to present a neuroscientific explanation, this without introducing into the discussion a homunculus, a clever storyteller living inside the biological brain.

5.3.1.4 Synesthesia

The phenomenon of synesthesia manifests in experiences such as ‘tasting shapes’ or ‘hearing colors’ in Ramachandran and Hubbard’s research (2001, 2003). Many ‘diagnosed’ synesthetes are practicing artists or poets, as discussed in e.g., Dailey *et al.* (1997), Domino (1989), or Root-Bernstein & Root-Bernstein (1999). While Eisenstein himself was not among the many artists diagnosed as synesthetes in the psychophysiological research of his collaborator Alexander Luria, synesthesia constituted one of the cornerstones in Eisenstein’s multisensory montage theory. Since Sir Francis Galton’s observations in *Inquiries into Human Faculty and its Development* (1883), many of the 19th century philosophers and psychologists had advocated the idea of synesthesia as “a key to the understanding of consciousness” (Damasio 2000, 348n8). Eisenstein in his essay ‘On Colour’ provides a historical account of the phenomenon (ESW2, 254–267). In Eisenstein’s era it was widely discussed as evidence of the hidden sense of the body based on the embodiment of previous experiences. For example, Merleau-Ponty in *The Phenomenology of Perception* (1945) suggested that “synesthesia and synesthetic metaphors have a common ground in the unified preconscious perception”; to talk about sensuous experience requires applying pre-existing language

based on the theory of five senses (Merleau-Ponty 1945; in van Campen 2008, 98).

In neuroimaging, the brain of a synesthetic has been shown to involve additional activation in the brain region relating to the verbal description of the synesthetic experience. The metaphoric language may use the neural cross-activation basis of conceptual maps, which is an analogue to the synesthetes’ cross-activation of perceptual maps (Ramachandran & Hubbard 2001, 17). The synesthetes’ hyperconnective use of language, for example in the arts, may eventually provoke a heuristic, interpersonal understanding. By simulating common things from radical perspectives or in novel contexts, synesthetic activity may elicit cultural ‘mutations’.

Perhaps when the Gestalt theorist Wolfgang Köhler met Eisenstein in 1929 they discussed his experiment, which concluded that a form-based perceptual link between the auditory and visual structures must exist: from two choices of names, the ‘pre-linguistic’ people in Tenerife linked an angular-shaped figure to the name *takete* and the round-shaped to the name *maluma* (Köhler 1929, 186–187). Ramachandran and Hubbard conducted the same experiment, confirming that the *Gestalt* experience of the pronunciation of *maluma* and the softness of the shape named *maluma* is not arbitrary (Ramachandran & Hubbard 2005, 172).

Somehow the brain seems to extract shared, rather abstract features from different sensory modalities, in this case from auditory and visual domains (Ibid. 170–171). The basic ability of perception to compare differences and similarities seems to have a strong dependence on the anatomical structure of the brain: the preference of directionality (mapping sound to the visual more often than visual to sound), and the tendency to recycle certain kinds of intersensory linkages expressed in typical metaphors (Ibid. 172). For example, the universal phenomenon of using sexually colored words to express aggression or hatred may be physiologically explained (Ibid. 173).

According to their article ‘The Emergence of the Human Mind: Some Clues from Synesthesia’ Ramachandran and Hubbard argue that synesthesia can eventually help to describe “the evolution of metaphor, language, and even abstract thought in humans (Ibid. 148). Synesthesia can mainly be assumed to occur on the lower level of the perceptual-cognitive system. Arising from the sensory system, it connects the aspects of the motor system tightly to the phenomenon (Ibid. 149). Furthermore, Anne Treisman in her article ‘Perceptual grouping and attention in visual search for features and for objects’ (1982) proposed that an immediate segregation of a perceptual phenomenon only occurs with certain sensory features, such as motion, color, and depth (Ramachandran & Hubbard 2005, 150).⁷² This is indicated also in the experiments with movements, where synesthetes saw actual movement between different replacements

⁷² According to E. B. Goldstein’s account in *Sensation and Perception*, Treisman’s feature recognition theory (FRT) suggests a sequential process, which starts from analysis of the visual features in a preattentive stage. This is followed by object perception in the focused attention stage, where features are juxtaposed. Object recognition occurs when the information constructed has been verified with the data in the memory. The basic features are determined by a *pop-out-boundary* method (instantaneous recognition) and by the method of *visual search* (time-related evaluation) (Goldstein 2002, 163-164). This type of sequential order of perceptual process is challenged today by the ideas of widely distributed processes, which assume that all cognitive processes involve simultaneously parallel top-down and bottom-up processes as well as integration between different functional areas of the brain.

of shapes that were altered in display plates, while the nonsynesthetes did not report perceived movement. Thus, the synesthetic experience may be assumed to connect the fusiform gyrus (V4) with the motor area MT (Ibid. 151).

This experiment can be compared to the classical experiment by Siegmund Exner (1875) with the two light spots altering at a certain frequency, which was shown to elicit a perception of movement. Curiously, Exner is mentioned as the first to formulate the notion of neural networks in *Entwurf zu einer physiologischen Erklärung der psychischen Erscheinungen* (1894). In another case, the brain image of, for example, a person claiming that he sees numbers in different colors, may show neural activation in the visual area particularly specialized in color perception. According to Ramachandran and Hubbard, the visual color area V4 is topologically located next to the area of representations of number-grapheme, thus suggesting a cross wiring in color-grapheme synesthetes (2005, image plate 9.3.). The numbers ‘popping out’ in their experiments with synesthetes was due to color perception related to perception of the physical shape of each grapheme (e.g. the number 5 or the Roman symbol of number V) (Ibid. 149).

Both bottom-up and the top-down processing affect the experience of the synesthetic phenomena. There exists a group of synesthetes whose experience suggests lower level synesthesia, i.e. immediate automated bottom-up experience. Amongst the higher-level synesthetes perception may be formed in the later stage of the visual system, for example, in relation to spatial organization (Ibid. 155–159). Such later processes are the cross-modal integration of perceptions to handle high-level numerical concepts (e.g. arithmetic); the lateral differences are left for language-related analogical reasoning and right for spatial and artistic metaphors (Ibid. 172, 176).

Ramachandran and Hubbard (2001, 2003, 2005) are determined to discover to what extent the perceptual systems of non-synesthetic people and synesthetics converge. (While synesthesia automates seemingly unrelated perceptions (for example, colors with numbers) as features of everyday experience, the researchers assume that it also plays an instrumental role in goal-directed artistic or scientific expressiveness.

Eisenstein was confident that this linkage existed, and it constituted the main interest of his mature research on the polyphonic orchestration of colors, sounds, movements, and other experiential dimensions of moving images. Perhaps the neurophysiological model of synesthetic ‘distortions’ as a basis of creativity suggested in the research of Ramachandran and others can open a new window on the generalization of complex dynamics of the mind. Synesthetic phenomena may be the underpinning, emotional force of cognition, imagination, memory, conceptual blending, associations, and a range of metaphors elementary in the Eisensteinian kind of figurative thinking.



5.3.1.5 Interoception

The neuroesthetic studies of Semir Zeki emphasize that “the almost infinite creative variability that allows different artists to create radically different styles arises out of common neurobiological processes” (2001, 51). This is in accordance with Eisenstein, who seemed to believe that the creative processes of cinema authoring harness those author’s bodily resources to which one may not have observational access but which emerge within the bodily being in the world, when called for in the creative processes of imagination. For him, also, this same bodily basis enabled the author to share emotional experiences with the spectator.

The perception of the outer world has been established as a natural and obvious part of the human cognitive system. Yet the unconscious, subconscious, or embodied domains of thinking and experience have been considered as impenetrable and out of the reach of the human perceptual system. Perhaps, as discussed in terms of Gazzaniga’s coherence generator, the narrative and stories the mind produces provide access into the hidden domains of the mind. In Eisenstein’s era, psychoanalysis was one of the few theoretical approaches to studying the unconscious alongside the romantic mystical tendencies of biocentrism as that of Ludwig Klages, in addition to James’s psychological approach to the underpinning dynamics of different senses and visceral body. Yet it has been assumed that there is no perceptual access ‘inwards’ to the interior of the body, only ‘outwards, to the external world.

Contrasting this view, Damasio brings forth the idea that in addition to the outwards directed perceptual system, i.e., *exteroception*, there exists another interoceptive bodily mapping system, which feeds the mind with otherwise ‘hidden’ information about the body. This is interesting in terms of the present work, which aims at understanding how the author might have access to and perhaps even control her proper embodied resources. The issue cannot be discussed here, being far too extensive and entering far too deep into the layers of neurosciences. Yet the possibilities the study and establishment of interoception opens up for the authoring process are inspiring. This is one of the secret domains of the mind, which Eisenstein is here argued to have peeked at when discussing his ideas of sensuous thinking and ecstatic experiences.

Damasio’s *somatic-marker hypothesis* assumes that the somatosensory system is the niche of emotional states (Damasio 2003, 147–150). This hypothesis may help to establish the idea of dynamic patterns as physiological images of emotions, perhaps in the parametric terms of the dynamic-organic approach to film structures, as suggested by Eisenstein, or later, for example, in Noël Burch’s elaborations of cinematic form. The somatic-marker hypothesis is based on the idea that an emotional signal automatically links to positively or negatively loaded information stored or *marked* in the subject’s memory; these embodied ‘markers’ describe ‘gut feelings’ or ‘intuitions’ (Ibid.). If something in the previous experience has failed to work causing unease or even pain, or if something has proven to be unreliable, a certain kind of feeling of uncertainty automatically becomes attached to similar kinds of experiences (Ibid.).

The map of the body emerges in the topography of the somatosensory and motor

cortex. Yet it is proportionally distorted if compared to the idea of the body in terms of a volumetric human figure in natural space: all facial parts, tongue, and jaw occupy exaggerated parts of the cortical space; thumb, fingers, and hands are well represented, while trunk, hip, neck, head, and legs have less space than one would imagine; and genitals are spatially expanded, hidden in the interhemispheric fissure separating the left and right hemispheres. (An image of the homunculus may be found in e.g. Gazzaniga *et al.* 2002, 650). The interoceptive system maps, for example, any physical pain or pleasure, or temperature sensations in the skin receptors (Goldstein 2002, 446–447; Gazzaniga *et al.* 2002, 75). The proprioceptive system, in turn, carries information about touch and proprioception, i.e. position of the limbs, and deals with such movements as a hand spreading paint over a canvas (*Ibid.*).

Inspired by Gazzaniga's interpreter, Damasio plays with the idea that what is going on in the interoceptive areas, such as the insular, somatosensory and motor cortices, may be the source of what is generally understood as rational thought (2003, 231). The idea that emotions are interoceptions to the inner body environment may further be connected to the recognition of the social 'otherness' in neural mirroring systems. Finding evidence for this view is however still in process.⁷³

The purpose of this section is to provide an overview of the interesting neuroscientific topics having relevance to future cinema studies. However, it is important to mention that as assumed to be bidirectional, the emotional process may start as a bottom-up stimulus evaluation or as the higher-level top-down directed thought chain (for example, eliciting disturbing imagery). These images, in turn, may work as stimuli that trigger the emotion evaluation in the particular brainstem nuclei specialized, for example, to fear. Damasio and his collaborators in 'Somatic markers and the guidance of behavior' have shown that the orbitofrontal lesion does not necessarily affect the semantic understanding of stressful images (mutilated bodies, disaster scenes and nudity). Instead, it has an effect on the physiological skin conductance response (SCR), or later in this study, electrodermal activity (EDA), a term used to describe changes in the skin's ability to conduct electricity. In other words, while normal, healthy persons show an increase in skin conductance response when viewing disturbing images, the response of patients with orbitofrontal lesion is completely flat. (Damasio *et al.* 1991, 217–29; Damasio 1994, 208–212; in Gazzaniga *et al.* 2002, 551–552)

One of the patients had explained that he knew the image content was emotionally disturbing, and he *should feel* disturbed. Yet he had not felt his body responding in the manner he remembers having felt. (Damasio 1994, 211) In Damasio's words, the patients "could avail themselves of abundant factual knowledge but could not experi-

73 The still prevailing views (Goldstein 2002, 446) assume that the somatosensory system delivers sensory information from the peripheral body areas, mainly from the skin, to the brain via the spinal cord. The spinal cord pathways relate to the organism's external and internal sensory information, that of *exteroception* (or *proprioception*) and *interoception*. In addition to relating to pain, body temperature, flush, itch, glucose level, presence of inflammatory agents, visceral and genital sensations, etc. (Damasio 2003, 106), the insular cortex appears to be the actual recipient of the signals "carrying" emotional content (see full discussion in Damasio 2003, 108–109). Only in the recent re-evaluations of interoception, such as Arthur D. Craig's article 'How do you feel?' (2002), does an organism appear to be enabled with direct sensory access to the body's interior (in Damasio 2003, 312n21).

ence a feeling, that is, the 'knowledge' of how their bodies ought to behave relative to the evoked factual knowledge" (*Ibid.*). The opposite situation occurs when the feeling emerging from the body's information system provides the mind with exaggerated or distorted perceptions of self. In psycho-pathological disorders such as panic attacks, obsessive-compulsive disorder, or post-traumatic stress, unbearable or uncontrollable physiological reactions provoke psychological affects such as painfulness, fear, non-intentional enjoyment, depression, irritability, or anxiety. These constitute the feeling repertoire of normal, healthy people as well, but in particular connection to psychiatric disorders, if not neurotransmitter-related, no external causes can be identified (Oatley & Johnson-Laird 1995; in Oatley & Jenkins 1996, 259–262).

The 'knowledge of how the body ought to behave', as in the above case study, exemplifies the Damasian somatic marker. Interoception enables the perception of body states in a similar manner as the more generally known visual or auditory perception enables observation of the external environment. It follows that somatic markers may also be regarded as the basis of socio-emotional behavior.

Emotion research⁷⁴ has found support for and from James's (1884) perceptual emotion theory idea that "the distinctive proprioceptive and interoceptive cues associated with basic emotions constitute sensory information, the perception of which can determine emotional experience" (Cacioppo *et al.* 1992, 65). Thus, somatovisceral perception occurs in a similar kind of visual perception that may be defined as discrete and unambiguous (*Ibid.* 65–66). Cacioppo and others augment this idea and suggest what they call *somatovisceral illusion*: similar to how visual perception may provide different interpretations from one image, so may somatovisceral perception be based on ambiguous bodily information, comparative to for example image (e.g. 'My Wife and my Mother-in-Law' introduced in Boring 1930) (*Ibid.* 68–69; 89–90).

In *Mind sights* Roger N. Shepard serves an analogue between the somatovisceral and visual: "The illusions, ambiguities, and other visual anomalies that have been explored by artists and by perceptual psychologists are not manifestations of arbitrary quirks, glitches, or design faults of the human visual system. Rather, these perceptual aberrations arise from the operation of powerful and automatic inferential principles that are well tuned to the general properties of the natural world. We owe our very existence to the effectiveness with which these principles have served our ancestors" (1990, 212).

Eisenstein was involved with the early developmental phases of these theoretical ideas, due to his collaboration with the *Gestalt* psychologists and the brain research of Alexander Luria. Also today, as shown above, contemporary studies on the visual system still rely on the *Gestalt* principles. The background as a holistic being in the world and a plastic figure as a (emotionally) meaningful perception within the world forms the basis not only of Eisenstein's montage compositions, but also today's media environment innovations. Inspiring in terms of the present study is that neuroimag-

74 The researchers used prototypical facial expressions. Ekman *et al.* 1983; Ekman, Levenson *et al.*; see in Cacioppo *et al.* 1992, 65

ing technologies such as the functional magnetic resonance imaging (fMRI) provide a continuously more profound understanding of the functional interplay between the hidden bodily aspects of the mind and its survival-oriented game in the world.

5.3.1.6 Neurobiological space and time

Eisenstein's montage system was constituted upon the idea of dynamical interaction of time and space, which was concretized in his multilevel analysis of metric, rhythmic, tonal, overtone and intellectual montages (section 4.1.2). The presumption of the correlation between neural and bodily dynamics and the phenomenal aspects of emotional montage composition provide the starting point for a parachronic reading of neural time consciousness, which aims to open new perspectives on Eisenstein's elaborations on overtone aspects of his *pathos* composition.

The significance of MacLean's idea of 'triune' brain (discussed in section 5.2.4.3), is in facilitating the conceptualization of the notion of time as a multidimensional dynamical variable, instead of assuming its mechanistic unity. Damasio proposes the notion of "trick of timing" for the activation in different regions of brain within the same window of time in *Descartes' Error* (1994, 95). The metaphor of 'movie-in-the-brain' is a metaphor of the self as a spectator viewing something projected on the high quality Cinemascope screen of the conscious mind. It may be interpreted as suggesting an isomorphic relation between conceptual space and time, and neurobiological space and time. Yet this intuition is false. Damasio explicitly rejects the idea of localized projection on any integrative brain site. He suggests a modular mind in which "our strong sense of integration is created from the concerted action of large-scale systems by synchronizing sets of neural activity in separate brain regions, in the effect of a trick of timing" (Ibid.).

This idea resembles Varela's proposition, based on his studies on Husserlian "absolute time-constituting flow of consciousness" (Varela 1999, 288; in Tikka 2005, 116). Echoing also James's ideas outlined in 'The Stream of Consciousness' (1892), Varela suggests a center/fringe structure for his dynamic fourfold structure of *nowness* (1999, 302). James in 'The Stream of Consciousness' writes: "The object before the mind always has a 'Fringe.' There are other unnamed modifications of consciousness just as important as the transitive states, and just as cognitive as they. (...) Let us call the consciousness of this halo of relations around the image by the name of 'psychic overtone' or 'fringe'" (James 1892).

Varela's idea of experiential *nowness* frame and center/fringe structure may be described in metaphorical terms as an emotional landscape. The multiplicity of the perspectives or narratives in the mind supports the idea that the environment or *landscape metaphor* creates a complex, nonlinear dynamical space for parallel, interconnected but independent narrative processes, or events, taking place simultaneously. This links back to the embryonic ideas presented in the model of *Manuscape* (Tikka & Kaipainen 2003), which will be elaborated further in the latter part of the present

work.

Eisenstein assumed that the polyphonic spatio-temporal orchestration of different senses in the montage composition automatically elicited an experience of wholeness or an organic unity in the spectator. All that was needed was the author to have the 'feel' of the cinematic material in order to extract the emotional theme embodied in its nonindifferent landscape of images. The neural perspective on the organization of montage structure within the author's mental space and time coordinates still needs some discussion.

Interestingly, Varela's neurophenomenological time consciousness as 'nowness window' describes the three scales of emotional anticipation at a neurobiological level as the fundamental elements in the emergence of time conception (1999, 300). These are, (1) firstly, *emotion* as "the awareness of a tonal shift that is constitutive of the living present"; (2) secondly, *affect* as "a dispositional trend proper to a coherent sequence of embodied actions"; and (3) thirdly *mood*, existing "at the scale of narrative description over time" (Ibid.). Varela refers directly to Damasio's research in stating that neurobiologically, "affect and emotions can be associated with a relatively stable set of neural correlates" (Ibid.).

But Varela does not discuss the triune brain and its consequences for time consciousness as 'historico-evolutionary' de-synchronization in brain. Instead, he suggests that global experience emerges from the cortical activities in *three scales of duration* of neural ensembles: the "1/10" basic organizational scale (<10 msec); the "1" scale of developmental learning level or large-scale integration (± 1 sec); the "10" scale of behavioral 'descriptive-narrative' duration (several seconds) (Ibid. 273–274). This idea of multi-scaled neural time inspires my *model of functional synchronization*, which suggests that low-level neural activation correlates with high-level representations of the mind when they are functionally synchronized (Tikka 2006, 147).

The philosopher Thomas Metzinger argues that "the holistic diversity of phenomenal contents becomes a coherent reality because there is an elementary 'window of presence'" in his book chapter 'Faster than Thought: Holism, Homogeneity and Temporal Coding' (1995, 7). This allows assuming that any embodied activity at any level of the biological organism occurring in the same temporal window, can be assumed to relate to the same psychophysiological function (Tikka 2006, 147). The psychophysiological integration, collapse or blending of the different scales of experiential duration are synchronized in one experiential frame of being-in-the-world (Ibid.).

My model of functional synchronization of what is generally referred to as the bodily and the phenomenal, or the unconscious and conscious experiences, describes simultaneous penetration of a particular emotive-cognitive process throughout the whole organism. From micro to macro phases, an organism strives to organize an anticipated change or modification of the situation. The shared constitutive element in the process is simultaneously worked out towards the goal in multiple levels of embodiment. The organism is characterized by the momentarily emerging tendency to reach a particular (also momentary) state of a kind of 'tektological' equilibrium (Bogdanov 1980). In this manner, functional synchronization guides all descriptions of the embodied phenomenon and their related intersubjective dimensions. For example,

functional synchronization enables one to draw analogues between macro-scale simulation, such as behavioral imitation or expressions of empathy, as manifestations of simultaneously active micro-scale simulation of the neuronal network (Tikka 2006, 147).

The *functionally synchronized* 'vertical' structures of individual mind/body systems assume physiological links between micro and macro levels, relating into one framework both innate and universal features of expressiveness. The links between micro and macro levels are introduced between sub-cellular phenomena and audiovisual macro reality in the model of self-referential but socially contextualized representations (Rizzolatti & Arbib 1998; Gallese 2003; Tikka 2005, 108). On a neural level functional synchronization may involve a similar kind of nowness window as the polychronization discussed in Eugene M. Izhikevich's article 'Polychronization: Computation with Spikes' (2005).⁷⁵ "Since the firings of these neurons are not synchronous but time-locked to each other, we refer to such groups as polychronous, where *poly* means *many* and *chronous* means *time* or *clock* in Greek. Polychrony should be distinguished from asynchrony, since the latter does not imply a reproducible time-locking pattern, but usually describes noisy, random, nonsynchronous events" (Izhikevich 2005, 249).

The study of Christina M. Krause and her collaborators, 'Relative electroencephalographic desynchronization and synchronization in humans to emotional film content' shows that viewing sad or neutral content elicited less relative synchronization than aggressive film content (Krause *et al.* 2000, 11). The researchers conclude that distinct emotional activation paradigms may be tracked particularly within the so-called *theta* (4–6 Hz) EEG frequency, while the *alpha* (~8–12 Hz) frequencies enable interpretation of such cognitive processes as attention and habituation (Ibid. 12).

The notion of functional synchronization (Tikka 2006) is description of the emergence of a holistic, multiscaled experience similar to that of Eisenstein's ex-stasis, Metzinger's 'window of presence', or Varela's 'nowness'. The polychronization is suggested to economize the neural plasticity of cognitive phenomena, for instance, consciousness as attention to memories (Izhikevich 2005). The hypothesis of co-existing temporal dimensions with different internal dynamics is here argued to have been present in Eisenstein's holistic montage considerations.

Cinema is an art of nowness, be it polychronous, synchronous or contrapuntal. Eisenstein acknowledged the challenge of finding a method to analyze the global inner synchronicity between the sensuous dimensions of vision and sound that are less obvious: those based on tonalities, emotional meanings, and other inner movements or associations. The simplest case is to subordinate sound and image to the synchronicity based on the rhythm inherent in the images. The metric montage can then be complicated by "syncopated rhythms" or "purely rhythmic counterpoint" produced in the

⁷⁵ Izhikevich in 'Polychronization: Computation with Spikes': "We present a minimal spiking network that can polychronize, that is, exhibit reproducible time-locked but not synchronous firing patterns with millisecond precision, as in synfire braids. (...) We speculate on the significance of polychrony to the theory of neuronal group selection (TNGS, neural Darwinism), cognitive neural computations, binding and gamma rhythm, mechanisms of attention, and consciousness as 'attention to memories'" (Izhikevich 2005).

interplay of "non-coincident stress accents, lengths and frequency of repetitions, etc." (ESW2, 335). From rhythmic movement Eisenstein proceeds to *melodic movement*, which represents the feature of 'linear' in the visual medium (ESW2, 335). *Oscillatory movement*, in turn, which one "perceives as sounds of different pitch and key", is in the domain of the visual that of tone and color (Eisenstein 1999, 335). The modes of synchronicity are *inherent, metrical, rhythmic, melodic, and tonal*, reflecting the montage categories in the 1929 essay (ESW2, 335). These aspects are assumed to correlate to the notion of the experiential 'nowness' window, as discussed above, and they will return back to Eisenstein's discussion on ex-stasis (section 4.4.2.6).

5.3.1.7 Neuroesthetics

An ecstatic experience in art relates typically to aesthetics. Lev Vygotsky argued that the study of aesthetics and arts should be submitted to field of psychology. He discussed aesthetics from below and aesthetics from above (Vygotsky 1924), the model in which practical artwork mediated between the unconscious emotional dimensions of the creative mind and the conceptualizations of socio-historical themes. Many psychologists and physiologists already in Eisenstein's time, for example, Alexander Luria, were focused on the aesthetic experience and studied for example artists or poets who had been diagnosed as synesthetics.

While, for example, Anna Bohn has discussed Eisenstein's theory formation from the aesthetic point of view in her *Film und Macht: Zur Kunsttheorie Sergej M. Eisensteins 1930–1948* (2003) the present treatment prefers to take the Vygotskian line of thinking in *Psychology of Art*, to which Eisenstein also seemed to relate. The preliminary assumption is that the psychophysiological basis of aesthetic experience does not differ from the psychophysiological basis of any other pleasurable experience to which one feels meaningfully connected. There is no need then to separate aesthetics from psychological research.

Today, neuroaesthetics refers to an only recently established discipline of neurosciences, which is set to discover the neural basis of aesthetic experience. Semir Zeki is one of the leading researchers of the discipline, which despite its youth, or perhaps due to it, seems to reflect the earlier discourses of Eisenstein's era. Particularly the topic of hedonism and the role of the pain/pleasure dichotomy in the aesthetic experience call for returning back, for instance, to the works of Alexander Bogdanov and Alexander Luria, among others.

In 'The Neurology of Kinetic Art', Semir Zeki and Mathew Lamb studied examples of kinetic art and its development to illustrate the following point: "in creating his art, the artist unknowingly undertakes an experiment in which he studies the organization of the visual brain" (1994, 632). Below are cited the laws of the visual system that Zeki and Lamb think all visual art must obey (Ibid. 607), and subsequently the neuroaesthetic laws of V.S. Ramachandran and William Hirstein from 1999 will be outlined. These theses from the two leading branches of neuroaesthetics will be cited as they

have been articulated in the original sources.

The paper by Zeki and Lamb opens with *Credo*, or a manifesto of three physiological facts (1994, 607):

- (1) The first law is that an image of the visual world is not impressed upon the retina, but assembled together in the visual cortex. Consequently, many of the visual phenomena traditionally attributed to the eye actually occur in the cortex. Among these is visual motion. (Ibid.)
- (2) The second law is that of the functional specialization of the visual cortex, by which we mean that separate attributes of the visual scene are processed in geographically separate parts of the visual cortex, before being combined to give a unified and coherent picture of the visual world. (Ibid.)
- (3) The third law is that the attributes that are separated, and separately processed, in the cerebral cortex are those which have primacy in vision. These are colour, form, motion and, possibly, depth. It follows that motion is an autonomous visual attribute, separately processed and therefore capable of being separately compromised after brain lesions. It is also one of the visual attributes that have primacy, just like form or colour or depth. We conclude that it is this separate visual attribute which those involved in kinetic art have tried to exploit, instinctively and physiologically, from which it follows that in their explorations artists are unknowingly exploring the organization of the visual brain though with techniques unique to them. (Ibid.)

On the basis of their fMRI neuroimaging experiments described in 'Neural correlates of beauty' Hideaki Kawabata and Semir Zeki argue that "the perception of different categories of paintings are associated with distinct and specialized visual areas of the brain, that the orbito-frontal cortex is differentially engaged during the perception of beautiful and ugly stimuli, regardless of the category of painting, and that the perception of stimuli as beautiful or ugly mobilizes the motor cortex differentially" (2004, 1699). The researchers "are puzzled that perception of the beautiful does not mobilize the motor system to the same extent as the perception of the ugly" (Ibid. 1704).

In comparison to the following elaborations Ramachandran and Hirstein propose in 'The Science of Art: A Neurological Theory of Aesthetic Experience' (1999) the following eight laws:

- (1) One, the peak shift principle; not only along the form dimension, but also along more abstract dimensions, such as feminine/masculine posture, colour (e.g. skin tones) etc. Furthermore, just as the gull chick responds especially well to a super beak that doesn't resemble a real beak, there may be classes of stimuli that optimally excite neurons that encode form primitives in the brain, even though it may not be immediately obvious to us what these primitives are.
- (2) Two, isolating a single cue helps the organism allocate attention to the output of a single module thereby allowing it to more effectively 'enjoy' the peak shift along the dimensions represented in that module.
- (3) Three, perceptual grouping to delineate figure and ground may be enjoyable in its

own right, since it allows the organism to discover objects in noisy environments. Principles such as figure-ground delineation, closure and grouping by similarity may lead to a direct aesthetic response because the modules may send their output to the limbic system even before the relevant object has been completely identified.

- (4) Four, just as grouping or binding is directly reinforcing (even before the complete object is recognized), the extraction of contrast is also reinforcing, since regions of contrast are usually information-rich regions that deserve allocation of attention. Camouflage, in nature, relies partly on this principle.
- (5) Five, perceptual 'problem solving' is also reinforcing. Hence a puzzle picture (or one in which meaning is implied rather than explicit) may paradoxically be more alluring than one in which the message is obvious. There appears to be an element of 'peek-a-boo' [that is, a kind of visual puzzle or a game, in which the very act of discovering a punch line or completing an image is pleasing] in some types of art – thereby ensuring that the visual system 'struggles' for a solution and does not give up too easily. For the same reason, a model whose hips and breasts are about to be revealed is more provocative than one who is completely naked. (E.g., in Plate 6 the necklace just barely covers the nipples and the dress is almost sliding off the hips.)
- (6) Six, an abhorrence of unique vantage points.
- (7) Seven, perhaps most enigmatic is the use of visual 'puns' or metaphors in art. Such visual metaphors are probably effective because discovering hidden similarities between superficially dissimilar entities is an essential part of all visual pattern recognition and it would thus make sense that each time such a link is made, a signal is sent to the limbic system.
- (8) Eight, symmetry – whose relevance to detecting prey, predator or healthy mates is obvious.
(Ramachandran and Hirstein 1999, 33–34)

In 1945 Eisenstein writes: "ecstasy can be purely physical like that of whirling Dervishes, psychic in terms of the exercises of St. Ignatius, or reached through the use of narcotics" (NIN, 177). The physiological stimulation of the human body for aesthetic purposes bridges neuroaesthetics to the *bionic aesthetics*, i.e., eliciting augmented human experiences using some kind of biophysiological means.

As a direct continuation of the biomechanics and biodynamics of Eisenstein's time, the prefix of bio- has been added to various physical and engineering notions. For example, the notion of bionics coined by Jack E. Steele in 1958 refers, according to Hans-Georg Beyer (2007), to the discipline that studies the results of biological evolution from the engineering point of view (e.g. artificial neural networks, cybernetics, and implantable high-technology neurostimulation devices). The author designing this kind of artificially created 'as-if' illusions for the body-mind system could then be conceived of as harnessing artificial *evolution techniques*, i.e., utilizing Darwin-inspired direct search and optimization methods for the development of technical systems via mutation, recombination, and selection, as described by Beyer (Ibid.).

5.3.1.8 Emotional homeostasis in cinema

A majority of cognitive scientists agree on a holistic brain–body system, which sustains its socio-emotional wellbeing in terms of homeostatic self-regulation and a continuous recursive interaction with its environment. How far the cinema experience may be argued to be private, and to what extent is it driven by the socio-cultural dimensions of being a human?

Torben Grodal's bio-cultural approach in *Moving Pictures: A New Theory of Film Genres, Feelings, and Cognition* is characterized by cognitivism and structural, semiotic text-analysis (1997, 13). He assumes holism, but such that cognition and emotions are two separate but interrelated and interacting systems, which, in turn, are shaped by *the limited capacity of the cognitive environment* resulting in an attentional hierarchy (Ibid. 15). These systems operate on experiential dimensions of cognitive identification, empathy, and motivation (Ibid. 93–94). Grodal relates to the psychologist V. Hamilton (1988), who defines cognition, motivation, and affect as the three recognizable aspects of a problem-solving system of mind (Ibid.). For example, “the lack of emotional appeal will cause an absence of motivation for cognitive identification, just as a lack of cognitive appeal will cause an absence of empathic representations [...]” (Ibid. 99).

The principle of *reality-simulation* in Grodal states that aesthetic or narrative simulations of reality such as fiction and its diversity of established genres share the same cognitive and affective mechanisms that one applies to making sense of real-life experiences (Ibid. 279). The spectator's film comprehension is based on mental models, similar to those suggested in Kosslyn (1994, 1983, 1980), Johnson (1987), and Johnson-Laird (1988) (Ibid. 280). Drawing evidence from psychophysiological and neuroscientific research, Grodal suggests that the cinema-viewing experience is not detachable from the whole body as a homeostatic cognitive system interacting with its environment. His ‘ecological conventionalism’ appears as mediating between realist and formalist views (Ibid. 21).

Grodal further argues that fiction films deal with human *concerns*. This notion is adopted from Nico Frijda, who in *The Emotions* (1986) describes as the inner conditions those, which define the emotional significance, i.e., if the action tendency elicited by the emotional stimuli maintains or aids the wellbeing of the subject (Frijda 1986, 277). For Grodal, the conscious attention of the film viewer directs to the most survival-critical aspects of the emotional situation. Meanwhile the other aspects of situational complexity of the narrative flow are recognized in “the non-conscious associative network” as adding to the holistic understanding of the situation of, for example, the protagonist in danger (Grodal 1997, 280). The spectator identifies with the protagonist in a simulation process that involves evaluation and understanding of the protagonist's fate, goals, and emotional motivations guiding his actions (Ibid.). However, the viewer's emotional response to a film's narrative content is biologically determined: more specifically, controlled by sympathetic and parasympathetic nervous systems.

Grodal discusses even the hormonal basis of cinema. Following his unifying theory

on cinema emotions, any novel approach to cinema genres should take into account the biological framing and re-evaluate the cultural conventions of genre categorization (Ibid. 180–181). The spectator often has an interest in or preference for a certain type of cinema genre. One may ask what is in horror films that make horror-film lovers insist that they enjoy the experience of fear and its involuntary bodily reactions, such as screaming, shivering, or increased heartbeat. What kind of addictive processes in the emotive-cognitive system enforce the willingness to go through the same scary feelings elicited in horror films again and again?

According to Grodal, certain kinds of narratives create biological experiences, eliciting a similar kind of addiction as acknowledged in relation to addictive drugs. That is, the neurohormonal and sensorimotor functions of sympathetic and parasympathetic central nervous systems may relate to genre preferences (Ibid. 180–181).

Several other studies show that genres are not only cultural products but emerge from the neurohormonal basis of evolutionary concerns, which in turn are socio-emotionally oriented. For example, M. M. Wirth and O. C. Schultheiss in ‘Effects of affiliation arousal (hope of closeness) and affiliation stress (fear of rejection) on progesterone and cortisol’ scrutinize the unconscious drive for positive social contact (in psychophysiological terms ‘implicit affiliation motivation’); the emotional polarities are described in arousal tendencies of approach-orientation as ‘hope of closeness’ and avoidance-orientation as ‘fear of rejection’ (2006, 787, 793–794).

In their article ‘The neural correlates of maternal and romantic love’ Andreas Bartels and Semir Zeki discuss two types of love that seem to activate regions in the brain's reward system that coincide with areas rich in the attachment-mediating neurohormones of oxytocin and vasopressin (2004, 1155). Mette Kramer, whose research ‘Melodrama as a shortcut to stress reduction’ (2005) relates to Grodal's evolutionary standpoint, suggesting that due to neurohormones women prefer melodramas to action dramas.

Grodal's *model of the aesthetic-narrative experiential flow* activates in associative and sequential forms the cognitive functions of the embodied domain, which involve perception, cognition, memory, affect, and enaction (1997, 279). In this conceptualization cognition is assumed to function in a reciprocal manner. Yet canonical forms of narrative mainly seem to harness the mental ‘downstream’ flow from perception to enaction, involving motives, cognitions, and acts. The associative forms of narration instead assume an ‘upstream’ flow, creating emotional tones of the experience (Ibid.). This involves “the ecological and functional benefits of our emotional makeup, such as the role of bonding and identification” or “the ‘physical’, direct transmission of emotions by facial expressions and tone of voice” (Ibid. 278).

Four prototypical aesthetic tones - intensity, saturation, tensivity, and emotivity - correlate to “the type of psychosomatic dimension activated, and the (cued) mental or psychical strategy required for handling the situation” (Ibid. 279). These correspond to characteristic functions of fiction film, restrictively: aesthetic, narrative, lyrical, and autonomic (Ibid. 58). Grodal further classifies the following prototypical genres: “associative lyricism; canonical narratives of action; obsessional fictions of paratelic cognition and enaction; melodramas of the passive position; fictions of horror; schizoid

fictions; comic fictions; and metafiction” (Ibid. 281). Grodal suggests his typology “as a guideline for understanding some of the parameters determining the prototypical emotional effect of dominant genre-patterns, and for understanding the way in which changes of certain parameters (for example, a change from a telic to a paratelic pattern) will influence the experience of emotional tone” (Ibid. 282). A comedy may twist to tragedy, depending on the balance of the mixture between the film’s different prototypical emotional patterns (Ibid.).

This may allow assuming a toolbox of prototypical innate emotional functions and schemata, which, when applied to the narrative structure of the film, have the tendency of manipulating and guiding the emotional reactions of the viewers towards a particular set of genre prototypical reactions, e.g. romantic comedy. The emotional set-up and maintenance of genre typicality may be authored in terms of a set of emotional parameters and authored changes in their interdependent relations.

In *Moving Pictures* Grodal harnesses the concepts of telic (goal-oriented) and paratelic (process-oriented) mechanisms to describe cinematic narratives (Ibid. 101–102). The two facets of *telic* and *paratelic* motivations allow a spectator “drive” for homeostasis in a reciprocal movement between pleasant and unpleasant arousals. In other words, in a telic process, for example, low arousal is experienced as relaxation or pleasure, while in a paratelic process it can be relabeled as unpleasant boredom (Ibid.).

The notion of ‘paratelic’ entails non-goal-oriented behavior, which relates to tendencies towards increased activity. The viewer’s paratelic emotional responses may relate to autonomic reactions she is not conscious of, arising from low-level rhythmic-repetitive mechanisms and passive bale-out mechanisms (Ibid. 281). In contrast, the conscious domain involves higher-level cognitive processes defined as goal-directed telic behaviors, i.e., “an attempt to reduce activation by reaching a certain goal” (Ibid.). These terms are not domain- or subject-specific and can be applied throughout the discussion on emotional aspects that relate to the viewer’s responses, the protagonist’s behavior, and the functional properties of the narrative structure.

In offering a biopsychological alternative to the psychoanalytic concept of desire, Grodal’s *Moving Pictures* seems to respond to Edward Branigan’s call for novel cognitive ‘drive’ theories in *Narrative comprehension and film* (1992) (Tikka 2005, 114). The practical and analytical approaches of Branigan and Grodal spring apparently from a common inquiry into the psychological organization of the spectator’s narrative comprehension. Grodal’s homeostasis represents a holistic biological emphasis of Branigan’s use of omniscience. Grodal’s use of the concepts of *telic* and *paratelic* motivations are more organism systemic expressions, compared with Branigan’s adaptation of the concepts of declarative and procedural knowledge (Branigan 1992). According to Branigan, the spectator operates with the *declarative knowledge* generated by the logics of narrative schemata (‘what’) and the *procedural knowledge* generated by means of narration (‘how’), which are limited as well as multiplied by epistemological and causal boundaries of the story world (Branigan 1992: 65, 115–116). However, while Branigan’s structuralism prefers knowledge construction and hardly mentions emotions or affects, these are well cultivated in the main core of Grodal’s bio-cultural theory. Interestingly, Eisenstein in the essay ‘On the structure of things’ applied the

same dyad to the authoring process, dividing his study on organic unity into two sections: the static, dealing with rhythmic divisions and proportions, and the dynamic characterized as procedural (NIN, 12).

Though focusing on the spectator experience, the author is not excluded from Grodal’s discussion. In Grodal’s view, by using frames and filters – such as ‘realism’, ‘fiction’, or ‘generic convention’ – filmmakers are able to modify the reality status comprehension in the film flow, thus provoking, for example, laughter in an otherwise inappropriate place (1997, 280). The socio-emotionally distorted framing of the viewer may also occur without *a priori* intentions on behalf of the filmmaker. In such cases, instead of arguing that the film is ‘badly’ constructed, the holistic emotional mood of the spectator may have been taken over by some reflective interpretation from the unconscious levels of the viewer’s subjective experience (e.g. traumatic memory) (Grodal 1997).

In relation to his expressive movement studies in the 1924 essay ‘The Montage of Film Attractions’ Eisenstein was aware of the conflicting dimensions of cultural and biological expressions of emotions. He refers to the cross-disciplinary study on facial expressions and emotions *Der Gesichtsausdruck des Menschen* (1913) by Hermann Krukenberg (1863–1935) on the modular character of voluntary and involuntary in emotional experience. Krukenberg had two reverse cases of patients with paralysis: when elicited to shocking stimuli, the one group was capable of involuntary emotional expressions (crying and laughter) but not controlled movements, while the others were capable of producing voluntary facial expressions but showed no signs of uncontrolled emotional expressions (ESW1, 52–53).

To conclude, Grodal’s work is instrumental in pioneering a new kind of biology-based insight into cinema experience and its dependence on the unconscious, emotional dimensions of the body. In this aspect it empowers the present study of the Eisensteinian conceptualization of embodiment of emotional theme. Yet it is also revolutionary in suggesting that the cultural conventions of cinema, such as cinema genres, cinematographic decisions, emotional cuing or editing, are not independent from the evolutionary goals and motivations of the spectator – or the author. As Eisenstein was well aware, the power of the author’s creative choices inevitably and unavoidably will affect the spectator’s emotional experience. In this sense, Grodal’s study also reminds cinema authors about their responsibility – due to this vulnerability of the spectators.



5.3.2 ORGANIC INTERSUBJECTIVITY

Cinema outruns other art forms in its emotional power, its ability to reach wide audiences, and in its universal nature as a spatiotemporal flow of moving pictures, which in most cases present on the screen ‘people like us’. Cinema represents a socially shared model of the phenomenal world and otherness. For Eisenstein, the author’s feelings embedded in the artwork were to a great extent identical (or isomorphic) to those of the spectator. Set to discover the biological basis of this empathy, this chapter will update the most recent neuroscientific understanding on the organic connection between the observer and the observed other on the screen, for example, in feeling empathy for the other’s misfortune.

In his conclusion to a graphic reading of his film *Alexander Nevsky* (1938), Eisenstein applies a description of an emotional reading of the sequence, based on a graphic or even ‘seismographic’ curve resulting from the sketched analysis (ESW2, 397). He reads in the curve the rhythm of *anxious expectation*. The physical experience of ‘holding of one’s breath’, ‘forced inhalation’, ‘profound exhalation’, ‘pulsating abreaction to the tension’, ‘a motionless pause when focusing attention’, and so on, are generalized and as such embodied in the movements of the vertical montage composition of *Alexander Nevsky* (ESW2, 398). How Eisenstein’s analysis starts from the abstract levels of the immaterial, what he calls ‘light-play’, and proceeds towards the higher-level movements of human flesh and blood, colored with the fear of the forthcoming battle for life and death (ESW2, 398), exemplifies here the intersubjective level of the Eisensteinian ‘embodiment of emotional theme’. The bodily basis of this shared emotional experience on the screen is explained here in terms of embodied simulation.

5.3.2.1 Embodied simulation and mirror neurons

The recently discovered *mirror neuron networks*, the sensorimotor-based simulation system in the human brain, has encouraged neuroscientists to suggest that the missing link has been found for explaining the human ability to imitate, understand, and anticipate the actions, intentions, and emotions of others, as Sari Avikainen summarizes in *Cortical Mechanisms of Action Observation, Imitation and Social Perception in Healthy and Autistic Subjects* (2003, 1, 56–69). Her dissertation reviews several original articles written with Riitta Hari and the brain research unit in the Helsinki University of Technology during the years 1998–2003. Put more bravely, unconscious simulation perhaps constitutes *all* socio-emotional interaction – from embodied neural micro scale activities to macro scales of human cultural, social, and ideological activities.

Vittorio Gallese’s article ‘Embodied simulation: From neurons to phenomenal experience’ (2005) introduces the notion of *embodied simulation*. In line with the earlier described neurophenomenological method, Gallese’s theoretical framework of embodied simulation is adopted to describe the underpinning complex, dynamical

neural principles of embodied experience. Embodied simulation stands for the neural dynamics underlying intersubjective understanding and is assumed to constitute an important part of the neural grounding of the author’s dynamical mind, as will be discussed later.

The idea of *simulation* is based on an assumed *recursive character of cognition*, which means that a subject’s earlier experience (e.g. memories, habits, and bodily routines) modifies all new experiences (e.g. perception, imagination, and anticipation), and vice versa, in reciprocal manner. This idea is supported by dynamical systems theory, which understands mind as emergent dynamics of the widely distributed, interrelated, simultaneously unfolding, self-referring multiplicity of neural interactivity, and exemplified in the writings of van Gelder, Varela, Kelso, among others. As Gallese argues, embodied simulation is “mediating between the multi level personal background experience we entertain of our lived body, and the implicit certainties we simultaneously hold about others. Such personal body-related experience enables us to understand the actions performed by others, and to directly decode the emotions and sensations they experience” (Gallese 2005, 42). The idea of embodied simulation has consequences on understanding the arts, as well. David Freedberg and Vittorio Gallese in their essay ‘Motion, emotion and empathy in esthetic experience’ (2007) describe the experience of an art object in terms of sensorimotor imitation underpinning the perceptual act.

In *Poetics* Aristotle writes: “Poetry in general seems to have sprung from two causes, each of them lying deep in our nature. First, the instinct of imitation is implanted in man from childhood, one difference between him and other animals being that he is the most imitative of living creatures, and through imitation learns his earliest lessons; and no less universal is the pleasure felt in things imitated. We have evidence of this in the facts of experience” (Aristotle 350 B.C.E.). Eisenstein carries on the discussion in the avant-garde film conference in the château of La Sarraz in 1930: “Anyone who sees Aristotle as an imitator of the form of objects misunderstands him” (ERD, 67). Aristotelian imitation is the basic principle of artistic creativity, and it demands mastery of the *pathos* principles, i.e., human instincts and emotions in appearance (ERD, 66–71). For Eisenstein, seeing human expression leads one via bodily mimicry to a state of empathy.

In their ‘Neurological Theory of Aesthetic Experience’ Ramachandran and Hirstein refer to mirror neuron findings only briefly in a footnote: “there are cells in the frontal lobes thought to be involved in the production of complex movements but which also fire when the animal perceives the same movements performed by the experimenter (di Pellegrino *et al.* 1992). This finding — together with the peak shift effect — would help account for Darwin’s ‘principle of antithesis’, which would otherwise seem completely mysterious” (Ramachandran & Hirstein 1999, 20–21n3).

J. S. Mill’s classical idea in his study *An Examination of Sir William Hamilton’s Philosophy* (1869) suggests that the act of inferring another person’s mental state relies on an analogue between one’s proper mental states and the other’s. This is pointed out in Robert M. Gordon’s ‘Simulation Without Introspection or Inference from Me to You’ (1995, 53, 64n1). Mill’s theory seems to correspond to the analogue that

Eisenstein draws between the author's emotional state and the spectator's emotional state: the first being transferred to the latter via the cinema screen (vehicle).

Yet here, as suggested earlier, the parachronic reading of Eisenstein's idea is argued to correlate to the autopoietic explanation, where both the author and the spectator are mutually oriented towards the emotional context of cinematic work. Thus the *Gestalt* isomorphism is abandoned, and the phenomenon is described in terms of functional synchronization (see page 211) in relation to the montage flow, this so if the relative similarity of human beings is accepted, as presumed in this study. Similar emotional events elicit similar kinds of emotional responses both in the author's and the spectator's experiences.

The essay 'Intentional attunement: Mirror neurons and the neural underpinnings of interpersonal relations' by Vittorio Gallese, Morris E. Eagle, and Paolo Migone suggests that the notion of *intentional attunement* correlates to the neuroscientific findings on shared activation and is suggested as a functional mechanism of embodied simulation (Gallese *et al.* 2007, 131). The researchers hypothesize that "when we confront the intentional behavior of others, embodied simulation, a specific mechanism by means of which our brain/body system models its interactions with the world, generates a specific phenomenal state of 'intentional attunement'" (Ibid. 144).

In 'Embodied simulation: From neurons to phenomenal experience' Gallese (2005, 42) concludes: "(...) Our seemingly effortless capacity to conceive of the acting bodies inhabiting our social world as goal-oriented persons like us depends on the constitution of a shared meaningful interpersonal space. This shared manifold space can be characterized at the functional level as embodied simulation, a specific mechanism, likely constituting a basic functional feature by means of which our brain/body system models its inter-actions with the world. Embodied simulation constitutes a crucial functional mechanism in social cognition, and it can be neurobiologically characterized. The mirror neuron matching systems represent the sub-personal instantiation of this mechanism" (Gallese 2005, 42; Gallese *et al.* 2007).

Simulation theorist Robert M. Gordon's idea about an egocentric shift takes into account the other as an *other* entity, whose mental states are being simulated (Gordon 1995, 56). Gordon's approach does not assume that one's proper mental state is transferred to the other, but that the simulator is transformed to the other by *re-centering one's egocentric map* to become the other in her situation (Ibid.). In some conflict with Gordon (1995, 53), in Alvin Goldman's essay 'Empathy, Mind, and Morals' (1995) the simulation view seems to rely more on embodied unconscious processes, while Gordon's view perhaps relies more on a conscious or intentional recognition of the simulation process (Davies & Stone 1995, 4). However, mirror neuron networks are proposed to describe biological mechanisms of this emotional resonance.

According to the simulation view of Vittorio Gallese and Alvin Goldman, the phenomenal level of 'mind reading' involves both 'pretend' and natural 'non-pretend' states of simulation routine. Mind reading occurs when the other person's emotive-cognitive states 'resonate' with the mental states of one's own, as suggested in simulation theory (Gallese & Goldman 1998, 493). If constituted by lower-level functional

dynamics, the resonant states⁷⁶ in the experiential level of empathy⁷⁷, for example, could therefore be considered to 'carry' similar 'meaningfulness' as the neural level activity.

When considering various cinema theories founded on intuitive speculation about the moving image as a mirror by Christian Metz (1977), imitation of nature by André Bazin (1967), or a peephole for unconscious desires, as in the Lacanian film theories discussed in Paula Murphy's essay 'A New Kind of Mirror' (2005), future cinema studies will not be able to ignore the neuroimaging window on the mind's mysterious domain.

Through the idea of the shared manifold of intersubjectivity, Gallese offers an idea of shared place or space for socio-emotional interaction and understanding of others in his article 'The roots of empathy: The shared manifold hypothesis and the neural basis of intersubjectivity'. Human mirror neurons instantiate *supramodal* intentional shared spaces (Gallese 2003, 177). In addition to phenomenal external macro-spaces like 'law and constitution', 'healthcare system', 'parliament building', or 'market square', there exists also an internal common space in each one that integrates the universal genetic and the cultural (Tikka 2005, 109).

All of this has particular consequences for understanding cinema. The idea that people share innate neural spaces invites one to draw analogues to an *experiential cinematic space* (Tikka 2005, 109). A shared experiential space is the underpinning idea of Lev Kuleshov's experiments in his workshops, and the same idea is also present in Eisenstein's treatment of the emotional dimensions of audiovisual cinema montage compositions.

Embodied simulation may occur under particularly framed cognitive guidance of the author. Perhaps fiction narratives do not tell the truth but instead tell a lie, equal to 'distorted' simulation at the neural level. When imagining any story, scene, event, or character's behavior or desires, the author utilizes the intentionally 'distorted' simulation in order to manipulate the experiential, self-referential resources of herself-as-author. Accepting the recursive dynamics in the brain, the simulation models internal representations, or 'as if' recognition patterns in processes of, for example, remembering, imagining or dreaming (Tikka 2005). In particular, now that the metaphor of mirroring has become more accurate, it suggests that neural mirror matching forms the physiological basis for understanding 'otherness' (Ibid. 108).

The idea of an active *imitation* process at the neural level has thus become widely

⁷⁶ Mental simulation as resonant states at the phenomenal level could be considered to have the same functional meaning as synchronization in the neural level. In 'Intersubject synchronization of cortical activity during natural vision' (2004) Uri Hasson and collaborators have provided evidence of intersubject correlation in an experiment where the test viewers showed a tendency to react in a similar way at the same moments of film action. Notable intersubject correlation was found in images with high attention value, such as hand movements, close-ups of faces, or abrupt, loud sounds.

⁷⁷ In addition to the widely discussed mirror neuron network involved in imitation of hand movements, i.e. grasping, mirroring may extend to explain mental phenomena such as empathy. E.g. Leslie et al (2003) assume the right hemisphere mirror neuron network enables empathy, especially via recognizing facial emotional expressions. See also about the 'motor resonance system' that links the perception-action system to emotions in Preston and de Waal (2002).

accepted after the discovery of mirror neuron system (later MNS).

The MNS-related brain areas become activated when a subject observes someone executing an act, when the subject herself executes the act, or when the subject only imagines the same act executed. The MNS is assumed to function as a motor-based *simulation system* for learning from others as well as understanding one's relation to the embodied and emotive space of others. The research team of Giacomo Rizzolatti, 1992, found the first evidence of neuronal activation occurring in act execution and observation in monkeys' F5 region (di Pellegrino *et al.* 1992). Further neuroimaging studies showed similar neural mirroring activation in humans (e.g. Fadiga *et al.* 1995; Gallese *et al.* 1996; Rizzolatti *et al.* 1996a; Rizzolatti *et al.* 1996b; Hari *et al.* 1998; Iacoboni *et al.* 1999; Nishitani & Hari 2000) (in Avikainen 2003, 8–13).

The research evidence of Rizzolatti and Arbib (1998) suggests convergent evolution of motor-controlled hand movements, e.g. grasping, and the evolution of language. Their claim is that the observation/execution matching system presented by the MNS “provides a necessary bridge from ‘doing’ to ‘communicating’, as the link between actor and observer becomes a link between the sender and the receiver of each message” (Rizzolatti & Arbib 1998, 188).⁷⁸ The mirror neurons are specialized and only become activated when related to a particular action, which can be perceived by seeing and/or hearing. Even when the actions are completed outside of the subject's field of perception, neural activation occurs (Umiltà *et al.* 2001; Metzinger & Gallese 2003, 551–552). This can be assumed to be a neural goal-action correlation to intentionality (Metzinger & Gallese 2003).

The mirror neuron findings suggest that sensorimotor imitation forms the physical basis for human-human socio-emotional interaction, language production and comprehension, other mediated images and forms of actions, goals and intention-relations (Rizzolatti & Arbib 1998; Metzinger & Gallese 2003; Järveläinen *et al.* 2001; in Avikainen 2003, 64). However, the neuroimaging of MNS activation in various brain regions provides a range of research results, some of them conflicting. On the one hand, mediated representations such as viewing interpersonal action on video or film seem to provoke lower activation than direct human-human interaction (Järveläinen *et al.* 2001; in Avikainen 2003, 56), while even still images of human action produce mirror neuron activation (Nishitani & Hari 2002). The comparative neuroimaging research between ‘direct’ perception and ‘mediated audiovisual image’ perception has been studied by Järveläinen and others (2001). According to Avikainen: “However, in contrast to the monkey data, [e.g. Rizzolatti *et al.* 1996a] movements with tools seem to activate the human MNS and this activation also depends on whether or not objects are involved (Järveläinen *et al.* 2003). In addition to hand actions, mouth and foot actions, as well as still pictures of actions can activate the human MNS (Buccino *et al.* 2001; Nishitani & Hari 2002)” (Avikainen 2003, 56).

On the other hand, a range of experiments show no bilateral activation typical for



the MNS when observing artificial objects, robots or other machines with gesture-like movements, or when viewing images of landscapes. In contrast, a sight of both animate and inanimate touch activates MNS, producing inner representations of touch (Keysers *et al.* 2004, 343). The spectator's reaction to a moving image in which a spider touches a film character's skin involves a shared circuitry of touch between the first-person and third-person experiences (Ibid.). Neuropsychology has shown that animated cartoon characters and people acting in cinematographic worlds (real-world-like) do activate different areas in the brain, i.e., human figures do elicit activation in particular areas of the brain, while animated figures are processed in the different regions (e.g. Hasson *et al.* 2004; Keyser *et al.* 2004).

The assumption is that as motion imitation provokes mirror neuron activation, there is also a particular mirroring system for empathy, an intersubjective emotion imitation/ interpretation automaton (Nishitani & Hari 2000). In their article ‘Empathy for pain involves the affective but not sensory components of pain’ Tania Singer and others “provide evidence for pain-related empathic responses and demonstrate that empathic experience does not involve activation of an entire pain matrix, but only of that component associated with the affective dimension of pain experience” (Singer *et al.* 2004, 1158). This contrasts “to accounts of emotional contagion—that empathic responses can be elicited automatically in the absence of an emotional cue (such as facial emotional expressions) through mere presentation of an arbitrary cue that signals the feeling state of another person” (Ibid.). More evidence of the underpinning complexity of the intersubjective representation of pain has been discovered in the neuroimaging findings of Hari and her research team. Their article ‘The compassionate brain: Humans detect intensity of pain from another's face’ argues that “not only the presence of pain but also the intensity of the observed pain is encoded in the observer's brain — as occurs during the observer's own pain experience” (Saarela *et al.* 2006).

In addition, the recognition of facial expressions forms an essential part of this innate anticipation of the other's actions and intentions in order to map future predictions. Connecting visual perception to sensorimotor functions, MNS enables the recognition and interpretation of human facial expressions and motor movements. It may serve social learning by imitation, and as a behavioral pattern-memory re-executing previously performed motor functions (in Avikainen 2003). As such, it may also provide a motor action-based key to the Pandora's box of human memory (Tikka 2005, 108).

In relation to cinema, an interesting dimension of intersubject pain-empathy studies is discussed in ‘Empathic neural responses are modulated by the perceived fairness of others’ by Singer and others (2006). Their functional neuroimaging experiments suggest that intersubject empathy correlates with the subject's socio-ethical judgments, also when a third person is involved. The intensity of the empathy recorded in the observing subject, when she or he observes another person receiving painful shocks, seems to correlate with the fairness or unfairness of the acts taken by the observed towards a third person. According to the research team, this enforces the argument that empathy forms a significant aspect for maintaining and controlling the mutual

⁷⁸ With respect to the shared understanding of the sameness of the communicated message between the receiver and sender, Rizzolatti and Arbib refer to Liberman (1993, 1–32).

wellbeing in social systems (Singer *et al.* 2006).

The mirror neuron findings have clear implications from the perspective of cinema, which has been characterized as an emotion machine in Ed Tan's study on *Emotions and the Structure of Narrative Film* (1996). The neural framework provides new insights to the study of feeling of empathy in viewing situation, as will be discussed in next chapter 'Simulatorium Eisensteinense'.

5.3.2.2 Shared action ontology – shared manifold

Metzinger and Gallese (2003) discuss mirror neurons as “a fundamental and mostly unconscious representational structure capable to build a *shared action ontology*,” providing conspecific multimodal dynamics for innate motor-controlled recognition of the other's intentions. At the motor level, the internal dynamic system of self-reflection continuously maps the goal-action oriented relations between the subject and others (Ibid. 549–571).

According to Metzinger and Gallese the mirror system has a central microfunctional contribution: it functions as an unconscious precursor of what can be represented on the macrofunctional, phenomenal level “as a goal, an acting self or an individual first-person perspective” (Ibid. 557). Accepting Metzinger and Gallese's definition of simulation as a core element of an “*automatic, unconscious, and pre-reflexive control functional mechanism*” means, on the one hand, that simulation can be utilized as a concept for embodied subliminal functions that relate to the organism's sensorimotor intentionality relations (e.g. Freudian pleasure principle) (Ibid. 555–556). On the other hand, it enables introducing simulation as a conceptual tool, firstly, to access the domain of understanding the perceived, sensed, or imagined, and secondly, to construct within causal, spatial and temporal structures the *plausible* narrative. Emotional evaluation and somatic markers by Damasio may be assumed to play a part in neural level mirroring, providing all possible information for the unconscious simulation process of intentionality recognized in others (Tikka 2005, 109).

Within an approach that could be characterized as neurophenomenological, Gallese (2003) develops further an enlarged definition of *empathy*. Gallese *et al.* (2002) point out in their commentary on Preston and de Waal's article 'Empathy: Its ultimate and proximate bases' (2002) the necessarily different conceptual levels when discussing mirror neurons and empathy. “Empathy is the phenomenal experience of mirroring ourselves into others. It can be explained in terms of simulations of actions, sensations, and emotions, which constitute a shared manifold for intersubjectivity. Simulation, in turn, can be sustained at the subpersonal level by a series of neural mirror matching systems” (Gallese *et al.* 2002). Gallese's *shared manifold of intersubjectivity* posits that the self-other identity manifests on the phenomenal level as empathy, assuming that actions, emotions and sensations are implicitly meaningful. On the functional level 'as-if-modes' of interaction emerge within the relational logics of self-other experience (Gallese 2003).

In relation to cinema, *audiovisual* mirror neurons have been identified that activate when one executes an action, sees or only hears the same action performed by another agent (Gallese 2003, 174; Kohler *et al.* 2002). The mirror neuron networks as the neural basis of socio-emotional interaction between people relate back to Vygotsky's idea of individuality as socially conditioned, and it will be extrapolated to the experimental ideas of future cinema described in the next chapter of 'Simulatorium Eisensteinense'.

5.3.2.3 Somatovisceral illusion: as-if-body-loops

Damasio discusses his simulation equivalents for mirror neuron systems under the conceptual notion of *as-if-body-loops*; he suggests that “the body-sensing areas constitute a sort of theatre where not only the 'actual' body states can be 'performed', but varied assortments of 'false' body states can be enacted as well, for example, as-if-body states, and so on” (Damasio 2003, 118).

As-if body loops together with Damasio's idea of the subject's experience of self as a movie viewer seems to imply the subject also has the ability to set a kind of fictional 'as-if' stage in mind (Tikka 2005). The author's creative processes may be seen to correlate to an 'as-if' simulation of 'false' body states when the author is creating, inventing, and simulating the fictional world, and its characters, situations, and emotions in her mental space (Ibid.).

Here 'as-if' simulation is understood as the author's means of imagining characters, events, situations, and even worlds that do not necessarily exist as such but are invented. In other words, the author constructs from her bodily resources the movie-in-the-brain, which is based on a kind of combination of both interoception and exteroception, as discussed earlier in connection to Antonio Damasio's research (see page 206). The 'as-if' state involves the whole organism, also affecting sensorimotor systems, in terms of the author mirroring the movements of the imagined others (fictional characters) in her mind.

This carries similarities with Ed Tan's conceptualization of a *virtual action tendency* of the spectator in *Emotion and the Structure of Narrative Film* (1996). Not having access to participate in the events in the diegetic world, but compelled with feelings that relate to empathy, e.g. pity for unfortunate events, or anger for witnessed injustice, results in a psychological state of *virtual action tendency* of the spectator (Ibid. 240).

According to Tan, the virtual action tendency may evoke strong feelings, such as desire for change in the diegetic flow of events, or fear of something bad happening to the protagonist. The spectator's action tendency is defined as *virtual* when she has no access to participate in the events in the diegetic world but is compelled with feelings that relate to empathy (Ibid.). However, the action taken towards the filmic events in traditional film forms is very limited, or in fact, impossible, and it often follows that the virtual action tendency promotes, on the one hand, feelings of frustration or fantasy, while on the other, it also provides a reasonable distance from the flow of the fiction (Ibid. 180).

Tan's approach suggests a kind of simulated double identity for the spectator, which

needs further elaboration. Perhaps it involves a similar kind of mental oscillation between different perceptual states, as were recognized by the *Gestalt* psychologists and later elaborated by many others. The author's 'virtual' 'as-if' situation, however, differs from that of the spectator in terms of 'feelings of frustration' because the author sets her own framework, while the spectator is dependent on the framework prepared by the author. The author's creative frustration, instead, may emerge from too open an action horizon, i.e., the availability of too many possibilities.

In 'The psychophysiology of emotion' the social neuroscientist John T. Cacioppo with his collaborators D. J. Klein, G. G. Berntson and E. Hatfield argue that the results from psychophysiological experiments on emotions often show conflicting and inconsistent evidence (Cacioppo *et al.* 1993, 137 Fig 9.1). To resolve the correlation problem between the somatovisceral changes and different types of emotional experiences, the researchers assume that the interoceptive (e.g. visceral) and proprioceptive (e.g. postural, facial, vocal) perception may involve *somatovisceral illusions*, this in a similar manner as visual perception is vulnerable to visual illusion (e.g. an ambiguous figure with competing double imagery) (Cacioppo *et al.* 1993, 138–140; original work Cacioppo *et al.* 1992). In other words, the differentiation in the emotional percepts, even though the same conditions are met, may arise from the embodied dynamics of 'false' perceptual comprehension, top-down manipulation, and other active cognitive processes (Cacioppo *et al.* 1993, 138–140). "Although it is no longer tenable to maintain that emotional feeling is merely the perceptual consequence of somatovisceral feedback, there are a variety of ways in which visceral afference may impact emotional reactions. Even a rather generalized pattern of autonomic reaction may contribute to specific emotional states by priming or biasing neural processing, or by a 'visceral illusion' process akin to the distinct percepts that are possible with visual ambiguous figures (Cacioppo *et al.* 1992)", as G. G. Berntson and J. T. Cacioppo write in their article 'Psychophysiology' (2002, 133).

In an interesting manner the approach presented in Cacioppo *et al.* (1993) is here seen to exemplify the phenomenon of *conceptual blending* in Gilles Fauconnier and Mark Turner's *The way we think: Conceptual blending and mind's hidden complexities* (2002). The researchers offer an explanatory framework for emergent phenomena of creativity and new ideas. The most complex continuum of integration networks in the mind has ability to blend often clashing conceptual frames, resulting emergent structures and creative solutions (Fauconnier & Turner 2002, 131).

Therefore, blending the *Gestalt* phenomenon from the domain of visual perception with the unresolved problem in the domain of visceral perception, Cacioppo's research team generated a novel idea: in this case, somatovisceral illusion. These somatovisceral illusions could explain why one on a rollercoaster ride is capable of experiencing 'reversible' rapid shifts between "the states of happy excitement and near-panic fear" (Cacioppo *et al.* 1993, 139). A linkage can be traced to the emotional oscillation between the pain-pleasure pair when someone says she enjoys seeing horror films, this as discussed in Torben Grodal's (1997) studies on cinema emotion (section 5.3.1.8). This relates also to Ed Tan's (1996, 85) discussion on the spectator's 'interest' in viewing films, which as a genuine emotion elicits cinematic immersion.

5.3.2.4 Imitation in the arts

Reflecting the basic need to understand the behavior and situatedness of the "other" portrayed on the screen, film theorists and filmmakers have cultivated the mirror metaphor. The mirror surface and cinema screen both allow a framed view to "an other space", where life, mediated by a physically inaccessible two-dimensional wall, seems to happen to *beings like us*.

The collaborative paper by David Freedberg and Vittorio Gallese 'Motion, emotion and empathy in esthetic experience' (2007) discusses the mirroring process as the underpinning dynamics for the aesthetic experience when viewing art objects, painting or sculpture. It represents a direct implementation of the mirror neuron networks idea and Gallese's theory of innate embodied simulation in the context of art: the spectator unconsciously experiences the physical movements of the painter's hand and brush via the texture depicted on the surface of the artwork. If this is so with still life and sculptures, it must be even more so in the cinema context. Here, the focus continues on the authoring process and in creation through imitation.

A conscious subject is automatically engaged into a situational dialogue within herself. French film theorist Jean Mitry in his psychological study on the film experience writes: "A film is a mirror in which we recognize only what we present to it through what it reflects back to us: all it ever reflects is our image" (Mitry 2000 [1963], 85).

On the other hand, the method of continuous self-reporting in connection to film viewing has been developed to test how the context and the demands of subjective self-report affect the emotional experience in the study by the psychologist Cendri Hutcherson and her collaborators, 'Attention and emotion: Does rating emotion alter neural responses to amusing and sad films?' (2005). The article proposes that continuous self-reporting on a higher conceptual level does not significantly affect the physiological, emotional processes: "Importantly, attentional manipulation in this context may be conceptualized best not as attention to one's internal feeling state but rather as attention to external perceptual features indicative of emotion (Hutcherson *et al.* 2005, 657). This perhaps allows the suggestion that mental oscillation may involve two separate, not overlapping, 'interest' areas: narrative characteristics are especially related to the left cerebral hemisphere while the right is involved with spatial and visual aspects, as discussed earlier in connection to Michael Gazzaniga's 'interpreter' in the brain (1985).

The subjectivity of the perspective on self is constructed upon the following three processes of cognitive inference: First, there is the brain constructing *images of an object*. Secondly, the same brain is constructing *images of an organism's responses* to the object. Finally, a third kind of image emerges in the brain, which represents *organism in the act of perceiving and reacting* to the object. (Damasio 2003, 242–243) This Damasian model of consciousness is based on second-order recursion, involving a system observing a system observing a system.

The non-conceptual, embodied, temporal and spatial mind's structures are fundamentally integrated to support the coherence of the survival-oriented movie-in-the-

brain. However, coherent but *false* (fictional) narratives also seem to emerge involuntarily or voluntarily (authored) as by-products of the Damasian emotion dynamics. The neurobiological basis of these ‘false’ narratives is in the present treatment understood in terms of Damasio’s ‘as-if’ body states and suggested to emerge as embodied simulation of ‘false’ (imagined, created) body impressions. However, the argument is that in order to emerge in the mind, the ‘false’ body states are simulated ‘as-if’ they were ‘true’.

Interest as a genuine cinema emotion means willingness to invest (Tan 1996). This kind of willingness is assumed to support the author’s *emotionally motivated* ‘as-if’ body states during the creative process. In other words, the subject is willing to invest to reach an emotionally motivated pleasure-pain equilibrium state (Grodal 1997). As discussed earlier, Grodal has provided an extensive account of how the individual body-brain systems may become ‘addicted’ to particular kinds of narratives, due to the emotional states they ‘induce’ in the organism (Ibid.).

The Damasian process of ‘as-if’ simulation implemented in a cinematic framework has a natural duration and can also be described as a primitive narrative. It is seen to correlate to Tan’s notion of interest. In addition, a primitive narrative can be characterized with durations comparative to those of emotional *moods* (Varela 1999, 300; see page 210). The underpinning dynamics are superimposed on the durational experience of *nowness*, meaning that the subliminal somatosensory processes of emotional stimuli may be assumed to integrate, in a manner similar to the multisensory ‘movie-in-the-brain’ (Tikka 2005, 116). This hypothesis of ‘as-if’ simulation provokes new challenges for future cinema.

5.3.2.5 Simulated spectator in a mental workspace

Drawing from the neural level models of embodied simulation (Gallese 2003) and Damasio’s ‘as-if’ simulation (1999, 2003), the notion of *a simulated spectator* was introduced in my essay ‘Dynamical Emotion Ecologies of Cinema’ (Tikka 2005, 104). A *simulated spectator* is a model of a hypothetical spectator, an instrument for the author in order to simulate the potential experiential aspects of the future spectator in interaction with the cinematic work-in-progress. Thus, the simulated spectator equips the point-of-view of the authoring mind with the spectator’s virtual observational attitude. A controlled virtual witness possesses an observation ‘place’ realized by the authored camera angles and camera movements inside the narrative, as proposed in Tan (1996, 239).

In comparison the notion of *implied author* gives voice to an implicit extra-fictional narration (Branigan 1992, 90). In Branigan’s words, Christian Metz’s *The Imaginary Signifier: Psychoanalysis and the Cinema* (1982) suggests that “the implied author is merely an anthropomorphic and shorthand way of designating a rather diffuse but fundamental set of operations which *we* sense as underlying what we do in making

sense and in making patterns” (Ibid. 94). Metz has a point; still, Branigan rejects Metz’s linguistic approach, which binds film comprehension to linguistic concepts such as paradigm and syntagm (Ibid. 95). Implied (invisible) diegetic narration is produced by an implied ‘diegetic narrator’. Diegetic here refers to the epistemological boundary of the story world, while implied refers to the possible description of a diegetic narrator, i.e. *if* this narrator had happened to witness events *in* the story world. (Ibid. 95–96)

As Grodal puts it, “fictions allow us to try out behaviours and to imagine prototypical behaviours and settings as well as alternative equivalents” (1997, 26). As an analogue to Damasian ‘as-if’ body states, my essay ‘Dynamical Emotion Ecologies of Cinema’ discusses cinema as a simulation of future consequences, potential action schemas, or intentions of others (Tikka 2005, 116). It hypothesizes about a kind of author’s global neural working space, similar to those of Bernard Baars and Daniel Dennett discussed earlier, with a kind of multiplicity of ongoing ‘as-if-body-loops’ (Ibid.). The oscillation between several co-existing perspectives on the self would allow the author to simultaneously process a range of separate but contextually interdependent perspectives (Ibid.). The idea of this kind of ‘multiperspectivity’ would be based on the mind’s ability to shift cognitive points of view consciously and/or unconsciously. This would explain the author’s ability to manage multiple points of view simultaneously according to momentary “emotional masks” and other inhibitive or filtering functions, as described within the emotion theories of Damasio, Grodal, and Tan (Ibid.). These ideas are elaborated further in the next chapter of ‘Simulatorium Eisensteinense’.

5.3.2.6 Cinema as survival-based simulation system

Equating cinema and the dreaming mind provides one plausible perspective on cinema as evolutionary survival-based simulation systems, as my article ‘Cinema as Externalization of Consciousness’ (2006) suggests. The discussion in this section is motivated by Antti Revonsuo’s approach to the dreaming mind as a model system for consciousness in his articles ‘Consciousness, Dreams, and Virtual Realities’ (1995), ‘The Reinterpretation of Dreams: An evolutionary hypothesis of the function of dreaming’ (2000), and his book *Inner Presence* (2005) (Tikka 2006, 149).

Neural level simulation is assumed to connect the mirror metaphor and the dream metaphor to the phenomenon of immersion, as for example, the films of Maya Deren exemplify. Jean Cocteau has also described the interrelation of dreams and mirrors thus: “The movie screen is the true mirror reflecting the flesh and blood of my dreams” (Cited in Malcolm 1999). My article compares these two metaphors of mental reflections, the *mirror metaphor* and the *dream metaphor*, which suggest public and private levels of cinema, respectively. As the dream metaphor describes the *intrapersonal* dimensions of experiential holism, the mirror metaphor describes the *interpersonal* phenomena like empathy, imitation, character identification, or situated contextualization (Tikka 2006, 145).

IMMERSION

Aristotle once analyzed in his text *On Dreams* the perceptual reality that the dreaming state presents to the sleeping soul in a similar manner as one might analyze it today. The ‘actual given’ here can be interpreted in accordance with the sensory perceptions when awake, i.e. as immersion.

“Moreover, as we said that different men are subject to illusions, each according to the different emotion present in him, so it is that the sleeper, owing to sleep, and to the movements then going on in his sensory organs, as well as to the other facts of the sensory process, [is liable to illusion], so that the dream presentation, though but little like it, appears as some actual given thing.” (Aristotle 350 B.C.E, *On Dreams*, Part 3)

The virtual cinema world seems to reflect multimodal experience in a similar way as the dream world. For instance, cinema and dream may be seen to share elements that relate to such aspects as immersion, empathy, identification with the protagonists, visualization, framed or an otherwise limited ability to determine the narrative, physical immobility in the viewing situation, and darkness in the cinema theater. In short, the dream and the immersive cinematic experience exemplify characteristics of an emotionally situated consciousness. (Tikka 2006)

However, cinematic consciousness involves the two-faceted problem of the viewer being conscious of the viewing situation (real world) vs. the cinematic immersion (fiction world). These two psychophysiological states seem to oscillate in a manner where the dominating state closes out the alternative state completely. Immersion in relation to cinema means a total emotional involvement in the fictionally contextualized events on the screen. It disappears momentarily if the viewer is disturbed but can be gained again.

The two-faceted phenomenon of internal immersion vs. external reality exists also in the virtual realities provided through technological extension. In *Inner Presence* (2005) Revonsuo suggests that the computer-driven virtual reality caves enable ‘being-in-there’ immersion as close to the online world simulation in the mind as the technology today can provide. However, in contrast to the technology-based views, immersion is about experiencing embodiment as emotional situatedness and not about perfect image projection (Tikka 2006, 151). Immersion, as here claimed, is not about a 90–120° perspective or identifying the point of view in Euclidian coordinates. The world may be projected as window-like (cinema screen), container-like (computer screen), world-like (virtual reality cave), or life-like (dream). If the context of the perceived world — interpersonal relationships, causal events, nature’s forces, or facial movements — is meaningful, it will enable immersion. And this is where cinematic immersion comes into play as a powerful extension of consciousness with all its distortions and grains, as opposed to perfect virtual reality without emotional devotion (Ibid.).

When discussing immersion in relation to the conscious mind, one could claim that immersion falls outside of the scope of consciousness studies because it actually describes a kind of unconscious phase of the human mind. If sleep in psychology is considered an unconscious state, from where all the connections to the external world

are excluded, what does it indicate for the discussion here? It is assumed that the ecological model of *inner and outer cognitive loops* (Kaipainen 1996) allows a re-writing of the dream event as follows: in the Rapid Eye Movement (REM) phase when dreaming occurs, the outer interaction loop between the real world and conscious brain is disconnected, while the inner loop continues feeding the brain with the internal dynamic representation patterns (Tikka 2006, 150).

Revonsuo (1995, 2000) adds a dimension of internal consciousness to the simulated picture by claiming that the dreamer, while unconscious of the external world, lives through vivid internal conscious experiences. Likewise, my essay suggested that in an immersive cinematic experience interaction with the real world and the conscious brain becomes disconnected at least partially, while the mirroring interaction between the brain and the cinematic representations can be regarded as an extended inner loop (Tikka 2006, 150). The dynamic representation of the embodied world emerges due to the simulation mechanisms of the brain, be it in the act of dreaming a dream or viewing a narrative story.

THREAT SIMULATION

How might cinematic experience correspond to simulation in the immersive experience of the dream? According to Revonsuo’s (2000) evolutionary framing, the modern dreaming brain performs a survival simulation mechanism that evolved in the ancestral environment filled with danger.

The prefrontal area of brain, which is mainly assigned with tasks of abstract organization, management and long-term planning when awake, does not activate during the REM phase. Instead, Revonsuo assigns the significance and meanings in the dream events to amygdala-related processes. When the amygdala-cortical network assigned to emotional evaluation is activated during a dream it indicates the threat recognition phase of REM sleep. This activation also occurs in the areas specialized for visual recognition and projections from long-term memory. In turn, the threat avoidance phase activates the cortical motor programs, which are inhibited by motor output paralysis (muscular atonia) characteristic in REM sleep (Revonsuo 2000).⁷⁹

The theta activation during the REM sleep phase seems identical to that of wakefulness. Interestingly, “the sleep cycle duration is about 90 minutes in humans, and, on average, REM sleep episodes last for about 20 minutes” (McCarley 2008). This correlates, respectively, with the preferred 90 minute duration of a mainstream fiction film, and its ‘point of no return’, which typically marks the moment towards the end of the story, where the ‘real action’ starts, or the main character’s destiny is sealed, giving her no other option but continue on the chosen path.

⁷⁹ J. Allan Hobson in his book *Consciousness* promotes the idea that dreams are random ‘noise’ without any purpose, which emerges from the neural patterns of motor experience (1999, 169). This implies that a dreaming brain is a default-state network based on self-organizing oscillation dynamics. Now, it seems that Revonsuo deviates from this view with the dreaming brain as survival-oriented adaptive evolutionary system. This does not conflict with the idea that natural self-organizing processes typically involve also randomness, which enable adaptive flexibility.

In their article 'Dreaming and Consciousness: Testing the Threat Simulation Theory of the Function of Dreaming' Antti Revonsuo and Katja Valli's analyses on the test group's dreams show a strong dominance of scary or fearful dreams that involve escaping from natural forces, strange men, and wild animals, while the positively valued evolutionary elements appear less, e.g. emotional bonding and tendencies to care-taking of children. One of the clues that lead Revonsuo and his collaborators to the threat simulation theory is the notion that the living situations in dreams seem to lack daily working routines such as reading, typing, or writing. Revonsuo's explanation for this is that the dreams mainly simulate situations that could be assumed to be present already in the ancestral environment (Revonsuo 2000). Instead of giving comfort or resolving some everyday family problems, dreams may have more survival value as a threat rehearsal program that keeps instincts alert – hence nightmares (Revonsuo & Valli 2000a; Revonsuo 2000).

Does the threat theory then suggest that dreams have *not* adapted to the modern techno-environment but stick to some earlier stage of evolution? If so, would it then also suggest that there must exist correlating adaptation gaps embedded in the brain, let us say between the earlier developed, 'older' limbic system and the 'younger' neocortical regions of brain such as the prefrontal cortex? Now, if accepting the *triple brain* assumption of MacLean (1993) that the physio-functional structure of the mammal brain corresponds to the brain's evolutionary development, then perhaps the dissociation of the neocortical area during the dreaming phase may support the idea of parallel evolutionary hierarchies in the brain: some activated when awake while others manifest themselves when dreaming (Tikka 2006, 152). Consider respectively the ancestral 'survivalist' and the 'sci-fi techno-manager'. In this respect human beings may still be living in the Stone Age, trying to survive according to ancestral inference structures, while surfing through the digital environments in the Internet.

The conclusion here leads to a brief excursion into comparing immersion experiences of dream to that of cinema, by speculating with a question that relates to the survival-based purposefulness intrinsically "written" into the human evolutionary psychology: Could cinema provide a survival-oriented simulation system, similar to Revonsuo's threatening dreams, for evolutionary purposes?

The following speculation becomes plausible, if considering cinema's apparent power over any human mind. The orientation to the survival game inherited in the biological organism manifests explicitly in the domain of entertainment, in the survivalist aspect of game players and cinemagoers. Interactive video games may have gained popularity exactly because of the situated threat simulation they provide. In commercial cinema productions as well as arthouse movies, sex and violence are the two dominant themes. How suppressed or open the themes are depends on the genre and target group of the film, but the survival game appears to be there with its merciless rule of "eat or be eaten". In this respect, cinema could be claimed to complement the same evolutionary task of threat simulation in modern society as dreams, according to Revonsuo, may have had in the ancestral environment.

My essay 'Cinema as Externalization of Consciousness' suggested that the mind's extension through cognitive technology has made it possible to perform the assumed-

ly evolution-related task of simulating potential danger in safe entertainment environments. Yet it notes that unlike most dreams, films tend to return the spectator to a happy ending and deliver a positive socio-emotional message. (Tikka 2006)

5.3.3 SUMMARY

This survey of diverse neuroscientific issues promoted equally both dynamical and organic lines of naturalization of a complex, emergent and embodied mind.

To summarize some of the most important research topics: The recognition of otherness in cinema is assumed to be based on mirror neuronal imitation, which links to dynamical views on action and perception in an embodied goal-driven survival system. The integration of the senses, neurophenomenological views of perception, the dynamics of 'as if' body loops, the 'narrator in the brain', image-schemas, and the neural basis of conceptualization all enable a description of the continuous unfolding of enactive cinema in terms of embodied simulation. The biological basis of cinema is described as embedded in the emotional simulation dynamics of the mind.

5.4 IMPLICATIONS FOR FURTHER ELABORATION

This chapter proposed grounds for further discussion on the emotional cognitive dynamics in a particular Eisensteinian framing. The following pages aim to converge the two lines of the naturalization of the mind, the dynamical and the organic lines, into one organic-dynamical cinematic framework. Further application of the scientific understanding gained will allow that the cinema author's creative processes are understood in terms of embodied simulation of otherness and the world. It further allows the claim that cinema equals a simulation model of the world. Some implications for further elaboration are summarized here, and the epistemological starting points outlined at the beginning of the treatment are also revised, based on the new aspects learned in the theoretical discussions of this chapter.



5.4.1 IMPLICATIONS FOR MODELING THE AUTHOR'S MIND

Though the research on artificial intelligence since the 50's was attracted by the idea that computers could function as models of mind (mind as a computer), today the belief on the power of algorithms to exhaust the complexity of the biological being has to a great extent been abandoned. The attempts to manage and hold control over increasing complexities in practical implementations has repeatedly proved a mission impossible. One is tempted to hypothesize that, perhaps, if a cinematic model of a dynamical mind can be constructed, cinema would automatically transgress all traditional borders of body-brain-world system – as holistic cinema.

The concept of mind can be described as a synonym for 'expanded' cognition, or embodied mind. Damasio has argued that the emotion research of the cognitive sciences and neurosciences of the 20th century has suffered from ignorance of the evolutionary perspective, homeostasis, and the organism (Damasio 1999, 44–45). Inspired by Damasio's statement, it is proposed that expansion takes place in several bio-cultural dimensions, which are in the following pages explicated in more detail.

- (1) Firstly, a kind of 'evolutionary' expansion involves both conscious and unconscious functions of the brain–body system, this inspired by Damasio's neuroscientific research (1999). Conscious cognition forms just the tip of the iceberg of embodied cognition, as Lakoff and Johnson in *Philosophy in the Flesh* metaphorically formulate the relationship (1999, 13). In experience such conceptualizations as emotions, sensations, perceptions, and actions are seen to integrate into one holistic unity.
- (2) Secondly, a kind of 'emotional' expansion assumes that emotional states guide cognitive acts, this meaning that the Cartesian dualism between rational and emotional is rejected. Instead of being marginalized as secondary to 'rational' consciousness, emotional processes are understood as the 'older' cognitive system, which governs all conscious enactment (Damasio 1999).
- (3) Thirdly, a kind of 'organistic' expansion allows the view of the biological mind as expanding into 'techno-culture'. The mind thus not only embraces the restricted domain of the brain (connectionist approach), but as the body-brain system (embodied mind approach) is also too limited, the mind instead embraces the organic triune unity of body, brain, and world (the radical embodied mind approach).

In a *parachronic reading*, the above issues relating to expanded cognition will be shown to echo also the psychological views of Eisenstein's era. Eisenstein's ideas of the embodiment of emotional experience, the isomorphic relation between the author and spectator in terms of *pathos* composition, the mutual roots of visual and conceptual forms, etc. will be elaborated in terms of today's scientific understanding on *emotions as the basis of cognition* (Damasio 1994, 1999, 2003), *embodied mind* (Varela *et al.*

1991), *embodied simulation* (Gallese 2003, 2005) and *embodied metaphors* (Lakoff & Johnson 1980, 1999).

The underpinning dynamics of mind, active perception, dynamical *Gestalts*, mirror neuron networks, and integration of the senses constitute the playground of the naturalizing mind project also in the focus here. An intellectual continuation of Eisenstein's emotion-driven keywords of 'embodiment, pathos, ecstasy, organic unity, synesthesia, sensuous thought, image, and regression' (as discussed earlier), and his conceptualizations of 'complex, polyphonic, plastic, dialectical, multidimensional, superimposed, multi-layered, web-like, and spherical' systems will be shown. These ingredients of Eisenstein's holistic universe have their equivalents in the recent studies on the emergent 'forms' of mind.

5.4.2 IMPLICATIONS FOR MONTAGE OF INTERACTIVE CINEMA

On the basis of what has been discussed thus far, the epistemological frames for an embodied cognitive modeling approach applied in the next chapter are described in the following.

5.4.2.1 Modeling the world

As suggested by Damasio, the mind is survival-driven by nature and sensory-based categorization forms part of the process. The mind continuously maps the world and its events, causalities, similarities and regular patterns, which become re-organized in the mental space of awareness, in terms of momentary interests of the subject. According to Lakoff, cognitive mental spaces are the media for conceptualization and thought, which "have no ontological status outside of mind" (Lakoff 1987, 281–282). This should not be taken as an externalist, internalist, or realist statement, but rather as a holistic one, since it suggests a subjective first-person experience and is described here as a kind of *first-order* cognitive model of the world.

First-order modeling occurs when the bio-cultural mind continuously maps the phenomena of the world in the bodily multisensory inference processes, which are both unconscious and conscious, *and*, further, exposes these maps to others in the conceptualization processes. The embodied cognitive models are intersubjectively conditioned, applying gestures, languages, or other representation systems (e.g. three-dimensional structures; miniatures; images; narratives; theories; and mathematical, geometrical, or algorithmic propositions).

Cinema as an artistic product with audiovisual duration may serve as a creative laboratory, which provides a kind of first-order description of the author's embodied

relation with the world. The author's embodied simulation dynamics enable cognitive mapping of the world. This emphasizes the method of inductive bottom-up reasoning from experience to description. The intersubjectively shared cognitive models of mind (as descriptions) when regarded as objects of the world may also serve as objects in the author's creative processes. This implies deductive top-down reasoning from description to experience.

5.4.2.2 Modeling the mind

The *second-order* enters the scene together with the observer, who is determined to model a first-order mind in the act of modeling the world. The cognitive scientist or observer constructs cognitive models of the 'natural' first-order processes ('natural' experiential ideas about the world). The observer may hold a first-person view on the observed mind, meaning introspection to one's proper mind. Or the observer may apply a first-person view of the other person's cognitive behavior (subjective reports, other observations), often described in a scientific context as a third-person view.

A kind of prototype of the modeling procedure as conceived of in the domain of sciences, Humberto Maturana in his *Biology of Language: The Epistemology of Reality*, is interpreted as follows: First, the phenomenon in scrutiny is defined. Then the conceptual or concrete system as a model of the system is designed. The proposed model computes a state or a process that should be studied. Finally, the predicted phenomenon is analyzed as a case in the modeled system to evaluate if the system under study is in that respect isomorphic to the functional model. (Maturana 1978a)

The process is the same as modeling processes in cinema, i.e., when cinema is seen to model the world.

The cognitive scientist studies, as a second-order observer, a systemic process of any other person's cognitive mind. However, the scientist's observation process does not differ from 'natural' everyday observation processes. Mind emerges in the processes of constructing cognitive maps of the world and its phenomena, in terms of any momentary personal conscious or unconscious interests (e.g. scientific), thus the return to the position of first-order observer. One may, in fact, detect here the spiral, 'chain rocket', or 'nesting doll' inference structures already familiar from Eisenstein's figurative models. A mind observes another mind apparently observing the world.

The *observer becomes aware* of her observation as situated and context dependent, then, in turn, introduces the process of introspection as a constitutive and complementary part of the scientific inquiry. Any modeling process inevitably involves the 'Observer Effect'. The observer's situatedness in the process of observing has been

promoted within Quantum Theory⁸⁰ and widely discussed in second-order cybernetics (Maturana 1978; von Foerster 1974, 1981; Scott 1996), especially in *First-person Methodologies: What, Why, How?* by Varela and Shear (1999). The observer herself is a kind of system that must be studied simultaneously with the object of observations (Maturana 1978). The observation procedure is framed by the situatedness of the observer, and in reciprocal manner "a procedure of observation specifies the phenomenon that he or she will attempt to explain" (Maturana 1978a).

5.4.2.3 Consensual domain of mutual orientation

The theory of autopoiesis by Maturana and Varela (1980) describes a biological communication model that assumes that the closest two organisms may get to sharing understanding or knowledge is in the act of reaching a consensus. This means that the two closed self-sustaining autopoietic systems succeed to negotiate a shared 'tuning' or cooperative state of mutual orientation.

Reaching some consensus in the scientific domain assumes a system of sciences that Maturana in *Biology of Language* describes as "a closed cognitive domain in which all statements are, of necessity, subject dependent, valid only in the domain of interactions in which the standard observer exists and operates" (1978a, 29).

This leads further to the emphasis on scientific relativism: several simultaneous but different points of view on the same intersubjectively shared descriptive domain are possible and are all equally true, false, or relatively 'objective'. All ontologies and epistemologies are understood as descriptions of experiential first-person perspectives to the consensual domain of intersubjectivity. A multiplicity of unique perspectives is assumed instead of a universal, objective third-person perspective within the canonical scientific positions.

Rather than 'objective' knowledge, research is recognized as a "*shared, relatively intelligible world*" as indicated in Mark Johnson's *The Body in the Mind* (1987, 209). It is the relatively sharable, consensual domain of intersubjectivity that enables all human-human interaction, communication, cultural discourses – and cinema. A further question could ask how cinema may claim an epistemological position of a model of the world.⁸¹

To conclude, in this chapter several significant lines of thought have been drawn

⁸⁰ David Bohm by Will Keepin: "the still-dominant 'Copenhagen interpretation' of Quantum Theory developed by Niels Bohr, Werner Heisenberg, Wolfgang Pauli, and others: Reality is identical with the totality of observed phenomena (which means reality does not exist in the absence of observation), and Quantum mechanics is a complete description of reality; no deeper understanding is possible" (Bohm in Paterson 1999).

⁸¹ This question should be understood in terms of the embodied mind approach and *not* according to the definition of classical epistemology of third-person objective knowledge. The latter implies that *cinema as a model of the world* ought to fulfill 'sufficient and necessary conditions' of objective knowledge, its sources (perception, introspection, memory, or other), structure, and constraints (Steup 2005 SEP).

from Eisenstein's theoretical considerations and his scientific landscape through the scientific landscape of the 20th century all the way to the present. In particular, a thematic continuum of the systemic, dynamical, and biological views from Eisenstein's notion of the embodiment of emotional theme has been highlighted. The following chapter will elaborate the implications of these lines for cinema and authorship.

5.4.3 IMPLICATIONS FOR EPISTEMOLOGY

The complex dynamical systems approach carries epistemological implications for the present study. It follows that the *principle of reciprocity* is assumed to hold for all cognitive processes without exception.

The egg–hen metaphor is a suitable description for the complex interaction of psychological and biophysical aspects also in regards to cinema experience. Human psychology seems to correlate to the ideas in the field of dynamic complex systems. The mind's hierarchies, categories, conceptual domains, and their functional entities are always relatively independent but interrelated, in a continuous bidirectional interaction process. This means that assuming a one-directional, functional dynamics would be an oversimplification. Instead, there are 'inputs linked with outputs', intra- and interrelated feedback loops, and top-down processes interacting with bottom-up processes, bifurcations and transgression in continuously fluctuating states, to name a few of the plausible functions. These aspects will be linked to cinematic practice in later elaborations.

Reciprocity is also assumed in all the methodological strategies, e.g. between the inductive (bottom-up, from particular to general) and deductive (top-down, from general to particular) reasoning. All goal-directed scrutiny involves a contradicting or dialectical dimension, e.g. creative/descriptive, inductive/deductive, or unfolding/en-closing modeling processes.

The working hypothesis of neurophenomenology proposes the *methodology of reciprocal constraints* (Varela 1996, 343; van Gelder 1999, 246). "Phenomenological accounts of the structure of experience and their counterparts in cognitive science relate to each through reciprocal constraints" (Varela 1996). This means that mutual tools, constraints, and laws ought to be described for both the domain of cognitive sciences and phenomenological first-person inquiry. The neuroscientific discoveries on mind should enable phenomenological descriptions. And, vice versa, phenomenological reduction should provide neuroscientific experiments with additional working hypotheses, in order to see the posed problem differently, from a fresh point of view. Varela's collaborator neurophenomenologist Antoine Lutz in his essay 'Toward a neurophenomenology as an account of generative passages: a first empirical case study' (2002) tackles the practical problem of phenomenological reduction.

In turn, Tim Bayne's essay 'Closing the Gap? Some Questions for Neurophenom-

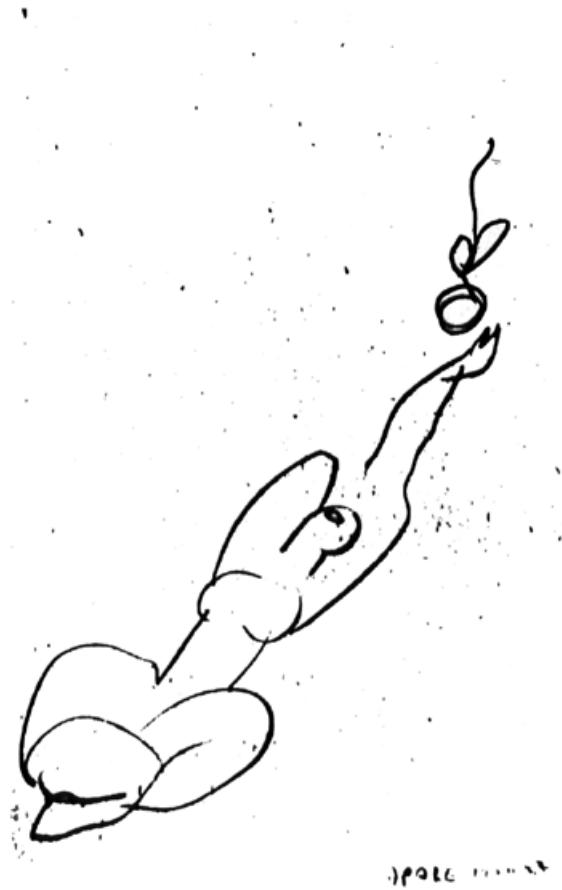
enology' categorizes the three modes of reciprocity, which may be extracted from the naturalizing phenomenology program: (1) as *reflective equilibrium* based on general intuitions, (2) as a *heuristic strategy* for gaining fresh perspectives to the research problem (Lutz *et al.* 2002), and (3) as *reciprocal causation* of a strong isomorphism or weak correlation between the neural activities and macro-scale behavioral states as applied in Thompson and Varela's 'The Radical Embodiment: Neural Dynamics and Consciousness' (2001, 421) (Bayne 2004, 8–11). In the third case of reciprocal causation, a kind of isomorphism, the similarity of the 'form' between two objects, is unavoidable, and may be detected in the explanations based on the 'weak causalities' between the neural and phenomenal dynamics (Bayne 2004).

A formal model of the reciprocity principle may be elaborated in such a manner that it mutually satisfies the need of both neuroscientific and experiential accounts. Lutz describes in 'Toward a neurophenomenology as an account of generative passages: a first empirical case study' describes reciprocity as providing *generative passages*: this refers to "the type of circulation which explicitly roots the active and disciplined insight the subject has about his/her experience in a biological emergent process" (Lutz 2002). A generative passage "constitutes an intermediate and neutral level in which both the experiential and biophysical levels can be expressed" (Lutz 2002, 28 in Bayne 2004, 12; see Varela 1997). Any reciprocity, which assumes two distinct domains in dialogue, may be characterized by "a subtle expression of dualism" (Lutz 2002, 150 in Bayne 2004, 11).⁸²

When trying to determine the biological basis of cinema, the reciprocal modeling correlation between the mind's embodied simulation system and its emergent 'forms' (feelings, metaphors, spaces, and so on) is the key question. This was already explicated by Eisenstein's interest in the attribute of plasticity characterizing the repetitive patterns of human expressiveness. However, the present study assumes that an explanatory linkage will eventually be found between the micro-dynamics of neural activations and macro-dynamics of emergent behavioral and perceptual patterns (to be seen; e.g. Gallese & Lakoff 2005; Ramachandran & Hubbard 2001).

A dynamically modified holistic formulation of neural correlations to cinematic consciousness has been suggested in terms of functional synchronization of the mind–body system, as presented in my essay 'Externalization of Consciousness in cinema' (2006). This means taking into account the dynamical temporal structures of the embodied mind system, measured with the help of e.g. real-time feedback circuits, meta-data structures, virtual simulation environments, and digital data-processing technologies. This is in terms of, for example, the neurophenomenological approach of Varela or Tim van Gelder's dynamical systems theoretical approach to mind, as they are presented in the manifesto of *Naturalizing Phenomenology* (Petitot *et al.* 1999).

82 It may be argued that the naturalizing phenomenology project is not as free from the inherent Cartesian dualism as it claims to be, because it seemingly assumes the two incommensurable domains of neural and phenomenal that need to be bridged. This is pointed out by Tim Bayne (2004) and also discussed by Alva Noë (2006), who advocates the radical embodiment view.



Appel (Eisenstein 1947)

6 SIMULATORIUM EISENSTEINENSE

In this chapter I will apply this parachronic reading to my own practice and further, in a reciprocal manner, feed the practical expertise back to my theoretical construction. I see this approach as a natural continuation of Eisenstein's research approach, and thereby intend to pay homage to it by calling my method *Simulatorium Eisensteinense*. The concept of *simulatorium* is coined in order to refer *both* to 1) a hypothetical model of a metaphoric *workspace* embedded in the author's mind *and* 2) to the work of art, as the practical outcome of the mental simulation process in which it was created.

The enactive cinema installation *Obsession*, a parallel production of a short film with the same name, will exemplify the application of a hypothetical model. The case will serve two purposes, that of theory and of practice. It is an interactive cinematic artwork which one can take to exemplify a more general hypothetical model on one hand, and, on the other, from which one may approach a more particular practical model. In other words, *Obsession* gives concrete form to the cinema author's *embodied simulatorium*. But it can also be conceived of as a particular artwork created by myself as a filmmaker-author and thereby as a practical extension of *my* embodied simulatorium built on the contemporary understanding of the issues Eisenstein was repeatedly addressing.

The structure of this chapter corresponds to the two research claims articulated in the chapter 'Eisenstein revisited'. They are now updated according to the insight derived from the 20th century science provided in the chapter 'Eisenstein extrapolated', as follows:

- (1) The authored cinema as an autonomous product (w/ montage composition) may serve as a creative laboratory for describing the ex-

periential basis of the emotional embodied dynamics in the mind. An allopoietic entity and its 'form' (cinema w/ montage composition) can represent aspects of an autopoietic entity that created it (author w/ mind). This implies inductive bottom-up reasoning from embodied experience to conceptual description, and *complements* the deductive top-down reasoning described in connection to the second claim (2) *in a reciprocal manner*.

- (2) Cognitive models of mind (as descriptions of the emergent dynamics of the cinema author) may serve as sources of creativity for authoring practical dynamics of cinematic structures. An autopoietic entity and its emergent 'forms' (author w/ mind) give structure to an allopoietic entity (cinema w/ montage composition). This implies deductive top-down reasoning from hypothetical descriptions to embodied experience, and *complements in reciprocal manner* the inductive bottom-up reasoning described in connection to the first claim (1).

Furthermore, the discussion proceeds according to the preliminary principle of reciprocity. The chapter intends to demonstrate a recursive loop, where the hypothetical approach (embodied simulation) leads towards practical implementation (intersubjective expressiveness) and further back from practical simulatorium (case *Obsession*) towards the hypothetical level of cinema as a complex dynamical simulation system (Enactive Cinema). Respectively, the simulatorium has two components:

Section I: EMBODIED SIMULATORIUM: 'ORGANIC' PERSPECTIVE ON SELF. This *embodied simulatorium* provides a hypothetical model of the author's creative simulation dynamics **on the one hand**, on the basis of the parachronic reading of Eisenstein's organic-dynamic views, and, **on the other**, on the recent neuroscientific knowledge on the dynamics of mind.

Section II: SIMULATORIUM IN PRACTICE: MONTAGE OF EMERGENT 'FORMS'. This *practical simulatorium* will function as a concrete play-out of the embodied simulation principles of the hypothetical *embodied simulatorium*. In addition, a practical simulation model will have an artistic dimension as an autonomous cinema installation.

The concept of embodied simulation relates both to dynamical modeling, as in computational modeling paradigms, as well as to the concept of simulacrum in aesthetics, referring to a 'copy' or a 'representation' often distorted to take into account the viewing perspective. However, while the latter is typically seen as a static, rigid, or mechanical structure (Sandoz 2003), I assume, to the contrary, that the terms 'simulation' and 'simulacrum' describe different aspects of one holistic process, respectively, autopoietic and allopoietic. Importantly, this pays homage also to Eisenstein, who, for example in his essay 'Laocoön' emphasized the durational dynamics of expressive movements embedded in the 'fixed' material composition, which would come into being in the reciprocity of the act of perception – in the momentary 'perceptual grasp' of the dynamical *Gestalt* of the object *and* within the duration of the spatio-temporal path of the perceiver's proper eye (ESW2, 114).

Eisenstein's guidelines in the 'Psychology of Art' dated November 22, 1947, are adapted to the further discussion: His "correlation and interconnection within sensu-

ously conscious functioning as the basis of an image" (ECOL, 241) is discussed in embodied simulatorium. And, respectively, an "image of thought as a unity of the sensuous and the conscious – the prototype of an artistic image" (ECOL, 241) describes my simulatorium in practice.

The insight explicated in the previous chapters will help me to formulate my vision for 21st century interactive cinema.

6.1 EMBODIED SIMULATORIUM: 'ORGANIC' PERSPECTIVE ON SELF AND THE OTHER

My focus is on gaining new insight into the '*embodiment of emotional theme*' in the process of authoring cinema. What might it mean to 'feel' such themes embedded in the cinematic material or the issue under scrutiny?

As a starting point, Eisenstein in his 1939 essay 'On the Structure of Things' argued that it is not only a question of *what* is represented in cinema, but what the author's *attitude* is towards the presented (NIN, 3). This results in focusing on *why* and *how* something is presented. The author must in the very first phase of a creative process study her own emotions and attitudes, which are elicited in cognitive interaction with a particular material or event under scrutiny. The self-directed perception or introspective analysis of one's proper 'feel' about the phenomenon one wants to depict will further enable the author to extract the core *emotional theme* from the same phenomenon (NIN 5). This theme was still going strong in Eisenstein's last essays, such as 'The Psychology of Composition' (1947).

My question concerns how an author could harness to her creative work this 'feel' Eisenstein is so concerned about, and which I argue emerges from the underpinning processes of embodied simulation. How could this understanding of the dynamics of embodied simulation contribute to the emergent '*cinema-in-the-mind*', referring to the Damasio's characterization of consciousness as 'movie-in-the-brain' (see page 193)? And finally, how could it contribute to practical cinema montage?

The treatment of this first section will flow in a 'top-down' manner. I will lead the three-fold discussion from the hypothesized (1) *sub-subjective* dynamics of the authoring process towards the more practical topics of (2) *subjective* 'feel' of mental imagery, and further, cinema as (3) an *intersubjective* experience. The focus is on the author's mind – understood in terms of an *autopoietic* system. In my creative process I take the right to blend my conceptual understanding on cinema, Eisenstein's figurative thinking, and embodied simulation processes of mind as they appear in the light of the recent neuroscientific findings identified in the previous chapter.

6.1.1 SUB-SUBJECTIVE LEVEL: UNDERPINNINGS OF EISENSTEINIAN 'EMOTIONAL THEME'

The notion of sub-subjective emphasizes the dominating role of the embodied dynamics in everyday being in the world. While the innate underpinning dynamics are typically referred to as unconscious or subconscious, here, sub-subjective links them directly to the subjective and, what is here taken to be even more relevant, to the intersubjective domains of cognition and enactment. Sub-subjective correlates to Antonio Damasio's (2000, 134-143) core self, a subliminal entity in continuous recreation dynamics, interacting with the environment and recognized in the feeling of bodily changes (see page 193).

The embodied simulation is assumed to form the emotion-driven unconscious basis of being, as indicated in the neuroscientific discourse earlier (section 5.3.2.1). It should be remembered that I take both the conscious and unconscious domains of human mind to converge in the definition of cognition, which lays the grounding for my enactive relation with and within my environment. This conflicts with the earlier generations of philosophical treatments and early cognitive science conceptualizations, which typically refer to cognition as *conscious* cognition only, and by doing so preserves the theoretical advantage that the researcher may assume herself possessing all plausible (cognitive, intelligent, and descriptive) tools for describing and/or explaining cognitive activities. This is the case also when Damasio described his core self as non-cognitive (1999, 180). Instead, accepting the holistic view of cognition, the unconscious and conscious dimensions of mind appear intertwined in such a manner that they cannot actually be separated. It has become apparent that I must surrender insistence on a fully equipped cinema author's toolbox, which would allow controlling or modifying both the conscious and the unconscious dimensions of cognition.

Assuming that unconscious dimensions are truly undetectable in conscious, directed perception, it is difficult to discuss the dynamics of the unconscious without becoming lost in the jungle of all plausible interpretations. As a related concept, in Eisenstein's time, the paradigm of psychoanalysis served as the source of inspiration for the studies of *preconscious* primitive underpinning of the '*autobiographic*' self. While previously psychoanalysis provided the exclusive domain of the explanation models for unconsciousness, sexuality, mirroring self-other relations, recursiveness, and so on, for the present research, the enactive cognitive sciences and related neurosciences will provide a new kind of research framing on these issues.

In the present treatment, the assumed neural simulation system enables me to discuss embodied simulation from the author's perspective without leaning to psychoanalytical constructions. Neural simulation allows a description of cinema as an intersubjective experience, which comes into being in the embodied understanding of otherness.

David Freedberg and Vittorio Gallese's article '*Motion, emotion and empathy in esthetic experience*' (2007) provides support for my idea of embodied simulation as

the basis of the authoring process, in a similar manner as the researchers argue it to be the basis of the spectator's perceptual aesthetic experience. As discussed earlier, the researchers interpret the spectator's artistic experience within the explanatory framework of embodied simulation theory. Here the spectator is assumed to 'feel' the movements of the artist's hand working on an art object. Other neuronal theories of aesthetics, discussed earlier, also lend support to my thinking: for example, the research of synesthetics by Ramachandran and Hirstein (see page 214), or the approach of Zeki and Lamb (see page 213), which advocates the idea that an artist practices neurosciences in her processes of creation.

While drawing from recent neuroscientific findings, the hypothetical simulatorium also has similarities to such metaphorical descriptions of cognitive processes as Baars's global neuronal workspace (1998), Damasio's 'movie-in-the-brain' (1999), Dennett and Kinsbourne's 'multiple draft model' (1992), Dennett's 'fame in the brain' (2001), the 'dynamic core' of Edelman's 'neural Darwinism' (1987), or Metzinger and Gallese's 'shared action ontology' (2003). They all promote a biological model of consciousness, which describes complex neural networking and context-dependent emergence of an embodied mind.

I need to also mention the Gestalt Bubble model of Lehar (2004), interpreted as a holistic model, with the disclaimer of particularly rejecting his dualistic representationalism.⁸³ Yet I explicitly highlight that my 'simulatory' metaphor should not be conceived of as a 'copy' in Lehar's sense (see page 183) or a 'representation', nor as something 'taking place' in some specific domain, cerebral location, or by some enactive entity, say, the homunculus. Instead, the behavior of the psychophysiological system, here particularly *the author's embodied mind*, emerges within the complex sub-subjective neural and homeostatic dynamics, to be described in terms of an autopoietic system as described by Maturana and Varela (section 5.1.2). Also earlier, von Uexküll's pioneering biosemiotic idea (see pages 137, 157), in debt to Kant, suggested that different individual species perceive the world differently, even in incommensurable ways. This seems to imply a model of simultaneously existing multiple worlds, each of which is constituted by the biological differences of the experiencing individual (species).

My point is that adopting the private first-person perspective and subjectivity may lead to a distorted understanding of mind, if only the conscious aspects of mind are taken into consideration. While people are willing to emphasize individuality as a character of the 'conscious personal level' of behavior, at the biological, physiological level the behavior of individuals is very much alike. This is not only due to humans being physiologically very similar to each other, but *also* due to environmental and cultural similarities (e.g. natural conditions of living environments, Western education,

⁸³ I want to point out that to a great extent the scientific disagreements reflect the paradigmatic disagreements on the conceptual modeling of the phenomena, in other words, how each individual perceives and further describes her experience. My epistemology here relates to the scientific relativism argument of e.g. Thomas Kuhn, Richard Rorty and to the relative 'objectivism' in Johnson (1987), and drawing further support from the first-person perspective emphasized in the enactive mind approach (Varela *et al.* 1991).

religion, gender views, and historical situatedness).

The previous chapter provided a framework for the discourse on modern means to study Aristotelian imitation, through advanced neuroimaging technology (e.g. MEG, fMRI) and the discovery of neural mirroring networks. Eisenstein's discussion on embodiment of emotional theme may now be reflected in new scientific light of a socio-emotional understanding of otherness. In this light, discussing embodied simulation, I assume that these neural mirroring activities occur to a great extent in a similar manner in different individuals, i.e., eliciting similar kinds of psychophysiological reactions linked to the autonomous nervous system: 'making one jump', 'making one sweat', or 'making one feel', for example.

Damasio's neuroscientific views on emotions suggest, in debt to James, that 'feeling' emerges from the unconscious emotional survival-based orientation 'afterwards', due to physiological reactions that have already taken place in the body system. In the evolutionary process, emotions support and guide the individual's social behavior, which is oriented towards building strategies to gain and maintain wellbeing. In this manner, the emotional system constitutes the basis of complex social behavior and social organizations. In my emphasis on the physiological dimensions of experience in interaction with culturally shared conventions, I also draw from the recent bio-cultural views on cinema emotions as advocated in Torben Grodal's *Moving Pictures* (1997).

Following Damasio, onwards from the moment of one recognizing a particular feeling (physiological changes in heartbeat, breathing, involuntary movements, etc.), it is all about socio-emotional interpretations, conceptualizations, explanations, and abstract hypotheses. At this 'higher level' of cognition individual differences often become more apparent than the dominating similarities. As Vygotsky emphasized, individuals are socially conditioned. However, I interpret this to mean *socio-emotionally conditioned*, which takes the focus back to the autopoietic biological framework of the embodied mind.

Generally, cinema is taken to represent a kind of *miniature model of phenomenal world* (a model 'outwards'), and simultaneously a model of the emotion dynamics of embodied simulatorium (a model 'inwards'). Here it is noted that these two 'directions' explicitly reject the dual realism (internal incommensurable with the external) but relate to the conceptual idea of dividing the holistic interaction dynamics into outer and inner interaction loops, as suggested by Kaipainen in 'Prospects for Ecomusicology: Inner and Outer Loops of the Musical Mind-Environment System' (1996). Yet the two hypothetical domains of 'internal' and 'external' discussed above are often modeled as separate domains, this for the sake of conceptual clarity. Consider, for example, Damasio's neuroscientific approach distinguishing between interoception and exteroception (2003, 107), which exemplify different orientation perspectives. On the one hand, the perspective on one's proper mind reveals one's conscious, cognitive act of perceiving oneself in interaction with the world (exteroception), and, on the other, it involves simultaneous unconscious perceptual activities (interoception), which are oriented to controlling the wellbeing of the subject (section 5.3.1.5).

I am confident, and it cannot be emphasized enough, that all aspects of the cinema author's imagery as 'cinema-in-the-mind' are to be considered *radically* dynamical,

globally distributed over the brain-body-world borders, and subjected to continuous processes of self-organization in terms of a dynamical systems approach (e.g. Kelso 1995, 2002; van Gelder 1999, 2004; Thelen & Smith 1994) (section 5.2.3.3). From the holistic view, all biological, physiological, and cultural dimensions of being intertwine in the complex dynamics of one experience.

Eisenstein recognized that *unconscious* dynamics dominate not only the spectator's behavior but also the author's own cognition. He searched for the tools of control from his contemporary scientists' studies on psychophysiology, reflexology, and synesthesia, in addition to the recursive patterns proposed in psychoanalytical interpretations. Today, one may have better scientific instruments for gaining access to inner neural activities, yet the implications of the unconscious dynamics of the authoring process continue out of the reach of direct control of the author. Indeed, to study oneself, to analyze the emotional 'feelings' and the author's own attitude towards different themes, remains today as fuzzy an effort as it was in Eisenstein's time.

Direct correlation between the unconscious neural activities and the mental imagery of the conscious mind still remain undiscovered, as concluded earlier (section 5.4.3.). The only way an author may dream of gaining control over the underpinning dynamics of her own embodied resources is through modifying and organizing one's own life-environment and affecting its living conditions. This then, in reciprocal manner, feeds back and shapes the author's autobiographic self, referring to Damasio's concept (discussed in page 224). From his own experiential resources of embodiment Eisenstein also mined his emotional themes, to discover "whole new tracts of utterly unexpected territory whose existence [he] never dreamed of" (BTS, 14). However, the sub-subjective cannot be 'perceived' elsewhere but in the dynamical *Gestalts* of cognitive behavior (e.g. experiential 'nowness', or functional synchronization) or in abstracted neuroimaging processes, which result in hypothetical interpretations and theory constructions. The framing of 'subjective' experience (rather than unconscious and 'sub-subjective') emerges in the conscious recognition of the 'feel' or 'feeling'.

6.1.2 SUBJECTIVE LEVEL: EISENSTEINIAN 'FEEL' IN CREATIVE SENSEMAKING

The top-down-directed movement towards concrete imagination, creative sensemaking, mental construction, and other emergent 'forms' in the author's mind, allows distinguishing the subjective perspective from the above discussion on the hypothetical sub-subjective underpinnings of the authoring process. This section concerns the recognition of the 'feel' or 'feeling' of the moment emerging on the grounding of the embodied, unconscious, or, sub-subjective simulation dynamics.

I understand cinema in two ways, as an *autopoietic* organism, and as an *allopoietic* product or entity (see page 160, 244). Cinema stands for (1) an emergent embodiment of an author's creative expressiveness, which is built on both conscious and

unconscious dimensions of mind, and for (2) an *authored simulation model* of the experiential world, which in the allopoietic cinema composition becomes partially framed according to the author's subjective selective decisions. This section on subjective is intended to describe the first, emergent embodiment of the author. This is the very meaning of *enactive cinema*.

Enactive cinema implies a dynamical abstraction of the emergent processes of imagination, which is in debt to Damasio's concept of 'movie-in-the-brain'. Enactive cinema assumes the complex underpinnings of embodied simulation based on the autobiographic lived experience *and* its creative entailment, that is, an imaginary construction of 'as-if' situatedness. 'As-if' refers to an unconscious embodied simulation of a phenomenon, such as hallucinations, erroneous perceptual constructions, or other kinds of illusions, which do not have anticipated consequences but elicit an alert body state (e.g. waking up 'hearing' a window breaking at night somewhere in the house).

While the next section is designed to discuss this intersubjective dimension of embodied simulation, cinema as an authored simulation model, this section considers the subjective experience of the cinema author. The reciprocity principle and the idea of the psychophysiological complexity of the embodied mind are taken into account. While the subjective first-person experience ('feel') is always embodied and unique, it is simultaneously socially conditioned and shared, as noted, for example, in the systemic psychology of Vygotsky as discussed earlier (section 4.3.3). My view, in accordance with the recent radical embodiment views (section 5.2.3), argues for the mind expanding over the traditional borders of body, brain, and world. In this complex system of mind, body and world, all high level cognitive activities (including theories, conceptualizations, and symbol systems) are founded on embodied simulation processes.

Alas, instead of following the three-fold schema, I am tempted to suggest that the notion of subjective, in fact, should be considered as a kind of convergence surface or a conceptual interface between the sub-subjective embodied simulation system and the intersubjective socio-emotional system. In this way, against the conventional understanding of individuality and first-person experience, the subjective dissolves into the convergence of the bodily underpinnings of the '*feel*' of the state of things and the socially conditioned forms of expressiveness.

My subjective interface is thus recognized as my proper 'feel' about the phenomenon I want to depict and how this 'feel' further enables me to extract the core *emotional theme* from the same phenomenon. The 'feel' makes me refer back to the earlier discourses on embodied simulation, interoception, somatovisceral illusion, 'as-if' simulation – and the emotional theme of the topics of active perception, multisensory sensemaking, and embodied coherence-control supplying the resources of Gazzaniga's cortical 'narrator' in the chapter 'Eisenstein Extrapolated'.

At first intuitive glance Gazzaniga's interpreter or the coherence constructor in the brain seems a very private and unique phenomenon. However, the coherence generator, that is, embodied mind, in its conceptual interpretation, eventually draws the explanation framework from the experiential intersubjective world, which it has learned to know in its ontogenetic development (e.g. Thelen 1995; Smith 2005). Co-

herence is the principal aspect of all intersubjectively shared socio-emotional interaction patterns, norms, narratives, and conceptualizations. If no coherence is present the embodied narrator will *construct* coherence. And this is not the case only in the verbal or conceptual domain. All senses have this tendency to produce embodied coherence for perception, filling in gaps, linking through similarity patterns or conceptual blending, and so on. And this seems to be the case even when the mind has to create things and behaviors that do not currently exist, or never existed, in that particular context. Or, due to interest and focus of attention, one may exclude existing things: these are simply not perceived even if they cross one's attentive frame of perception.

Instead, one perceives what one is *interested in* paying *attention to*, i.e., what is momentarily meaningful. *Interest* is one of the genuine cinema emotions, argues Tan (1996, 85). Interest selects what the senses sense. I have also participated in Ulric Neisser's classical experiment, where the attention focused on the given task prevented me, as the majority of the others, from seeing a gorilla walking in the midst of the moving image frame (Neisser & Becklen 1975; Neisser 1979; Simons & Chabris 1999). The perceptual process of comparing similarities and differences between two or more entities also underlies cinematic sensemaking. The *dialectical* dynamics of continuous similarity search serves as another conceptual framework for modeling the unfolding of cinema montage *in flux*.

Enactive cinema here refers to one of the many emergent 'forms' of cognition, as it also is constituted by a diversity of emergent cognitive 'forms' itself. It involves an emotive-cognitive analysis of the 'feel' these forms elicit in the subjective experience of the author-proper, simultaneously with an automated orientation towards wellbeing. Instead of bracketing, as in the Husserlian reduction, or excluding an a priori emotional and intellectual attitude towards what is studied, in the act of studying oneself my focus is on human expressiveness in its holistic complexity. The emergent 'feel' of the author's creative simulation dynamics is grounded on the survival kit of the human mind, and the meaning of the 'feel' is interpreted in the context of social situatedness. The artistic meaningfulness is also elicited and reinforced in relation to feedback, for example, in human-human dialogue or other intersubjectively determined goal-driven activities. This means emphasizing conceptualizations of experiential interests, perceptions, attitudes, and emotional feelings as they are described in embodied metaphors, metonyms, and the Eisensteinian *pars pro toto* – as a principal cognitive (creative) method. As these 'shared' conceptualizations are argued to emerge from *embodied simulation*, and in some sense also to correlate to global non-discrete cognitive processes, they are deliberately assumed to have similar cognitive functions also in the more restricted domain of the authoring processes.

I could also have used the term 'externalization' as I did in 'Cinema as externalization of consciousness' (2006). However, the notion of 'externalization' has been problematized by Lev Manovich (2000), among others. In addition, I want to avoid naïve dualism or realist illusionism, which assumed incommensurable internal and external worlds to exist side by side. Here, the notion of 'externalization' is understood as one of many words for describing intersubjectivity, or what according to the theory of autopoiesis could be described as the domain of consensual or mutual orientation.

My hypothetical model of embodied simulatorium assumes a two-directional modeling perspective, from the point of view of the author 'outwards' and 'inwards'. If I were to emphasize the 'experiential' point of view of the spectator, I would deliberately give the enactment of the spectator the position of the 'first' enactor. Yet this position from my author's point of view is a kind of 'as-if' enactment position. I, as an author, will never be able to enact the other person's subjective situatedness as she experiences my authored installation. Instead, I experience it as a kind of *simulated enactment*, which I execute within my own embodiment. Therefore, from the point of view as an author, my perspective 'inwards' to my self is actually my perspective 'outwards' towards intersubjectivity. It is a perspective towards understanding the experience of the other, here, the spectator. Particularly from my authoring perspective, the first enactor is 'I' as an author in the midst of my embodied simulation of the other.

In my view, the author's embodied simulation and socio-emotional expressiveness, or the Eisensteinian 'feel' and 'attitude' towards what is represented, converge. In debt to A. Greco's discussion on his cognitive integration model, the dynamics of enactive cinema can be conceived of as integrating the two following framings: (1) A *psychological* model and (2) an *epistemological* model (Greco 1994). According to the first, I understand enactive cinema as an autonomous simulation model (similar to an *allopoeitic* system) emerging in the author's embodied simulation dynamics, read, the autopoietic system of Maturana and Varela discussed earlier. The second model suggests a manifestation or externalization of embodied cognitive processes as a worldview. This links to Eisenstein's discussion on the cinema author's emotional attitude or understanding about the selected theme one wants to depict. The worldview affects the 'feel' of the pathos composition, and vice versa, in a two-directional manner.

If taken as a general model of spectator participation, enactive cinema is a model of the interaction dynamics between the spectator and the 'external' cinematic framework of interfaces, screens, other spatial set-up *and* the story generation. Simultaneously, it models the spectator's complex 'internal' simulation dynamics (as captured in psychophysiological measurements) in the act of experiencing the cinematic framework. Here, however, due to my emphasis on the author's point of view, I will describe spectator enactment as a *simulated spectator*, i.e., a metaphoric 'externalization' or an 'extension' of my embodied simulation as an author. Instead, the process of authoring enactive cinema models the author's complex simultaneous enactment 'outwards' within the phenomenal world (modeled with cinematic framework) and 'inwards' within the complex simulation dynamics.

The discussion above on the subjective aspects of the authoring process leads my discussion to the intersubjective dimensions of being in the world – language, metaphors, conceptualizations, theories, etc. Perhaps the borderline between body (sub-subjective), mind (subjective), and world (intersubjective), may indeed be rejected, lending space for a holistic understanding of mind.

6.1.3 INTERSUBJECTIVE LEVEL: EISENSTEINIAN 'ATTITUDE' TOWARDS THE EMERGENT THEME

This section leads towards shared practical implementation of the embodied simulation hypothesis.

All cultural objects such as cinema may naturally be categorized as intersubjective phenomena. The theoretical grounding of the phenomenon of intersubjectivity is constituted on the idea of embodied neural simulation.

As a starting point I assume that creative imagination aiming at intersubjectivity is based on *embodied simulation of relatively shared, intelligible knowledge about being-human-in-the-world*. This relates to the two roles of cinema, that of 1) a *miniature model of a phenomenal world* (a model 'outwards'), and 2) a model of the emotion dynamics of embodied simulatorium (a model 'inwards').

On the basis of neuroscientific findings, as described in the theoretical section of 'Eisenstein Extrapolated', it can be concluded that embodied simulation constitutes the author's sensorimotor basis of understanding and imagining the 'other' and 'otherness'. The sub-subjective dimensions of enactment intertwine with the intersubjective environment. This means that the experience of oneself being an individual amongst other individuals alike, yet somehow unique, is embedded in the cognitive dynamics of bio-culturally determined intersubjectivity.

As discussed earlier, the evidence of unconscious mirroring processes suggests that observing an act, for example grasping an object that anticipates a torture scene, activates in the pre-motor regions of the brain the same neural networks that would be activated if I were actually grasping the object myself. Grasping an object in cinema is rarely without future meaning but always relates to context. As all acts in the everyday world are context-dependent, on the cinema screen they are even more particularly so. Cinema is typically authored according to economical aspects, for transmitting a reasonable amount of information to the spectator in the most economical amount of time, while balancing between the emotional aspects of spatio-temporal montage flow, for example by means of optimizing the introduction of an element not too soon, not too slowly, and not too late.

As suggested by Eisenstein, cinema resembles a basketweaving or an orchestral composition, where all the threads are folded in such a way that they all support the construction of the end product as a whole. Now, *embodied simulation* posits an interesting question on the authoring process, if instead of typical everyday-life scenes (e.g. basketweaving) one is determined to author a painful torture scene as part of the creative process. I as an author 'feel' or perhaps have become convinced by my producers or other tutors involved that the emotional theme demands showing the action of torture instead of referring to it at a more associative level with sounds or other imagery. On the professional level of cinema conventions, which determine how these scenes are typically constructed, this seems an easy task. A cinema author may rely on a group of professional actors, set-designers, special effect designers and cinematogra-

phers, perhaps even torture experts, to design a believable and emotionally powerful scene. Yet, to be able to show something emotionally shaking, I have to imagine what kinds of aspects the act involves. How do I imagine showing pain, humiliation, and fear of death on behalf of the tortured, on the one hand, and the pleasure of power, routine work, or self-disgust on the part of the torturer, on the other?

Assuming that human beings share emotional experiences to a great extent, if I find a scene of torture disgusting and difficult to watch, I assume most people feel the same. This has also been shown in a number of psychophysiological and neuroimaging experiments with test persons who have a normal, healthy brain structure, i.e., the linkage between the limbic emotion system and neo-cortical areas (see pages 199, 215, 234). Neuroimaging has also suggested that the cortical activations of individual brains have the tendency to synchronize with others when watching films (Hasson *et al.* 2004). However, the intersubject correlations differ in terms of the film genre and the level of aesthetic control of the films, a higher aesthetic control relating to higher intersubject correlation, and vice versa (Hasson *et al.* 2008).

According to the embodied simulation theory, one may hypothesize that the following three events activate very much the same neural networks in my biological brain: (1) Observing a violent event (a torture, or a rape) only a few steps away from me, which demands my immediate reaction, (2) the same event on the screen reinforced by a dramatic sound environment, or (3) imagining a violent event happening just a few steps away from me and how I or someone else would react to it, this 'as-if' the violation would take place 'in reality'. From the embodied simulation point of view these options may be considered as differently contextualized aspects of the same emotion-driven (sensorimotor/perception-action) event. The context-dependency arises from *my attitude* towards what is happening, as also Eisenstein emphasized. Perhaps, in (1) and (3), from the culturally defined perspective (education, moral views, religion, etc.) my own behavior or reactions reflect socio-emotional patterns, expectations, norms, and cultural conventions, e.g. automatically defending someone threatened, accepting altruistic punishment 'She got what she deserved' (Singer *et al.* 2006), or expressing nonchalant attitude 'C'est la vie'.

Here, one is reminded of the functional neuroimaging findings of Tania Singer and others, which suggest that the intensity of empathic activation in brain is directly related to the subject's judgment of right or wrong acts of another person. In their words, "people like cooperating with fair opponents but also like punishing unfair opponents" (Singer *et al.* 2006, 468.). This may explain the popularity of the action or thriller films, where usually the man, who has lost his beloved ones, revenges the suffered unfairness. Another interesting topic arises from the experience of injustice executed by such superior powers as landowners, or political and institutional agents, such as psychiatrists, layers, police, or other legal representatives of societal order, including also the psychological violence towards a child by the biological parents. Now, the scene of torture provides a complex simulation task for I as the author, who has set off to create a powerful cinematic imagery.

Simultaneously, and what the embodied simulation maintains automatically, I make judgments of the event in terms of my own wellbeing (for example, estimate

the risk of getting hurt myself). In my imagination (3), I may even succeed to simulate my acts in such a way that the situation is resolved to the advantage of the violated. Yet, as a viewer of a screen event (2) I cannot help the threatened, but neither can I escape the event even through the effort of closing my eyes and blocking my ears preventing the screaming sounds of the violation to enter my mind. Even though I react against it and try to close it out, I know that the event is going on. Even though I do not hear the screams or see the action, my embodied mind with its effort invested in voluntary rejection, on the one hand, and the unconscious survival-based orientation, on the other, enforces the fact that I cannot escape the scene. As psychophysiological evidence on emotional contagion suggests, I cannot but simulate or 'feel' the fear of the violated, and/or perhaps unconsciously simulate the danger of getting hurt myself. This may also be described with a cultural construction as the feeling of anger elicited by the injustice.

When assigning something as meaningful, the complex dynamics of embodied mind makes no distinction between the two facets of 'real' life or 'simulation environments' such as cinema. From his evolution theoretical point of view, Antti Revonsuo (2000) discusses dreams as a survival-oriented simulation system, which particularly in the ancestral environments enabled mental rehearsals of potential threatening situations one may come across in the 'real' world. Inspired by Revonsuo, cinema and computer games may also be considered as modern simulation environments for preparing oneself for threatening or otherwise demanding social situations (Tikka 2006).

This discussion further suggests that what is typically conceived of as 'pure' fiction or entertainment may be 'pure' only at the conceptual level. This relates to Noë's (2007) argument that no such thing as a 'pure' Husserlian reduction exists elsewhere but at the hypothetical level. My view is in accordance with this holistic view on cognition. All attempts to extract a 'pure' cognitive process out of its context are doomed, because the innate sensemaking of a biological being cannot be excluded. Sub-subjective underpinnings guide the conscious processes, converging in the emotional dynamics of the mind. Once embodied simulation is assumed to be involved, 'pure' reduction is lost. In addition, I assume that at the experiential level (emotional embodied level) the real and fiction mix; observation, enactment, and imagination are based on the same embodied simulation process. Following the principle of reciprocity, no 'pure' conscious processes nor 'pure' embodied simulation processes exist.

The meaningfulness of the reproduced, depicted, or simulated situation builds on experiential aspects that are not related to form or format of perception or any 'representation.' This assumption allows me to argue that, for example, an emotional experience in a virtual environment with large, high-quality audiovisual screen imagery or a miniature screen of a mobile phone may equally provide similar emotional involvement (Tikka 2006).

I have suggested elsewhere (Tikka 2005) how the model of a hypothetical *simulated* spectator inhabits the author's embodied workspace, which in turn may rely on prototypes, unique character constructions, or perhaps borrowed figures created by someone else.

6.1.3.1 Shared Emergent 'forms'

An authored cinema montage equips cinema with *an intersubjective frame of sensemaking*. This means that the practical making of cinema, production of its allopoietic form, can only come into being in embodied simulation dynamics of, first, the author and then, of the spectators. Eisenstein argued in his time that the dynamical structures of the author's creative mind surrender themselves to further scrutiny in the functional structures of montage composition.

In a reciprocal manner, the author's embodied simulation constitutes the basis for 'forms' of enactive cognition, involving conceptualizations, categorizations, montage structures, or other intersubjectively determined objects and symbolic systems that emerge within the authoring process. These emergent forms, in turn, may function as conceptual structures for embodied simulation processes. The notion of emergent form refers to the spatio-temporally structured experience, for example, image-schemas or other repetitive sensorimotor patterns, which are assumed to affect the plastic adaptive simulation processes of a holistic system. It is reasonable to suggest that the coherence of experience generated in the mind is based on intersubjectively shared metaphoric projections and image schematic structures, as described in Lakoff and Johnson's *Philosophy in the Flesh* (1999). These structures are conceptualizations, or visualizations, that function as the bio-culturally sharable borderline between the embodied simulation and intersubjectivity. This is sharply distinct from classical semantics, which is interested in defining an 'objective' meaning for propositions or symbols. Meaningfulness may not be attached to the objects or entities of the world, as their proper features, as also noted in the affect theorizing of Husserl (see page 175).

It seems that in a similar manner as the sub-subjective sensemaking relies on Gazzaniga's coherence generator, so does the intersubjectivity. I generally assume that, put in metaphoric terms, the less an enactor has to involve the Gazzanigan interpreter in the brain, the less she becomes involved. This correlates with the experience of meaningfulness. In relation to cinema, meaningfulness is strongest when the participation involves enactment, filling in gaps, building bridges, constructing explanations for supporting coherence of the experience, or as in computer war games, making a physical effort not to be killed – once again. In accordance with Torben Grodal's (1997, 2000) or M. M. Wirth and O. C. Schultheiss's (2006) framework, both anticipating a romantic kiss or a violent rape scene would equally involve the massive machinery of neurohormonal enactment. Eisenstein experimented with psychophysiological emotional shocks in his practical work, when small children were crushed or animals slaughtered (*Strike* 1925), but also at the metaphoric level, when the cream separator finally spouted white milk in a vital arch onto the face of a woman bursting into laughter (*Old and New* 1929).

In this light and in the Eisensteinian spirit, montage is conceived as the cinema author's method for creating emotionally meaningful cinematic experiences in montage compositions (montages). Furthermore, the montage structures that the author's mind produces and interprets into meaningful events I assume to correlate within an ecol-

ogy of continuous self-recognition and self-modification (Neisser 1976, 12; Kaipainen 1996). Conceived of as a property of the mind, these embodied feedback loops enable an organism to continuously construct and modify the experiential perspective on the world, and further, the enactment according to this subjective construction (Varela *et al.* 1991; O'Regan & Noë 2001; Thomas 1999).

The hypothesis of the author's embodied simulation as a sensemaking method correlates to the practical *methods of montage*. In other words, and echoing Eisenstein's embodiment of emotional theme, the bodily spatio-temporal organization and orientation schemas of these sub-subjective feedback loops correlate to expressiveness of the author. To be read, they are dynamic-organic correlates of creative processes.

The act of montage is the author's method of sensemaking, which organizes cognitive patterns of mind into comprehensible structures (montages). I infer therefore that, for example, emergent cognitive models that cognitive scientists apply to describe functional structures of the human mind (models of conceptual blending, force dynamics, multiple drafts, global neuronal workspaces, etc.) must also, by nature, be applicable to the cinematic sensemaking structures (montages). In other words, such cognitive models could thus be modified and implemented as montage models. This correlation between the modes of thinking and the methods of montage, in my view, is what Eisenstein tried to concretize in his 1935 speech, when he described the primitive habit of Indians to open all knots in the village when a woman was giving a birth to a child (ESW3).

The interaction of the multiplicity of constitutive elements, stylistic decisions, camera movement, lighting, and so on, constitutes the emotional *balance* of a montage composition. Cinema montage, as any imaginative or descriptive cognitive model, relies on inherently dynamical *Gestalt* principles, such as perception of closeness, groupings, similarities, sequences, and so on. The embodied image-schemas and the emergent patterns of sensorimotor perception give structure to the author's cognitive conceptualization and categorization. Leonardo Talmy notes that a significant proportion of subjective introspection ought to accompany the otherwise 'objective' interpretation apparatus of the scientific third-person perspective, in order to discover how one's experience of the physical forces affects the way one conceptualizes and uses language in abstract levels of expression (Talmy 2000, 4).

This kind of *understanding* is assumed to happen in the cinema author's domain in a similar manner as Talmy argues it to happen in the scientific domain. Indeed, the domain seems to have an innate capability to generate cognitive models (Talmy 2000, 455). As discussed earlier, Mark Johnson in *The Body in the Mind* (1987) also shares with Talmy (2000) and other proponents of cognitive semantics an interest to show how the general *Gestalt principle of force* shapes the conceptualization of embodied meaningfulness (see pages 172, 187).

These topics on emergent 'forms' of mind direct the present treatment towards the practical authoring process and montage as a kind of intersubjectively shared sense-making system.

6.1.3.2 Montage as a model of sensemaking

Thus far I have studied the theoretical basis for how the Eisensteinian method of *montage*, treated in the chapter 'Eisenstein revisited', might rely on the same dynamic organic laws that govern the nature of an author's embodied mind. Eisenstein previsions that in the future "the laws of construction of inner speech turn out to be precisely those *laws which lie at the foundation of the whole variety of laws governing the construction of the form and composition of art-works*" (Eisenstein 1949, 130; *italics by S.E.*). Eisenstein points out that his considerations particularly focus on applying the theoretical discussion on the image-sensual thought processes to artistic practice (FF, 130n).

The present work follows Eisenstein's way of referring to practical implementation: "This thesis is not offered as either new or original. Both Hegel and Plekhanov gave equal attention to sensual thought processes. What appears to be new here is a constructive distinction of the laws of this sensual thinking, for these classics do not particularize on this aspect, while no operative application of this thesis can be made to artistic practice and craft training without this distinction. The following development of these considerations, materials, and analyses, has set itself this particular operative aim of practice use" (FF, 130n*). This involves studying, for example, how the synesthetic integration of the senses is embedded in multisensory montage compositions and how the emotional theme becomes embodied in the montage structure in the authoring process.

According to Eisenstein, the author's thinking structures have to embody the emotional source, in order for this to become further embedded in the cinematic structure. Human psychology defines "in exactly the same way" both "the complex compositional elements of form" and "the content of the work for itself" (NIN, 10). Emotional experience constitutes the foundation of montage, which organizes and manages complexities of anticipatory cognition, imagination, creativity, memory, etc. In my view, enactive montage as sensemaking is a synonym for mental schemas and other emergent 'forms' of mind. In a reciprocal manner, embodied montage (based on embodied simulation) emerges and constitutes the author's cinema-in-the-mind and further, the diversity of practical montage structures. Perhaps one could define montage as *the* holistic meaning structure that 'glues together' the emotional content of cinematic imagery. Montage is a kind of image-schema that constitutes the dynamics of montage composition.

Imagined in the embodied mind's workspace, i.e. simulatorium, how certain spatio-temporal rhythms or other patterns would converge, alter, superimpose, blend, dissolve and so on, the instruments for this imagination are embedded in the biological dynamics of the mind. Taking this into account, it is not feasible that human cognition would have separate parallel but identical systems for fiction and fact, that is, dramatized, yet based on something that is believed to be true or real.

According to Eisenstein, holistic *montage replaces narrative*. He always systematically applied the notion of montage rather than narrative. Even in his literature analyses he emphasized the author's role as the composer of the artwork rather than a 'narrator'. This act may be regarded as an Eisensteinian 'aggression' towards the position that claims cinema as an extension of 'plot-based' literature, naturalist theater, or other rigid forms of art.⁸⁴

The reciprocity principle (see page 240) allows the notion of montage to be viewed as either the *process* of organization, and the *product* of this process, or the product *as* organization, producing (enabling) various processes of organization. In the following pages, the notion of 'montage' refers to the *author's method* of sensemaking, conceptualizing, problem-solving, and structuring of enactive cinema experience. The noun 'montage' (in plural 'montages') refers to *the authored system* that, in dynamical manner, structures, controls, and enables the unfolding of cinema experience.

To sum up, while the authored linear structure takes the spectator from the beginning through the middle to the end as exemplified in the archetypal journey of a Hero in Joseph Campbell's classic book *The Hero with a Thousand Faces* (1949), here the authored non-linear, real-time montage organization comes into being in the enactment of the spectator and from a kind of dynamical landscape of potentialities. The author's intention is to maintain control over the spectator's experience within this landscape. The next section will experiment with this in practice. Promoting a new enactive approach to cinematic interaction, which is based on the spectator's physiological presence, I will discuss how my practical case study *Obsession* introduced the management of the ontology of emotional content as an authoring activity.

6.2 SIMULATORIUM IN PRACTICE: EMERGENCE OF 'FORMS' AS MONTAGE

This section describes my practical implementation of the above theoretical understanding of embodied simulation processes and shows in what manner the practical extensions of my authoring mind correlate to the simulation processes in the mental simulatorium, when I create things, worlds, entities, stories, theories, or tell jokes. My creative processes, that is, my imagination, or my mental simulation dynamics, enable cognitive models, emergent schemas, conceptual blending, metaphoric projections, or other heuristics.

Dialectical sensemaking of the montage method will be shown to both structure

⁸⁴ The term 'literacy' used in Messaris (1994) is rejected in relation to cinema as over-emphasizing narrative and literary dominance in the cultural constructivist descriptions of cinema comprehension.

and govern the complexities of the embodied simulation dynamics. In the following, I will suggest a cinematic model of emotion dynamics, which may be considered a hypothetical model for the holistic complex dynamics of the mind *per se*. This means employing a metaphor of emotional landscape similar to the metaphor applied to describe the dynamical landscape of the human mind (e.g. Thelen 1995), and which would be based on a continuous follow-up of the spectator's emotional experience.

The keyword in the following pages continues to be *embodied simulation*. The hypothetical idea of the embodied simulatorium will be elaborated in terms of a functional model of interactive cinema, or a *practical simulatorium*.

The practical simulatorium has a two-fold modeling function:

- (1) It models in practice the embodied simulation dynamics, which have been described as constituting the basis of the authoring process in the previous chapters. This implies inductive bottom-up reasoning from experience to description, and *complements in reciprocal manner* the deductive top-down reasoning of the previous section.
- (2) The practical simulation model will also have an artistic dimension as an independent cinema installation.

I understand practical simulatorium as an allopoietic system, i.e., an autonomous product of an autopoietic organism, as conceived of in Humberto Maturana and Francisco Varela (1980). The technological and scientific tools are cognitive extensions of the embodied mind, and their convergence with the organic being in the world may be conceptualized as a kind of liminal conceptual space in-between the mind and its descriptions of the world, as Andy Clark proposes (1999). This supports my argument that the products of one's mind may tell us something about the dynamical structures of that particular mind. This means an allopoietic entity (film/montage composition) describes aspects of the autopoietic entity that created it (author/embodied simulation). This should also apply when I direct my attention to the products of my mind proper. I find it particularly challenging to discover how, and to what extent, it is possible to author the unconscious interface of emotional enactment.

Throughout this section, my research-based *practice* reflects back to the theoretical considerations of the earlier pages.



6.2.1 CASE: ENACTIVE CINEMA INSTALLATION OBSESSION

“One does not express one's ideas as logical deductions; one embodies them in camera shots and creative editing” (Eisenstein 1999, 399).

Enactive cinema has been concretized in the practical implementation of my *enactive cinema project Obsession* (2005).⁸⁵ It is an interactive work with multiple screens, *biosensitive* interface, and nonstop structure.

Obsession was designed so as to play with the anticipations and expectations of the spectator, that is, with those uncontrollable fears and desires that the author assumes the unfolding of the story to elicit in the spectator's experience. In order to create a laboratory framework that is to some extent controllable, one of the main strategies was to reduce the elements of the story to a minimum, while allowing multiple narrative interpretations. In the story, concentrating on the emotionally loaded atmosphere between the female and male characters, it was necessary to minimize the number of other affective entities. It was obvious that the conceptual and experiential understanding of the relationship between the woman and the man was sufficient to enable a wide associative landscape of potentialities. The emotional set-up of *Obsession* assumed an innate, mutually shared ecological grounding for survival-based emotional anticipations, for example, those that are related to sex and violence.

In the following pages, I will outline the project's emotion-driven montage dynamics and show how it was designed to take into account the unconscious dimensions of cinema experience. As a simulation of emergent emotion dynamics in a cinematic context, it is intended to reach beyond the particular project as a prototype for a more general concept of enactive cinema, and to serve as a *creative laboratory* for describing the emotional basis of the authoring process.

Enactive cinema involves creating, controlling, and maintaining complex emotion-driven interaction between an enactive mind and dynamical cinema montage. Unlike the common idea of interaction, conventionally defined by means of conscious manipulation of the narrative, in *Obsession* the spectator interaction is augmented so as to involve both unconscious and conscious cognition.

The starting point of *Obsession* was framed with a question: If the activity of the holistic mind is based on emotions as Antonio Damasio has suggested, how, then, could these emotions be captured and authored in cinema? How can one concretize the 'emotional feel' or the embodiment of the emotional themes of the cinematic material? How could emotions be grasped in a similar manner as one may grasp the rhythmic, graphic, tonal, over-tonal, and other physical features in the cinematic mate-

⁸⁵ For the story content and the cinematic imagery, see the short film *Obsession* (30 min) included in the attached DVD. It also includes the documentation video of enactive cinema installation *Obsession* (2005). See Appendix 1: Team credits for the project *Obsession*; See Appendices 2: Technical descriptions of enactive cinema installation *Obsession* (2005).

rial or montage compositions?

The description below concentrates on the tools and concepts elaborated through the project, and only secondarily the story itself.

6.2.1.1 *Obsession* short film

The footage and other material of the installation are based on an autonomous short film *Obsession*.

Obsession's story-world depicts a young woman Emmi, who works in a self-service launderette managed by her mother Jatta. Jatta is about to give birth very soon and is obviously happy. Nothing in her behavior reveals that she became pregnant due to 'date rape'. She has wiped past events into oblivion. Instead, her daughter Emmi is going through the grieving and healing process on behalf of her mother. When a customer Henrik enters to do his laundry, Emmi's mental processing begins to fast-track – in Emmi's own obsessive manner.

There are two interpretations of the attribution of 'obsession' for the project.

The first interpretation simulates the factual symptoms of psycho-pathological disorder in the main character Emmi's mental state, which is disturbed by repetitive violent imagery. A psycho-pathological disorder across all medical and psychological paradigms, obsession involves recurrent and persistent thoughts, impulses, or images that are experienced at some time during the disturbance as intrusive and inappropriate and that cause marked anxiety or distress, as described in *The Diagnostic and Statistical Manual of Mental Disorders* (2000).

The second perspective is metaphorical in the same sense as Eisenstein described the emotional primitive force driving the authoring process. For Eisenstein the notion of obsession implies the psychic flux of the author. In the essay 'Superconcreteness' "the theme engenders that 'special' psychic state in which described norms of perception, vision, expression, and performance operate in the vivid images of that given material of the theme that appear in the finished work" (NIN, 168). "But", Eisenstein continues, thus stating the case for *Obsession* as well, "the obsession with this state does not spread to some kind of abstract, timeless, spaceless, formless, and objectless state: Through conscious willing, its whole force 'electrifyingly' makes its way into material through whose essential qualities this very state arose, so that it forces this material to take shape according to the law of copying precisely that psychic state in which ('inspired') the artist found himself" (NIN, 169).

Marked by intensive teamwork and a short ten-day shooting schedule, the production followed the typical path of cinema production since Eisenstein's time. As shot on 16mm color film just as cinema was beginning to increasingly digitalize, the production perhaps may be seen as mediating between the gradually diminishing returns of the use of film technology (emulsions, laboratory development, film negatives) and a growing generation overwhelmed by the potentialities of digital technologies.

6.2.1.2 First installation. From interactive to enactive

The need for a novel conceptual treatment of spectator interaction became evident to me already at the first public exhibition (Voipaala Art Center, Finland 2003) of a cinematic work that relied on the idea of unconscious interaction.

My original assumption was that upon entering a space with moving images on the screen, the spectators would immediately understand that the installation was about 'viewing a film' or 'being told a story'. This however did not happen. Interestingly, the notion of 'interactive' in the advertisement poster of my experimental 'interactive cinema installation' apparently killed the one-hundred-year-old schema of immersive cinema viewing: enter the cinema, find your place, and watch the film. As I followed the people in the installation space, they seemed to concentrate on waving their hands and making abrupt movements instead of watching the film. I came to notice that the notion of *interactive* cinema without explicit instructions confused the participants. The general layman understanding of interactivity as a goal-directed task to successfully *force* the narrative to change seemed to dominate and create a fundamental conflict with my preliminary idea of cinema as immersive, feeling-driven situatedness.

My conclusion was to reject the participant's *conscious manipulative goal-driven interaction*. Instead, the cinema montage should be driven by the spectator's unconscious emotional experience.

Managing the multiplicity of potentialities implied by the material was a great challenge. The solution was to organize it as a content database with corresponding spatially organized ontology, to be described in next section. With this organization, the limited footage opened up to an infinite range of potential emotional atmospheres or perspectives on the material, however, with a coordinate system.

In this setup, the idea was to give the author full control over how content units co-occur and follow each other in the unfolding narrative. An algorithm for generating narrative was developed that relied on fuzzy rules. This machinery was referred to as the *Eisensteinian montage machine* (Tikka, Vuori & Kaipainen 2003).

In the exhibition setup, the audience was allowed to walk around in a space with no seats, and the assumed unconscious interaction was tracked and interpreted from the movements of the spectator. Stillness was interpreted to indicate interest and attention while movement was interpreted as the lack of these. These apparent, simplified reflections of the spectators' emotional and situational presence were used to modify the generation of montage – without requiring the spectator's conscious interaction.

Based on the experience of the Voipaala pilot installation, I introduced a new concept of *enactive* cinema. This was done in order to create distance from the distorted meaning of conscious manipulative interactivity. The enactive aspect emphasizes the continuous, unconscious interaction between the cinema and its spectators, referring to the idea of acting with and within an environment, an idea synthesized from Neisser (1976), Varela *et al.* (1991), and Kaipainen (1994).

6.2.1.3 Enactive cinema installation

The *Enactive Cinema Installation Obsession* was premiered to the public at the Finnish Museum of Contemporary Art Kiasma, Helsinki, in June 2005, thereby testing the notion of *enactive cinema* for the first time.

The installation description emphasized the spectator's affect on the story: How the narrative unfolds, and how rhythm and soundscape emerge, depend on how the spectator experiences the emotional situations on the screen. My notion of *dynamic emotion ecology* was introduced, referring to the unconscious interaction between the spectator and the fully authored cinematic artwork. The Eisensteinian montage-machine matched the cinematic content with the spectators' psychophysiological states. The data measured from the sensors was referred to as *situation data*, which specified how the spectator contributed to the story flow.

The story told by enactive cinema was not controlled by any kind of conscious activity of the spectators, such as clicking interface elements with a mouse. Instead, the emphasis was on the unconscious immersive experience, which was argued to characterize cinema viewing.

Obsession was designed to support maximal artistic authorship. Following the first of filmmaker Eisenstein's principles, the author's responsibility is to prepare a cinematic environment that best protects the spectator's emotional construction of cinematic experience. The emotional dynamics was given its own cinematic role. Instead of two tracks, the unfolding of cinema montage involved three: moving image, sound, and emotion tracks. I emphasized the cinematic quality of the material shot on film and the soundscape, carefully supporting an almost infinite range of emotional atmospheres on the four large-scale cinema screens.

The data resulting from the psychophysiological measurements was captured from the cinema seats in the middle of the installation space. On the arm of each chair, a red-lit shape of a hand invited the spectator to place her hand on the built-in biosensors. Each spectator's heart rate (HR) was continuously measured from her fingertip, and the emotional arousal was captured from her palm in terms of electrodermal activity measurement (EDA). The spectator decided which one of the four screens to watch. Her orientation was tracked with an infrared sensor hidden in the rotating chair. The screen momentarily attended to was defined as a *dominating screen* while the three other screens referred to the narrative direction taken on the dominating screen. The spectator's situatedness in the cinema space became analyzed in terms of the particular emotional content of the unfolding montage on the screens.

The implementation of the enactive cinema installation relied on an authored, spatially defined content ontology, or *ontospace* (Kaipainen *et al.* 2008). It described meaningful emotional and technical dimensions assigned to the content elements in a spatial manner.

One may recall that Eisenstein was obsessed with the idea of including spectators' emotions through the montage organization. Continuing this path that he was not able to take himself due to the limitations of the available technologies, in case *Obses-*

sion, I also included an emotional track, in addition to the sound and video tracks. The idea that emotions were part of the montage, with a status equal to those of image and sound, provided a novel perspective on the concrete organization and attribution of emotions.

Technically implemented by means of a cluster of computers, the Eisensteinian montage machine managed the analysis of sensory data, sound atmosphere, and cinematic data for each of the four screens. The process could also be monitored and managed remotely over the Internet. The interpretation of the spectator's real-time psychophysiological data, on-the-fly analysis and feedback to the montage system aimed at maximum responsiveness. The following section describes the technical aspects of the enactive cinema installation *Obsession*, published also in 'Narrative logic of enactive cinema: *Obsession*' (Tikka *et al.* 2006).

6.2.1.4 Author's Creative Toolbox

In *Obsession* the authoring process came to involve the creation of an ontological workspace (later *ontospace*, Kaipainen *et al.* 2008) with which I was able to frame the ontology of the cinematic world out of my experimental world. The cinematic *ontospace* relied on the idea that any conceptually defined environment can be analyzed in terms of entities, and their mutual similarities qua proximity in the *ontospace* (Tikka *et al.* 2006, 209–210).

The holistic standpoint inspired the design of *Obsession's* (1) annotation tools, and (2) montage machine, both of which are described below.

CINEMATOGRAPHY

All of the content was first broken into an n of narrative units (or media clips, fragments, shots, sound clips). The cinematographic units were single-shot compositions, which were handled as 'enveloped' framings or 'authored durations' taken from the original pre-produced video and sound clips. Each image or single element was assumed to be subject to the same compositional laws that governed the logic of the montage as a whole.

ANNOTATION TOOL

Faithful to my idea about the fundamental emotional underpinnings, a set of annotation tools was developed to facilitate an ontological analysis and generation of narrative sequence. The complexity of resulting media clips was managed such that each narrative unit was labeled, its features listed, categorized, and annotated according to their multiple qualitative, emotional, or contextual coordinates in an m -dimensional *ontospace*, as described later in this section. Determining the positions of content elements with respect to them was a major part of the authoring process.

■ TWO-DIMENSIONAL SIMILARITY MAP:

A two-dimensional similarity map implemented in the annotation interface was a specific tool for the spatial visualization of the similarity relations of the narrative units in the m-dimensional space. The spatial view showed the positions of the units in terms of any two selected dimensions (e.g. aversive and negative). The similarity map was designed to manage the multiplicity of narrative units by dragging and dropping any of the narrative units (represented by its icon) within other narrative units. This allowed an organization of those units intended to be similar with respect to two ontological dimensions chosen at one time (see image 26). The software then automatically set the appropriate values to correspond to the positions of those narrative units. This solution was instrumental in determining ontological positions in a coherent manner.

■ 'SYNESTHETIC' ANNOTATION TOOL:

In order to link the annotation process even more intimately to the unconscious dimensions of mind, and to the idea of widely grounded integration of senses, a 'synesthetic' annotation tool was tested. A blurred color space and a color picker were implemented in the annotation interface (see image 25j). The analyzer pointed with the picker to a spot on the color space that she *felt* featured best the emotional resonance of the particular media object. This tool for capturing the 'emotionally felt tone' of the particular image or sound clip was used during the annotation process of both the visual and the sound clips, such as voice-overs and atmospheric sounds.

MONTAGE MACHINE

The authored *algorithmic montage* managed the montage process according to the authored rules, as coded into the dynamical framework of *Obsession*. Inspired by dynamical systems theory and embodied mind views (section 5.2.3.), the project aimed to study the author's control over the spectators' situation data, i.e., psychophysiological presence, behavior, and emotional states. The play-out of *Obsession's* cinematic montage in the Kiasma installation space performed according to the production decisions taken by the author (design team). This means, on the one hand, that the *algorithmic montage* successfully provided adequate dynamic metadata-related content management based on an authored cinema ontospace, and on the other, the system enabled spectator participation within the *authored emotion dynamics* (i.e., the spectator's physiological data and the movements of the chairs were tracked and fed into the montage system).

The principles of *Obsession's* narrative logic were discussed in the article 'Narrative logic of enactive cinema: *Obsession*' (Tikka *et al.* 2006, 209–210). The notion of narrative logic linked to the general notion of narrative and narration, while the notion of logic, in turn, associated to the mathematical formulations of computer-driven generative systems. As discussed in more detail below, the narrative logic of the enactive cinema project *Obsession* were further divided into reciprocally interacting dynamics, that of the logic of framing and the logic of enactment.

The two algorithmic montage principles of (1) dialectical dynamics and (2) coherence dynamics were introduced into the system within the author-set rules.

The dialectics (1) constituted the grounding principle of *Obsession's* dynamical cinema montage. It enabled emergent meanings from the juxtaposition of opposing forces. The conflicting forces in turn enabled abrupt changes from dominating narrative features to completely different ones, and served emotionally and intellectually interesting montage generation. The dynamics of conflict were conceptualized with the notion of *appealing* and *repelling* based on similarity features of sequential images. In turn, the inner coherence (2) of the scenes was supported by selectively introducing *strong attraction*. Based on similarity features, strong attraction was authored to *enforce* a particular feature dimension relevant for scene coherence.

In the montage machine these two dynamics were designed to affect the play-out simultaneously. The change from one scene to another I prefer to describe as a kind of *narrative bifurcation*, an event where the scene reached its inner and outer limits. Inner limits related to running out of the images related to a particular scene. Limiting conditions from outside of the scene were authored to come into play when the attraction of images from some other scenes exceeded the force of the inner attraction maintained in the inner dynamics of the scene in question. A scene was viewed in dialectical position with the potentially following scenes and their contexts.

■ LOGIC OF MONTAGE:

Enactive cinema is implemented as an algorithm that performs a continuous montage of cinematic elements stored in the database and indexed by a relevant ontology, i.e., a set of selected, generated, imagined, or otherwise produced cinematic entities and their interactions. The montage machine generated cinematic experience from the particularity basis of the author's description of cinema ontology. Based on the dynamics of coherence and dialectics of conflicting forces, derived from Eisenstein, a set of narrative rules regulated the succession of cinematic elements by means of maximum similarity, computationally identified as closest mutual proximity in the content ontospace, thereby representing narrative continuity with respect to chosen dimensions. In the algorithmic generation of the montage, the rule set was applied to each narrative unit to calculate its fitness to follow the current one. The resulting fitness table was then translated into a probability table that regulated the stochastic choice of the narrative content at each moment.

The rules of *Obsession* were expressed in terms of a formula, designed so as to implement fuzzy logic in a similar spirit as Lotfi A. Zadeh outlines in his introduction 'Towards a Perception-based Theory of Probabilistic Reasoning' in *Fuzzy Logic: A Framework of the New Millennium* by Vladimir Dimitrov and Victor Korotkich (2002, 2). This means taking into account in the probability table both the input from the biosensors on one hand, and perception-based information of the enactive cinema framework on the other. This formulation allowed that rules could be blended in flexible ways, and the influence of each could be adjusted parametrically.

A generalized rule of *Obsession's* Eisensteinian montage machine can be described as such in which some fuzzy condition of the present narrative state relates to, for example, some relatively high or low ontological value, or a particular combination or trend of some psychophysiological measurements. A chosen dimension of the current

IF CURRENTLY		THEN				
C_j		$A_t P_t$		r_j	$A_x P_x$	W_j
HR	EDA	Current property		Follower property		Influence
-	+	10. DOMINANCE		ATTRACTS	11. ACTIVE-AVERSIVE-CONTROL	
-	+	6. POSITIVE		ATTRACTS	6. POSITIVE	
-	+	7. NEGATIVE		ATTRACTS	15. ABRUTION-SURPRISE	
+	-	8. COMEDY-TENDENCY		REPELS	7. NEGATIVE	
+	-	6. POSITIVE		ATTRACTS	11. ACTIVE-AVERSIVE-CONTROL	
+	-	10. DOMINANCE		ATTRACTS	15. ABRUTION-SURPRISE	
+	+	10. DOMINANCE		REPELS	12. PASSIVE-ACCEPTNG	
+	+	6. POSITIVE		REPELS	11. ACTIVE-AVERSIVE-CONTROL	
+	+	7. NEGATIVE		ATTRACTS	11. ACTIVE-AVERSIVE-CONTROL	
+	+	11. ACTIVE-AVERSIVE-CONTROL		REPELS	12. PASSIVE-ACCEPTNG	
+	+	12. PASSIVE-ACCEPTNG		REPELS	7. NEGATIVE	
+	+	15. ABRUTION-SURPRISE		ATTRACTS	11. ACTIVE-AVERSIVE-CONTROL	
-	-	12. PASSIVE-ACCEPTNG		ATTRACTS	7. NEGATIVE	
-	-	10. DOMINANCE		REPELS	10. DOMINANCE	
-	-	15. ABRUTION-SURPRISE		REPELS	15. ABRUTION-SURPRISE	
-	-	7. NEGATIVE		ATTRACTS	11. ACTIVE-AVERSIVE-CONTROL	
+	+	38. EMBODIED-HIGH-FQ		ATTRACTS	38. EMBODIED-HIGH-FQ	
+	+	39. EMBODIED-MID-FQ		ATTRACTS	39. EMBODIED-MID-FQ	
+	+	40. EMBODIED-DARK-LOW-FQ		ATTRACTS	40. EMBODIED-DARK-LOW-FQ	

Table 1. Emotion-related interpretations of ascending and descending heart rate (HR), and electrodermal activity (EDA).

narrative unit is thus related to a specified dimension of the candidate narrative unit. The relation indicates whether the property dimensions so specified should attract or repel the property dimensions of the possible following narrative unit, that is, whether similarity or contrast with respect to the selection should be favored in calculating the fitness for the next narrative unit. The probability of a narrative unit appearing is given as the ratio of its fitness function in relation to all fitness functions. For detailed mathematical formulations, the readers are referred to the article 'Narrative logic of enactive cinema: *Obsession*' (Tikka *et al.* 2006).

Logic of enactment drives the biofeedback circuit between the spectator's emotional situatedness and the cinema montage, i.e., the continuously tracked spectator's situation data are fed back to the montage system as a *perspective* to the narrative ontospace, that is, a particular choice of ontodimensions with respect to which the similarity relations are calculated.

Situation data were mapped to three emotional polarities (i.e., six end-states representing six action tendencies) of *approach* and *withdrawal*, *arousal* and *relaxation*, and the *anticipation of pleasure* and *anticipation of pain*. All these dimensions were assumed to be interdependent, inherently nesting one in the other, and embodying the multiplicity of psychophysiological dimensions. For example, the polarities of approach and withdrawal in correlation with the polarities of pleasure and pain have often been encoded as the expectation of sexual confrontation and fear of violence. The experience of fear was exposed to strong cinematic elaboration, while the narrative aspects characterized with pleasure were designed to play along in a more discreet manner.

One of the main guidelines followed in designing the emotion-driven montage generation was that the direction of the change indicated by the continuous follow-up of the situation data, was generally used to *enhance* the present emotional mood by means of directing the narrative flow, rather than dampening the present emotional mood. For example, if the situation data suggested strong arousal in connection to the momentary aggressive, fast-moving content, this kind of emotional content was enhanced rather than changing the mood to the opposite (see table 1).

The psychophysiological measurement set-up in case *Obsession* was much more simplified than those used in scientific emotion laboratory conditions. For example, the electromyography (EMG) of facial muscle activity was found an effective emotion tracking method in the preparatory phase of the work (in M.I.N.D Lab/CKIR).⁸⁶ However, this measurement requires sensors to be pasted on the skin. To avoid the disrupting effects of attaching sensors to the spectator herself, the following sensor devices were mounted in the armrest of the viewing chair, as discussed earlier (Tikka *et al.* 2006):

⁸⁶ The psychophysiological principles of interpreting emotion-related data rely on the collaboration and expertise of Niklas Ravaja. Under his supervision, Mikko Salminen recorded the data at the M.I.N.D laboratory, Center for Knowledge and Innovation Research, Helsinki School of Economics.

		EDA+	EDA-
<p>Note: Changes in HR involve synergistic counter-balance of opposing effects of sympathetic (ēflight or fight) and parasympathetic (ērest and digest) cardiac activations (Ravaja 2004); Skin conductance activity relates to behavioral inhibition, and cardiovascular to behavioral activation (Obrist 1981, 505)</p>		<p>Indicates intensity of stimuli; increased arousal, increased information processing capacity, supporting sensorimotor action tendency in threatening or exciting situations. (Dillon et al. 2000; Ravaja n.d.)</p>	<p>Calm situation, media stimuli relatively long; indicates low stress condition; note that electro-dermal response habituates quickly (Dawson et al. 2000; Ravaja 2004, 213)</p>
HR+	<p>Emotional arousal, general preparation for action, defensive reactions (Obrist 1981; in Ravaja 2004, 201); increased sympathetic activity vs. decreased parasympathetic activity; in positive valence stronger than in negative (Lang et al. 1993; see Dillon et al. 2000; Ravaja 2004, 209)</p>	<p>High values indicate high arousal; correlates to immersion; threatening or otherwise highly intensive stimuli; slow habituation; increased movements in response to high intensity stimuli; ēflight or fight</p>	<p>EDA- relating to decrease in sympathetic activation of the autonomic nervous system (ANS), and particularly after a high EDA+, instead of indicating increased sympathetic activity, HR+ may indicate decreasing cardiac parasympathetic activity, i.e., attentional engagement is lost</p>
HR-	<p>Increased automatic attention, if negative valence of stimuli is present (action readiness), information processing and stimulus identification; increased cardiac parasympathetic activity vs. decreased sympathetic activity (Graham 1992, 6; see Dillon et al. 2000; Ravaja 2004)</p>	<p>Orientation to novel or unexpected stimulus, e.g. cuts, movements: elevating subjective ratings of emotional intensity; cognitive inhibition (Detenber, Simons & Bennett 1998; Simons, Detenber, Roedema & Reiss 1999; see Dillon et al. 2000)</p>	<p>HR- may indicate increased cardiac parasympathetic activity due to attentional engagement; yet, in correlation with decreased EDA-, HR- may relate to decreased cardiac sympathetic activity; no arousing stimuli involved; relaxing; neutral, habituation condition</p>

Table 2. Emotion-related interpretations of ascending and descending heart rate (HR), and electrodermal activity (EDA).

1) A sensor for cardiovascular activity that measures the reflection of infrared light from the fingertip and calculates the heart rate (HR) from the changes between increased redness (systole, blood in peripheral) and decreased redness (diastole, blood in heart).

2) Changes in electrodermal activity (EDA) were measured from the spectator's hand resting upon tiny metallic pins attached to the surface of the sensor device. The device measured the opposite value of the electric resistance. A high value indicates dryer skin and lower arousal, while the lower values indicate a sweaty palm and higher arousal.

The data captured from the sensors was interpreted in terms of three emotion theoretical dimensions: valence, arousal, and dominance (Ravaja 2004; Tikka *et al.* 2006). Valence and arousal were taken to account for most of the independent variance in emotional responses (Greenwald *et al.* 1989), and they could be used to effectively discriminate between emotional responses (Simons *et al.* 1999). Valence rated the experience from positive to negative. It was understood to frame or contextualize the action-evaluation by either supporting the tendency to approach or withdraw. Arousal, in turn, associated mainly to the skin's electrodermal activity (EDA), implying changes in the sensorimotor information processing in terms of action readiness (see table 2).

Dominance as the third dimension of emotional activity was assumed to rate the feeling of being controlled by or being in-control of the situation. It suggested differentiation, for example, between the negative valence of anger and grief. It could also correlate to pleasure (of empowerment).

6.2.1.5 Further development

Obsession (2005) pioneered the concept of enactive cinema and paved the way for more advanced technological elaborations of dynamical montage. It also exemplified a first prototype for authoring dynamical emotion ecology, as I conceive of it to happen in 'real' human environments. Furthermore, the psychophysiological interaction dynamics between the spectator and the cinema montage could be studied in relation to the psychologically complex cinematic material.

Taking psychophysiological data into account expressed new kinds of demands on the cinema montage with respect to artistic freedom, on the one hand, and to artistic control, on the other. It also showed that it was necessary to go even further in distancing the enactive mode from the conscious interaction mode in order to protect the unconscious emotional dimension of the spectator's immersive presence from 'external' disturbances.

The expectation of the audience of manipulation-oriented interactivity became obvious in the installation venue. Once again, now in Kiasma, the immersive experience of the cinema genre had to compete with the curiosity of the spectator to the novelty of the system itself. How do my hand and its movements on the interface surface affect the narrative on the screens? Is it possible to detect the system underneath? Or

perhaps Johan Huizinga's (1950) *homo ludens*, here, a playing (wo)man, could even cause the system lose track of her enactments by some particular movements. The conclusion from the Kiasma installation was that the external visible interface on the armrest for tracking the physiological responses from the hand had to be removed.

In the following year in the International Symposium on Electronic Arts, ISEA 2006 & ZeroOne, San Jose, CA, in order to protect the spectator's immersive involvement with the story, *Obsession* had a medical monitoring foil embedded and hidden into the chairs.⁸⁷ It was also acknowledged that a mixed diversity of sensors, e.g., eye-movement tracking, could potentially contribute to even richer access to the spectators' emotional involvement. The ongoing technological elaborations are a topic for another thesis and another time. Instead, the following pages function as an outlet beyond *Obsession* with the intention to embrace all present and future versions in equal manner.

6.2.2 IMPLICATIONS: EMERGENT LANDSCAPE MODEL

In this section I discuss the implications of enactive cinema by the means of the *emergent landscape model*. The model takes the prototype of dynamical emotion ecology (Tikka 2005) towards more generalized conceptualizations of its dynamical characteristics.

It must be remembered that the cinema author's creative process is the focus here. Therefore, all entities other than the main character of this treatment ('the author' or 'I as an author') are to be considered simulated entities. The author's embodied simulatorium allows an infinite range of all kinds of imaginable entities to potentially inhabit a particular emergent cinematic world.

I consider the authoring of enactive cinema as a *modeling process*, which involves the following phases: a) constituting a cinema ontospace as a framing of world (dynamical ontospace); b) cinema montage for generating the functional interaction between the entities of the cinema ontology ('inner' interaction dynamics); and further, c) psychophysiological simulation dynamics for tracking the spectator's enactment ('outer' interaction dynamics). The *emergent landscape model* is partly framed out of the intersubjective phenomenal world according to the author's selective decisions (a model 'outwards'), on the one hand, and, on the other, it models an emergent embodiment of the author's emotional expressiveness (a model 'inwards').

The *emergent landscape* metaphor and its entailments as a set of sub-metaphors provide conceptual tools for further descriptions of the dynamics of cinema montage and spectator enactment. An emergent landscape model replaces the metaphor of the

⁸⁷ The 'second-generation' biosensors were implemented in enactive cinema installation *Obsession* (2006). The discreet vital signs monitoring (DVM) and dynamic, thin-film sensors were developed by Emfit Ltd. (<http://www.emfit.com>)

linear timeline of classical narrative theories, providing with it the modeling potentialities of non-linear montage generation. It is inspired by Eisenstein's discussion on the emotional correlations between the cinematographed visual landscape and the orchestration of music (see pages 58, 92, 118). It also has its basis in the thermodynamic principle of minimum energy in dynamical systems, referring back to the ontogenetic models applied to describe the dynamical aspects of cognitive development (Smith 2005; Thelen & Smith 1994) and to the concept of Manuscape (Tikka & Kaipainen 2003) (see pages 186, 189).

Enactive cinema is here modeled according to a master metaphor of emotional enactment *as* situatedness within a landscape, which emerges in the embodied simulation of the experiential world. The small verbal item of '*as*' by definition implies a modeling relation or analogue between the study object and its description. However, my special interest is on the combination of '*as if*', which embraces the domain of cinema conceived of as an emergent construction in the mind or an illusion, and has been discussed above in connection to emotions and embodied simulation (Damasio 1999; Gallese 2003; Cacioppo *et al.* 1992).

As discussed earlier, I have adopted the metadata concept of *ontospace* (Kaipainen *et al.* 2008), which describes the media elements, i.e., cinematic entities, their feature dimensions and relations, in terms of a spatial conceptualization, such that the characteristics of each element are described in terms of respective coordinates in the ontospace (see pages 168, 265, 279). A cinematic ontospace may be regarded as "a collection of coordinates that describe all [the author] feels is needed to give a complete description of the system" (Meiss 2007). It is also reminiscent of what Murray calls a *navigable story world* (1997, 134–135), given that appropriate navigation tools are provided. Yet conceptual ontologies only explicate what things exist and can potentially occur in the cinematic world without offering any narrative binding between them.

The emergent landscape metaphor has consequences for the modeling of cinematic dynamics in experiential terms of any 'natural' environment and with other metaphors of nature, such as trees or rivers. Embodied metaphors (Lakoff & Johnson 1999) play a significant role in describing the modeling relation of the cinematic framework (enactive cinema) and the spatial situatedness.

The emergent landscape model with its spherical multidimensionality allows one to move in any imaginable direction; a multiplicity of points-of-view are shaped by the viewer's emotions, motivations, attitudes, and interests; a stochastic simultaneity of a probability distribution of possible events and entities is assumed, a few of which may emerge due to the 'selective' attention of the enactor; exploration comes into being in a emotional effort, which, in turn, reflects the anticipated difficulties or the anticipated pleasantness of the direction taken; a deviation from a familiar path excites, even shocks the enactor, eliciting physiological changes in her enactment which, in turn, affect the manner in which the surroundings seem to her; dynamical coherence relates to the meaningfulness and duration of an experiential continuity, allowing, for example, temporal ellipses or flashbacks. The above given examples of emotion-driven enactment within a montage-driven emergent landscape exemplify my idea of enactive cinema, which will be discussed in more detail below.

6.2.2.1 Content ontologies

The emergent landscape model and the enactment within it must be understood as metaphoric and always relating to the particular ontospace and its authored ontological dimensions.

Any conceptually constructed or defined environment can be analyzed in ontological terms of the entities, which inhabit it, this including their particular similarities, feature characteristics, and their relations. Following this principle, the authored ontospace is suggested to constitute a list of property dimensions (metadata), which together with the cinematic content (database) establishes the resource domain of cinema montage.

The *multiplicity of potential points-of-view* relates to the assumed multiplicity of emotional, perceptual, and virtual aspects embedded into the montage compositions and described by the ontodimensions that define its ontospace. The multiple points-of-views form the elementary part of the emergent landscape metaphor. It is constructed on the idea that a dynamical montage enables the composition of its spherical multiplicities and its potential points-of-view.

The subjective point-of-view typical to spectator-oriented cinema research (e.g. Branigan 1992, Bordwell 1985) equips the spectator with the emotive-cognitive abilities to step virtually into the bodily being of the main character. This does not necessarily mean experiencing otherness on screen through the actual experience of 'being there as the character'. Yet the spectator is assumed at least to ask herself, "if I were the character what would I perceive and do" in a particular kind of situation. The spectator is often described as imagining the same physical (in a virtual sense) eye-view that the main character is seeing from her own fictional standpoint.

While the above views could also describe experiential aspects of the author's simulation process, the present work deviates from them in the following manner. Instead of relating to the momentary point-of-view of the main character, the assumed narrator, or any other subjective entity in the diegetic world, it addresses the concept of 'point-of-view' to describe the experience of the enactor when exploring the cinematic landscape. A multiplicity of potential points-of-view is embedded in the metaphoric landscape during the creative process. The notion of 'as-if' describes its imagined or simulated situatedness, which comes into being in the emergent dynamical potentialities of the montage generation. Yet, first they have to be created *in the author's embodied simulatorium*.

If one imagined a path through a hilly countryside landscape, each point on the path would enable a different kind of view, i.e., constituting a multiplicity of ontodimensions and their descriptive values (from 0 to 1). The multiple dimensions describing the landscape metaphor allows that two ontological positions may be described as positioned next to one another with respect to chosen ontodimensions, and distant in terms of some others.

CINEMATOGRAPHIC DIMENSIONS

Each content element was assigned with a set of ontodimensions that corresponded to my choices of cinematic characteristics (e.g. speed of camera movement, strength of contrasts, rising diagonal pattern, or aggressiveness). The annotation tool allowed each narrative unit to be specified by means of a unique m-dimensional vector. Each property value, ranging from 0 to 1, indicated the author's estimate of the degree to which that property characterized the particular unit. For example, a value of 0.92 indicated a strong relevance of emotional '*aggressiveness*' and the value 0.08 stood for a slow '*speed of camera movement*'. In this manner, the annotation defined each narrative unit with a unique position in the m-dimensional ontospace, which it shared with an n-number of other narrative units. These kinds of 'soft' ontospaces can be modified, and new elements as well as new dimensions may be added on the fly.

ENACTIVE DIMENSIONS

One of the major contributions of case *Obsession* to cinema is to introduce the organization of the multiplicity of cinematic elements according to their emotional content.

Emotions assumed by the author to be associated to media elements are defined as coordinates of the author's *experiential sensemaking* on those dimensions, technically in the same manner as cinematographic dimensions. This approach provides a novel perspective to the concrete organization and attribution of emotions in a manner that allows them to be treated equal to, for example, positions or properties of image and sound.

6.2.2.2 Two coupled Dynamics

In the emergent landscape model, the author operates on two levels of enactive cinema montage, which are in reciprocal relation to one another: the *logic of montage* and the *logic of enactment*, as defined by Tikka *et al.* (2006).

MONTAGE DYNAMICS

In *Obsession* algorithmic montage shapes the experiential landscape in a dynamical manner. The 'scenery' to be explored emerges on the logical basis of montage. The algorithm can also be regarded as a model of embodied dynamics, in which database retrieval occurs in response to each enactment of the spectator and generates a sequence of the narrative's enactment. The authored algorithmic montage performs that comparative segregation and search for similarity that the mind continuously performs in all processes of sensemaking in the everyday world.

The algorithm follows explicit and implicit rules set by the author, some of them allowing fuzziness or randomness, some of them enabling the system to recognize and learn from its history. The author may include in the software some mutative or

adaptive behavior, thus bringing the system towards what is understood as a form of artificial intelligence.

The logic of montage may be set up as an autonomous montage generator, which functions without any feedback from the outer enactment loop. A closed montage system may be described as autistic, in the sense suggested in Kaipainen (1994, 149). However, enactive cinema is suggested to come into being only when the spectator experience is connected to the montage system.

I have suggested elsewhere that the notion of montage replace the notion of narrative. From this point of view, if the landscape metaphor stands for a model of generative narration or embodied experience, my approach takes it as an analogue of cinema montage.

As discussed earlier, Manovich (2000, 225) argues that in the domain of new media the notions of database and narrative appear as competing enemies, where narrative is often obliged to surrender to the dominance of database. This is based on his idea that while new media objects rely on the organized indexed collection of media data, they do not necessarily enable meaningful narratives as inherited from cinema conventions (Ibid.). However, the spatially organized ontospace applied in *Obsession* allows, in principle, overcoming this limitation by annotating the narrative factors that carry meaning, provided that they can be properly analyzed.

EMBODIED DYNAMICS

The logic of enactment may be analyzed in terms of embodied effort of exploration in the landscape. The logic of enactment drives the experiential feedback circuit between the spectator's emotional situatedness and the cinema montage, i.e., the continuously tracked spectator's situation data are fed back to the montage system. One is reminded that in the authoring process, this interaction dynamics between the cinema montage and the spectator's enactment is simulated in the author's mind. Only within the ready-made cinematic framework are the 'real' enactors involved.

The logic of enactment thus tracks the enactor's exploration of the landscape. Through changing places and having different points-of-view within the landscape, the enactor thereby affects the experience of the scenery, and the experience of the landscape becomes modified. In this experiential, embodied (yet metaphoric) way the logic of enactment may be argued to affect the logic of montage and its generation of landscape.

The metaphoric landscape embodies the awareness of holistic situatedness with its spatio-temporal constraints and possibilities. It also emphasizes that each enactive move in the space changes the situatedness, takes one further from or closer to some other position in the space. It also may result in losing sight of something, while in turn revealing something earlier not visible. Each momentary perspective emerges from the complex multiplicity of equally unique emotional, perceptual, and virtual points-of-view the enactor has to the whole.

The metaphoric landscape may describe emotional moods that strongly affect the way one contextualizes and evaluates things (a conclusion upon which emotion theorists mainly agree). The embodied senses of physical volumes or forces link to the obstacles or distances within the landscape: imaging the height of the mountains may correspond to the difficulties and dangers on the path. The landscape may model the emotional enactment in cinema experience in terms of metaphoric correlation to the psychophysiological effort one has to invest in moving and exploring the surroundings, or gaining the desired goal (e.g. climb the hill, or swim over the river). Seen from below, the mountains also may shadow the sun or prevent one from viewing far. Reaching the peak, in turn, implies a control over the future events, the multiplicity of choices of which direction one starts to move in, anticipation of potential places of rest or socio-emotional confrontations with non-friendly entities.

In the physical environment, enactment is limited to the movements that are possible in a human scale space. Alternatively, in the metaphoric landscape the moves are defined, in addition to the embodied and psychophysiological experience, in the metaphorical and emotional terms of enactment. This allows any enactment to be conceived of in virtual manner, for example, in the temporal ellipses or flashbacks often harnessed in cinema.

6.2.3 GENERALIZATION: ENACTIVE CINEMA AS COMPLEX DYNAMICAL SYSTEM

This section extends towards generalization of enactive cinema as a complex emotion-driven dynamical system.

I suggest that a hypothetical model of an enactive system negotiates with the features of complex dynamical systems as they are conceived functioning in organic nature. These ideas have been embedded in an embryonic state in the montage dynamics of *Obsession*. Here, I deliberately adapt to the discussion on complex dynamical systems in the earlier context, particularly those of the second-order cybernetics of *autopoiesis* (Maturana & Varela 1980) and self-organization dynamics, e.g., van Gelder, Kelso, Thompson, Clark, and other dynamicists discussed in the chapter Eisenstein Extrapolated. This section also reflects the tektological conceptualizations of Eisenstein's era, in terms of the systemic notions of conjunction, ingression, linkage, disingression, boundary, and connecting crises and separating crises (section 4.2.2).

This list is loosely modified from a general complex systems description.

A cognitive entity, if modeled as a dynamical system, is *relatively* independent but interrelated, and involved in continuous bidirectional interaction processes with other entities. Such processes are characterized by 'inputs linked with outputs', intra- and interrelated feedback loops, top-down processes interacting with bottom-up processes, bifurcations and transgression in continuously fluctuating states, to name few of the plausible functions (as discussed by dynamicists in sections 5.1.3. and 5.2.3.).



If cinema is argued to externalize these types of cognitive processes of its author's mind, then it follows that cinema should be assumed to meet these characteristics of a dynamical system as well. Yet, as noted in the early pages of the present treatment (section 2.6), the linear 'fixed' structure of cinema does not meet these conditions. To create a model of such a system, the author must, as a minimum, introduce a feedback loop into the cinematic framework. However this may be hypothesized, practical implementation is at any rate complicated, particularly if the modeling of complexity similar to that of mind is set as the starting point. The enactive cinema system may be argued to represent high complexity when it exhibits "a mixture of order and disorder (randomness and regularity)" and "a high capacity to generate emergent phenomena" (Sporns 2007).

In suggesting enactive cinema as a complex dynamical system, I continue the extrapolation line from Eisenstein's ideas of the emotion dynamics within a fully authored montage composition.

ENACTIVE CINEMA AS COMPLEX DYNAMICAL SYSTEM

1. Enactive cinema is assumed to emerge in embodied experiential duration (e.g. functional synchronization in Tikka 2006, neurophenomenological nowness in Varela 1999, or trick of timing in Damasio 1994, 95). This means that a non-linear unfolding of sensemaking dynamics in relation to discrete cinematic elements may interact with each other in a manner not supported by causality or sequential in linear sense. Simulated elements may be partially or totally masked or, vice versa, masking other elements, despite their temporal, sequential or causal emergence in mind, as far as they are perceived in the same time window of nowness (see pages 174, 194, 210). In mind's simulatorium, rather than causal coherence, the emotional significance dominates and organizes the perceptual evidence. While in linear systems effect is always directly proportional to cause, in nonlinear systems the experienced effect may range from non-proportionally larger scale to unrecognizably small in scale. This means that the relationship between a cause and effect is difficult to track.
2. The ability to adapt to participant actions or reactions constitutes the dynamics of the future enactive montage, implemented with fully adaptive feedback loops, as well as a complex multiplicity of different functional interaction dynamics (Neisser 1976; Kaipainen 1996). Feedback loops can be negative (dampening or inhibiting) or positive (amplifying or exciting).
3. The future enactive montage is characterized by continuous unfolding of events in a generative open-ended manner, in the manner of self-organizing systems (Kelso 1995, 2002; among others). The unpredictable enactment of the spectator keeps the system unfolding in terms of an autopoietic organism (Maturana & Varela 1980), or as an open ecological system (Kaipainen 1994, 1996). I envision that the generative possibilities of the future enactive cinema system are not restricted to the existing pre-determined database, because enactive cinema montage generates new combinations on the fly.
4. As a complex system enactive cinema exhibits the phenomenon of hysteresis, a

primitive form of memory, as defined in Kelso (2007), i.e., previous experience affects the process in terms of reaction or adaptation efficiency: a kind of functional buffer is required to manage the data 'overload'. In addition, the present states are influenced by the previous states, i.e. dependent on the immediate history.

5. The complexity of enactive dynamics is extended 'outwards' and 'inwards'. As a systemic model, enactive cinema is viewed to expand 'outwards' while it nests within the experiential world, a complex dynamical system in its own right. In expanding 'inwards' the inner dynamics of the elements become exposed /explained in terms of complex dynamical systems. However, outwards and inwards are conceptual descriptions that describe different perspectives to one holistic complexity of being. In radical terms of embodied mind this means reciprocally interdependent perspectives on the self and the world (e.g. Damasio's interoception/exteroception, or Kaipainen's inner/outer interaction loops).
6. Enactive cinema comes into being in the unique subjective sensemaking frame of each enactor, be it author or spectator. However, while cinema in more general terms constitutes intersubjectivity, one is reminded that, in addition, enactive cinema assumes a significant similarity between human beings (this on the basis of scientific understanding of the human mind as discussed in section 5.3), due in part to relatively intelligible shared worlds (western world, gender, religion, etc.). For example, human brain activity has the tendency to synchronize if experimented on in groups: a tendency towards a similar kind of emotional arousal in relation to particular kinds of imagery. This similarity plays a role here, as opposed to emphasizing the significant difference (as in post-modern cultural theories).
7. Enactive cinema models the complexity of world, body, and mind. A potentially infinite number of superimposed layers of multiple-scale networks interact simultaneously in an independent, but interrelated manner. The complexity of the dynamics of enactive cinema may be conceptualized with dynamical models such as ontospaces (Kaipainen *et al.* 2008), ontogenetic landscapes (Thelen 1995), the topologies of neural networks, e.g. the self-organizing map SOM (Kohonen 1982), or the global brainweb (Baars 2003).
8. *Emergence* is the key word for enactive cinema. Emergence of meaningfulness, for example, is recognized as Damasian feelings of emotions such as pain or pleasure. However, how this feeling of meaningfulness emerges from the unfolding of the cinematic complexity returns the question back to the correlation between the experiential or phenomenological world and the potential scientific explanation frameworks. A range of interdisciplinary hypotheses has been produced, e.g., amongst the theorists of the naturalization of mind.

As a complex dynamical system, enactive cinema is also argued to model (or frame) some aspects of its author's proper mind, such as attitudes, interests, aesthetic preferences, and ethics. However, some speculative questions remain.

6.3 IMPLICATIONS FOR AUTHORSHIP

In this chapter I have introduced my concept of enactive cinema. Two author-related perspectives on enactment were suggested:

The first part of section ‘Embodied simulation as “organic” perspective on self’ discussed cinema as emerging in the author’s embodied simulatorium, an embodied simulation model for describing the biological basis of creative processes. It provided a hypothetical model of the author’s autopoietic simulation dynamics. Embodied simulation was highlighted, on the one hand, on the basis of a parachronic reading of Eisenstein’s organic-dynamic views on the creative authoring process, and, on the other, on the grounds of the recent neuroscientific knowledge on the dynamics of mind (as provided in the previous chapter).

The second part discussed the practical implementation of the acquired understanding of embodied simulation processes in terms of an allopoietic dynamical simulatorium, *Obsession*. My Eisenstein-inspired goal of authoring real-time emotion dynamics was a challenge to the computational architecture of *Obsession*, which was based on the earlier *Eisensteinian montage machine* (Tikka, Vuori, & Kaipainen 2003). The created computational apparatus can be regarded as a model that highlighted the psycho physiological homeostasis, which was referred to as the *dynamical* basis for cinema montage. In *Obsession* I claim to have proved that even in practice authored cinema montage can unfold in a meaningful manner following the spectator-enactment interpreted from a biosensitive feedback system.

But the cultural conventions and contexts of viewing films affect the psychophysiology and emotional situatedness, perhaps flavored with the aroma of popcorn or the whispers of fellow audience members. Including these types of contextual factors into the content ontology will be a challenge for future work.



7 CONCLUSIONS

This study, entitled *Enactive Cinema: Simulatorium Eisensteinense*, began from the theoretical landscape of Eisenstein's figurative thinking, penetrated the recent neuroscientific views, and has now reached the 21st century interactive media via theoretical and practical elaborations. The following pages will summarize the treatment of *enactive cinema* as a cinematic artifact constituted by an authored emotion-simulation dynamics. It will also draw conclusions from the related findings intended to serve creative and critical elaboration of the ideas introduced and discussed in this study.

The concept of *simulatorium* has been introduced in order to describe the author's embodied workspace. *Simulatorium Eisensteinense* consists of two interrelated conceptual settings for authoring enactive cinema as a dynamical system: *embodied simulatorium*, and *practical simulatorium*.

As to the first, the present treatment prioritized the interest *towards the cinema author*. How can the cinema author herself, her proper interests, attitudes, emotions, and bodily being in the world, play her part in the authoring process? The dynamics of cinema authoring was described by means of the hypothetical concept of *embodied simulation*. Emerging as a kind of Damasian *cinema-in-the-mind*, such a holistic simulation system represents the underpinning autopoietic dynamics that enable the author to simulate, i.e., imagine, create, make decisions, solve problems, anticipate, dream – or feel the Eisensteinian '*emotional theme*' in the cinematic material.

The practical simulatorium, in turn, involved a production of the enactive cinema *Obsession* with feedback from the spectator's unconscious psychophysiological enactment within the cinematic system. The allopoietic cinematic product appeared comparable to a kind of skillfully authored persuasion machine, or Eisenstein's *pathos composition*, which

has the power of eliciting the spectator's emotional experiences. As the experience of it indicated, the systemic setting becomes very complex and gains features of a self-organizing complex system with such feedback coupling. What Eisenstein had come to describe as the author's full control of the dynamics of *multisensuous vertical montage* had to be reformulated as what can be called *second-order authorship*, that is, the role of creating whole systemic environments, such as the montage machine of *Obsession*, for the spectators to explore, while giving up the possibility of direct influence by means of linear narrative.

As to the historical aspect of the work, it has adopted what can be termed *parachronic* reading: the superimposition of two historically distinct eras into one interpretation window has allowed the study to penetrate through the already established discourse on Eisenstein, cinema, montage, body, and mind with new perspectives. The method has found support from *tektological* considerations of Alexander Bogdanov, a contemporary of Eisenstein. An extrapolation drawn from Eisenstein's views on *organic-dynamical embodiment* of cinema emotions via the key notions of *radical embodiment* and *embodied simulation* to the contemporary concepts of *interactive cinema* contributed to the formulation of the new concept of *enactive cinema*.

7.1 NATURALIZATION OF CINEMA

The treatment at hand can be associated with the broader philosophical movement of naturalization of mind, respectively appearing as a project of *naturalizing* cinema, plaguing on before and after the turn of the century involving the influence of Antonio Damasio, Vittorio Gallese, Mark Johnson, Francisco Varela, Semir Zeki among others, and as to the particular domain of cinema, for example, Joseph Anderson, Torben Grodal, and Ed Tan.

The roots of the naturalization of mind have been argued to date back as far as Hume, Kant, Hegel, and more recently, the holistic views of Merleau-Ponty, or in Cassirer's universalism of symbolic forms (section 5.2.). The early sensorimotor holism of Helmholtz or James, for instance, is today also associated with the neurally based perspectives of Damasio, Gallese, Ramachandran, and the embodied mind views of Johnson and Lakoff. The sources discussed in this study altogether emphasize the holistic body-brain system as the foundation of the phenomenon of mind (section 5.3).

Unlike the orthodox hermeneutic line of phenomenology (Heidegger and others) that has been characterized by its profound distrust of what they define as 'exploitive means' of natural sciences, the recent discussion on naturalizing phenomenology (Petitot *et al.* 1999) draws from multiple interdisciplinary domains. The proponents of this approach apply *both* the Husserlian phenomenological reduction *and* the modeling method of dynamic systems theories in describing the basis of intersubjectivity, con-

sciousness of time, 'explanatory gap', *qualia*, and other issues typical to the tradition of phenomenology. As to naturalization of cinema, Eisenstein himself can be positioned as a predecessor. Eisenstein's practical efforts to author multisensory cinema montage seemingly concretize the aims of more general naturalization in the philosophy of his time, as indicated in the chapter 'Eisenstein Revisited'.

Enactive cinema can be regarded as a demonstration of recycling emotional understanding in a two-way manner, expanding outwards to the techno-cultural knowledge environment (modeling the world), and, reciprocally, inwards to the sensorimotor apparatus of subjectivity (modeling the body). The present work, in the spirit of naturalized cinema, argues that *Obsession's* underpinning neural dynamics of embodied simulation involve very natural instruments of the author's sensemaking processes.

7.1.1 MIRRORING THE OTHER

From the perspective of authoring cinema, establishing the basis of *understanding the other* through the recent neuroscientific finding of the *mirror neuron systems*, which are argued to play a fundamental role in socio-emotional interaction and learning by imitation (section 5.3.2), has been groundbreaking.

The present treatment has been built on the basis of scientific understanding of the human being as an *emotion-driven* organism. It has emphasized biologically inherent similarities between different individuals as humans. To focus on this view, the present treatment has excluded the discussion on cultural differences. Even so, it is recognized that the reactions to painful or pleasant imagery normally involve both biological and cultural factors, as discussed earlier.

The discussion has also found that many recent neuroscientific ideas seem to echo Vygotsky's socio-systemic ideas about intersubjectivity. The finding of neural mirroring system has greatly contributed to elaborating the concept of embodied simulation dynamics and its sub-dynamics. In this light, cinema authoring can be seen to rely on neurally based empathy by means of *shared action ontology*, as Vittorio Gallese and Thomas Metzinger call it (see page 226), or to the *emergent consensual domain* of mutual orientation and enactment assumed by Humberto Maturana and Francisco Varela (see page 161, 176, 239).

Eisenstein's discussion on montage has been extrapolated to the recent enactive cognitive models of embodied mind and the method of *embodied simulation*, which will allow further elaboration of the emergent cinematic forms in terms of embodied metaphors, metonyms, and image-schematic structures described in the framework of Mark Johnson and George Lakoff (see page 201, 236, 256). Eisenstein's concept of *pathos*, an elaboration of emotions and persuasion in Aristotelian rhetoric, has been interpreted as building on the author's inner dialogue between the author's emotion-based perspective to *what* was represented (perspective outwards) and the author's

proper feelings of *how* it was represented (perspective inwards). (Section 6.1)

Furthermore, it has been discussed how the expertise of the author builds up from the recognition of the danger of the *uncanny valley* of meaningfulness, as proposed by Mori (see page 183). This has been suggested as a conceptual model for the experiential framing of meaningfulness. As stated by Gallese, the fuzzy interplay between one's anticipations and past experience shapes one's embodied simulation of otherness and the world (see page 172, 220, 230). Also in the domain of cinema, conceived of as a model of the world, the uncanny valley phenomenon points at the critical balance between the enactor's embodied simulation of familiar and unfamiliar patterns of experiential being in the world. Cinematic experience becomes more meaningful for an individual when it involves investing one's own cognitive effort in filling in gaps, building bridges, and constructing explanations for supporting coherence of the montage events.

This embodied interpretation process glues together fictional events of the cinema and one's experience of being in the world. The less the Gazzanigian interpreter in the brain is involved, the less the coherence of the narrative has to do with the enactor's own emotional meaning evaluation system. This means also that the more complete the organization, the less the enactor has to invest effort in the processes of understanding, and the less she feels involved, corresponding to a *hot medium*, as suggested by Marshall McLuhan (1997, 22–32). At the other extreme, if the organization of the cinematic system is too open, the effort may turn out to be too demanding and the enactor to lose interest, corresponding to too *cold* in McLuhanian sense.

7.1.2 PERSPECTIVE TO THE AUTHOR'S SELF

A lesson learned from the *simulacrum* relates to Eisenstein's idea that by studying oneself, one may find from one's deepest inner presence the resources for creative work. The creative basis of cinema has been argued to base on a kind of '*as-if*' *simulation* emerging within the neurally-based mirroring dynamics (see page 227, 254). The embodied understanding of the phenomenal world and the intersubjectively shared cinematic worlds may increase the ability to control its unpredictable events. Embodied unconscious simulation provides the basis of socio-emotional understanding, which, as it is claimed, is the only available one.

As has been discussed, the discovery of the mirror neuron system has also consequences for the study of oneself. It provides the means of perception to self via the consensual domain of otherness. When I observe the other, I describe her behavior, feel her words; in fact, it is me myself whom I observe in the other. How I understand someone's behavior or meaning of words is dependent on what kind of embodied simulation processes are underpinning my emotive-cognitive evaluation processes. Following Damasio's thinking, perhaps a way to act out Eisenstein's call for the author

studying herself lies in the interoceptive unconscious perceptions that are identified as feelings at the conscious level.

7.2 SECOND-ORDER AUTHORSHIP

Enactive cinema, conceived of as a dynamical complex system, was initially associated to the idea of cybernetic control, but in the course of the study it became apparent that it was more like a system with emergent, self-organizing behavior, driven by the system's recursive two-way dynamics. Seen as such, the cinematic system receives emotional feedback from the spectator who, in turn, is influenced by the cinema. Such a system can no longer be authored in the first-order cybernetic sense of having full control, or *first-order authorship*. The author of such a complex system has to adopt the meta-level idea of constructing frameworks or environments within which individual narrative events can take place in an emergent manner, outside of the author's control, however within the ontospatial constraints set by the author. This new relationship, comparable to that of an architect to the spatial artifact she creates, can be characterized as *second-order authorship*, emphasizing the author's own proper impact on the system as part of the system, meaning, not as an external actor, but an *enactor*.

Meaningful generation of the unfolding narrative is the key issue for the author of narrative database cinema, that is, how different elements relate to one another in the alternative individual and particular sequences generated by interactive cinema montage. The present study holds that Eisenstein's pioneering work contributes even to this. In his famous speech of 1935 Eisenstein advocated the *pars pro toto* principle and the formulation of the *unity of inter-penetrating opposites*, which have been recast in the articulation of enactive cinema.

While a first-order enactor manages detailed structures of the system, the second-order author assumes a perspective to the system as a whole. This again calls back Eisenstein, who argued for the holistic embodiment of the *emotional theme* in the authored montage composition, which then would be transposed to the experience of the spectator. In his historical context, he dreamed of an emotion-driven psychological machinery of montage for steering the working masses towards social consciousness of the new Soviet man. The suggested transition from first order to second-order authorship parallels the paradigm shift in systems theory. As late as 1948, the year of Eisenstein's death, Norbert Wiener introduced his idea of *cybernetics* mainly as a theory of *governing* complexities. Today, 21st century systems theories are more focused on *describing* emergent phenomena in complex dynamical systems including technological, biological, cognitive and social.

Even as a product of second-order authorship, enactive cinema is to be considered as a dynamically functioning and adaptive *allopoietic* system, as discussed by Varela and

Maturana (see page 160), that is, a free-standing, self-sustaining product of its creator with its own life.

Finally, referring to sciences is not to undermine the intuitive creativity of the author as a cinema professional. Neither does it suggest overlooking the tacit professional knowledge and expertise that cinema authors have accumulated during the last hundred years of cinema history.

7.3 MEETING THE CHALLENGES OF FUTURE CINEMA

The impact of Eisenstein has been proven once again. Over the historical timespan, Eisenstein's holistic views have both challenged and inspired work to follow in many ways. The present work has however pointed at how his work can help meet the challenge cinema has to encounter in the 21st century in order to communicate with the generations that have grown up in the age of the Internet and video games. One vision is that the audience will eventually grow to demand expanding modes of 'smart' interactivity, including also a new kind of cinema format that takes into account the spectator's emotional experience. Interpretable today as an argument for *participatory authorship*, already Eisenstein wrote that the audience deserves the status of the creators of the cinema (see page 28, 150).

The interest of the author to maintain full control over the interactive spectator experience is not explicitly obvious to an uninitiated spectator. Typically, an interactive participant experience involves the *feel* of control, and this is to a great extent true particularly with interactive games. However, all commercial and non-commercial interactive products can be considered as fully authored artifacts, involving highly optimized *psychoengineering*, referring to the discourse in Eisenstein's time. Indeed, both at the macro-scale level of the massive input of the entertainment industry as well as at the micro scale, the designer of the product unavoidably holds the 'spectator's remote control' in her hand by means of the functions that the interactive system offers to the spectator. It is to be noted that second-order authorship actually takes distance to this kind of direct power-relation, allowing more freedom to the spectator to explore the space, based on her own embodied constellation.

Though a study into cinema, this study relies on an exhaustive coverage of recent scientific knowledge on the dynamics of mind, the issues ranging over interdisciplinary cross-sections of theoretical and artistic activities. Thereby it exemplifies a research-based approach to cinema practice, rather than a practice-based research. David Bordwell in his *Cinema of Eisenstein* referred to Eisenstein as being interested in "everything besides cinema" (1993, 137), involving the physiological basis of images

and language, emotions, perception, action, and synesthesia, yet also often emphasizing the non-rational, mysterious, imaginary, aesthetic, hermeneutical and intuitively heuristic aspects of life. Following both Eisenstein's strive towards a synthesis of arts and sciences, and the contemporary discourse of *naturalization of mind*, this treatment has juxtaposed and integrated subjective and objective, material and mental, scientific and phenomenological domains into one holistic framework.

While a vast volume of literature exists on Eisenstein covering historically-oriented psychoanalytical, formalist, and cultural constructivist perspectives, the perspective most familiar to Eisenstein's own thinking, the *organic-dynamically* oriented research, has been lacking. The work at hand hopefully contributes to understanding this aspect of Eisenstein's thinking with some new insights, rather than leaning on the conventional views of Eisenstein as a formalist, semiotician, or a master of psychoengineering, among others. Eisenstein's ideas of the *feel of the material*, the *embodiment of emotional theme (pathos)* and the participation in organic unity (*ecstasy*) from a chosen perspective have been discussed in depth.

According to the arguments given throughout this study, Eisenstein can be seen as the precursor of the recent *radical embodiment* views to the human mind, though in an early embryonic form. According to the author's view, studies into the embodied mind are part of the ongoing search for understanding what life is in general and what it means to have a mind. The interdisciplinary approach has been crucial for facilitating a new kind of exploration and insights into the very grounds from within even the phenomenon of cinema emerges. The vision is that future enactive cinema practice can transgress the borders of world, brain and body, contributing on its part to understanding the embodied dynamics of a cinematic mind. However, in the big picture, the mystery of mind is far from being exhausted. Rather, it continues to be a challenge to science, and thereby also to cinema scholars and authors.

To conclude, if for Eisenstein cinema meant *figurative thinking*, in the present revisiting and extrapolating sense it can be reconstituted as *enactive thinking*.



8 POSTLUDIUM

At the podium of the All-Union Creative Conference of Soviet Filmworkers in 1935, Eisenstein held his closing speech. A significant part of his speech was aimed to defend his views against his colleagues' accusations that he had abandoned his filmmaker's practice to live in an 'ivory tower' of theoretical abstraction. To contrast the passive elitism of the ivory tower, the closing speech harnessed a metaphor of an active living elephant with its two ivory tusks.

"If my work over the last few years has been with the one tusk, the theoretical and academic – of the methodology, theory and practical education of directors. Then henceforth I shall start working with both – *production work and theory*" (ESW3, 44). Prolonged applause supported Eisenstein's proclamation.

With one of the tusks Eisenstein would continue piercing each in turn the open methodological problems of Soviet cinema, while the other tusk was reserved for practical production work. Still, not even one hundred furious elephants rushing into the auditorium would have helped Eisenstein to successfully punch his theoretical ideas through the hostility of the conference participants (ESW3, 44; Bulgakowa 1998, 170–172; Seton 1978, 330–340). Indeed, Eisenstein's practical tusk was already directed towards a script-in-development: in a year's time his film project *Bezhin Meadow* was to become a nightmare Eisenstein could never have envisioned.

I have earlier briefly reminded the reader that in Eisenstein's times, challenging practice with theory was not only a move in an intellectual game but a matter of life and death. From the 1930's onwards, intellectuals and scientists who had made the mistake of focusing on theoretical research (e.g. genetics) instead of providing practical outcomes were sent to workcamps or were simply executed. Even since those days the dichotomy of research and practice has never truly abandoned the domain of arts and cinema.

Today, a comparable kind of techno-scientific euphoria that Eisenstein lived through may be detected in the new possibilities of virtual realities, neuroimaging, and bionics (implantable, high-technology neurostimulation devices); biologically interesting convergences are emerging where artists and scientists can collaborate today. A cinema author oriented towards exploring such domains may no longer be literally executed, but will face strong opposition from mainstream cinema traditions.

Eisenstein was a modernist whose figurative thinking keeps lingering on as a creative source of post-modern and hyper-modern cinema discourse. Revisiting Eisenstein in a parachronic interpretation window has supported a new kind of insight, in terms of depicting an image of Eisenstein as a figurative philosopher, an interdisciplinary system theorist and a holist, instead of relying on standard analyses of Eisenstein's cinema and montage considerations.

In the process of extrapolating Eisenstein's dialectics of research and practice to the present discourse, *research-based practice* has proven itself to be a fruitful method. It has provided a reciprocally complementary methodological approach and counterforce to the popular idea of *practice-based* research in the arts. In the work at hand, theoretical research has preceded the practice, followed by further application of the acquired knowledge to the practice. This study has exemplified how the filmmaker-researcher's own autobiographic cinema expertise and the scientific knowledge gained through exploration may converge. The practical simulator not only functioned as a cinematic laboratory for experimenting on the dynamics of emotional mind, but it also produced the enactive cinema installation *Obsession* as its allopoietic case in point.

Though a research-based artwork like *Obsession* does not necessarily stand as proof or disproof of the success of the theoretical considerations, it emerges from the research and faithfully harnesses the ideas discovered and defended in the theoretical considerations. Often, as acknowledged in the domain of experimental sciences, following Popper's epistemology of falsification, more advantage is gained if the labo-

ratory work provides new evidence *against* some predictions or hypothesis under testing. In other words, if an experiment fails to provide preconceived results, this may be argued a positive result, in the form of the new knowledge it entails. The method of excluding some of the multiplicity of options, in terms of proven dead-ends, supports the big picture of the explorative research field.

The falsification principle enables systemic self-regulation in the evolution of thinking. But in the arts, this deserves special attention because arts themselves are constituted on a kind of questioning, or *deconstruction* as it appears in post-modern thinking, of the surrounding world in their artifacts, illusions, or imagery of non-existing phenomena. Yet, to complete a process of research-based practice one should not be expected to *produce* scientific evidence, for instance by means of statistics or formal calculations. In the domain of the arts the focus is rather on publishing the research in terms of innovative formulations, for example, as bodily coding (e.g. in dance performances) or in hybrid formats, for example installations, web-based media, or settings of 'virtual reality'. On one hand, the practical product recuperates its research value both through its confirmation or its partial falsification or reorientation of the research hypothesis. On the other, the research recuperates its value in the artistic research-based end product, which is at any rate still dependent on the critical evaluation of the demanding cinema audience.

If cinema is regarded as a way to model life, it packs life into a concentrated form. 'Living pictures' on the 'mind's screen' have excited cinema authors and cinema audience for over one century. Already in 1920's cinema author Eisenstein and neuroscientist Alexander Luria established a fruitful collaboration for creating intellectual and methodological ways of studying human mind with cinema as a research tool. Recently neuroscientist Uri Hasson and his collaborators (2008) celebrated the new notion of 'neurocinematics' as an innovative neuroscientific paradigm for studying socio-emotional aspects of human mind(s) in the context of film narratives. Not only cinema studies benefit from neurosciences but, reciprocally, neural and cognitive sciences have realized that they may gain from cinema, implying future collaborations for understanding the socio-emotional human mind.

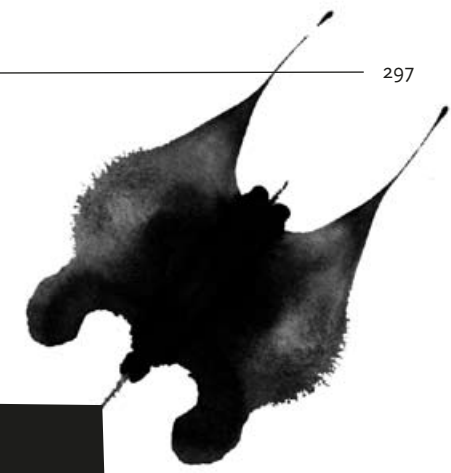
In the spirit of *Homo Ludens*, this research process has embodied the cultural theorist Johan Huizinga's famous idea of the reciprocal relationship between 'playing' and 'learning': "Let my playing be my learning, and my learning be my playing" (1950). Research-based practice enables one to fruitfully *play with* scientific implications, models, and psychophysiological data within a carefully framed academic *simulatorium*. The extrapolation of Eisenstein's *embodiment of emotional theme* to the cinema author's creative process applying *embodied simulation* turns to something comparable to what was referred to as *tektological poetics* in Eisenstein's time. Life on the cinema screen emerges in dialectics of the protagonist's wellbeing in life and love, and the antagonist force of nonbeing in destruction and death. I will end this study with Eisenstein's visionary cry for future research efforts on the domain of cinema.

EVER ONWARDS! (INSTEAD OF A POSTSCRIPT)

"*Will it still be a screen?*" Eisenstein asks in 1947 in his provocatively titled essay 'Ever Onwards!', an essay that refuses to use a full stop but instead, literally brackets the more conventional 'postscript': "(Instead of a Postscript)" (ESW3, 349; *italics by P.T.*). As part of the collection of writings intended for publication, the text rushes to answer the question: "Surely the screen will dissolve before our eyes, in the latest achievements of stereoscopic cinema, its three-dimensional representations taking over the entire interior and space of the theatre building – not just the rear wall of the auditorium – which it hurries along into the limitless expanse of the surrounding world, in the wonders of television technology?!" (ESW3, 352).

Eisenstein continues to envision the future surprisingly aware of the immense possibilities of new technology: "*if the eye, aided by infra-red night-vision goggles, [...]; and the hand, guided by radio [...]; and the brain, aided by electronic calculators [...]*" (ESW3, 353; *italics by P.T.*). The holistic harmony of the social consciousness of the masses in the giant land of the Soviets will collect the fruits of their constructive struggle in a totally new art form (ESW3, 353). Though the large scale cybernetic dream of the systemically governed Soviet country eventually failed, due to chaotically increasing complexity that evaded its leaders' control, visions of a new kind of holistic cinema will linger on through the dawn of the 21st century in a very Eisensteinian spirit. Eisenstein continues ever onwards (ESW3, 353; *italics by P.T.*):

"I should be very surprised if the sum of traditional arts satisfied the new humanity!"



9 APPENDICES

9.1 THE PROJECT OBSESSION

9.1.1 APPENDIX 1. TEAM CREDITS

ACTORS

EMMI: Maria Järvenhelmi

HENRIK: Matti Onnismaa

JATTA: Maija Junno

ARTIST: Urpo Tikka in memoriam

LADY: Heidi Krohn

NEWBORN: Lumitähti Jyrälä

OTHER CHARACTERS: Ulla Tikka, Mauri Tikka,

Arja Tikka, Sini Tikka, Vesa Tikka, Onni

Tikka, Marko Haataja, Markku Hirvelä,

Leena Kaurismäki, Miko Leppänen, Markku

Pätälä, Ilkka Tikkanen, Kari Ylitalo

INSTALLATION TEAM

IDEA, DIRECTING AND

PRODUCING: Pia Tikka

SOFTWARE ARCHITECT: Rasmus Vuori

TECHNICAL SUPERVISER: Mauri Kaipainen

ARTISTIC SUPERVISER: Maureen Thomas

PRODUCTION COORDINATOR: Tea Stolt

PRODUCER'S ASSISTANT: Patrik Pehkonen

INSTALLATION DESIGN: Jaakko Pesonen

& Saara Renvall

BIOSENSOR DESIGN: Joonas Juutilainen

BIOSENSOR CONSULTING: Jukka Ylitalo

PSYCHOPHYSIOLOGICAL CONSULTING:

Niklas Ravaja & Mikko Salminen M.I.N.D Lab

SOUND DESIGNER: Joonas Jyrälä

RE-RECORDING MIXER: Paul Jyrälä

DIALOGUE MIXER: Miia Nevalainen

SOUND EFFECTS EDITOR: Miia Nevalainen

FOLEY: Eero Koivunen

FOLEY ASSISTENTS: Salla Hämäläinen,

Mika Niinimaa

SPEAK RECORDIST: Eero Koivunen

VOICE-OVER DRAMATIZATION: Unika Lii

VOICE-OVER ASSISTANT: Yakup Albekoglu

EDITOR: Minna Nurminen

WEB DESIGN: Adele Simula

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CO-CINEMATOGRAPHER: Harri Rätty

SCENOGRAPHER: Markku Pätälä

SOUND DESIGNER: Joonas Jyrälä
LINE PRODUCER: Pauliina Ståhlberg
PRODUCTION ASSISTANT: Lassi Tykkyläinen
CINEMA RESEARCH CAMERA: Mari Mantela
SCRIPT SUPERVISER: Assi Laitila
EDITING: Samu Kuukka
COSTUME DESIGN: Johanna Ilmarinen
CAMERA ASSISTANT: Janne Kallis
SOUND ASSISTANT: Elina Vanhanen
I ELECTRICIAN: Eero Lämsä
II ELECTRICIAN: Mikko Heino
SCENOGRAPHER'S ASSISTANT: Anssi Himanen
SCRIPT: Pia Tikka
SCRIPT CONSULTING: Eeva Tikka
INVITED CINEMATOGRAPHERS: Pirjo Honkasalo, Marita Hällfors, Jouko Seppälä

VOICE OVERS

VOICES: Maija Junno, Maria Järvenhelmi, Elina Pielä, Pauliina Ståhlberg, Nina Stenros, Tea Stolt, Satu Teppo, Maureen Thomas

EMMI

DRAMATIZATION: Unika Lii

JATTA, EMMI'S MOTHER

PHILOSOPHICAL VOICE-OVER EXCERPTS FROM LUCE IRIGARAY: Marine Lover of Friedrich Nietzsche, transl. Gillian C. Gill (New York, Columbia University Press, 1991), and Luce Irigaray: An Ethics of Sexual Difference, transl. Carolyn Burke and Gillian C. Gill (Ithaca, New York, Cornell University Press, 1993).

SPECTATOR COMMENTS

DRAMATIZATION: Pia Tikka and Yakup Albekoglu

DIGITAL POST-PRODUCTION
DIGITAL FILM FINLAND / PRODUCER: Petri Siitonen

COLOURISTS: Rob Lang & Chris Wallace
ONLINE EDITOR: Severi Glanville;
FILM DIGITIZING: Mika Kongas

COLLABORATION CREDITS

Obsession is produced by Pia Tikka (Oblomovies Oy) in association with the University of Art and Design Helsinki / School of Motion Picture, Television and Production Design, Media Centre Lume, and Media Lab. The Content Development Support with Periferia Production Oy from AVEK and the Finnish Ministry of Education; Marianna Films Oy; P. Jyrälä Oy.

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9.1.2 APPENDIX 2. TECHNICAL DESCRIPTIONS

A) TECHNICAL DESCRIPTION BY SOFTWARE ARCHITECT RASMUS VUORI

The *Obsession* installation consists of a cluster of computers, networked, and communicating using TCP/IP based protocols.

The main installation consists of seven individual computers of which:

- One computer acts as the main “conductor”, the central computer, which makes all the calculations and synchronizes the media. This computer is an Apple Macintosh Dual CPU G4 running OS X, Apache/PHP/ MySQL and the *Obsession* Server Application.

- Four computers (one for each screen), presenting the video material and doing the edit on the fly. The video computers are all connected to the central computer and get their live edit-lists as a constant feed. They also retrieve subtitle information from the central database. All four are Apple Macintosh G5 running OS X and the *Obsession* Video-client Application.

- One computer for sound, running three separate audio processes for multi-channel audio. The audio computer has separate outputs for voice-overs (directed to the built-in speakers in the seats) as well as four channels of audio for ambient soundscapes. Intel based PC, running Windows 2000 and *Obsession* Audio-client Applications.

- One computer to manage sensory input from the five seats. Each chair is connected via a USB hub to this computer that reads the serial input from the sensors and passes the calculated information to the central computer. This computer is an older Apple iMac running OS X and the *Obsession* Sensor Application.

All computers also connect over the internet to a central server from which they retrieve metadata information. The *Obsession* editing tool – the fragment-editor, which can be used on a variety of computers – can upload changes to the piece from any location to the Internet-based server. When the installation server notices changes it updates the local information and the piece is automatically updated.

The modular structure of all the elements has offered many options for further development. Reliability has been an important element in the design, and while such a complex system cannot be made completely failsafe, the impact of minor glitches or reconfiguration can be greatly reduced by building automatic recovery options as well as failure isolation mechanisms. For example if one module stops or is rebooted, the other processes will keep going until it is back online – even rebooting the server will make the clients “improvise” until it is back online.

B) SENSOR TECHNICAL DESCRIPTION BY SENSOR DESIGNER JOONAS JUUTILAINEN

The sensors used in the *Obsession* installation consisted of five specially manufactured sensor chairs, each communicating individually via Universal Serial Bus (USB) with a computer running the *Obsession* Sensor Application and sending the sensor data to the “conductor” computer.

Each of the five sensor chairs has a built-in Parallax Basic Stamp 2 microcontroller attached to a BOE-base with power input and a USB output. The BS2 chip runs a simple PBA-SIC program to gather and analyze the sensor data input, reformatting it to sequel string end sending it to the base computer.

Each BS2 chip has three individual sensor sets attached to it: 1. Infrared Gate Sensor measuring the occupancy of the chair, 2. Infrared Direction Sensor measuring the orientation of the chairs and 3. Hand-rest Sensor measuring the heart beat and skin resistance and providing feedback to the user sitting.

The Gate Sensor consists of an Infrared Light Emitting Diode (IR LED) and an Infrared Sensitive Photo Transistor (PT). When the amount of infrared light emitted to the PT by the IR LED changes, in this case when the viewer is blocking the beam with her body, the PT's electric resistance changes accordingly. The BS2 is used to measure the resistance of the PT and to give out a value of 1 or 0, attached to the string to be sent to the base computer.

The Direction Sensor has the same basic structure as the Gate Sensor (IR LED + PT). In this case, the infrared beam is reflected back from a gradient gray slip attached to the leg of the chair. When the chair rotates, the sensor rotates around the gradient and a different amount of IR light is reflected from each spot. The BS2 is then used to measure the resistance of the PT, outputting a number between 0 and 255. This number is attached to the string, to be calibrated on the base computer to point to an individual screen.

The Hand-rest Sensor consists of a specially manufactured *Obsession* circuit board. The board has three main tasks: 1. measuring heart beat, 2. measuring skin resistance and 3. giving feedback to the user. The heartbeat is measured from the user's fingertip by analyzing the reflectance of infrared light on the skin's surface; when the heart pumps, blood is flushed in the skin and the amount of infrared light increases – and vice versa. An IR LED – PT pair is again used to measure the reflection,

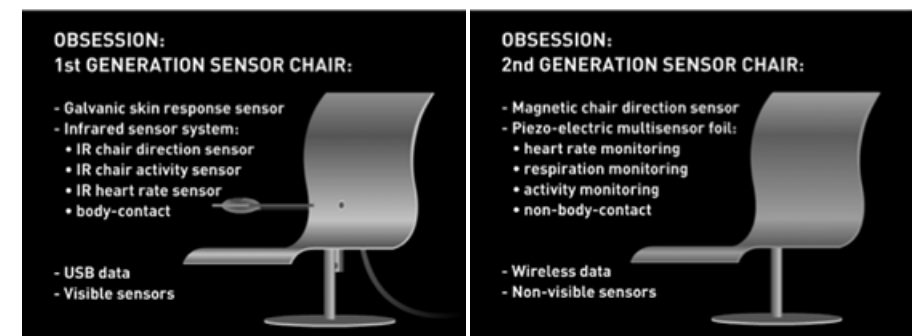
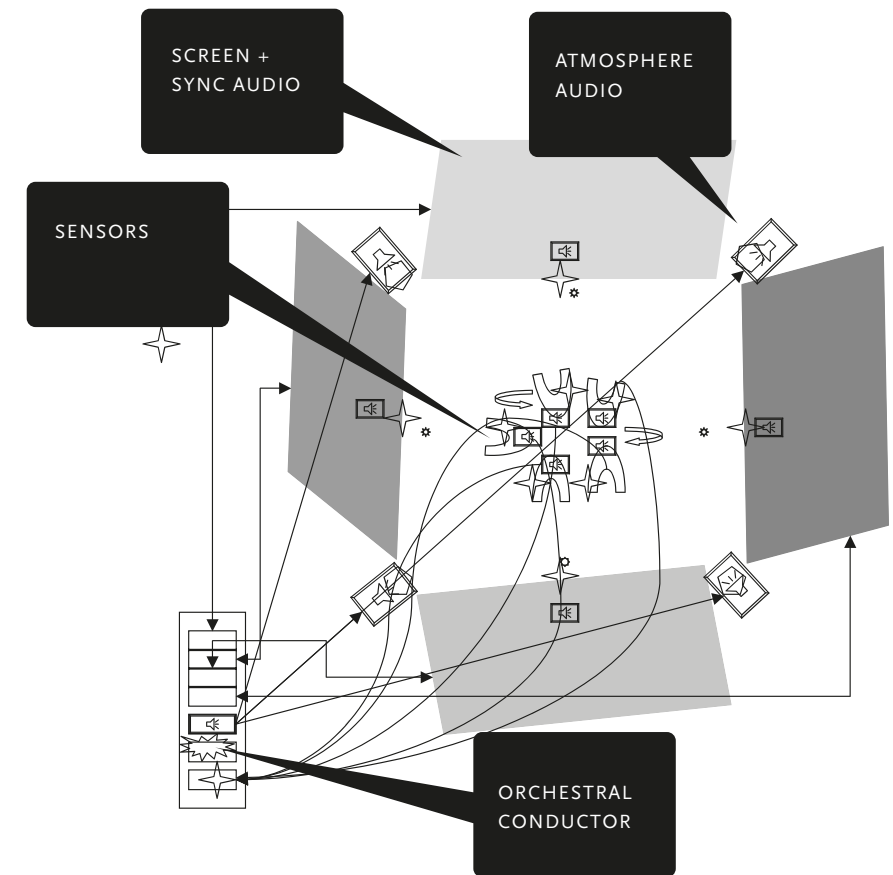
and a micro amplifier chip used to amplify the tiny difference. The pattern of differences is then analyzed in the BS2 and transformed to a number representing Beats per Minute (BPM), attached to the string. The Skin resistance is simply measured by BS2 with two probes with direct contact to the palm, giving a value between 0 and 255 attached to the string.

The feedback is given from the hand-rest in three modes: a green light indicating a free seat, a red light indicating an occupied seat and a red light flashing according to a successfully measured heart beat. The lights themselves are by super bright LED lights, divided by optical cables creating the shape of a human hand.

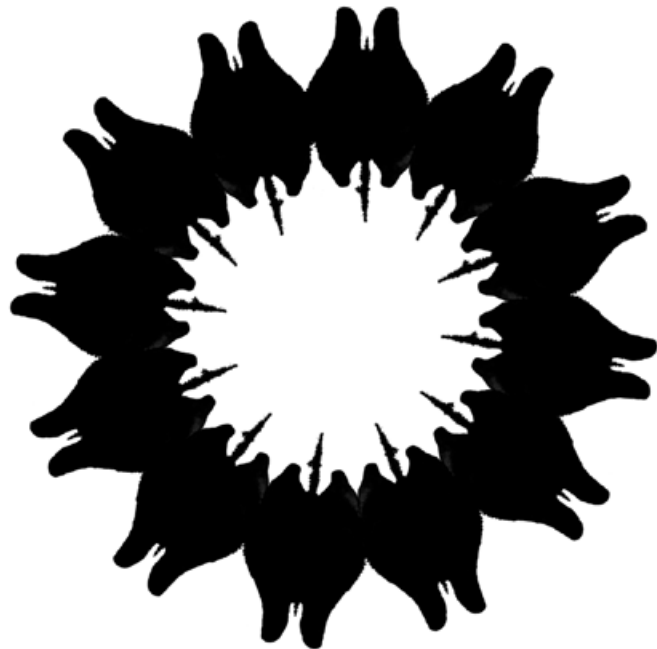
Gathering the data to a short time memory the BS2 sends the string, formatted in the following manner, to the base computer in one-second intervals.

The string:

```
[sensor number: 01 – 05]:[occupancy: 1 or 0]:[chair direction: 0–255]:[heart beat in BPM: 0 – 200]:[skin resistance: 0–255]:[time code]
```



From the left, the first-generation biosensitive chair in Kiasma (2005) and the second-generation biosensitive chair in ISEA2006&ZeroOne. Images by Joonas Juutilainen.



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