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Towards a Cyclical Genesis of Enactive Signification: The Case of Eastern Baltic Early Material Signs

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Abstract. This paper develops a theoretical framework for semiogenesis by integrating cognitive archaeology, philosophy, and Eastern Baltic archaeology. The study considers similar material artefacts used for counting in two regions: early clay figurines from the Eastern Baltic and tokens from the Near East. Although similar semiotic counting practices were employed in both regions, they underwent different semiogenetic processes: the Baltic tradition ceased, while Near Eastern tokens evolved into novel symbolic types and writing. I argue that linear models of becoming, particularly those corresponding to hylomorphic ontology, cannot account for these differences; instead, I propose an enactive, genetic, and archaeologically grounded framework that conceptualises signification as a dynamic and cyclical process. Drawing on Lambros Malafouris and Gilbert Simondon, this approach explains how significations and thus material signs emerge and transform through interactions between mind and materiality, while developing through phases of anticipation, perception, memory, and invention; it is proposed that each signification, depending on the milieu, may transform in different directions, thus enabling the variety of material sign changes.
Keywords: Material sign, image, enactive signification, cyclical genesis, philosophy of archaeology.

Ciklinės enaktyvios signifikacijos genezės link: ankstyvųjų Rytų Baltijos regiono materialių ženklų atvejis

Santrauka. Šiame straipsnyje formuluojama teorinė prieiga semiogenezės proceso analizei, kuri integruoja kognityvinę archeologiją, filosofiją ir Rytų Baltijos archeologiją. Darbe svarstomi analogiški materialūs ženklai, naudoti skaičiavimui dviejuose regionuose – molinės figūrėlės iš Rytų Baltijos ir Artimųjų Rytų *tokenai*. Nepaisant to, jog abiejuose regionuose egzistavo analogiškos semiotinės skaičiavimo praktikos, jos kito skirtingomis kryptimis: Rytų Baltijos regione tradicija nutrūko, o Artimuosiuose Rytuose *tokenai* išsivystė į naujus simbolinius tipus ir raštą. Tvirtinama, kad linijinis tapsmo modelis, ypač toks, kuris atitinka hilomorfistinės ontologijos principus, negali visapusiškai apibūdinti tokių semiotinių atvejų; vietoje to siūloma enaktyvi, genetinė ir archeologinė prieiga, kuri apibūdina signifikaciją kaip dinamišką ir ciklišką procesą. Remiantis Lambro Malafourio ir Gilberto Simondono teorinėmis pozicijomis, prieiga plečiama siūlant, kad signifikacija iškyla ir transformuojasi per sąmonės ir materijos sąveiką, keičiantis per anticipacijos, suvokimo, atminties ir išradimo fazes; kiekviena signifikacija, priklausomai nuo ryšio su terpe, gali transformuotis skirtingomis kryptimis, įgalinant materialų ženklų kaitos įvairovę.
Pagrindiniai žodžiai: materialus ženklas, vaizdas, enaktyvi signifikacija, ciklinė genezė, archeologijos filosofija

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Introduction

This paper develops a theoretical framework that integrates the prehistoric Eastern Baltic archaeological case with a broader philosophical account of semiogenesis. The Eastern Baltic archaeological record from the Bronze Age (dated to 1700–530/520 BC) has yielded small clay figurines used for counting, which are comparable to Near Eastern clay tokens, whose relationship and mnemonic predisposition I have analysed elsewhere (Barusevičius 2024, 2026). These figurines are primarily associated with the Striated Pottery Culture and have been discovered in settlement contexts, in some cases in direct association with pottery vessels and storage-related areas, thus providing the archaeological basis for their interpretation as counters. These figurines and tokens were used to account for produced resources, various transactions, vital processes, and, perhaps, many other activities. As they were primarily manipulated by hand through grouping and summing up the figurines, as well as by separating and subtracting them, this paper conceptualises them as material signs signifying types and quantities of things being counted.

Interestingly, through multiple developmental processes, these material signs in the Near East gradually evolved into impressions (imprints of the same figurines) and pictographs (drawings of the same figurines) on administrative clay 'balls' and clay tablets, paving the way for the emergence of writing (Schmandt-Besserat 1992; Malafouris 2013: 112–113). By contrast, there is no known evidence in the Eastern Baltic archaeological record of such a progression; the figurines do not appear to have changed their symbolic forms. Additionally, the emergence of writing in the region was not related to accounting practices but, instead, resulted from external influences, namely, the spread of Christianisation (Zinkevičius 1988: 13; Ališauskas 2009: 95, 105). The Eastern Baltic case, therefore, suggests that, although similar material signs may enable comparable forms of signification, their genetic trajectories may depend on much broader material and environmental conditions.

The prevailing interpretation of the semiogenesis of material signs, based on Near Eastern archaeological evidence, understands it as a process of vertical progression, in which, a lower order of signs (e.g., material signs, indexes, icons) grounds a higher order of signs (e.g., symbolic signs) (Iliapoulos 2016: 120). In this context, Iliapoulos further draws on Hoffmeyer's (2007) insights, suggesting that lower-order signs scaffold higher-order ones, namely, a symbolic sign system such as writing. Although Iliapoulos (2016, 120) acknowledges that this interpretative model is not universally applicable to all cultures, the case of the Balts in the Eastern Baltic provides an opportunity to explore an alternative perspective of semiogenesis. Therefore, the Eastern Baltic case provides a valuable example demonstrating that similar sign practices may develop along different genetic trajectories. This, in turn, calls for the development of a new theoretical framework, which, in my view, should begin with a critical re-evaluation of hylomorphic ontology.

In this paper, hylomorphic ontology is articulated as a possible pitfall. Reconsidering hylomorphism not only provides a starting point but also allows the connection of theoretical positions that build the required framework. As is well known, Aristotle (2016:

1033b) is considered as the main influence for hylomorphic (*hyle* – matter, *morphe* – form) framework, obliging one to view objects as compositions of form and matter. Yet, this presupposition carries problematic premises, such as the distinction between the active form and the passive matter, and the separation of mental representation as the primary source of becoming. In this view, mental representation reduces semiotic genesis to a linear, vertical process, thus suggesting that preconceived information is necessary for a sign to emerge. However, the Eastern Baltic archaeological case shows that preconceived information – as there are minor indications that the Near Eastern counting practices actually reached the region (Barusevičius 2024) – is not enough to initiate semiotic transformation, and that its explanation should be sought beyond the hylomorphic framework.

Instead of the vertical model of material sign becoming and hylomorphic ontology, I argue that an enactive, genetic, and archaeologically supported view of signification enables a better understanding of semiogenesis by extending a dynamic and cyclical framework to material signs. In other words, based on the Eastern Baltic case, this paper suggests viewing material sign becoming as a cyclical process that depends on a variety of different conditions, and may therefore potentially develop in different directions. This proposition is rooted in the consideration that, rather than relying on preconceived information or mental representations as the condition for sign transformation, one should address the structure and grounds of semiogenesis within a relational ontology. I seek to articulate this perspective by relating cognitive archaeology to philosophy, while describing the approach as a philosophy of archaeology.

The theoretical framework proposed in this paper is grounded in the complementary insights of Lambros Malafouris and Gilbert Simondon. In *Material Engagement Theory* (2013; 2021), Malafouris, through the notion of enactive signification, allows one to explain how a material sign emerges and brings forth the world, while Simondon (2017; 2020; 2022), in his philosophy, provides a way of analysing the relation between the milieu and the becoming, thus revealing the genetic phases. However, what is strongest in the interpretation of Malafouris – the detailed account of signification – is lacking in Simondon's project; conversely, what Simondon emphasises – specifically, the structure and the conditions of genesis – is less explicitly articulated in Material Engagement Theory. I therefore consider their comparison fruitful and propose a framework that brings material and enactive signification into relation with the milieu, thereby accounting for semiotic transformations across different genetic phases.

I suggest that the best way to establish a conceptual relationship between Malafouris' and Simondon's positions is through their considerations of the material sign and the image. Malafouris (2013: 97) states that that the material sign operates "…on the principle of participation", emerging through enactive signification – which is a conceptual blend of mental and material inputs (*ibid*.: 90). Simondon (2022: 9) defines an image as "… parasites or a surplus", which, depending on the virtualities and potentialities provided by the milieu (Simondon 2017: 60–61), undergoes genetic cycles of transformation – anticipation, perception, memory, and invention (Simondon 2022). Accordingly, if the

material sign is understood as an image in the Simondonian sense, it becomes possible to consider the cyclical genesis of enactive signification in relation to the milieu. This framework suggests that material signs emerge through blends of mental and material inputs, transforming through phases of anticipation, perception, memory, and invention; invention initiates a new cycle of enactive signification, paving the way for materially engaged semiogenesis. Each signification, depending on the milieu, may develop in different directions, enabling diverse transformations of material signs usage.

To the best of my knowledge, the relationship between Malafouris' Material Engagement Theory and Simondon's philosophy has only been addressed a few times, emphasising the relationship between life, subjectivity, and technics (Dereclenne 2021), as well as digital practices (Poulsgaard 2017). Yet Malafouris' and Simondon's comparison in terms of semiotics and the notions of enactive signification, material sign, image and milieu is undertaken here for the first time. An attempt at highlighting this, and establishing co-parallels between the theories, allows me to begin by examining their positions in detail.

Relating Relationalists

L. Malafouris' Material Engagement Theory and Material Sign

Concerning the similarities, both authors (Malafouris 2013: 235–236; Simondon 2020: 21–36) adhere to the critique of hylomorphism, which holds that objects are created through the unification of *form* and *matter*. Although hylomorphism is often associated with Aristotle's (2016) philosophy, in this context, the critique does not directly target his thought, but rather domains in which a rigid distinction between form and matter is made. And precisely this distinction introduces several problematic implications, which can be outlined through examples such as: active form vs. passive matter; inner form vs. outer matter; mental representation vs. physical representation; isolated mind vs. unrelated object, etc.

Accordingly, for Malafouris, the understanding of the notion of the material sign stems from a critical stance toward representationalism. Malafouris (2013: 90) states that a material sign is not solely "…the product of representation…", outlining two types of the latter: "the internal or mental type and the external or public type. Mental representations can be understood as what philosophers call the representational content of a certain intention or belief about the world; public or external representations are those material signs or sign systems that are publicly available in the world" (*ibid*.: 89). Thus, a material sign is not solely a product of either mental or public representation. Predisposition based on mental representation assumes a linear model of becoming – from non-being to being – in which a preconceived mental form shapes raw matter, overlooking the multiple sources from which material signs can emerge or operate. Public representation, by contrast, presupposes that material signs depend solely on collective needs, while excluding forms of becoming beyond society or the human individual, such as biological, material, or relational influences.

Additionally, in the Material Engagement Theory, this critique of representationalism is aligned with the language-oriented approach, which prioritises form – sign, word, or the signified – over its referent, material, or the signifier. This over-prioritisation is termed *the fallacy of the linguistic sign*, in which, the material sign may be subjugated "under the general category of the linguistic sign" (*ibid*.: 91), even though "language and material culture differ substantially in respect of the cognitive mechanisms that support their semiotic function" (*ibid*.). For example, this implies that the word 'clay figurine' and the actual figurine share identical semiotic qualities and possibilities, even if the linguistic sign is assumed to precede and determine the material sign. Regarding both the critique of representationalism and the *fallacy of the linguistic sign*, the essential issue, in my view, concerns the source of determination – representational, mental, public, or linguistic – which, although explanatory, simultaneously limits our understanding of the nature of a material sign.

This is the reason why Malafouris shifts his focus from the representational domain to the relational one. He (*ibid*.: 227) proposes an ontology of the hylonoetic (*hyle* – gr. matter, *nous* – gr. mind) field, while situating analysis within material engagements, that is, interactivities, connectivities, and mediations with and through matter. Thus, the material sign depends on different scopes of material engagement, "… a mindscape quite literally extending into the extra-organismic environment …" (*ibid*.: 227), where matter itself is potentially "*co-extensive and consubstantial with mind*" (*ibid*.: 77). This means that representation and the linguistic properties of the material sign do not come prior, but are treated as side effects or outcomes of various relationalities or engagements.

G. Simondon's Philosophy of Imagination and Image

Similar to Malafouris, for whom material engagement, matter, or material culture are of importance, Simondon (2020: 23) lays his emphasis on relations and the milieu, in the context of the critique of hylomorphism targeting the problematic nature of the notion of form by his famous brick-making example. While one might assume that the geometric mould – i.e., form – fully governs the process, it is more complex: clay – i.e., matter – must be excavated, cleared, crushed, sifted, shaped, dried or wetted; the mould, likely wooden, must be crafted, shaped with specific gestures and tools, and coated to prevent sticking. This example shows that form is neither temporally nor ontologically prior to relationalities, both form and matter depending on them.

The evaluation of form is additionally extended by the critical reconsideration of Gestalt theory, where the problematics of reducing an image to a form becomes evident. Simondon (2017: 61) states that "gestalt psychology, while recognizing the function of totalities, attributed force to form…", yet, a deeper analysis "…show[s] that what is determinant and plays an energetic role are not forms but that which carries the forms, which is to say their ground" (*ibid*.). Thus, Simondon seeks to dethrone forms as active agents, which would reduce an image to fixed mental or physical representations and lead to the same outcome – the image transformed solely by internal cognitive capacities or the needs of a collective – and relies more on the determinacies of the ground, that is, on the milieu.

Accordingly, I want to suggest that, as Malafouris emphasised material sign dependencies on material engagement and interactions between mind and matter, Simondon similarly understands the notion of image, thereby outlining the importance of the connection between the imagination and the milieu. Simondon (2022: 14) defines imagination as "…not just an activity of image production or evocation, but equally the mode of receiving images concretized as objects, the discovery of their sense, of the perspective of a new existence for them". This means that the form, whether mental or physical, does not come prior, but is rather a surplus of the entanglement between the imagination and the milieu.

Therefore, neither does a material sign subjugate to the logic behind representation or the linguistic sign, nor is an image regarded as form separated from the relations or the milieu. Thus, a material sign operates "…on the principle of participation" (Malafouris 2013: 97); that is, an artifact, thing, or tool, through its affordances, establishes meaningful interaction with various surroundings. While images, instead of standing for reality, are "…parasites or a surplus […], sometimes inhabiting the subject, other times leaving it" (Simondon 2022: 9); in this sense, although somewhat inconsistent, Simondon's use of the notion of image can be regarded "…as a metaphor derived from tradition, expressing the intensity of the relationship being established with reality" (Sabolius 2021: 76). Accordingly, I suggest that material signs and images are semantically parallel as active fields of interaction and connectivity; whereas, abstraction, such as representation, is a result of engagement through material signs/images with the surrounding milieu, with no fixed sources but shifting mediations that rearrange action possibilities.

Productive Difference between Relationalists

After outlining similarities that enable their comparison, and before articulating Malafouris' notion of enactive signification and Simondon's concepts of the milieu and cyclical genesis, I highlight their productive difference, which concerns their views on potentiality. In Material Engagement Theory, potentialities are understood as affordances brought forth by matter or material culture. The notion of affordances, derived from Gibson (1979), refers to a field of interaction possibilities. Accordingly, Malafouris (2013: 252) defines the matter or material culture as a field that brings forth possibilities for engagement, while giving limited consideration to material constraints or dissociations. Additionally, Malafouris' (*ibid*.: 89–118) model of enactive signification corresponds to material counting in the Near East, thus opening consideration of the relationship between signification and different kinds of milieu, such as in the Eastern Baltic.

This is where Simondon's notion of milieu becomes relevant. For Malafouris, matter or material culture is one type of milieu that affords interaction. Simondon (2017: 55), however, extends the notion beyond matter to include living organisms, technical objects, and various internal and external surroundings. Yet, in this context, what matters is not what Simondon's notion of milieu refers to, but how the author describes what milieu brings forth – namely (*ibid*.: 60–61), various potentialities and virtualities. Potentialities

and virtualities show that relations are never purely positive or unidirectional; they involve both association and dissociation, as well as connection and breakage (*ibid*.: 62). While Malafouris emphasises possibilities for engagement, Simondon's philosophy allows articulation of both engagement and disengagement between the individual and their surroundings. Thus, their comparison is not only possible but also productively meaningful, covering a wider range of the relational domain.

Enactive Signification

As was mentioned above, the critique of representationalism and *the fallacy of the linguistic sign* demonstrate that abstraction or concept is not "…temporally and also ontologically prior to its actual objectification" (Malafouris 2013: 97). Temporal precedence would imply that an abstraction or a concept is prior and thus is the source of a material sign, while ontological priority might assume a preestablished single abstraction or concept grounding the material sign or its objectification. In contrast, Malafouris (*ibid*.) suggests that "reality, at least for Material Engagement Theory, is neither *post* nor *ante res*; it is *in res*. Material signs are not simply message carriers in some pre-ordered social universe. Material signs are the actual physical forces that shape the social and cognitive universe".

This means that abstraction and concept arise as developmental outcomes, dependent on the usability of the material sign, which "… brings forth the concept as a concrete exemplar and a substantiating instance" (*ibid*.); a material sign "… does not refer to something existing separately from it, but is a constitutive part of what it expresses and which otherwise cannot be known" (*ibid*.). Accordingly, the logic of a material sign is enactive (*ibid.*: 96–99), which means that a material sign is intrinsically distributed and intertwined with interaction possibilities from the directly approachable world. If one must understand how abstraction or concept – e.g., symbolisation – is conditioned through material signs, one should raise the question of their emergence in the first place.

Malafouris (*ibid*.: 99) understands the emergence of the material sign as enactive signification, as "[it is] a process of embodied 'conceptual integration' responsible for the co-substantial symbiosis and simultaneous emergence of the signifier and the signified that brings forth the material sign". This means that enactive signification is treated as a semiotic aspect of material engagement, through which a material sign emerges in different scopes: relations between mind and matter condition it and define its limits. Depending on the established relations – when the mind enters new material domains, and *vice versa* – the specificity of material sign also changes. These process in the Material Engagement approach is concretised through the notion of conceptual projection.

Conceptual projection is "…the pervasive and (in most cases) unconscious capacity of the cognitive agent to establish direct implicit ontological correspondences between domains of experience" (*ibid*.: 100). Importantly, conceptual projection does not involve one domain being imposed on another at the expense of the source or the target; rather, it is balanced and characterised by correspondence, while "…these ontological correspondences primarily involve connections of identity, analogy, similarity, causality, change, time,

intentionality, space, role, and part-whole, and in some cases also of representation… They constitute the basic cognitive mechanism by which we make sense of things, often without being able to explain why and how" (*ibid*.).

Conceptual projection occurs in two types: metaphorical and integrative. The metaphorical projection refers to the basic level of conflation between "…a familiar or concrete and an unfamiliar or abstract phenomenal domain…" (*ibid*.: 102), projecting the concrete elements and the meaningful experiential domain onto an abstract and otherwise meaningless conceptual domain. In this context, the example of weight is introduced (*ibid*.: 98–99). The idea is that weight is meaningless without embodiment: weight is a property of material things, and, without experiencing these things, the concept of 'weight' has no meaning. Thus, interaction with matter exceeds the conceptualisation of standardised or quantified units. A similar example can be seen in early Eastern Baltic clay figurines: interaction with their materiality afforded counting specific quantities, while their shapes (biconoids, concaves, discs, miniature vessels, spheres, and tools) might have been associated with particular accounting operations or types of commodities.

The notion of integrative projection is borrowed by Malafouris from Fauconnier's (1997) cognitive theory. It refers to a projection "…in the conceptual system that constructs a new hybrid or blended phenomenal domain" (Malafouris 2013: 103), exceeding a metaphorical one, which is limited to two domains – familiar/unfamiliar, meaningful/meaningless, or concrete/abstract – in the sense that a third, novel structure – a blended domain – is composed, which cannot be reduced to these dualities. Thus, Malafouris (*ibid*.: 103) states that:

> …the basic structure of conceptual integration can be presented schematically by way of a minimal network that comprises at least three mental spaces: two input mental spaces (though there can be any number of influencing spaces projecting to a blend) and the blending space. The input spaces contribute structure selectively via projection to the blended space, which as a result develops a new structure ("emergent" structure) not initially available from the separate inputs. Thus, conceptual integration constructs a new hybrid assembly with "emergent" meaning.

An attentive reader may have already noticed that the meaning of integrative projection, based solely on Fauconnier's approach, contrasts with the main intentions of Material Engagement Theory, as it remains within the domain of mentality and does not account for the effects of materiality. This is precisely why Malafouris extends the original concept of integrative projection using Hutchins' (2005) idea of the material anchor, which demonstrates, through various case studies, that materiality or material culture provides input into the blending process. In this way, the conceptual blend inherits characteristics of materiality, which stabilise – more specifically, anchor – the conceptual blend, "…thereby enhancing and tightening conceptual blends in a memorable and durable manner" (Malafouris 2013: 104). This directly relates to the metaphorical meaning of 'anchor': its function is to fix a ship to the ground so that, even in rough waters, it remains in place and does not drift into areas that are physically inaccessible.

Therefore, the core of the process of enactive signification, which gives rise to the material sign, is explained through the connection between integrative projection and the material anchor. In this sense, a material sign emerges as a conceptual blend, composed of and inheriting both the mental input (*n*) and the material anchor (*n*). For example, in the Near East, the meaningless mental problem of counting through the projection of the material clay token was integrated into the perceptual and physical process of the counting practice, which became a novel and manageable semiotic problem in real space and time (*ibid*.: 105, 114); "thus, the process becomes meaningful, and I want to suggest that meaningful engagement of material signs is the precondition for the emergence of symbolism" (*ibid*.: 104–105). Then, engagements through material signs with the environment precondition symbolisation temporally and ontologically by surpassing and stabilising it, thus creating the conditions for its presence in the first place.

Milieu and Cyclical Genesis

Given that the image is not reduced to form, nor is it preceded by it, Simondon considers images as fields containing possibilities for connectivity. As such, an image's status transforms depending on different established relations between the individual and their milieu and is not subordinated to a single one. Simondon states that an image "…is a sample of life, but it remains partly abstract because of the patchy and partial aspect of this sample" (Simondon 2022: 10); then, there are, rather, concretised images, such as "… image-objects—artworks, clothing, machines—become obsolete, larval memories, ghosts from the past that slowly vanish with the vestiges of lost civilizations" (2022: 14). Once the image as a sample of life transforms into an image-object, it gains technical objects status, which are "…mediators between man and nature" (Simondon 2017: 15). Thus, Simondon's notion of cyclical genesis not only explains how an image changes, but also indicates how, through these transformations, the relationship between the individual and their external milieu alters as well.

In this context, the entanglements between the imagination and the milieu play a central role. For Simondon, let us remember, imagination is not only the productive power of images *qua* interaction possibilities but also the capacity to receive them as objects and discover their sense and new modes of existence; accordingly, in my view, this indicates a direct parallel with the process which is important for Malafouris, that is, material engagement. Through interaction possibilities, imagination depends on the milieu, which "… plays the role of information…" (*ibid*.: 61) and provides a "…system of virtualities, of potentials, forces that carve out their path…" (*ibid*.). Here, virtuality refers to partly concrete possibilities, like yet-unrelated parts of a tool, and potentiality refers to undetermined possibilities, such as unshaped raw clay, with these examples only illustrating and not exceeding the contents of the milieu.

Thus, image *qua* interaction possibilities transformations – including their reception as objects and the discovery of their meaning – depend on variations in the relationship between the imagination and the milieu. The milieu, bringing forth different combinations

of potential and virtual possibilities, informs the imagination, and, at the same time, establishes both partly determined and undetermined restriction for the transformation to occur. Importantly, such a relationship is not solely positive, as Simondon (*ibid*.: 62) shows that these transformations occur not only through connections, but also depend on 'alienations' or detachments. Thus, connections and detachments shape the various interaction possibilities, while determining its characteristics, status, and 'parasitic modes'. As possibilities of interaction enter new surroundings (and *vice versa*), they transform their specificity; this connectivity between the imagination and the milieu enacts image transformations, with these possibilities mediating and making the relationship present, so that we understand a cycle containing stages and breakages rather than a linear, vertical, and purely successful transformation.

This cyclical genesis contains phases. However, rather than viewing it temporally, where one stage ends and an unrelated sequential stage follows, Simondon (*ibid*.: 173) defines it as "… an aspect that results from a splitting in two of being and in opposition to another aspect; … one cannot conceive of a phase except in relation to another or to several other phases; in a system of phases there is a relation of equilibrium and of reciprocal tensions; it is the actual system of all phases taken together that is the complete reality, not each phase in itself…". Based on this, the cycle should not be understood as a circle-wheel rolling in a single direction, but rather as a super-spiral—spinning, stretching, and contracting without temporal predetermination, and at times rupturing into new cycles of genetic processes. For Simondon (2022; Sabolius 2019: 41–43), such a cyclical genesis contains anticipation, perception, memory, and invention.

Anticipation. "Anticipation, before the organism's relation to the object, is the set of activities that make the organism an auto-kinetic system" (Simondon 2022: 30), showing that the image contains motor action, which are charged by pre-determined behaviour that brings forth spontaneous reactions. Images are anticipations of the experience of the surroundings – an unconsciously generated, vitally significant enactive and embodied knowledge that creatively directs the individual toward their milieu. In this relationship, the surroundings are not fully describable and present possibilities that are constantly changing. Thus, the image prepares the individual for the unknown, spontaneously providing guidance and decisions for questions or uncertainties, laying the groundwork for the individual's engagement with regenerating possibilities of interactions.

Perception. In this phase, an image is a possibility to shape responses determined by stimuli from the surroundings: "…in progressive perceptual-motor behaviors, the role of intra-perceptual images is primordial: since perception is given only at the end of the activity, at the moment of consummation, each preceding stage is founded on a sketch of perception that is, precisely, the image" (*ibid*.: 65). An image is not only an impression of the surrounding but also a motoric reaction imposing limited affordances to external signals. Accordingly, the image does not function unidirectionally because of the experience of the surroundings; it also provides the individual with the specific predefined possibilities for engagement.

Memory. "The memory-image is that which may reappear at any time after the end of the perceptual situation to which it is related; the image is then the occasion of a representation

or a revival [*reviviscence*] characterizing the secondary state and differentiating it from the primary state, the latter being extended in rather than represented by the consecutive image and the immediate image" (*ibid*.: 110). In other words, an image becomes an abstraction – not in a pure representational sense, but as one which contains the perception stage motor actions and at the same time surpasses them by making memorisable patterns – of the milieu, allowing the individual to determine an analogue version of it. Therefore, by forming a 'copy' – which is at the same time similar but structurally different from the external surroundings and actions directed to and conditioned by – recollection gives way for invention of the technical object to occur.

Invention. "Invention is the emergence of an extrinsic compatibility between the milieu and the organism and of an intrinsic compatibility between the subsets of the action" (*ibid*.: 139), thus referring to the creation of a novel characteristic of reality. In this sense, the system of recollection changes, paving the way for the emergence of new organisations, such as image-objects or technical objects. Consequently, the novel entity conditions transformation and increases the graduality of the relationship between the individual and the milieu, ending one cycle and allowing the next to begin. This is the phase in which an image becomes a technical object – an image-object – enabling anticipation of novel interactions with the surrounding milieu. The process of genesis shows that, depending on the phase, an image assumes different statuses and functions as the same entity transforms through anticipation, perception, memory, and invention. In this genetic expansion and contraction, there is no pre-established starting point; the process can begin at any phase.

In my view, the meaning of the phases in cyclical genesis can be extended through Simondon's notion of the orders of magnitude. Simondon (2020: 384) illustrates the notion of the orders of magnitude through photosynthesis, which enables interaction between two distinct scales – the cosmic (carbon dioxide and sunlight) and the infra-molecular (soil and atmospheric water molecules). He thus posits intrinsic connections between different levels of reality, mediated by a third process, without which, such a relationship would not be possible. The interpreters of Simondon's account suggest that the equivalent contemporary meaning of the notion of the order of magnitude is the notion of scale. Then, the point of it is "…to point to the utterly unequal "scales" of the terms of a relation" (Voss 2018: 111); and if an "…individual *is* relation and not merely *in* relation […], then the individual can only be relation between orders of magnitude" (Barthélémy 2012: 220).

Therefore, each phase can be an order of micro-magnitude (i.e., a micro scale), carrying its own characteristics and processes between the individual and their milieu. Each unfolding phase simultaneously inherits the structural components of the preceding one while introducing novel elements, thus establishing an ongoing cycle of genesis. From a broader perspective, a cycle of genesis is an order of macro-magnitude (i.e., a macro scale), carrying its own structural characteristics of splits, stretching, and contractions – and not between the individual and their milieu, but, instead, between different types and instances of cyclical geneses. Thus, one may raise questions not only about the transformations of phase structures at the micro level, but also about the relationships between different cycles of genesis at the macro level.

Cyclical Genesis of Enactive Signification

Let us remember the part discussing Malafouris. In terms of enactive signification, a material sign – such as the Eastern Baltic clay figurine – emerged as the possibility to integrate the inherently vague mental problem of counting, through projection onto and anchoring by the stable and durable materiality of the figurine, into a novel and more manageable practice. The figurine's shape signified a specific quantity and type of a product, thereby bringing the practice of counting forth as a perceptual and physical process and enabling its manipulation in real time and space. From this point, in describing how a material sign emerges and brings forth the world – drawing on the parallel between the material sign and the image as possibilities of interaction, connectivity, and dissociation – Simondon's framework comes into view, allowing a rethinking of the cyclical genesis of enactive signification.

Anticipation. Enactive signification occurs as a reorganisation of the action system, which spontaneously recalibrates mental elements (input *n*) and materialities or material structures (anchor *n*). Accordingly, a material sign emerges as a possibility for renewed behavioural compositions and transforms the relationship between the individual and the external milieu. In this sense, clay figurine-related movements, groupings, or shaping renew, corresponding to previously unaccounted commodities and grasping previously unknown quantities; thus, the expanded usability of clay figurines allows the previously known scheme of action to be exceeded.

Perception. Enactive signification occurs at the level of perceptual-motor behaviour, which serves as a ground composed of an individual's minimal mental capabilities (input *n*), providing an opportunity for engagement with materialities or material structures (anchor *n*). Accordingly, a material sign emerges through basic level of perceptual-motor behaviour as a possibility to establish action and the relationship between the individual and the external milieu. In this sense, clay figurines, while requiring minimal effort, allow the type and quantity of the commodity to be grasped; thus, the shape or known usability of the clay figurine imposes specific schemes of engagement with the surrounding milieu, providing the individual with particular action possibilities for computational engagement.

Memory. Enactive signification occurs based on memorised sequences and schemes of action, building on the perceptual-motor level while allowing it to be exceeded, and organises the relationships between mental elements (input *n*) and materialities or material structures (anchor *n*) into persisting patterns. Accordingly, a material sign establishes both the traditions of action and the patterns of outcomes in the relationship between the individual and the external milieu. In this phase, a clay figurine belongs to the broader complex of other types of clay figurines and their associated gestures or actions, functioning as a totality of schemes with particular parts; thus, one can recognise which clay figurine engages which computational operations, approaching a limit when the established system of clay figurines cannot fully address the occurring problem, and thus paving the way for an invention to happen.

Invention. Enactive signification occurs as a unification of mental elements (input *n*) and materialities or material structures (anchor *n*), becoming a material sign or the

clay figurine itself; this shows the creation of a novel aspect of computational reality. Accordingly, a material sign is neither static nor passive, but it transforms and augments the relationship between the individual and the external milieu. In this sense, a new type of the clay figurine arises, carrying specific yet novel gestures and correspondences with commodities and quantities; thus, the system of recollected clay figurine traditions is disrupted by the addition of new physical entities, thus conditioning a further generative cycle with novel computational anticipations.

Accordingly, the Near Eastern semiogenesis of counter tokens – developing from physically handled clay figurines to imprints and pictographs – can also be understood, and the interpretation that meaningful engagement preconditions symbolism can be extended not as a direct evolution grounded in and following the previous phase, in which one phase (handling) simply gives rise to a new one (impressions or pictographs), but as cycles of geneses, which may in some respects be opposed: handling and impressing/drawing. This means that both handling and drawing carries their own cycles, only partly arising from any of them, and, at the same time, developing through transformed relations with the milieu.

Conclusions

The analysis shows that the Eastern Baltic case of enactive signification, like the Near Eastern case, can be interpreted as enabling counting practices, but, depending on the local milieu, remained in the same cycle rather than genetically developing into impressions and pictographs. Although the notion of cyclical genesis of enactive signification allows analysis of the Eastern Baltic semiotic procedure at the micro level, it also indicates that focusing on a single micro cycle (individual – the clay figurine) risks an anthropocentric interpretation of a population as 'lacking' something. To avoid this, I propose that the notion of cyclical genesis of enactive signification, anchored by the Eastern Baltic archaeological record, shows that materially engaged semiogenesis is not limited to the micro level but, instead, that it extends to a macro level of diverse conditions. At this scale, the macro level can be seen as cosmic, where more complex factors shape the semiogenetic process.

References

Ališauskas, V., 2009. *Sakymas ir rašymas*. Vilnius: Aidai.

Aristotle, 2016. *Metaphysics*. Trans. C. D. C. Reeve. Indianapolis: Hackett Publishing Company, Inc.

Barthélémy, J.-H., 2012. Fifty Key Terms in the Works of Gilbert. In: *Gilbert Simondon: Being and Technology*, eds. A. De Boever, A. Murray, J. Roffe, A. Woodward. Edinburgh: Edinburgh University Press, 203–231.

Barusevičius, D., 2024. Counting in Action: On Early Baltic Computational Practices and Their Possible Near Eastern Influence. *Archaeologia Lituana* 25: 36–51. https://doi.org/10.15388/ArchLit.2024.25.2

Barusevičius, D., 2026. On Relational Memory through Archaeology, Technics, and Organization. *Technophany: A Journal for Philosophy and Technology* 5/1: 1–20. https://doi.org/10.54195/technophany.23898

Dereclenne, E., 2021. Simondon and Enaction: The Articulation of Life, Subjectivity, and Technics. *Adaptive Behavior* 29(5): 449–458. https://doi.org/10.1177/1059712319861915

Fauconnier, G., 1997. *Mappings in Thought and Language*. Cambridge: Cambridge University Press.

Gibson, J. J., 1979. *The Ecological Approach to Visual Perception*. Boston, MA: Houghton Mifflin.

Hoffmeyer, J., 2007. Semiotic Scaffolding in Living Systems. In: *Introduction to Biosemiotics: The New Biological Synthesis*, ed. M. Barbieri. Dordrecht: Springer, 149–166.

Hutchins, E., 2005. Material Anchors for Conceptual Blends. *Journal of Pragmatics* 37: 1555–1577. https://doi.org/10.1016/j.pragma.2004.06.008

Iliopoulos, A., 2016. The Material Dimensions of Signification: Rethinking the Nature and Emergence of Semiosis in the Debate on Human Origins. *Quaternary International* 405(A): 111–124. https://doi.org/10.1016/j.quaint.2015.08.033

Malafouris, L., 2013. *How Things Shape the Mind: A Theory of Material Engagement*. Cambridge: MIT Press.

Malafouris, L., 2021. Mark Making and Human Becoming. *Archaeol Method Theory* 28: 95–119. https://doi.org/10.1007/s10816-020-09504-4

Poulsgaard S., K., 2017. Enactive Individuation: Technics, Temporality and Affect in Digital Design and Fabrication. *Phenomenology and the Cognitive Sciences* 18: 281–298. https://doi.org/10.1007/s11097-017-9539-6

Sabolius, K., 2019. Traversing Life and Thought: Gilbert Simondon's Theory of Cyclic Imagination. *Social Imaginaries* 5(2): 37–57. https://doi.org/10.5840/si20195213

Sabolius, K., 2021. Anapus funkcijos: vaizduotė kaip semideterminacija. *Problemos* 99: 63–79. https://doi.org/10.15388/Problemos.99.5%0D

Schmandt-Besserat, D., 1992. *Before Writing, Volume I: From Counting to Cuneiform*. Austin: University of Texas Press.

Simondon, G., 2017. *On the Mode of Existence of Technical Objects*. Trans. C. Malaspina, J. Rogove. Minneapolis: Univocal.

Simondon, G., 2020. *Individuation in Light of Notions of Form and Information*. Trans. T. Adkins. Minneapolis: University of Minnesota Press.

Simondon, G., 2022. *Imagination and Invention*. Trans. J. Hughes, C. Wall-Romana. Minneapolis: University of Minnesota Press.

Voss, D., 2018. Simondon on the Notion of the Problem: A Genetic Schema of Individuation. *Angelaki: Journal of the Theoretical Humanities* 23(2): 94–112. https://doi.org/10.1080/0969725X.2018.1451471

Zinkevičius, Z., 1988. *Lietuvių kalbos istorija III: Senųjų raštų kalba*. Vilnius: Mokslas.