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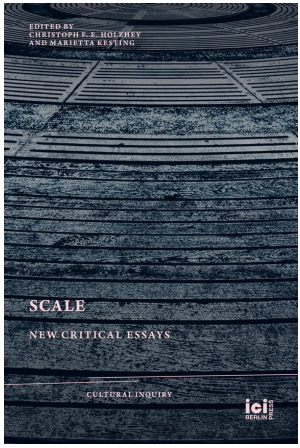

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Scale and Discourse

On the Seismographic Connections between Processes

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ABSTRACT: In this intervention, I examine the macro-micro relationships or effects that can be established between processes of different scales, particularly processes attributable to heterogeneous temporal scales. I then describe the agency that material processes — such as economic or climatic ones — can have in facilitating the production of specific human discourses or acts.

KEYWORDS: scale; discourse; pre-discourse; subject; timescale; statement; chance

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INTRODUCTION

Starting from its Galilean formulation, and more precisely the first day of his *Dialogue on the Two World Systems*,[1] the concepts of *scale* and *scalability* have become, as is well known, fundamental in the sciences (such as physics), in technology, and in economics. Beyond its technical-scientific use, the concept of scale has profound philosophical, speculative, and anthropological repercussions, as evidenced by the rich literature this concept has generated. My aim in this essay is to examine its applicability within a specific philosophical domain, namely that pertaining to theories of discourse (Pêcheux and Foucault) and the idea of social change. The core of my argument is that the appearance of *enunciative events* in the social field might be the local manifestation of interactions between processes unfolding at broader scales. The term 'enunciative' in 'enunciative events' is to be taken in the broadest sense, indicating any production of either speech, artistic

1 Galileo Galilei, *Dialogues Concerning Two New Sciences* [1638], trans. by Henry Crew and Alfonso De Salvio (Macmillan, 1914).

form, bodily gesture, and so on.[2] In this regard, then, both the appearance and production of articulated discourses and corporeal acts (both intended and cognized or escaping control, such as *acting out*) qualify as enunciative events. My hypothesis is that these events not only have a local reality, that is to say, an ontological legitimacy that makes them uniquely describable events, but also that their regularity and distribution allow us to take them as local offshoots of more general trends. This second aspect, which makes use of the concept of scale, points to the idea that, although local description of the agencies of individual actors is legitimate, the view 'from above', so to speak, allows us to see the broader constraints and regularities in which these actors move, often unbeknownst to themselves. Through this type of scalar dislocation, we are able to see the agency of the *whole* (process) in shaping the *part*. In fact, I propose to consider the concept of scale as a useful ally in repeating the theoretical and philosophical gesture of the 'decentring' of the human. Put differently, I consider scale arguments as an essential component of the philosophical lineage that goes (at least) from Freud to Lacan, from Marx to Foucault, from Althusser to Lévi-Strauss. Scalar dislocations of agency allow us to see how enunciative events are not just the product of local know-hows and articulations at the scale of the individual actor or the group, but also — in their distribution in space and time — of forms of regularities and logics that escape the dimension of the actors themselves.

That the idea of heterogeneous spatio-temporal scales is itself powerfully posthuman, insofar as it relativizes our existence in the cosmos, is a recurring topos. As Diann Bauer puts it:

> [T]here is such a divergence between our lived experience of duration and how time functions when looking at scales beyond what we can perceive directly, either at the quantum or cosmological scales, that the question of time can stop making sense altogether.[3]

2 I take this broader meaning of 'enunciation' from Maria Giulia Dondero, 'Geste de la pensée, gestualité picturale: le diagramme chez Peirce, Deleuze et Goodman', *Metodo*, 9.1 (2021), pp. 67–95 <https://doi.org/10.19079/metodo.9.1.67>. See also Maria Giulia Dondero, *I linguaggi dell'immagine* (Meltemi, 2020).

3 Diann Bauer and Suhail Malik, 'Xenotemporality and Time-Complexes: Recomposing Time for Non-Experiential Risks', in *Catastrophe Time!*, ed. by Gary Zhexi Zhang (Strange Attractor Press, 2023), pp. 215–25 (p. 211).

In this regard, it is useful to mention the concept of *xeno-temporality*, proposed by Suhail Malik.[4] We are immersed in temporalities that are alien to us but that nonetheless have the power to push us in different directions, a condition that modern complex societies have only exacerbated.

Of course, the types of macroscopic processes that can have an overarching effect on more human ones can be both non-human, such as the geological or climatic, or human-made, such as global economic crises, wars, or a combination of both. What is important is that, independently of the type, these processes spread and propagate, covering distances and timeframes which eschew local 'small-scale' detection by the actors involved, so that effects of realization occur often with a significant delay.

In other words, I propose to hypothesize that these spatio-temporally larger processes — climatic, economic, social — play a role in shaping more authentically human processes, exerting forms of pressure and constraint that are often recognizable only a posteriori, in that their patterns become visible only in retrospect and often with specific analytical tools. Following certain concepts from the continental philosophical and linguistic tradition, by 'human processes' I mean *discourses*, an umbrella term encompassing spoken and uttered discourse, statements deposited in archives (understood as surfaces of inscription in a general sense), or performed gestures and acts (both spontaneous and conventionally codified or trained).

Discourses and material processes (natural or otherwise) are not at all isolated from one another. Although a certain 'operational closure' can be ascribed to the two domains, meaning that the rules of one can be explored in partial isolation from the other (linguistics on one side, hard sciences on the other), I believe there exists an interactive dimension between them, and that it can be explored through consideration of scale. In short, it is a matter of hypothesizing how processes spread across temporal scales incommensurable with human scale can play a role in 'prompting' or 'facilitating' the precipitation of human symbolic forms and discursive events. The interaction between

4 Ibid., p. 219.

processes of different scales would allow us to see, in Karen Barad's terms, the 'entanglements' between materiality and discursivity.[5]

'Discourse' is a crucial term for many continental philosophers, philosophers of language, linguists, and psychoanalysts. My idea is that of a power (or agency) of macro- and micro-scalar processes (where 'meso-scalar' is understood as the human scale) that *prompt* or *facilitate* the appearance of certain statements or discourses, that is, that activate historically contingent discursive formations. Ultimately, our discourses and our gestures are not only directed towards other humans but also towards the very conditions that *make us speak and act*. Enunciation, then, is something that seethes beneath processes like a subterranean stream, of which we see, ex-post, only the final deposit. What is recorded as an event leaves behind it a trail of statements. It is a matter of investigating 'the historical existence of the statement', to borrow Jean-Jacques Courtine's expression, thinking of it as a trace.[6] The transient islands of coherence and monotony in which statements and gestures can appear can thus be framed as *effects* of processes spread across scales heterogeneous to the human one.

In proposing a scalar vision concerning discourses, I do not necessarily intend to draw on distributionalist hypotheses in discourse analysis, although such approaches have been attempted.[7] Rather, I intend to position myself in a median dimension, an intermediate theoretical space between what is properly non-human and what, through discursive activity, becomes so.

If there are material processes on temporal and spatial scales of magnitudes incommensurable with human processes, which neverthe-

5 Karen Barad, *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning* (Duke University Press, 2007).

6 Jean-Jacques Courtine, 'Quelques problèmes théoriques et méthodologiques en analyse du discours, à propos du discours communiste adressé aux chrétiens', in Courtine, *Analyse du discours politique*, special issue of *Langages*, 62 (1981), pp. 9–128 (p. 52) <https://doi.org/10.3406/lgge.1981.1873>.

7 For a distributional reading of Michel Foucault's *The Archaeology of Knowledge* in relation to digital humanities, see, for example, Henning Schmidgen, Bernhard J. Dotzler, and Benno Stein, 'From the Archive to the Computer: Michel Foucault and the Digital Humanities', *Journal of Cultural Analytics*, 7.4 (2022), pp. 1–14 <https://doi.org/10.22148/001c.55795>. See also Jacques Guilhaumou, Denise Maldidier, and Régine Robin, *Discours et archive. Expérimentations en analyse du discours* (Mardaga, 1994).

less have the power to create conditions (necessary but not sufficient) for the emergence of certain discourses, then thinking in terms of scale means thinking of a form of temporality analogous to what Quentin Meillassoux defines as an *ancestral temporality*, that is, thinking 'without inconsistency what there is when thought is not'.[8] To paraphrase, it is about thinking 'what there is when *discourse* is not *yet*'. Scale allows us to see the material preconditions that actualize certain discursive events. In this regard, we are embedded in an always self-reproducing ancestrality which silently shapes our agency as humans. A similar invitation is made by Zachary Horton regarding scalar thinking, which is said to have been born tainted by a form of 'pan-scalar humanism'.[9] If, on the one hand, the idea of scale has relativized and decentred the human scale in relation to all others — micro and macro, cosmic and cellular — then, on the other hand, it still thinks of 'all trans-scalar encounters as either extensions of the human into analogous scales' or as 'the beneficent extension of the human lifeworld into frontier scales'.[10] Horton's critical remark aligns with the argument by Meillassoux regarding an ancestral temporality operating before (human) thought. The intermediate link connecting the two arguments has to do with the fact that scale, if taken not simply as an extension of the human towards the non-human, can be precisely the antidote to the all-too-human view of temporality. Put more simply, scale views that focus on what happens 'around' the human — either above or below its scale — allow us to see the agency of processes shaping the human itself from the 'outside', so to speak.

As noted by Marie-Anne Paveau, in her enumeration of the occurrences and uses of the term 'pre-discursive' (*pré-discursif*) in Foucault, there is, according to the French philosopher, 'no pre-discursive providence' (il n'y a pas de providence prédiscursive).[11] With this incisive and forceful expression, Foucault means that 'there are no pre-existing

8 Quentin Meillassoux, 'Metafisica, Speculazione, Correlazione', *Iride*, 1 (2009), pp. 87–106 (p. 90).

9 Zachary Horton, *The Cosmic Zoom: Scale, Knowledge, and Mediation* (University of Chicago Press, 2021), p. 3.

10 Ibid.

11 Michel Foucault, quoted in Marie-Anne Paveau, *Les prédiscours. Sens, mémoire, cognition* (Presses Sorbonne Nouvelle, 2006), p. 8.

meanings since discourse is not prior to the human practice that elaborates it'.[12] Paveau, less radically than Foucault, admits the existence of 'pre-discursive givens' (*données prédiscursives*) which, although devoid of any providentialism, have the power to preconfigure discursive constructions. According to Paveau, the pre-discursive would be the set of knowledges and practices shared by a particular community (knowledges, encyclopedias, techniques, and so on). Following Paveau's theoretical suggestion, I propose to extend this reasoning on the pre-discursive and to propose the *non-discursive*, namely the set of (climatic, economic, social, geological, et cetera) processes on macro- and micro- scales which, while not yet being either pre-discursive or (much less) discursive, can function as systemic preconditions for the emergence of phenomena related to pre-discourse or discourse. More precisely, their effects lie in affecting the probability of discourse emerging from pre-discourse.

FROM COSMIC AWE TO WITCH-HUNTS: ON PROCESS SYNCHRONIZATIONS

In their 2022 article 'The Social Effects of an Awesome Solar Eclipse', Sean Goldy, Nickolas Jones, and Paul Piff attempt to describe the social impact elicited by the 2017 solar eclipse in the USA.[13] Specifically, they try to determine the effect of the eclipse in terms of the emotions it aroused in the population. They focus on awe and prosocial emotions such as a sense of unity with humanity, altruism, feelings of connection with others, and so on.

Their hypothesis is that such a cosmic phenomenon could elicit these types of affects. To assess this possibility, they examine a rich corpus of data from the Twitter platform, specifically those comments ('tweets') from the two million users who were located in the part of the country where it was possible to observe the eclipse in its entirety. While the emotional experiences themselves of course remain inaccessible, the authors infer these on the basis of the users' statements and

12 Paveau, *Les prédiscours*, p. 8.

13 Sean P. Goldy, Nickolas M. Jones, and Paul K. Piff, 'The Social Effects of an Awesome Solar Eclipse', *Psychological Science*, 33.9 (2022), pp. 1452–62 <https://doi.org/10.1177/09567976221085501>.

expressions, focusing on both the frequency of the use of the pronoun 'we' compared to the singular 'I', and on phrases such as 'I experienced one of the coolest things I've ever seen'.

The platform comment, the tweet, is therefore used as an archival trace that allows for 'a direct window into individuals' thoughts and feelings via the words they use'.[14] Furthermore, these comments are 'archival, enabling the capturing of ephemeral states at levels of granularity often inaccessible by traditional research methods across an extended time frame'. Finally, they can be 'either directly or indirectly connected to users' locations'.

To explore the phenomenon of awe and the prosocial psychological effects presumably elicited by viewing the eclipse, the authors use the aforementioned indices, namely the occurrence in tweets of specific words, such as the use of the plural pronoun 'we'. In summary, all those verbal indicators that would signify 'a more interdependent, socially cohesive sense of self' are relevant.[15]

The scholars conclude their study by stating that the 2017 eclipse was associated with an increase 'in awe and social processes that are core to collective life'.[16] Specifically, the likelihood of expressing awe, humility, prosociality, affiliation, and a sense of collectivity was higher among individuals located in the path of the total eclipse compared to those who only had access to a partial eclipse.

Goldy, Jones, and Piff further add that their data indicate how astronomical events that inspire a sense of wonder, such as a total solar eclipse, can stimulate tendencies vital to collective life, such as greater attention to one's own group, attention to caring for others, less selfishness, and so on. Also increasing in frequency was the occurrence of linguistic markers indicating openness 'for ambiguity in one's views and openness to alternative viewpoints', such as 'maybe' or 'perhaps'.[17]

One aspect that must be emphasized, and that directly touches upon the concept of scale, is the interaction between a cosmic phenomenon, the eclipse, and the deposition of specific expressive forms.

14 Ibid., p. 1453.
15 Ibid.
16 Ibid., p. 1460.
17 Ibid., pp. 1454–55.

Statements and signifiers linked to specific affects appeared and were deposited in the areas where the eclipse was most visible, and particularly where it was visible in its totality. What I wish to highlight is that we could frame all of this as a form of interaction between cosmic and social dimensions: the eclipse phenomenon triggers a series of discourses linked to specific affective modes. The presumed psychological authenticity of the human subjects involved in those utterances is not important here, that is, whether or to what degree the speaker can actually distance themselves from the discourse fragments they appropriate. Rather, what matters is that a series of affective artefacts — that is, heard, learned, repeated discourse fragments linked to prosociality and typical topoi like 'the unity of all humans' — appeared in coincidence with a cosmic event.

The interaction left traces of this contingent interpenetration. We can imagine the idea of leaving traces as a deposit of things said and done, in their pure and empirical appearance. Let us also imagine a non-human intelligent being who, after the extinction of our species, thousands of years from now, manages to access the database of things written and circulated in the media sphere of Twitter or other platforms, as well as online databases and libraries.

Scouring these digital spaces far and wide, this fictional non-human archaeologist suddenly finds themselves contemplating an anomalous peak around the year 2017, and distributed in the vicinity of a specific region of the globe, of statements invoking ideas of wonder, brotherly love, a sense of humanity, amazement, and so on. They observe this strange and sudden cluster, distributed in a delimited spatio-temporal region, of similar things said, of related and associated symbols piled up in a delimited portion of human history.

In another case, rather than interactions between different scales (cosmic and human), we can see an interaction of economic processes — in terms of food prices — with the social field, in the form of a facilitation of social instability. In a 2011 article, Yaneer Bar-Yam and his team ask if there is a single numerical value that could predict the likelihood of riots and social unrest on any inhabited continent.[18] The

18 Yaneer Bar-Yam, Marco Lagi, and Karla Z. Bertrand, 'The Food Crises and Political Instability in North Africa and the Middle East', SSRN, 16 August 2011 <https://doi.org/10.2139/ssrn.1910031>.

researchers focus mainly on North Africa and the Middle East. In their article, they confirm their initial suspicion: the main parameter for predicting the outbreak of unrest and social instability in a country is neither the dominant religion nor the ruling government, but rather the price of food. Based on the UN Food Price Index, they discovered that the threshold value of 210 per cent — just over double — is the critical point beyond which any further increase in commodity prices leads to dissatisfaction and social disorder. Of course, it is reasonable to doubt that this is the *necessary* and also *sufficient* condition. However, the price of basic commodities remained the most reliable value for predicting the likelihood of social disorder and uprisings.

If we consider how events in our hyperconnected and globalized world can result in disruptive effects that pop up and propagate in remote areas, we have a picture of how the global and the local are intimately connected. It is indeed reasonable to suspect that, under conditions of globalized social reproduction,[19] events occurring in a specific part of the world can rapidly reverberate globally, creating destabilizing local effects even in places very far removed.

There is another case I wish to focus on. Unlike the cosmic wonder surrounding the 2017 eclipse or the social instabilities linked to price explored by Bar-Yam and his team, the far more serious and extensive phenomenon of the witch-hunt represents a particularly important case study for the attempt to explore interscale interactions. This is for two reasons: firstly, due to its severity, in terms of the number of victims claimed by witch-hunts in Europe; and secondly, because it has been the subject of numerous historical and anthropological studies.

To explore the presence of interscalar connections in the case of this particular phenomenon, I draw on Wolfgang Behringer's historical analysis of the witch-hunt phenomenon, in which he observes and

19 I borrow the term from Tim Di Muzio, who uses it 'as a heuristic to imagine the ways in which the production, consumption and reproduction of our lives and livelihoods have become ever more internationalized and interconnected so that few people in this world can reproduce their lives and lifestyles without depending on global markets and the labour power of strangers' (Tim Di Muzio, 'Historicizing Capital as Power: Energy, Capitalization and Globalized Social Reproduction', in *The Capitalist Mode of Power: Critical Engagements with the Power Theory of Value*, ed. by Tim Di Muzio (Routledge, 2014), pp. 19–35 (p. 19)).

describes a clear correlation between cyclical agricultural crises and the resurgence of persecutions against witches.[20]

Specifically, both violence against women accused of witchcraft and peaks of interest in demonology correspond to dramatically poor harvests caused by particularly adverse climatic conditions. The period we must refer to is the so-called Little Ice Age, a particularly cold period in climatic history spanning from the mid-fourteenth to the mid-nineteenth century. As Behringer explains, witchcraft, as a social construct, began to spread during the fourteenth century precisely in parallel with the Little Ice Age. In Central Europe, the witch-hunt reached its peak in precise coincidence with the worst years of this era, namely in the two decades immediately before and after the year 1600. The crime of witchcraft itself disappeared at the end of the glaciation, when new and more plausible theories about harvest crises began to be proposed.[21]

In other words, there exists a 'seismographic connection', to use Behringer's expression,[22] between particularly harsh climatic conditions, inflation, and the intensification of persecutions against women accused of witchcraft. The peak of the violence in Europe occurred in 1628, the moment when the prices of primary goods skyrocketed.

If we imagine superimposing, on one hand, the curve indicating the prices of primary and derived harvest goods, and, on the other hand, the curve indicating the killings over time of women accused of witchcraft, we would see that the peaks of one roughly coincide with those of the other. At least for the long period of the Little Ice Age in Europe, the best way to predict whether there will be a resurgence of violence against witches is to observe the temperature: the major episodes of violence against women accused of witchcraft are strongly correlated with the low temperatures of the harshest winters.

We are witnessing a climatic process spread across much broader temporal scales, manifesting its effects locally in the outcomes of particular human acts. Persecutions of witches, accusations, and even

20 Wolfgang Behringer, 'Weather, Hunger and Fear: Origins of the European Witch-Hunts in Climate, Society and Mentality', *German History*, 13.1 (1995), pp. 1–27.

21 Wolfgang Behringer, *Storia culturale del clima*, trans. by Corrado Bertani (Bollati Boringhieri, 2016), p. 176.

22 Behringer, 'Weather, Hunger and Fear', p. 17.

interest in specific signifiers belonging to the code of demonology intensify precisely around the coldest years of the Little Ice Age. If we zoom out from local communities to broader regional scales, we see the mechanism repeating almost monotonously across Europe. The pattern is: poor harvests, a theory of a punishment sent by God as a result of a witch's dealings with the devil, identification of the suspect as a witch, and a killing.[23]

Before moving on to more properly scalar theoretical reflections, I want to dwell on some aspects of the witch-hunt phenomenon. The fact that similar episodes could occur in these ways is the result of the combined action of several elements. The interaction between climate and systematic violence against women accused of witchcraft has an intermediate link in the fact that they, the victims, underwent what Gilles Deleuze and Félix Guattari call an 'incorporeal transformation' (or semiotic transformation).[24] The material process — harsh winter, poor harvests — becomes a social event because an incorporeal or semiotic transformation of the woman takes place, as she suddenly finds herself identified as a witch. Not by chance, Deleuze and Guattari, in their *A Thousand Plateaus*, give a similar example drawn from economics. The galloping inflation in Germany after 1918 is a 'process affecting the monetary body, and many other bodies', but it is only 'the set of "circumstances" that suddenly makes possible a "semiotic transformation"' which turns this material condition into a series of political-economic decisions.[25]

Incorporeal transformations have the power *to make things happen*; they are intrinsically normative and exhortative. If I say, using another example from Deleuze and Guattari, 'Tu n'es plus un enfant…' ('You are no longer a child…'), I am not only saying something about your body, but I am also automatically giving a series of implicit norma-

23 The phenomenon of the witch-hunt is of course also present in other periods and contexts (including non-European ones). What interests me here, however, is the way in which it can create forms of synchronization or regularity by linking to other (in this case, climatic) processes. For a historical examination of the phenomenon, see Wolfgang Behringer, *Hexen. Glaube, Verfolgung, Vermarktung* (C. H. Beck, 2024).

24 Gilles Deleuze and Félix Guattari, *Mille plateaux. Capitalisme et schizophrénie* (Les Éditions de minuit, 1980), p. 102. See also Brydie Kosmina, *Feminist Afterlives of the Witch: Popular Culture, Memory, Activism* (Palgrave Macmillan, 2023).

25 Ibid., p. 103.

tive implications, such as, 'you should think about getting married', 'you must be more mature', and so on. Similarly, incorporeally transforming a woman into a witch has a whole series of implications for the community and for herself. The interaction between climate and local communities is not enough; therefore, a set of pre-circulating discourses is also required. Not only that: as Silvia Federici has clearly shown, one cannot overlook the fact that such climate-violence *entanglements* were also made possible thanks to the new legal and social preconditions that shaped the relations between men and women in the workplace and the domestic sphere. In fact, things like the progressive and general *decriminalization* of violence against women belonging to the lower classes, and their subjugation to the reproduction of the labour force, prepared the conditions, throughout the fourteenth century and in many different regions, for those process 'synchronizations' (or seismographic connections) to manifest with such frequency.[26]

TIMESCALE BETWEEN THE NON-DISCURSIVE AND THE DISCURSIVE

What Behringer calls 'seismographic connections' between climate and witch-hunts, and which we might also call, in this specific case, *pernicious synchronizations* — given their violent outcomes — can be explored thanks to the fact that, at least in the case in question, we have a series of data (harvests, temperatures, local population archives) allowing us to move from one process to the other and to see how they interact.

In other words, the interscalar nexus is describable because we can map, even while admitting margins of imprecision, events occurring at the level of one process onto events occurring at the level of the other process, that is, climate and social behaviour. In this regard, it is useful to recall Joshua DiCaglio's concept of 'scalar relations' (that is, impacts across scales), which he deploys to describe how action on

26 Silvia Federici, *Caliban and the Witch: Women, the Body and Primitive Accumulation* (Autonomedia, 2004), pp. 47–49.

one scale might influence action on another scale.[27] When possible, as in the case of the witch-hunt phenomenon, we are able to dissect the causal relationship because we have access to the entire chain of scalar relations. We can thus describe the phenomenon in terms of inter-translatability from one scale to another, and follow the causal thread leading from entities on one scale to those on another. It is a matter of reconstructing a cascade of interscalar agencies that, starting from cold climate and passing through poor harvests, inflation, and discourses on demonology, leads all the way to the stake.

What is central, however, is not only the idea of spatial scale — the large or the small — but also the idea of *temporal scale*, an aspect perhaps not considered sufficiently. As Marcia Bjornerud suggests:

> Most humans, including those in affluent and technically advanced countries, have no sense of temporal proportion — the durations of the great chapters in Earth's history, the rates of change during previous intervals of environmental instability, the intrinsic timescales of 'natural capital' like groundwater systems.[28]

I suggest conceiving the difference between the two temporal scales in terms of how relevant or significant the same level of granularity might be in the two cases. For example, when measuring an era or a climatic period like the Little Ice Age, being off by two or three years, or even a few decades, is not very relevant. Relative to the object of study in question, these are non-significant portions of time. A part or 'phase' of it is identified with relatively loose margins. Conversely, for a human being, a difference of two or three years is not insignificant: within that period, many significant things can happen, for an individual as for humanity in a general sense. For these reasons, it makes more sense to measure a climatic era or a geological period in multiples of ten years, whereas the same criterion for a human life would prevent the capture of many significant events or phases. In other words, the degree of temporal granularity changes from entity to entity. The implication of

27 Joshua DiCaglio, *Scale Theory: A Nondisciplinary Inquiry* (University of Minnesota Press, 2021), p. 77.

28 Marcia Bjornerud, *Timefulness: How Thinking Like a Geologist Can Help Save the World* (Princeton University Press, 2018), p. 7.

this difference is that there is a dislocation of agency: what appears as a thought-out, intentional act, that is, the result of a rational deliberation (namely, persecuting witches), is also, zooming out to the broader picture, the result of a form of constraint and regularity exerted from *above and below*, so to speak — in other words, by processes which condition our human contexts for action without us always being aware of them. Of course, this does not make episodes of human violence as neutral as a natural phenomenon. Rather, it means that the first-person, local, and presumably *cognized* justification given by the perpetrators of such violent acts (relying as it might on things like the influence of demons, sinful behaviours, divine punishment, and so forth) is only one ingredient of this complex social outcome, with the others being the contextual processes relating to climate and economic ebbs and flows.

As I have said, the scalar relations in this case are possible because there exists a series of intermediate mediations, social elements that functioned as unstable precursors so that extremely harsh temperatures could transform into violence against a scapegoat. It is here that I propose to deploy the useful notion, proposed by Marie-Anne Paveau, of the *pre-discourse*. In the definition given by Paveau, pre-discourses are 'a set of collective pre-discursive frameworks (knowledges, practical beliefs, practices, prejudices), which provide instructions for the production and interpretation of meaning in discourse'.[29]

The pre-discursive indicates 'discursive organizations available for the production of discourses, which guide them in a more or less binding manner'.[30] The pre-discursive indicates that level of knowledge, practices, and encyclopedias which, for a given group, constitute shared self-evidences. There are several properties of the pre-discursive. They are: (1) *collective*, because they are appropriated more-or-less unconsciously (or naturally) by members of a community; (2) *immaterial*, because they are not material like actual discourses, but can leave traces within them; (3) *transmissible*, in the sense of being communicable between different members of the same community and from one generation to the next; (4) *experiential*, because they are 'organizers of

29 Paveau, *Les prédiscours*, p. 85; my translation.
30 Ibid.

experience' that construct and preconstruct the 'individual perception of the world';[31] and (5) *temporal*, in the sense that they are temporally anterior to discourse on the diachronic axis of their production, while being 'located in the relations between the subject and their social, cultural, historical, and technological environment'.[32]

The pre-discursive actually has a very close relationship with the discursive, that is, with what is actually said and done, and this in at least two senses. Firstly, the pre-discursive can always potentially materialize and become discourse. Secondly, every pre-discourse is actually always the 'sediment' of a discourse made *earlier* and *elsewhere*.

Similarly, although Michel Pêcheux does not distinguish, as I am proposing, between a systemic-material non-discursive and the discursive, nevertheless, for him, what comes before discourse, that is, the set of perceptions and experiences, is actually always already traversed by an 'already heard' and an 'already said'.[33] In other words, the perceptual and experiential dimensions are imbued with previously sedimented discourses that become a presumed shared self-evidence.

For example, when harvest conditions and inflation reached the peak of their crises, the reaction was to impulsively turn to demonology and its network of significations. In his treatise on witches from 1592, the bishop of Trier, Peter Binsfeld, called for particularly severe measures against them: 'Witches are traitors to the homeland, because they secretly conspire, as experience shows, to destroy wine crops, make fruits rot, and raise grain prices.'[34] Furthermore, as noted by Silvia Federici in her historical reconstruction of the witch-hunt in relation to primitive capital accumulation, one cannot underestimate the appearance of an entire plethora of new typifications of women in theatrical dramas, comedies, and other works, such as the characters of the 'disobedient wife', the 'scold', the 'witch', the 'whore', and so on.[35]

I propose, then, to think of scalar relations as the propagation of effects that traverse the non-discursive, the pre-discursive, and the

31 Ibid., p. 88.

32 Ibid., p. 92.

33 Michel Pêcheux, *Analyse Automatique du Discours* (Dunod, 1969), p. 22.

34 Peter Binsfeld, *Tractat von Bekanntnus der Zauberer und Hexen* (1592), quoted in Behringer, 'Weather, Hunger and Fear', p. 15.

35 Federici, *Caliban and the Witch*, p. 101.

discursive. Given this conceptual framework, we can say that, in the case of the witch-hunt, a non-discursive process (temperature variations related to climate) activates the pre-discursive and discursive dimensions.

The non-discursive constitutes the reservoir of material and systemic processes of which we are a part, often suffering their consequences in a sudden manner. In the jargon of dynamic systems, a 'tipping point' is a moment in the history of a system when a drastic change occurs that modifies it. According to Marten Scheffer, these sudden changes do not occur exclusively in natural systems. On the contrary, they can also take place in human or social systems: 'social systems are notorious for periods of relative inertia with occasional rapid transitions *on scales varying from locally held opinions and attitudes to massive shifts such as the collapse of states and civilizations*.'[36] In the specific case of climate and local communities, the sudden shifts in locally held opinions and attitudes are the result of scalar relations between the non-discursive (temperature fluctuations in the Little Ice Age), the pre-discursive, and the discursive (the production of discourses that draw upon other pre-discourses).

SCALE, CHANCE, AND DESUBJECTIVATION

As DiCaglio has pointed out, 'scale radically reworks our notion of the "I"' because it 'reconfigures not just "subjects" but one's own sense of being-a-subject as a clear entity tied to a discernible structure'.[37] In the case of synchronizations between climate and witch-hunts, this reconfiguration of being-a-subject does not so much consist in saying — through zooming in and out — that we are made of cellular tissues, themselves made of cells, then molecules, atoms, and so on. Rather, the crisis of our being-a-subject consists in discovering how there exist pre-subjective or pre-personological agencies that are capable, in a certain sense, of *making* us do or *say* something. There is a kind of tragic discovery, often only possible in hindsight, regarding the fact that a process has led us to act in one way or another. The reworking

36 Marten Scheffer, *Critical Transitions in Nature and Society* (Princeton University Press, 2009), p. 1; my emphasis.

37 DiCaglio, *Scale Theory*, p. 121.

of our notion of the 'I' is then to be thought of as the bracketing of a presumed individual, first-person rationality as the sole altar for verifying our actions. Our identification with any object, such as our 'body', 'is dissolved to make way for the multitude of new objects (cells) and connections (ecological relations to the planet)'.[38] This is the second aspect I want to emphasize here. More than the well-known arguments about levels of emergence, the concept of scale evokes the idea of a *dislocation* of our very agency.

Alongside this dislocation of agency, the processes described in the case of the witch-hunt involve another aspect of scalar relations, namely their statistical nature. The tipping points that led to the exacerbation of violence against women and the consultation of demonology do not tell us exactly *who*, *where*, and *when* will be executed following a witchcraft trial. Rather, we observe a general proliferation of similar events (in practices and discourses) and their more-or-less coherent distribution relative to the inhabited centres of Europe at the time. This, however, does not diminish the ontological legitimacy of the objects we are observing. Although we are not talking about singular entities clearly definable by distinct and neat boundaries or membranes, like a living organism, scalar arguments also apply to statistical processes, that is to say, to cases where particular trends can be detected. As DiCaglio emphasizes,

> [in] terms of scale, statistics provide descriptions of patterns that emerge in the aggregate while still retaining reference to the smaller components. Therein lies the conceptual difficulty but also rhetorical power: statistics provide a means of redescribing how objects on a smaller scale relate to a larger one.[39]

Statistical reasoning tells us something about broad trends or tendencies, while always keeping in mind that 'statistics do not annihilate the diversity on the scale below; they identify patterns within that diversity'.[40] This type of reasoning, although it does not eliminate the ontological legitimacy of entities on smaller scales, encapsulates

38 Ibid.
39 Ibid., p. 168.
40 Ibid.

very well the idea of the dislocation of agency. 'Think of patterns, not people', says Mark Buchanan.[41]

We can borrow the concept of a 'statistical macro-event', as proposed by Dave Elder-Vass.[42] An example of a statistical macro-event is the divorce rate in a specific country. There is no single actor who produces all the divorces considered. Rather, 'each [divorce] is an independent micro-social event and their aggregation into a summary statistic is an artefact of the statistician.'[43] However, as Elder-Vass rightly notes, this does not mean we cannot offer explanations for these statistical macro-events, but rather that 'explanations need not be a simple aggregation of the explanations of the micro-events'.

Many of what Elder-Vass then calls *historical* macro-events are similar to statistical macro-events. In cases such as the French Revolution or the Watergate scandal, we are dealing with aggregations of micro-social events where the actors do not belong to a closed totality. What we qualify as, for example, the French Revolution is the result of a multiplicity of smaller (that is, micro) events that, by happening in a spatio-temporal proximity, constitute the macro-event we now know as the French Revolution. In other words, a set of micro-social events collectively constitutes 'a change or episode of historical significance'.[44]

Statistical macro-events are fascinating because they necessarily lead us back to considerations of scale and different levels of observation. The case of divorce frequency is paradigmatic. We can place ourselves at the level of the statistical macro-event itself, but we can also zoom in on individual cases to see what happens in each of them. Looking closely at individual cases shows us a unique story in all its detail. However, shifting our perspective to statistical macro-events leads us to dilute that uniqueness and make it a *typical case* of a larger-scale process. The dislocation of our gaze between the two scales produces a bifurcation of perspectives: if we get closer, we see a unique case,

41 Mark Buchanan, *The Social Atom: Why the Rich Get Richer, Cheats Get Caught, and Your Neighbor Usually Looks Like You* (Marshall Cavendish, 2007), p. 5.

42 Dave Elder-Vass, *The Causal Power of Social Structures* (Cambridge University Press, 2010), p. 181.

43 Ibid.

44 Ibid., p. 182.

with irreplaceable people who said and did certain things; if we move away, we see a macroscopic process spread across different areas and developing over a specific period. Neither dimension is more true than the other.

By way of conclusion, I wish to propose a suggestion that returns to the initial question regarding discourse, the statement, and the non-discursive dimension. In a passage from *L'ordre du discours*, Foucault mentions the idea that we 'accept the introduction of *aléa* [*chance*] as a category in the production of events', then immediately adds that 'we feel the absence of a theory enabling us *to think the relations between chance and thought*'.[45] Perhaps one way to fill this theoretical absence of which Foucault speaks is precisely to think in terms of the relations between processes across different scales and the (statistical) effects that these scalar relations can cause, as we have seen in the case of the witch-hunt. Perhaps the *chance* behind the events that Foucault mentions can be thought of as what emerges from the propagation of effects from the non-discursive to the discursive, passing through the pre-discursive.

45 Michel Foucault, 'The Order of Discourse', trans. by Ian McLeod, in *Unyting the Text: A Post-Structuralist Reader*, ed. by Robert Young (Routledge and Kegan Paul, 1981), pp. 48–78 (p. 69; my emphasis).

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