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COUNTERFACTUALITY AS A POLYPHONIC ASSEMBLAGE. ENTANGLED HUMAN AND NONHUMAN STORIES OF EARLY MODERN SCIENCES IN NEAL STEPHENSON'S *THE BAROQUE CYCLE*

Summary. In recent science-fiction literature, we can witness a proliferation of new counterfactual narratives which take the 17th century as their point of departure. Unlike steampunk narratives, however, their aim is not to criticise the socio-political effects caused by contemporary technological development. Such authors as Neal Stephenson or Ian Tregillis, among others, are interested in revisiting the model of development in Western societies, routing around the logic of progress. Moreover, they demonstrate that modernity is but an effect of manifold contingent and indeterminate encounters of humans and nonhumans and their distinct temporalities. Even the slightest modification of their ways of being could have changed Western societies and cultures. Thus, they necessitate a rather non-anthropocentric model of counterfactuality which is not tantamount to the traditional alternative histories which depart from official narratives of the past.

By drawing on contemporary multispecies ethnography, I put forward a new understanding of counterfactuality which aims to reveal multiple entangled human and nonhuman stories already embedded in the seemingly unified history of the West. In this context, the concept of “polyphonic assemblage” (Lowenhaupt-Tsing) is employed to conceptualize the contingent and open-ended encounters of human and nonhuman historical actors which cut across different discourses and practices. I analyse Stephenson's *The Baroque Cycle* to show the entangled stories of humans and nonhumans in 17th century sciences, hardly present in traditional historiographies. In particular, Stephenson's depiction of quicksilver and coffeehouse as nonhuman historical actors is scrutinized to show their vital role in the production of knowledge at the dawn of modernity.

Keywords: counterfactuality, assemblage, science-fiction, Anthropocene, science studies.

In recent years, science-fiction literature has witnessed an emergence of counterfactual narratives which take the history of the 17th century as their point of departure. Unlike steampunk narratives, offering counterfactual versions of the 19th century, they do not reflect upon the consequences of technological development. Rather, they critically engage with the progressivist model of Western modernity. The most recent example is *The Alchemy Wars* trilogy (2015–2016) by Ian Tregillis.¹ Although the novels are set in early 20th century, they depict what would have happened if it had been the Dutch natural philosopher and horologist Christian Huygens, rather than Robert Boyle and the Royal Society, who created the protocol of contemporary sciences. In traditional historiographies,

it is typically the latter whose air-pump experiments are presented as a prototype of objective protocol in sciences. In Tregillis's novels, Huygens's horological pursuits not only found modern sciences but also determine the trajectory of technological development in Europe. Combining state-of-the-art mechanical philosophy and alchemical pursuits of Spinoza, he develops a technology to create an army of artificial men. The Clakkers, as they are called, are clockwork slaves endowed with a mechanical soul which subjects them to their human masters. Clakkers' warfare capacities, however, surpass those of English and French armies, which makes the Dutch a global power for centuries to come. Thus, at the beginning of the trilogy, the world at the beginning of the 20th century is ruled by a Brasswork Throne,

based in the Hague. As the story unfolds, the Throne faces resistance not only from a French King in Exile but also from Clakkers themselves. Throughout the three volumes, we follow Jax, the leader of the Clakker revolution, and French spymasters in their quest for not only political but, first and foremost, existential liberation.

The Alchemy Wars trilogy adopts a scenario in which artificial creatures desperately strive to have their rights recognized by humans, a widely recognized trope in science-fiction literature. However, Tregillis also offers a vision of the West which has not developed according to the logic of progress. His Europe, ruled by the Protestant Low Countries and their overseas colonies, is still haunted by papist conspiracies and traitors, as spies are tried and hanged in public. Moreover, in Tregillis's world, there has been no Enlightenment to separate arts, sciences, politics, and the so-called everyday life. *The Alchemy Wars* demonstrate that what we usually call modernity is only an effect of contingent and open-ended encounters of heterogeneous temporalities and human and nonhuman ways of being. Even the slightest modification of those components could have interfered with the rhythm, trajectory, and direction of socio-political and cultural changes in the West. Hence, the novels enable us to notice not only the hybrid connections between the sciences and arts, characteristic of the 17th century and intentionally overlooked by modern historiographers, but also possible non-progressive modes of historical development.

Taking Tregillis's trilogy as a vantage point, I analyse counterfactual strategies of contemporary science-fiction literature as they stage entanglements of human and nonhuman histories which flaunt the dominant Western progressive and linear version of the past. In this context, counterfactuality is not merely about writing an alternative history that opposes the dominant narratives of the past. Rather, it is about revealing intricate interrelations between what Dipesh Chakrabarty calls *History 1* and *History 2*.² The former is the universal and linear story of the past which emerged in the West together with the birth of modern capitalism. It posits that all societies eventually adopt capitalist economy together

with typically Western ways of being and thinking. The latter consists of heterogeneous non-capitalist, often conflicting versions of the past. Moreover, *History 2s* are usually affective and embodied in everyday-life practices of individuals and communities. Those are not only colonized groups in which remains of pre-capitalist practices and ways of thinking are still active, but also social groups marginalized in Western societies. Chakrabarty rightly points out that only by encompassing the dynamic relations between *History 1* and *History 2* can historians notice heterogeneous local pasts, partially influenced by Western historiography and partially retaining indigenous ways of relating to the past.

On the other hand, as an overview of *The Alchemy Wars* trilogy has already indicated, analysis of counterfactual strategies in science-fiction literature must include the historical agency of non-humans, excluded by Chakrabarty from both *History 1* and *History 2*. Thus, in the first part of this paper I put forward a non-anthropocentric model of counterfactuality by turning to contemporary multispecies ethnography. Such scholars as Donna Haraway, Eduardo Kohn, or Elizabeth Povinelli, all working against the backdrop of the concept of the Anthropocene, have convincingly argued that nonhumans, biotic and abiotic, also have their distinct ways of establishing relationships with their past, interdependently of human historiographies. I specifically draw on the findings of the anthropologist Anna Lowenhaupt-Tsing, co-director of AURA (Aarhus University Research on the Anthropocene), whose studies of matsutake mushrooms in multiple natural-cultural contexts suggest a new counterfactual historiographic model. In her *Mushroom at the End of the World. On the Possibility of Life in Capitalist Ruins* (2015), she puts forward the concept of "polyphonic assemblage" to give an account of entanglements between various heterogeneous human and nonhuman ways of being and their distinct temporalities which only contingently come together, bringing about indeterminate change.³ In such polyphonic assemblages, there is no history as a unified version of the past in which only humans (mainly exceptional individuals) bring about historic changes—only an

entanglement of stories told from different human and nonhuman points of view. Similar counterfactual strategies may be found in literature which draws on historical materials and fuses them with fictional accounts for its own purposes.

From the perspective of Lowenhaupt-Tsing's polyphonic assemblages, I go on to analyse *The Baroque Cycle* (2003–2004) novels by the American science-fiction writer Neal Stephenson. The cycle comprises eight novels, only for marketing purposes collected in three volumes: *Quicksilver*, *Confusion*, and *The System of the World*.⁴ As the cycle is set in a period spanning from 1665 to 1714, it allows me to reveal entangled counterfactual versions of Early Modern sciences, departing from traditional historiographies. Unlike Tregillis, Stephenson does not provide an alternative history of the period in which we can pinpoint a single event in the course of which the narrative diverges from traditional historiographies. Rather, the 3000-page cycle weaves equally plausible accounts of the period with different temporalities. Each of them unfolds in a different rhythm and Stephenson often suspends the narrative, speeds up or slows down the course of events. Thus, he stages an intensive reading experience which constantly questions the facticity of characters and events he describes. My analysis of the novels aims to scrutinize polyphonic assemblages of human and nonhuman ways of being in the 17th century laboratories of natural philosophers. Whereas Lowenhaupt-Tsing focuses predominantly on interactions between biotic nonhumans, I am particularly interested in Stephenson's depiction of two abiotic nonhuman historical actors—quicksilver and coffeehouse—often neglected in traditional historiographies. The former is marginalized as a pre-modern, alchemical version of the chemical element mercury. The latter is usually regarded as a mere backdrop for laboratory practices or an element of their cultural and socio-political context. By interweaving facts and fictions, Stephenson's counterfactual strategies make us notice that both abiotic nonhumans had agency in Early Modern sciences. Looking at the history of science from the perspective of those actors may not only reveal complex interrelations between sciences

and other areas of life but also shed new light on knowledge production in 17th century laboratories.

Contemporary debates about the Anthropocene necessitate significant methodological shifts in thinking about history as a linear narrative of the past. The Anthropocene differs from other epochs in Earth's history in that its dominant geological force is no longer tectonic movement, sea tides or volcanic processes but, rather, human activity. Human influence manifests itself, for instance, in the greenhouse gases, generated by the industry, that have already interfered with the million-year cycle of climate coolings and warmings. To encompass similar processes, the term *Anthropocene* was coined at the turn of the 1980s by an American paleoecologist, Eugene Stoermer. However, as ecocritic Rob Nixon recounts, the term was used informally.⁵ It was only in 2000 when the term entered the official discourse of Earth sciences due to an endorsement by a Nobel prize winner, Dutch chemist and meteorologist, Paul Crutzen.⁶ The concept instantly became widely debated, as it turned out that, unlike in case of other geological epochs, scientists were able neither to define geochemical parameters of the Anthropocene nor to select an event which would mark its beginning. From this perspective, Anthropocene studies have a manifestly counterfactual character. Depending on pragmatic decisions of particular scientists, different, yet interrelated, histories of the epoch emerge. According to some of them, the Anthropocene began approximately 10000 years B.C, with the Neolithic revolution⁷, others trace it back to 1610, when the colonization of the Americas started, and even to 1964, which marks international agreements concerning reduction of CO₂ emissions.⁸ These competing accounts, however, have nothing to do with traditional periodization, introduced by Earth sciences from the 19th century onwards. Each of the dates entails different causes and effects of the anthropogenic process that we witness today. Thus, the Anthropocene requires a new definition of history that would allow for analyzing relations between different, entangled counterfactual versions of the past and notice encounters of human and nonhuman ways of being.

A new concept of history in the Anthropocene may be found in transdisciplinary studies conducted by Lowenhaupt-Tsing. Paradoxically, her activity is aimed against the dominant anthropocentric discourse on the Anthropocene. Lowenhaupt-Tsing particularly criticizes those Anthropocene scholars who put forward a linear, consistent, and universal story of Man conquering all life on Earth. In her view, the Anthropocene is inherently patchy,⁹ which means that anthropogenic environmental changes follow different rhythms in different parts of the world. In this context, *patchy* describes not only the heterogeneous intensities with which humans damage the planet. Lowenhaupt-Tsing borrows the term from geocology—i. e., the study of environments defined as a system of interdependent patchy landscapes. Geocologists maintain that ecologies not only differ in terms of landforms and biodiversity but also develop in different temporalities. For example, forests are exactly such patchy landscapes, with old tree stands coexisting with dynamically growing plants inhabiting deforested sites. Western societies comprise similar multitemporal landscapes as they perform a mosaic of practices and discourses which transform the planet for better or worse in different rhythms. Lowenhaupt-Tsing suggests that only by following minute changes occurring in such patchy Anthropocene can we start looking for means of survival in a world which in places has been irreversibly destroyed.¹⁰ In this context, she talks about polyphonic assemblages that enable us to conceptualize entanglements of human and nonhuman ways of being in the patchy Anthropocene.¹¹

Polyphonic assemblages allude to contemporary assemblage theory, often applied to Anthropocene studies, which emerged in the field of new-materialist sociology. However, they differ significantly from assemblages defined by an American sociologist Manuel DeLanda, as “wholes characterized by relations of exteriority.”¹² In other words, assemblages are relational entities emerging from dynamic interactions between humans and nonhumans. Although there is close affinity between Lowenhaupt-Tsing’s ideas and DeLanda’s assemblage theory, the author of *Mushroom at the End of the World* clearly distinguishes her understanding of assemblages:

The qualifier “polyphonic” may help explain my variant. Polyphony is music in which autonomous melodies intertwine. In Western music, the madrigal and the fugue are examples of polyphony. These forms seem archaic and strange to many modern listeners because they were superseded by music in which a unified rhythm and melody holds the composition together. In the classical music that displaced baroque, unity was the goal; this was “progress” in just the meaning I have been discussing: a unified coordination of time. In 20th century rock-and-roll, this unity takes the form of a strong beat, suggestive of the listener’s heart; we are used to hearing music with a single perspective. When I first learned polyphony, it was a revelation in listening; I was forced to pick out separate, simultaneous melodies and to listen for the moments of harmony and dissonance they created together. This kind of noticing is just what is needed to appreciate the multiple temporal rhythms and trajectories of the assemblage.¹³

In other words, polyphonic assemblages are not exactly relational entities but, rather, entanglements of human and nonhuman ways of being. They also have little in common with polyphonic music. In contrast to madrigals and fugues, for instance, they are not autonomous creations of an artist, but they emerge from situated experiences of the researcher. Not only does Lowenhaupt-Tsing notice particular harmonies and dissonances but her own ways of being and research strategies also become elements of the polyphonic entanglement. However, Lowenhaupt-Tsing employs the musical metaphor to grasp the distinctive temporal aspect of polyphonic assemblages. For in music there are no entities but acoustic waves of different frequency, moving through the air. The waves, generated by voices or instruments, reach the listener’s ear in sequence and rhythm determined not only by the musicians and singers. The listener’s position in space also influences the sequence and rhythm, as she moves in relation to the source of the sound, modifying the music she listens to. Although these

human and nonhuman encounters are contingent, they always bring a change of sorts, whose effects are completely indeterminate. From the perspective of such polyphonic assemblages, producing history in the patchy Anthropocene is inextricably linked with the strategies of particular scholars. They do not produce objective representations of the past but always create its counterfactual versions to reveal entanglements of human and nonhuman ways of being. What, then, is historying in the context of polyphonic assemblages?

As the ways of being of humans and nonhumans develop over time at different speeds and in various rhythms, polyphonic assemblages posit a distinct model of historicity. It is different from the historicity pertaining to anthropocentric historiographies interested in narratives about humans, societies, or states, reconstructed from remains, documents, and artefacts. According to Lowenhaupt-Tsing, the historiographer of the patchy Anthropocene must also encompass the historical agency of nonhumans, for they are not merely a setting for human actions—she writes:

“History” is both a human storytelling practice and that set of remainders from the past that we turn into stories. Conventionally, historians look only at human remainders, such as archives and diaries, but there is no reason not to spread our attention to the tracks and traces of nonhumans, as these contribute to our common landscapes. Such tracks and traces speak to cross-species entanglements in contingency and conjuncture, the components of “historical” time. To participate in such entanglement, one does not have to make history in just one way. Whether or not other organisms “tell stories,” they contribute to the overlapping tracks and traces that we grasp as history. History, then, is the record of many trajectories of world making, human and not human.¹⁴

In other words, any account of the past of polyphonic assemblages is inevitably counterfactual, but not in the sense of creating alternative narratives of “official” history. Polyphonic assemblages simply

flaunt the binaries of fact/speculation and historying/storytelling. The heterogeneity of human and nonhuman entanglements urges those who trace the past of the patchy Anthropocene to produce different narratives of different materials, perspectives, conventions, and tropes. This means creating multiple versions of the past, each told from a different human or nonhuman perspective, and confronting them within a single text. The change of perspective from human to nonhuman histories may not only reveal hitherto overlooked relations between their ways of being but also perform entirely new ways of thinking about the past. To show such historying in practice, let me refer to an example analyzed by Lowenhaupt-Tsing.

In one of the chapters of *The Mushroom at the End of the World*, Lowenhaupt-Tsing produces two entangled histories of the Finnish pine forest: first from the perspective of foresters and then from the point of view of pines. The human history of the forest is a story of a sustainable and renewable source of valuable commodity which follows the “natural” cycle of life. Lowenhaupt-Tsing contends that this history of the forest is extremely predictable as trees are treated as “self-contained, equivalent, and unchanging objects.”¹⁵ Evidently, the human history of the forest is predicated upon the binary between nature and culture—the latter, of course, being the only true object of historical research. Meanwhile, from the perspective of pines, the history of the forest turns out to be far more eventful and full of surprising turning points. It is a history in which pines cannot exist outside the symbiotic relations they form with other entities, such as matsutake mushrooms. Matsutake secrete strong acids which dissolve rocks and sand, transforming them into nutrients for both mushrooms and pines. This helps the trees to resurge after deforestation or fire caused by humans. Thus, the pines’ history of the forest is a history of contingent and dynamic encounters of humans and nonhumans, characteristic of polyphonic assemblages. Instead of self-contained organisms growing according to a “universal” principle, there is interspecies cooperation and constant change. The pines’ history, however, is not an alternative version of the past. To reconstruct it, one must look for material

traces of human and nonhuman encounters already present in the forest. The history of symbiotic relations between pines and matsutake in Finnish forests is manifest, for instance, in the life cycles of the two species. The local pines are notorious for their irregular masting: one year they produce abundant seeds, the next there are hardly any to be found. Foresters usually explain this irregularity in terms of trees adapting to weather conditions. Yet, if one looks at the frequency of fruiting in matsutake, one can find closely coordinated ways of being. Sometimes matsutake also produce plenty of fruiting bodies and sometimes few specimens can be found.

The latter example demonstrates that, although Lowenhaupt-Tsing uses the term “history”, her aim is nowhere near writing history in any classical form. To tell the entangled stories of mushroom, plants, animals, and people, she invents a new form of writing, which departs from Modernist historical narratives and their linear chronology. Lowenhaupt-Tsing’s book, itself a polyphonic assemblage of sorts, not only meanders through time and space as she not only follows human and nonhuman actors but also interweaves research, autobiographical narratives, and literary material, among other sources. From this perspective, similar new ways of establishing a relationship with the past may be found in Stephenson’s *Baroque Cycle*, which also preys upon historical materials to show the historical agency of humans and nonhumans. However, unlike Lowenhaupt-Tsing, Stephenson fuses facts and fiction specifically to problematize traditional historical accounts of the birth of Western modernity. Guided by the historicity of polyphonic assemblages, let me now turn to Stephenson’s work to analyse entangled human and nonhuman stories of early modern sciences.

Stephenson produces a counterfactual version of 17th century sciences, fusing different literary genres. He juxtaposes, for instance, elements of historical, epistolary, and picaresque novels with fragments of drama resembling Restoration comedy and fictional accounts of meetings of the Royal Society. Each genre reveals different aspects of the period. Moreover, from chapter to chapter Stephenson transports the reader in time and space: from Massachusetts in 1713, through Gresham College in London in early

1660s, to Ahmedabad in India nearly 30 years later. As for his characters, he is interested less in their inner lives than in their distinctive ways of being which show multiple aspects of early modernity. This is manifest in the story of three main characters of the cycle. Together with the young natural philosopher Daniel Waterhouse, we witness experimental practices of Robert Hooke, alchemical pursuits of Isaac Newton, and the budding of the scientific community in North America. Together with Jack Shaftoe, an illiterate yet extremely eloquent vagabond, we take part in the battle of Vienna of 1683, we visit German mines looking for Solomon’s gold, and we board a ship full of convicts. Finally, with Eliza, a princess of the fictional realm of Qwghlm, who later becomes Jacks mistress, we take part in political and economic machinations in 17th century courts and peep into sexual practices of Louis XIV and William of Orange, among others. Similarly to Lowenhaupt-Tsing’s stories about pines and matsutake in Finnish forests, the seemingly unrelated histories of Daniel, Jack, and Eliza contingently meet, often changing the way of depicting the characters. For instance, in different parts of the cycle Jack is referred to as the King of the Vagabonds, L’Emmerdeur, Half-Cocked Jack, Alim Zayabak, or Jack the Coiner. Thus, Stephenson creates an intensive reading experience which blurs not only the boundaries between fact and fiction but also between sciences and other areas of life. Moreover, Stephenson’s novels invite us to notice the agency of nonhuman actors in the history of early modern sciences. Following those actors may contribute to problematising certain aspects of production of knowledge in the 17th century, as viewed by traditional historiographies.

Let me begin with quicksilver, figuring in the title of the first volume of *The Baroque Cycle*. It should not be confused with mercury which features in traditional histories of sciences, for science historians’ approach to mercury resembles the way Finnish foresters described by Lowenhaupt-Tsing think about pines. Suffice it to mention the frequently quoted *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life*, written by science scholars Steven Shapin and Simon Shaffer.¹⁶ As the subtitle suggests, their history has two main (human) protagonists: Robert Boyle

and Thomas Hobbes. According to Shapin and Shaffer, the former—experimenting with the air-pump constructed for him by his assistant Robert Hooke—created the reproducible protocol of modern sciences. It encompassed not only material technologies of conducting experiments but also literary strategies one should use to account for the experiments, and a set of social conventions regulating the exchange of thoughts in the community of natural philosophers. Only together were those three elements supposed to produce objective matters of fact. The latter protagonist, also a natural philosopher, claimed that Boyle's protocol cannot produce impartial knowledge because it is accepted by an exclusive group of members of Royal Society. Shapin and Shaffer scrutinize natural-philosophical ideas of Hobbes, usually considered a political philosopher, indicating close links between knowledge production in 17th century laboratories and political ideas of the time. What is the role of mercury in this history?

In Shapin and Shaffer's narrative, mercury is merely one of the materials used by Boyle to prove the existence of vacuum. To this end, they argue, he recreated the then famous experiment of Evangelista Toricelli from 1643. Toricelli filled with mercury a 1-metre-long cylinder, closed at one end. He blocked the other end with his finger and put the cylinder into a larger copper container also filled with mercury. When a portion of the liquid in the cylinder spilled into the container, Toricelli concluded that the remaining empty space is void. However, the machinery he used was imperfect and there was a considerable risk that the cylinder filled with air. To eliminate the risk, Boyle conducted Toricelli's experiment in his air-pump. When the mercury in the cylinder and in the container stayed at the same level, he had no doubts that the remaining space is void. Thus, in Shapin and Shaffer's narrative, mercury is important insofar as its unchangeable physical properties allow Toricelli and Boyle to confirm their hypotheses. From the perspective of history of sciences, the mercury in their cylinders is the same substance that we can find in our modern thermometers.

Conversely, throughout *The Baroque Cycle*, Stephenson consistently avoids the word *mercury* in

its modern sense. He, rather, uses the word to situate the experiments of natural philosophers in the context of 17th century theology, medicine, and alchemy. Whereas Shapin and Shaffer concentrated on the unchangeable material properties of mercury, Stephenson depicts quicksilver as a historical agent. However, its agency is not tantamount to the shape-shifting properties described by alchemists of the time, who claimed that quicksilver may transform into any metal. The agency of Stephenson's quicksilver consists in its capacity to form relations with humans and nonhumans that lead to emergence of unstable, contingent wholes. From this perspective, mercury from Shapin and Shaffer's narrative is merely one of such wholes and becomes an unchanging substance only in experimental practices of natural philosophers. Thus, let us return to *The Baroque Cycle* to reconstruct a history of sciences in the 17th century from the perspective of quicksilver.

Stephenson's counterfactual strategies make it clear from the beginning of the cycle that quicksilver differs from the mercury in Shapin and Shaffer's narrative. We encounter it for the first time in 1665, when two members of the Royal Society accidentally discover underground rivers of quicksilver, flowing in two distant parts of England. Fluid mercury is virtually impossible to find in soil. Usually, it is obtained through heat treatment of cinnabar or mercury sulphide. Moreover, Stephenson alludes to supernatural properties of quicksilver. This may be illustrated by the way the discoveries are interpreted by Daniel's father Drake Waterhouse. As an ardent Puritan and former supporter of Oliver Cromwell, he treats quicksilver rivers in England as a bad omen and harbinger of the end of the world. He believes that the imminent apocalypse is God's punishment for the restoration of the sinful Stuart monarchy, considered by Puritans to be an incarnation of promiscuity and moral decadence. However, Stephenson does not look down at such theories as religious fundamentalism, for the apocalypse prophesied by Drake materialises in the plague which ravishes London in the same year and the Great Fire of the city a year later. Apart from the story of Drake, who dies in the flames of his burning house while calling

Londoners to repentance, we encounter quicksilver in Newton's laboratory. Once again, it is not used to conduct scientific experiments we know about from Shapin and Shaffer. Stephenson depicts Newton as he swallows a portion of quicksilver as a way of curing sore throat, which—as it turns out rather quickly—does not improve his health. In the *Baroque Cycle*, the “therapeutic” effects of quicksilver unfold as Newton rarely leaves his house, gradually sliding into depression. His story, however, is deeply interconnected with another account of quicksilver, which begins in the laboratory of the alchemist Enoch Root. He develops a technology to use quicksilver to transmute iron ore into pure gold. Inspired by his discoveries, Jack and Eliza plot to set up their own mint, independent from the supplies of gold controlled by court. When their plan succeeds towards the end of the cycle, quicksilver threatens the Royal currency recovering from a recent crisis due to Newton's efforts as a master of the Royal Mint. The three trajectories of quicksilver make it possible to notice polyphonic assemblages of sciences, religion, medicine, and economy, characteristic of the 17th century.

From the perspective of quicksilver in Stephenson's novel, the history of sciences is not merely a history of natural philosophers experimenting with materials of unchanging physical properties. In this context, one cannot even talk about a single history but, rather, three entangled stories. Each of them reveals a different aspect of laboratory practices in the 17th century. The first illustrates an early modern assemblage of sciences and religion—scientific experiments of the time also entailed theological ideas. The aforementioned practices of Boyle, for instance, aimed on only to produce objective matters of fact but also to prove that God actively intervenes in the world. The second story indicates an assemblage of sciences and medicine. In their *Quackery: A Brief History of the Worst Ways to Cure Everything* (2017) science historians Lydia Kang and Nate Pedersen convincingly argue that in the 17th century quicksilver, alongside coffee and tobacco, was one of the most popular medicines.¹⁷ Instead of curing diseases, however, it only worsened patients' condition, causing hallucinations and depression.

As Kang and Pedersen suggest, natural philosophers did not question those malpractices, regarding them as the best treatment available. It was only in the 19th century that the germicidal properties of quicksilver were discovered. The third story reveals the 17th century entanglement of sciences, alchemy, and economy. All prominent members of the Royal Society, including Boyle and Newton, made serious efforts to find the philosopher's stone and experimented with transmutation of base metals into their precious equivalents. Their findings could easily fall into the hands of William Chaloner and other coin counterfeiters active in England at the time, who posed a serious threat to the budding monetary system. From the perspective of such polyphonic assemblages, Stephenson's counterfactual strategies invite us to situate knowledge production in the 17th century in a wider socio-cultural context. To do so, let us move to another nonhuman historical actor depicted by Stephenson.

In the *Baroque Cycle*, experiments and scientific discussions take place not only in the laboratories at Gresham College but also in such diverse locales as private mansions, Royal chambers, and even in the middle of the Indian Thar desert. In this way, Stephenson reconstructs the early modern spatial continuum between the public and the private, in which the laboratories of natural philosophers were situated. Only recently did the continuum become of interest to science historians. In their introduction to the book *Domesticity in the Making of Modern Science* (2016), its editors Donald Opitz, Staffan Bergwik, and Brigitte Van Tiggelen argue that “[t]he practices and cultures of science [in the 17th century] have reached far beyond the walls of the laboratory and academy, and network approaches provide ways for understanding the many interactions and knowledge-making processes that include, yet transcend, institutional settings.”¹⁸ Evidently, the authors of the introduction focus solely on the relations between institutional laboratories and narrowly defined domestic spaces. Stephenson, on his part, turns to the coffeehouse as a site crucial for modern sciences and largely neglected in the history of science. Not only does it intermingle the private and the public, the local and the global, but,

more importantly, it also fuses intensive multisensory and affective experiences which become crucial for production of knowledge.

To notice the entangled histories of the coffeehouse and sciences in 17th century England, suffice it to take a closer look at the map of Oxford. The first coffeehouse on the British Isles, The Angel, was founded there in 1650 by a Jewish entrepreneur named Jacob. As Grand Café, it exists to this day on High Street, one of Oxford's main streets. Just across the street, you can find Queens College, where in the 1640s *virtuosi*, as natural philosophers were then called, met regularly to conduct experiments, and where they subsequently established a society of sciences under King's patronage. The short distance between the sites is far from coincidental. In *The Social Life of Coffee. The Emergence of the British Coffeehouse* (2005), the British cultural historian Brian Cowan claims that the coffeehouse "was not simply one among many backdrops or stages upon which the development of experimental science was played out; it was itself the product of the cultural world forged by the *virtuosi* in Britain's age of scientific revolution."¹⁹ Cowan alludes to the fact that natural philosophers' interest in properties of exotic plants stimulated the emergence of British coffeehouses. As early as at the turn of the 17th century, Francis Bacon, drawing on accounts of English travellers, argued that infusion of roasted coffee beans has similar effects to opium. Thus, as Cowan suggests, when first coffee beans reached the port in London in 1628, they had for long been used as an anaesthetic. In this context, The Angel was less a place for socializing than a laboratory of sorts, where natural philosophers could drink coffee to study its properties. No sooner had they proved that coffee invigorates the body without causing harm, than the culture of coffee drinking spread to wider aristocratic and then bourgeois circles, and coffeehouses appeared in London and other cities. However, Cowan scrutinises the relationship between coffeehouses and laboratories in the context of social changes in England in late 17th century. To see the process of knowledge production of the time from the perspective of the coffeehouse, I shall return to Stephenson's novel.

In *The Baroque Cycle*, *virtuosi* meet not at The Angel but at a fictional Mrs. Green's coffeehouse in London. At this point in the narrative, Daniel is a mature natural philosopher:

The air in the coffee-house made Daniel feel as if he'd been buried in rags. Roger Comstock was peering down the stem of his clay pipe like a drunken astronomer drawing a bead on something. In this case the target was Robert Hooke, Fellow of the Royal Society, visible only barely (because of gloom and smoke) and sporadically (because of table-flitting patrons). Hooke had barricaded himself behind a miniature apothecary shop of bottles, purses, and flasks, and was mixing up his dinner: a compound of mercury, iron filings, flowers of sulfur, purgative waters from diverse springs, many of which were Lethal to Waterfowl; and extracts of several plants, including the rhubarb and the opium poppy.²⁰

Stephenson's depiction of scientific practices in the coffeehouse radically differs from methodical experiments described by Shapin and Shaffer. The author brings to the fore the role of sensations in the production of knowledge in the 17th century. However, in this scene, they do not produce the experience of wonder, staged by natural philosophers in their laboratories. As cultural historians Lauren Daston and Katherine Park explain, wonder "was a cognitive passion, as much about knowing as about feeling."²¹ In other words, it aimed to stimulate curiosity in those who participated in laboratory experiments. In contrast, the olfactory experiences in Stephenson's coffeehouse are so intense that they make it hard for Daniel to understand what is happening around him. Thus, Stephenson depicts the coffeehouse less as a site of wonder than a site of affect, as a "zone of indiscernibility" defined by Deleuze and Guattari in their *What is Philosophy?*²² Deleuze and Guattari regard affect as an impersonal force blurring the boundaries between different experiential modalities, areas of life, and even humans and nonhumans. The scene evidences the performance of such affect in the coffeehouse on at least two levels. First, the smoke obstructs the view

to such an extent that it is virtually impossible to know what Hooke is doing: he prepares a medication, conducts another experiment or, simply, prepares his dinner? Secondly, his apothecary is full of substances coming from different polyphonic assemblages of the early modern period. On the one hand, flowers of sulphur and purgative waters were probably found by English *virtuosi* who usually supplied the Royal Society with such materials. On the other, rhubarb and opium poppy were typical colonial plants imported from East Asia. 17th century merchants also provided natural philosophers with material for experiments as they brought most exotic specimens of fauna and flora from all over the world. By depicting the coffeehouse as a site of experiment, Stephenson shows that production of knowledge in the early modern period did not necessarily follow strict rules. Rather, it emerged from contingent encounters between humans and non-humans from different parts of the world. In this context, Boyle's protocol turns out to be only one among many equally valid ways of doing science in the 17th century.

To conclude, Stephenson's novels evidence that counterfactual strategies of science-fiction literature are not limited to alternative histories, as in Tregillis's *Alchemy Wars*. Blurring the boundaries between fact and fiction, *The Baroque Cycle* invites readers to notice contingent and open-ended entanglements of different human and nonhuman stories in the 17th century sciences, hardly present in traditional historiographies. The stories not only reveal numerous interconnections between sciences and other areas of life in early modernity. They also stress the importance of multisensory and affective experiences staged by scientific experiments across the private-public spatial continuum. Such polyphonic assemblages demonstrate that Latour's famous claim that we have never been modern requires a new mode of historying—one that produces historical narratives from human and nonhuman points of view. These narratives should not combine into a "comprehensive" account of the past but, rather, make room for the diversity and dynamic character of human and nonhuman ways of being.

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Notes

¹ See Ian Tregillis, *The Mechanical* (2015), *The Rising* (2015), *The Liberation* (2016), London: Orbit Books.

² Dipesh Chakrabarty, *Provincializing Europe: Postcolonial Thought and Historical Difference* (Princeton and London: Princeton University Press 2000).

³ Anna Lowenhaupt-Tsing, *The Mushroom at the End of the World. On the Possibility of Life in Capitalist Ruins*, (Princeton: Princeton University Press, 2015).

⁴ Neal Stephenson, *Quicksilver* (London: Arrow Books, 2004); Neal Stephenson, *Confusion* (New York: HarperCollins, 2004); Neal Stephenson, *The System of the World* (New York: HarperCollins, 2004).

⁵ See Rob Nixon, *The Anthropocene. The Promise and Pitfalls of an Epochal Idea*, in *Future Remains. A Cabinet of Curiosities for the Anthropocene*, eds. Gregg Mitman, Marco Armiero, Robert S. Emmett, (Chicago and London: The University of Chicago Press, 2017), 1–18.

⁶ Paul Crutzen, Eugene Stroemer, *The Anthropocene*, (IGBP Newsletter 41, 2000), 17–18.

⁷ See William F. Ruddiman, *The Anthropogenic Greenhouse Era Began Thousands of Years Ago*, *Climatic Change*, (vol. 61, issue 3, 2003), 261–293.

⁸ See Simon L. Lewis, Mark A. Maslin, *Defining the Anthropocene* (*Nature* 519, 2015), 171–180.

⁹ Anna Lowenhaupt-Tsing, *A Feminist Approach to the Anthropocene: Earth Stalked by Man*, https://www.youtube.com/watch?v=ps8J6a7g_BA&t=2733s (05.11.2017).

¹⁰ Ibid.

¹¹ Ibid.

¹² Manuel DeLanda, *A New Philosophy of Society. Assemblage Theory and Social Complexity*, (London and New York: Continuum, 2006), 10.

¹³ Lowenhaupt-Tsing, 23–24.

¹⁴ Lowenhaupt-Tsing, 168.

¹⁵ Ibid.

¹⁶ Steven Shapin, Simon Schaffer, *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life*, (Princeton: Princeton University Press, 2011).

¹⁷ Lydia Kang, Nate Pedersen, *Quackery: A Brief History of the Worst Ways to Cure Everything* (New York: Workman Publishing 2017).

¹⁸ Donald Opitz, Staffan Bergwik and Brigitte Van Tiggelen, *Introduction*, in *Domesticity in the Making of Modern Science*, (London and New York: Palgrave 2016), 4.

¹⁹ Brian Cowan, *The Social Life of Coffee. The Emergence of the British Coffeehouse* (New Haven and London: Yale University Press 2005), 260.

²⁰ Neal Stephenson, *Quicksilver*, 659.

²¹ Lorraine Daston, Katherine Park, *Wonders and the Order of Nature, 1150–1750*, (New York: Zone Books, 1998), 14.

²² Gilles Deleuze, Felix Guattari, *What is Philosophy?*, (New York: Columbia University Press, 1994), 169.

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KONTR(A)FAKTIŠKUMAS KAIP DAUGIALYPIS ASAMBLIAŽAS. SUSIPYNUSIOS ANKSTYVOJO MODERNAUS MOKSLO ŽMOGIŠKUMO IR NEŽMOGIŠKUMO ISTORIJOS NEALO STEPHENSONO „BAROKO CIKLE“

Santrauka

Dabartinėje mokslinės fantastikos literatūroje ryški naujų kontr(a)faktinių naratyvų proliferacija, kurios pradžia siekia XVII amžių. Skirtingai nei *Steampunk* stiliaus naratyvai, kontr(a)faktinėmis strategijomis nesiekiama kritikuoti šiuolaikinių technologijų vystymosi sukeltų sociopolitinių pasekmių. Tokie autoriai, kaip Nealas Stephensonas ar Ianas Tregillis yra pasiryžę iš naujo įvertinti ir detalizuoti progreso logiką triuškinantį vystymosi modelį Vakarų visuomenėse. Pažymėtina, kad šie autoriai atkreipia dėmesį, jog tai, ką įprastai vadiname modernybe, yra tikrai atsitiktinių, neribotų žmogiškų ir nežmogiškų būvių sąveikų rezultatai bei jų individualus laikinumas. Vis dėlto net ir menkiausios šių komponentų modifikacijos turi sąveiką su kultūrinių ir sociopolitinių pokyčių ritmu, trajektorija ir kryptimi Vakaruose. Taigi šie būviai lemia kontr(a)faktiškumo neantropocentrinį modelį, kuris nėra tolygus tradicinėms alternatyvioms istorijoms, kylančioms iš formalių praeities naratyvų.

Akcentuojant šiuolaikinę daugiaryšę etnografiją, šiame straipsnyje konstruojamas naujas kontr(a)faktiškumo supratimas, kuriuo siekiama atskleisti daugialypes, tarpusavyje susipynusias žmogiško ir nežmogiško būvio istorijas, įtvirtintas tariamai unifikuotoje Vakarų istorijoje. Bandant conceptualizuoti atsitiktinių ir beribių žmogiškų ir nežmogiškų istorinių veikėjų susidūrimus, kurie vyrauja skirtinguose diskursuose ir praktikoje, pasirenkamas polifoninio asambliažo (Lowenhaupt-Tsing) terminas. Remiantis šia perspektyva, straipsnyje tiriamas Stephensonso *The Baroque Cycle* („Baroko ciklas“), reprezentuojant susipynusias žmogiško ir nežmogiško būvio istorijas XVII a. moksluose, menkai pristatomas tradicinėse istoriografijose. Ypač Stephensonso apibūdinamos gyvybingos kavinės

tampa nežmogišką būvį įkūnijančiais veikėjais, kurių atidus tyrimas leidžia išryškinti, kokią svarbią įtaką jos turėjo modernizmo aušroje akumuliuotam žinių gamybos procesui.

Reikšminiai žodžiai: kontrfaktiškumas, asambliažas, mokslinė fantastika, Anthropocene, moksliniai tyrimai.

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