Narrative, Contingency and Singularity

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The aim of philosophy has been defined as understanding "how things hang together".[i] One of the ways to do this is by drawing cognitive maps of reality, showing how different aspects of reality can belong in the same map. This holds for different disciplines of knowledge—how on earth do they fit together in the same reality, or in the same head? Maps must be drawn, neurons must be connected. Consilience, Whewell and Wilson's term for the integration of knowledge,[ii] involves a remapping of reality, a constant shift of paradigms. Improving the consilience between disciplines of knowledge is a worthwhile philosophical aim. Arguably, it makes reality itself more coherent.

Maps of reality cannot then be static. For one thing, our understanding of the different conceptual territories being mapped, and of their connections, their landscape and the roads leading from one to the other, is constantly changing. These connections keep changing, too. More generally speaking, a map of reality cannot be static because reality is itself in process, in the making: a flux for Heraclitus, an evolutionary process for Herbert Spencer. And, I dare say, for us too. Work in progress, or a web under construction. Now, a moving map of reality is a narrative of some sort; or, at least, it exhibits many dimensions of narrativity.

The understanding or analysis of narrative may contribute to our understanding of cosmic evolution, or Big History, all the more if we are conscious of the role of narrative as a cognitive instrument at this scale. Far from being in the age of the demise of Grand Narratives, we live in an age in which the grandest narrative of them all, the cosmic evolution of complexity, integrates all previous big narratives in a scientifically coherent way. It is the Big History of how mankind came to be and how its different cultures and their cultural productions evolved through prehistory and recorded history, towards the accelerated tip of modernity of recent world history. The history of the world in this extended sense is the background for all stories—which may be understood as chapters of the same, or imaginative variations on the same. Even fictions and fantasies are historically rooted in the age which makes them thinkable. I call "narrative anchoring" this grounding of all possible and actual stories on the larger story of their historical background. We are effecting such anchorings all the time, whether through presuppositions or in more explicit ways. For instance: when we say that "now" all the cities look the same because of the franchises, our statement is grounded not just on historical processes, but on ways of speaking about them, narrative versions and stories about these processes. Imperialism, industrialism, globalization, the spread of immigration, the MacDonaldization of society, the spread of electronic communications…—such broad historical narratives provide the

background for much of our everyday experience and conversation. Perhaps walking some steps towards a grammar of narrative anchors or analyzing some instances of narrative anchoring would be a worthwhile way of developing this talk. There is, too, a relevant narratological dimension in the achievement of consilience: the disciplines which achieve a consilient integration are thereby transformed, and the global map of knowledge looks different after that enhanced understanding has been achieved. There is a story there too, one of a successful path towards comprehension, towards *someting understood,* as in George Herbert's poem ("Prayer"). But I must move more explicitly towards my title, which is *narrative, contingency, and singularity*.

The contrast between the uncertainty of the future and the fixity of the past is, despite some postmodernist strictures, a basic presupposition in our everyday experience of time: it provides, actually, much of the ground for an ontological distinction between the future and the past. Narrative is a major cognitive instrument to deal both with the irrevocability of the past and with the contingency of future events, dealing as it deals at its core with a retrospective perspective on events which used to be future or contingent, but have since become past and irrevocable. Narrative also models the limited openness of the past through selectivity and perspectivism, and therefore stands at the no-man's land between the irrevocability of the past and the emergence of "new pasts".

The relationship between narrative and the contingency and singularity of events may be approached in a number of ways, for instance, analyzing the plot of a novel in which future events are open until they are gradually closed by choices, by chance and by the movement of the plot at large. But I want to take another perspective to examine the peculiar relationship of narrative to the representation of contingent and singular events—some interesting contemporary developments in evolutionary cosmology. In their book *The Singular Universe and the Reality of Time* Lee Smolin and Roberto Mangabeira Unger have recently formulated an evolutionary theory of physical science, extending to physics the Darwinian principle of "descent with modification". In so doing, they provide a novel perspective on the laws of physics and the origin and nature of the Universe which might result in a revolutionary scientific paradigm, one which limits the role of mathematics in the understanding of the universe (what we might call the Newtonian-Einsteinian paradigm). Both Newtonian and Einsteinian physics presuppose the existence of a body of laws of nature, and a repertory of the basic constituents of nature, which is eternal, outside time—in the mind of God, to use a celebrated expression by Stephen Hawking. This eternal dimension preexists change and rules it. Taking seriously the evolutionary nature of reality involves a recognition of the singularity of events at all scales, and of the reality of time as the grounding dimension of the universe. There is a great narrative being told here, an *enormous* history. One might argue, though, that there is an insufficient narratological awareness in the theories of physicists and cosmologists. Narrative is a prime instrument to deal with emergence and singularity, but the concepts of narrative and narratology are missing in the conceptual toolkit of the theory, and we might try to spell out some narratological implications and concomitances of this evolutionary theory of physical reality and of its new conception of ontological singularity.

We will briefly examine here some aspects of the role of hindsight in narrative hermeneutics, bearing in mind the notion of emergent levels of cosmic complexity.

There is a narratological dimension in cosmological approaches to complexity which has been insufficiently theorized, and some way ahead may be made by emphasizing the narrativity of evolutionary processes, and the role that narratology can play in making the conceptual models addressing them more self-conscious and aware of their own historical situatedness and of their semiotic and generic constraints

In Lee Smolin's work physics is becoming an evolutionary science. It is not by chance, then, that Smolin likes to quote a dictum by Anaximander which may be taken as a starting point for both physics and evolutionary theory. It can be paraphrased thus: Things are necessarily generated, and then destroyed, and there is a kind of cosmic justice in the successive destruction and birth of things according to the order of time. This dictum may also be read as a definition of time: the process whereby our present world (complexity) is generated and then dissolved. This Greek dictum is perhaps the ultimate short-short story for scope and compression, cosmic history rewritten as a short narrative or mental map which contains ourselves, as well as the dawn of things and the death of the universe, just as vain Borges said, or perhaps just as just, as our own death.

Anaximander's dictum combines, then, philosophy, physics and natural laws, narrative succession and closure, narrative understanding and satisfaction, and a theory of time and evolution. Or at least all of these might be unfolded from its cryptic formulation.

Time is for Smolin, as it is for Anaximander, and I dare say for us, an irreducible characteristic of reality. It is directional by nature: Smolin emphasizes that (*contra* Hume and Kant) causality is not just a retrospective maneuver of the mind, but an active principle of generation of new events and things, succeeding each other "according to the order of time". A prize-winning article in mathematical physics by Smolin and Marina Cortês provides a mathematical model for the description of unique events at a universal scale—to some extent, a refutation of Aristotle's principle that there can be no science of individual phenomena. (If there can be no science of individual phenomena there can be no science, because all phenomena are ultimately individual).

Brains can be conceived as the original time machine. A brain manages the organism's response to stimuli, including decisions resulting from the sum and the relative weight of stimuli. A more elaborate brain anticipates possible responses, creates scenearios and models possible realities depending on the outcome of choices. The brain is therefore not just a time machine, but a virtual reality machine, and a narrative machine. A higher animal brain reworks the proto-narrative elements of reality (time, causality) into an ongoing representation which is the original model for virtual reality, for narrative and for film—the prototype for the *cinematic apparatus of consciousness* which according to Henri Bergson characterizes human experience. Or, perhaps, experience as such.

Time, understood as the conscious time experienced by brains, and not merely as the unconscious time of sentient life, has complexified reality into a new dimension: the virtual reality of experience mediated by memory, by anticipations, by expectations; it is time made conscious through representations. In this new level of reality, everything is not just a sign of itself, but of its past and of its presumable future:

things appear already annotated, as in the expanded reality of Google glasses. I am emphasizing here, for the sake of evolutionary theory, the continuity between human experience and prehuman animal experience—but it goes without saying that human culture intensifies this virtualization of the environment, and human beings inhabit the ultimate virtual reality game, a multidimensional space of cultural representations and semiotic objects which includes, finally and literally, actual narratives and virtual reality devices. The human world has always been a stage, but now much of the play takes place in cyberspace.

There exist, therefore, many dimensions of time: the word doesn't mean the same at the level of sub-atomic events and at the level of molecular events; time as physical causality cannot be conflated with time as memory and anticipation, and these only provide the experiential basis for the time of narrated and symbolic worlds. We might do worse than call the time of physical processes *proto-time,* for time in the fullest sense is for us the complex time of a world of temporal representations, with narrative structures taking pride of place. Time fully emerges only as *represented time,* and as time experienced through temporal representations. The time of cosmic evolution, the time of history, fully exist only as a function of our narratives, in which the past, the present and the future flourish in a way unknown to rocks, plants and storyless beasts.

Narrative is, therefore, an emergent phenomenon which turns back on the evolutionary nature of cosmic reality itself. What is proto-narrative in cosmic becoming—the generation of events, causality, the kinship of forking paths of becoming—becomes fully narrative only (of course) through narrative experience and through narrative genres. Proto-time becomes time in its full complexity only in Proust. And the illusion that there is "time" as we commonly understand it in nature—human time for trees, for animals, for the stars—is a glorious example of back projection, of *hindsight bias.* Narrative is an instrument both for the articulation of reality and for its manipulation and perspectivization—but it also brings with it a whole panoply of narrative fallacies, *post hoc ergo propter hoc,* omens, fate, and hindsight bias.

If "man" so-called is in any way "the shepherd of Being" (Heidegger 1996) —or at least of Being as seen from here— his dearest world-storifying tool must be tightly woven with the order of the world—a deeper relationship than meets the eye. Behind all fictions, and all stories, there is Story, the human potential for narrative, and underlying it all there is something like a proto-narrative structure of reality, in the sense that physical, non-institutional, non-human reality, provides the foundation for such basic narrative dimensions as sequentiality, causality, or transformations.

Call this proto-narrative grounding Time, for short; call it universal Evolution, or Becoming. The infinitely complex can only be understood in correlation with the infinitely simple—*everything* being both a plural and a singular. And narrative is a unique way of relating simplicity and complexity, origins and results—of coming to terms with time, to the extent that the past, and the future of the universe, fully emerge only through narrative.[iii] Narrative is also, more specifically, a way to handle the human time of action, experience, and social relationships. Each of these dimensions of narrative has an evolutionary background of its own.

For our present purposes we may stick to the aforementioned levels pertaining to a) cosmic evolution and b) the evolution of the earthly environment; and, at higher levels of complexity, c) the levels of biological evolution (from the origin of life and cellular structures, to multicellular organisms and sexual reproduction, through genetic inheritance and population dynamics), and d) behavioral and cultural evolution, culminating in e) symbolic evolution and human history: the development and interaction of cultures, the history of social institutions and technologies, f) the individual lives lived within or around them—around the *things* and *events* labelled as such in the augmented reality of our cultural milieu, and g) communication, representations, narratives and discourses about all these *things, events, people, institutions, processes* and levels of emergence, according to a number of genres, protocols and frames of reference.[iv]

Although our cognitive ability rests on abstraction and on the identification of classes and kinds of phenomena, every phenomenon in the universe, not just human persons, appears at the same time to be highly individual.[v] In order that science may be possible at all (and Aristotle said that there is no science of individual phenomena), this complex individuality of the phenomenon has to be accounted for as the result of the interaction of simpler phenomena and of more general laws which formalize abstract processes. The theory of biological evolution has had to evolve from single explanatory principles to a more holistic perspective, conceiving of evolution as radically local and ecological: as the complex and historical interaction of multiple principles, not reducible to "adaptation" or "genetic drift" or "the survival of the fittest" or any favourite single explanatory principle (Jablonka and Lamb 2005). Reality as we face it is a vast web of related phenomena, each of which appears to be supervenient, or "just-so", the result of a contingent facticity inherent to the complex structure of the universe itself. Reality is full of *things*—but things belong to classes of things, and every thing and class of things has a potential history. The notion of a global explanation for complex phenomena is a regulative ideal for human understanding, one best exemplified perhaps at present by the current interest for "Big History" (Christian 2004), arguably our most comprehensive map of evolutionary complexity and of time.

This is one reason why the many complexities of narrative must be carefully distinguished: some narrative structures take root in more general mental abilities, while others are highly evolved or specifically human, and may need to be contextualised in history and culture. A complex life experience has a structural "narratological" dimension in its own right, as far as some structural levels are concerned, but *narratives* proper are not just experienced: they must be socially shared, communicated through language or images. And it is this sharing of experientiality, with its associated semiotic media, technologies and genres, that is most distinctive in narrative proper, i.e. in the narrative acts and objects performed and exchanged by humans.

But an interest in *narratives* should not deter narratologists from studying *narrative,* or narrativity—the narrative and pseudo-narrative structures lurking everywhere (if reality, being evolutionary, is inherently proto-narrative in nature).

1) the levels of analysis and phenomena required for a narrative perspective, such as bodies, causes and effects, events, perceptions, human cultures, etc., emerge

historically in the cosmic process, and therefore complex phenomena (including narrative) carry along, inherently, an evolutionary history of the "ingredients" which go into their makeup; and

2) given that our perspective on time and Big History is inescapably narrativistic, everything in the universe, in order to be thought and understood as part of a complex history of emergence, acquires a *proto*-narrative dimension, as a result of the very perspective required by the cognitive instrument that enables us to conceive of evolutionary processes in the first place.

There is, more specifically, an inherent narrativity in evolutionary theories and explanations, especially as regards their retrospective nature. An account of complex and supervenient phenomena requires the insights provided by hindsight, by retrospection. It also requires, however, a critical perspective on the potential fallacies which accompany narrative explanations, notably hindsight bias.[vi] There is insight to be achieved through hindsight, an insight we cannot renounce, but critical narrative knowledge necessitates a dialectic of vigilance and deconstruction in order to counter the self-fulfilling dynamics of hindsight bias or backshadowing.

Our objects of study are historical and subject to narrative anchoring; but the conceptual toolkit brought to bear on the object, and the interpretive situation or perspective, are themselves historical and ultimately referrable to a global cognitive mapping which accounts for the historicity (or the evolutionary origin) of conceptual tools, objects, perspectives, situations, and personal histories. Every object or event has an inherent history, a narrativity which can be teased out of it, and every theory brought to bear on the object or event has a historical situatedness, an intellectual history, and an institutional context.

There exists therefore an inherent dialectic between (1) the contingent / supervenient aspects of the phenomena and of the discursive perspectives we bring to bear on them, on one hand, and (2) the coherent situatedness of both phenomena and perspectives when understood from an evolutionary perspective, on the other. And this dialectic gives rise to an intriguing dimension of the complexity of an object, as approached from a given perspective. An evolutionary narratology needs to examine the implications of the concepts of evolutionary supervenience, retrospection, and hindsight for theories of narrative mapping and of narrative anchoring, theories which are crucial for evolutionary historicist hermeneutics. With some exceptions such as Stephen Jay Gould, major evolutionary theorists have been insufficiently aware of the cognitive implications of narrative structures and of narrative thinking in evolutionary theory.

To come full circle to the issue of contingency, the recent cosmological proposal by Roberto Mangabeira Unger and Lee Smolin in *The Singular Universe and the Reality of Time* (2015) forcefully asserts the nature of reality as a unified web of relationships within a single temporal system, an Enormous History so to speak, as it restores the singularity of time as an irreducible cosmological primitive. Not a simple phenomenon, but rather one which inherently produces complexity and results from it, as it appears from Unger's very definition of time:

> Time is the contrast between what changes and what does not change. More precisely, it is the contrast between what changes in a particular way and what either does not change or changes in some other way. It is the relativity or the heterogeneity of change. (222)

To the Einsteinian mathematized space-time, resulting in a block universe of mathematical relationships, they oppose the inclusive reality of time and a universe without fixed laws or natural kinds; also, they demote mathematics to a mere tool for abstracting time—a tool which is immensely useful but often misleading (ignoring as it does the temporal grounding of the universe), and which is in no way a Platonic blueprint to the essence of reality. Reality is the temporal unfolding of events, and path dependence is a central concept in Unger and Smolin's evolutionary conception, as it was in Gould's. Complex emergent phenomena are path-dependent, and this is a major dimension of what we have been calling the proto-narrativity of the cosmos. All things and all events have a history, which amounts to saying that all things and events are path-dependent and unique, and that they carry their history with them as a partly readable text.

Note that I call complex and path-dependent phenomena *proto-narrative* rather than narrative, as there is a cognitive dialectic involved here whereby they both enable and generate the basic structures of narrative (sequence, causality, etc.) and, moreover, become themselves a factual narrative, asking to be told, once they are perceived and understood by human minds. The full extent and significance of proto-narrative experience has only been occasionally suggested in phenomenological analysis. Lampert's (1995) emphasis on "back reference" in his analysis of Husserl's intentional synthesis of experiences points to a pervasive role of what I call retroprospective structures in cognition, including a kind of paradoxical bootstrapping closely related to the fallacies and paradoxes studied in narrative theory—whereby emergent meanings present themselves as already being awaited by the past. That is, they project, retroactively, a past which was anticipating them (we are all Whig theorists of history, in a way). Although Husserl's or Lampert's focus is not specifically narratological, this philosophical analysis of experience presents a perspective which emphasizes the central role played by hindsight in the genesis of human experience.[vii]

In *The Singular Universe and the Reality of Time* Unger and Smolin posit a rethinking of cosmology and physics by extending to them the notions of a co-evolution of physical laws and phenomena, and of the mutability of natural kinds—not just of biological species, but of sub-atomic particles too. They advocate an evolutionary physics based on the natural selection of universes (and their laws), the co-evolution of regularities and structures, and the pervasiveness of path dependence. Their notion of the inclusive reality of time provides, too, an ultimate theoretical grounding for narrative anchoring, as it posits the existence of "a preferred cosmic time such that everything that has ever happened in the history of nature can in principle be placed on a single unbroken time chart" (2015: 139). Human history, and human histories, find thus their natural grounding in the fundamental laws of nature, and narrative understanding reveals its deepest connections with the structure of the reality from which it emerges.

The most important feature of the cosmos is *that it is the way it is,* its facticity resulting from evolutionary path-dependence. Unger and Smolin's model offers thus a

suggestive foundation for a cosmological narratology, and most particularly for a theory of narrative anchoring—although (as in other approaches to cosmology) there is room for an increased narratological awareness in their approach. As it is, the understanding of time appears as the ultimate encompassing narrative map, one which captures not merely the human understanding of things, but the very fabric of reality or "Being". The universe progressively expands in time and generates unprecedented levels of complexity, evolving as an emergent process which is creative and not as a replay of pre-established models, not as the projection onto time of a timeless set of Platonic models and mathematical ideas.

John Wheeler, a major theorist of the anthropic principle, formulates a similar principle from the point of view of quantum physics: "we used to think that the electron in the atom had a position and a velocity regardless of whether we measure it or not"…. but the observer's position has to be taken into account —and here quantum theory ties in with George Berkeley's metaphysics of observation. According to Wheeler, "this is the strict sense in which we have a part in bringing into being that which we think is already there in the world around us. The world does not exist 'out there' the way Einstein used to think" (*Horizon* 1987). And, according to the cosmologist George R. Ellis (2012), in complex systems events are unpredictable until the moment they happen.

We could envisage narratives as our way to make events predictable after the fact—which is by no means as easy as it sounds. These cosmological views of Ellis's, and of Smolin and Unger's, return in part to Bergson's (1959) notion of creative evolution, as against the "block universe" of Einstein and Minkowski, which has been a dominant conception in twentieth century physics. A return to emergence is also a return to narrative—narrative is closely linked to the uniqueness of events in the complex universe, and to the path-dependence of evolutionary emergence. Increased interdependence and complexity has been linked by systems theorists to the dynamics of the arrow of time (D'Souza 2011): in this light, narrative is, arguably, the complex system par excelence, and the very tip of the arrow of time—a tip pointing paradoxically both backwards and forwards, reworking time as the story progresses. Unger emphasizes an important aspect of the mind apart from its machine-like ability to repeat, mathematically, the regularities of the world. It is its plasticity, the ability to act as an anti-machine, to alter the relation of structure to function. The mind changes its focus in surprising and anti-methodological ways, it "tries out what it has not yet learned how to repeat, or therefore to reduce to formulaic expression (…). It discovers what the extablished axioms and the canonical methods do not allow but cannot prevent, and then establishes retrospectively the assumptions and procedures that enable it to make sense of them" (Unger & Smolin 145). This ability to transgress or transcend fixity is also connected to narrative representation, as the reference to retrospection in this account may suggest—and to narrative paradoxes as well. The complex becoming of the universe, a universe in flux without fixed laws or natural genres, cannot be predicted; it can only be narrated and understood in hindsight.

The study of narrativity is a promising avenue for future reseach bridging the sciences and the humanities. For instance, narrativity is a hidden player in the problem of cosmological fine-tuning and anthropic observation. Any evolutionary development is unique in an unlikely way—and therefore exhibits narrativity. That some of them

exhibit an even greater degree of unlikelihood may obscure this fundamental evolutionary dimension of narrative.

If Time is to be asserted once again as the irreducible fundamental backdrop of cosmic evolution, as the foundation on which complex emergents are built through unprecedented interactions, *narrative* too is a basic dimension of experience: it is both a final flourish of complexity, and a major cognitive tool in understanding the complexity of all phenomena, since narrative is our way of coming to terms with time, with events, and with objects as they appear in the world—as the product of time and of complex unprecedented interactions.

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Appendix: Two articles in post-relativistic mathematical cosmology

Cortês, Marina, and Lee Smolin. "Quantum Energy Causal Sets." *Phys. Rev.* D 90, 044035 (14 August 2014)
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Abstract: We propose an approach to quantum theory based on the energetic causal sets, introduced in [M. Cortês and L. Smolin, arXiv:1307.6167]. Fundamental processes are causal sets for which the events carry momentum and energy, which are transmitted along causal links and conserved at each event. Fundamentally there are amplitudes for such causal processes, but no space-time. An embedding of the causal processes in an emergent space-time arises only at the semiclassical level. Hence, fundamentally there are no commutation relations, no uncertainty principle and, indeed, no $\hbar$. All that remains of quantum theory is the relationship between the absolute value squared of complex amplitudes and probabilities. Consequently, we find that neither locality nor nonlocality is a primary concept; only causality exists at the fundamental level.

Giovanni Amelino-Camelia, Laurent Freidel, Jerzy Kowalski-Glikman, and Lee Smolin. "Principle of relative locality." *Phys. Rev.* D: *Covering Particles, Fields, Gravitation, and Cosmology* 84, 084010 (5 October 2011):
https://journals.aps.org/prd/abstract/10.1103/PhysRevD.84.084010
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Abastract: We propose a deepening of the relativity principle according to which the invariant arena for nonquantum physics is a phase space rather than spacetime. Descriptions of particles propagating and interacting in spacetimes are constructed by observers, but different observers, separated from each other by translations, construct different spacetime projections from the invariant phase space. Nonetheless, all observers agree that interactions are local in the spacetime coordinates constructed by observers local to them. This framework, in which absolute locality is replaced by relative locality, results from deforming energy-momentum space, just as the passage from absolute to relative simultaneity results from deforming the linear addition of velocities. Different aspects of energy-momentum space geometry, such as its curvature, torsion and nonmetricity, are reflected in different kinds of deformations of the energy-momentum conservation laws. These are in principle all measurable by appropriate experiments. We also discuss a natural set of physical hypotheses which singles out the cases of energy-momentum space with a metric compatible connection and constant curvature.

Endnotes

[i] Wilfrid Sellars, quoted by Daniel Dennett.

[ii] Whewell (1840); Wilson (1998). For some cognitive narratological implications of the concept, see also García Landa (2013).

[iii] On the phenomenological status of the past and the future, see Mead (2002, first edition 1932).

[iv] On cosmic evolutionism, see Spencer (1937, first edition 1862); Bergson (1959, first edition 1907); Smuts (1927), Christian (2004), Chaisson (2006). On the complex dynamics linking biological evolution, environment, behavior and symbolism, see Jablonka and Lamb (2005).

[v] See Cortês and Smolin (2014) for a scientific perspective on the uniqueness of events in the fields of physics and cosmology.

[vi] The term 'hindsight bias' is more common in psychology and in the social sciences than in the humanities; see Hoffrage and Pohl (2003). But the phenomenon is not: see the analyses on "backshadowing" in Bernstein (1994) and Morson (1994).

[vii] I am indebted for this insight about Lampert and hindsight in Husserl to Marina Grishakova and Maria Poulaki. Some paragraphs of this paper also appear in my contribution to their volume on *Narrative Complexity.*

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