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Inertia

Bruno Villalba¹

Abstract: Inertia describes the ability of a movement to persist, after the application of the initial driving force. The earth's biophysical cycles have inertia of their own, while social systems have a particular dynamic, giving rise to other forms of inertia. Modern society has pushed back against natural inertial constraints, but our activities have also established other, disquieting inertia mechanisms (e.g. nuclear inertia). The Anthropocene raises questions about the compatibility of these inertial cycles; the timescales on which they operate are orders of magnitude apart, so it is no easy task to reconcile them. Today, we have begun to see clashes between the inertial mechanisms of the different systems, and urgently need to redefine the timescales that policymakers consider, so new policy can address and mitigate these clashes.

When considering ecological matters, one must, inevitably, also think about time (Adam, 2000). Barbara Adam continuously tries to reconcile the timescales on which ecological systems operate (the rhythms of the climate, the carbon cycle, the unpredictability of the living world, etc.) with those on which society runs (the pace of development, the conditions for wellbeing, and so on). Quite rightly, she focuses on the sustainability of the interplay between the two phenomena (for the safety of future generations, both human and non-human). Where her work differs from her predecessors' is that she takes account of temporal tipping points (crises, catastrophes) which could, potentially, threaten humanity's very survival. In this, Adam's view of time is in conflict with that of modern society. Society today tends to view itself as being able to wrest free from the influence of certain physical and social realities (the laws of physics and social traditions) which have, in the past, been seen as immutable inertial barriers.

Inertia describes a movement's ability to persist after the initial driving force has been applied. It may be viewed purely as the result of a physical principle, contingent upon the determinism of the laws of mechanics. In the absence of any outside interference, a moving body tends to remain in its original state of motion. However, inertia cannot be considered the absence of a reaction due to lack of activity. Quite the contrary, it describes the dynamic that is unique to each body.

Our planet is governed by the physical laws of the climate mechanism, thermodynamics, etc. The cycles on which these phenomena operate may be extremely long (tens of thousands of years, for geological phenomena) or shorter (only a few hundred years for oceanic circulatory systems). The differences in their duration aside, all such mechanisms are affected by inertia: a system is set into motion, it has an effect, it is prolonged, or else it ultimately comes to rest (it is finite). All these cycles interact with one another, which makes it much more difficult to assess the general inertia of the Earth system.

Human history also displays inertia. Here, we refer to the ability of an *idea* to persist, as the result of the notion which birthed it. It is certainly true that there is no universally shared anthropological concept of time. However, numerous theories draw upon the idea that we are shaped by specific factors, which have led us to form a certain collective imaginary concerning our role in the planet's evolution. Thus, we have developed models of relating to the world, which serve the particular goals of different groups of people. Viewed through this lens, history becomes logical and meaningful. The action of human groups results from an initial driving

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force, which imbues the movement with dynamism, with collective beliefs justifying the actions.

However, the western view of time has gradually gained wider acceptance. We have constructed the concept of ‘clock time’ founded on Newtonian principles, based on a linear view of the passage of time (Adam, 1998). According to this view, social time is an independent construct, entirely separate from the timescales of the natural world. There is an overwhelming focus on the present, with barely any consideration of nature’s long inertial cycles. As a result, we have slowly developed what Hartog (2016) terms a ‘regime of historicity’, which determines the way in which time is recorded, imposing a certain order upon how it is perceived. This becomes a framework for long-term thinking which shapes our mentality – both individual and collective. The industrial and political revolution (which brought about individualistic liberal democracy) has led to a concept of time with two facets: *presentism* and *acceleration*. Presentism means that our experience of time is focused on here and now, with emphasis being placed on the *indefinite continuity* of the present. Acceleration involves *amplifying our immediate use of time*, increasing the possibilities for use of different slices of time (work time, leisure time and social interaction time) by increasing the capability and availability of technological tools (from the pocketwatch to advanced digital technology). This focus on the endogenous conditions of maintaining this social motion (primarily through technological innovations) leads us to downplay the natural exogenous constraints which could threaten that evolution. Thus, the inertial mechanisms to which our ancestors have been subject are tamed, with individuals gaining greater autonomy. Individuals construct their relationships with the world on the basis of these two forms of emancipation: ecological timescales are subrogated to human developmental goals, while social timescales are transformed to allow for the perception of a constant opportunity of personal development. However, the imperative to make progress (as time passes) has caused us to lose sight of the inertial margin to which we, ourselves, are subject.

Nevertheless, the dawn of the Anthropocene calls into question whether it is appropriate to dissociate ourselves in this way from the timescales of the natural world (the biophysical cycles of the Earth system, the unpredictability of ecosystems and populations, etc.). The Anthropocene shines a light on the temporal disturbances resulting from human activities (notably, socio-technical development), which interfere with our presentist view of social time. We now face a situation never before seen in history, where the Earth system’s inertia could critically impact the evolution of the inertia of social time in the modern era. Human action has given rise to its own types of socio-technical inertia, which interfere with the inertia of natural cycles. We are at a decisive moment in history, and need to come up with a policy to regulate time, which takes account of a particular conception of time (presentism, which tends to downplay the inertial aspects of natural cycles), and of major tipping points which threaten irreversible harm (the inability to adapt, leading to either the elimination, or a complete transformation – if indeed such a transformation is possible – of nature). This threat of irreversibility raises questions as to the very capacity of our social systems to ensure their own survival (Steffen, 2015). However, the inertia and feedback mechanisms of the Earth system are slow, which preserves the illusion that the changes currently being wrought are not so drastic as they actually are, and that we are still able to control their impact. The timescale over which these inertial phenomena manifest themselves makes it more difficult to address them here and now. Public policy is drawn up from a short-termist point of view (looking no further than 30 years, at most, into the future). How, then, are we to devise policy that takes account of inertial stresses which will increase the pressure on future generations?

In addition to natural inertia (and worsening impact of human activity), we must consider the inertia of technical threats (such as nuclear and chemical weaponry), and the inertia of political views (a *continuist* vision of time, owing to the ability to control risks through technological

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innovation, which is perceived as infinite). In the latter case, we need to fully take account of the inertia of institutional structures and of public action, which stem from the long historical practice of distancing ourselves from nature (McNeill, 2001). As time passes, it becomes increasingly difficult for policy to change direction, because previous policy choices shape current organisational rules, and determine the path of future solutions. This phenomenon, known as *path dependency*, leads only marginal changes to be made, as we seek to make use of tried and tested, past practices. Thus, the passage of time reinforces the existing concepts and institutions, making it difficult to bring about change. For example, it is enormously complicated to act against the role of oil in our society, because the use of such fossil fuels is woven into the very way in which our political and social systems function, the infrastructure upon which those systems are built, and our daily lives. We can see the ‘lock-in through interdependency’ to which Pierson (2004) refers. The institutional inertia of the world of research also leads to veritable conservatism in academic circles. Self-referent mechanisms represent a barrier to inventive fundamental research, in the interests of academic objectivity. Such objectivity is founded on an existing knowledge base, which often takes little consideration of ecological issues. We also need to take account of behavioural inertia, because our way of life, by definition and by its structure, has an important inertial element to it. We have developed, and continue to perpetuate, a model of normalised comfort which should be of concern to everyone today, and which should certainly concern future generations. We envisage a continuous and extensive chain of improvements to individual comfort (Shove, 2003). However, this approach has ecological consequences which cannot be ignored (Hoekstra, Wiedmann, 2014).

Finally, socio-technical inertia also has a profound impact on social systems’ ability to evolve, and may cause major shifts in natural inertial systems. The manufacture of certain tools (in particular, nuclear weapons, and nuclear waste from civilian activities) inevitably creates inertial mechanisms which operate over tens of thousands of years. In 2019, France’s *Agence nationale pour la gestion des déchets radioactifs* (National Radioactive Waste Management Bureau) had a store of 1.67 million cubic metres of radioactive waste. 3% of that waste accounted for 99% of the radioactivity, but the materials would remain radioactive for hundreds of thousands of years. Even now, nowhere in the world are there facilities for the permanent storage of such highly radioactive waste. The nuclear threat (from both civilian and military quarters) leads to an inertial situation never before seen, because it brings with it the risk of an irreversible and radical shift (for this reason, some authors, including Waters et al., 2015, suggest that the ‘militarocene’ would be a more appropriate label for the new age in which we live). We have entered the so-called ‘end times’, characterised by the risk of the permanent erasure of all life on Earth: ‘However far generations to come stretch into the future, and wherever they go to escape it, the bomb will always be one step behind them.’ (Anders, 2002: 342). In addition, these threats create the need to maintain enormous long-term investment and bear huge risk-management costs. This will put pressure on States’ financial resources – all the more so against the backdrop of tightening budgets, which will mean priorities need to be defined. The consequences of such human inventions over the very long term will go beyond what political and academic organisations, in vulnerable human societies, are capable of regulating.

Age-old forms of inertia are now resonating with more recent inertial mechanisms caused by humans. Certainly, these different types of inertia are characterised by different rhythms: our CO₂ emissions will continue to have a tangible impact on the climate for 5,000 years to come, with average global temperatures continuing to climb past the end of this century. The inertia of the oceans and the atmospheric system lead to gradual transformations of the natural regulatory mechanisms; but the sudden rupture that a nuclear detonation represents could bring about a complete shift of social and ecological systems. Thus, we must deal with the cumulative

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effects of systemic inertia in multiple systems, creating ever more unpredictable situations, and further increasing the risk of irreversible damage. Now, within a limited window, political actors must attempt to address these conflicting timescales, to preserve the possibility for human societies and the natural environment to co-evolve.

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