Inertial thrust engines as non-conventional clocks

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Summary

The non-conservation of angular moment, and its eventual conversion in linear impulse, in many inertial engines, already is an excellent indicator of the internal time of the system: of its internal synchronization, instead of the external or conventional synchronization. Hence the great theoretical interest, in addition to the practical one, of such devices.

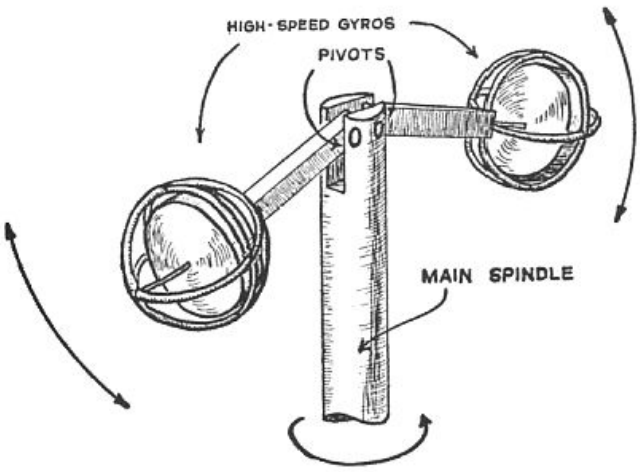
It is well known the gyroscopic rotor Eric Laithwaite introduced in the Royal Institution more than thirty years ago, and the glacial reception received. Innumerable similar machines, based in the exploitation of the inertial impulse, have been constructed worldwide before and after this exhibition. Laithwaite himself adopted the idea after a communication of an amateur inventor.

Laithwaite´s machine, a centrifugal rectified rotor, produces when turning a lift force reducing the weight of the apparatus –without apparent reaction of the medium to support it. Taking into account the “suspicious" aspect of the device for the assumed laws of mechanics, Laithwaite dedicated all his efforts to demonstrate that none violation of the fundamental laws existed, but only a separation between the action and reaction for Newton´s third principle –none “local violation” of it; a good explanation, at least, for his satisfaction. Even so, and in spite of the great utility that this class of devices and its principles must have rendered already at this point, the engineers and the industry have not been able to find them generalized application still.

The “Laithwaite machine", ridiculously simple and concrete, remain thus in the same border line between which is considered acceptable in science and the misty world of the unexplainable. Only one form to explain the reason is to talk about the unconditional assumption of the principle of angular moment conservation of Wallis and Newton, although this principle only can

be rigorously applied for punctual particles under the same line of force –a very exceptional condition in nature, that makes us think that machines like these, far from being episodic artefacts, are closer to nature and its habitual behavior than so well-intentioned and phantom principles. Nevertheless, the rupture of this conservation principle spoils the usual calculations and even makes them impossible, being this the first reason for ignoring it as much as possible. This barrier in the mathematical description affects not only the theoretical exposition of these problems, but also the practical interest of engineers and the industry, unable to work without reliable standards of calculation. This barrier in the mathematical description and prediction is the very wall faced in all those alternative approaches to physics and energy, beyond any real or imaginary conspiracy.

Nevertheless, the non-conservation of angular moment, and its eventual transformation in linear impulse, in many inertial engines, already is an excellent indicator of the internal time of the system: of its internal synchronization, instead of the external or conventional synchronization. Hence the great theoretical interest, in addition to the practical one, of such devices.



In the Laithwaite design, when the main axis rotates, the acceleration caused by the precession makes rise and fall the gyroscopes during each

revolution; being the problem to arrange or synchronize the ascension of the gyroscopes to get lift effect, disengaging simultaneously the descending swing. Given its intrinsic instability, the device tends naturally to violent oscillations. Many other people have introduced multiple types of partial rectifiers to stabilize the system.The designs of Alfred Evert, for example, starting from own principles, are a fascinating unfolding of motifs with great universal content, which transcend our accidental and arbitrary idea of the machines.We will not enter to consider now to what extent they could have been successful. On the other hand, the instability of this kind of devices is not accidental, nor attributable merely to the imperfections of design: the root of the problem lies in the same fact that these machines, with their successive rectifications, tend to recreate artificially and with increasing approach one of the more omnipresent motifs in nature, and in a fluid medium in particular: the eddies or vortices, inherently unstable, and with the uncontrollable ramification of its vectors. This already is a merit itself, and one can ask why would be reprehensible the increasing approach to the model of the nature, no matter how clumsy our attempts could be.

The “Laithwaite machine" only demonstrates a separation between the action and reaction; but being both the sceptical and the rash enthusiastic waiting for an action without reaction, most of them decided that the subject has not interest at all. But, far from it, the separation between action and reaction, the non-immediate character of the third law of dynamics, is the basic and fundamental premise to translate the conventional mechanics, purely descriptive, to a causal mechanics as demanded, for example, N. A. Kozyrev: a mechanics of open systems with time like an active agent, and in which even the reversible behaviour depend on the open nature of the system and one defined action with the environment. If the non-conservation of the angular moment may be matched with the separation between action and reaction, and with an interpolated sensitivity, this one may as well become equivalent to the global effect of the environment in a non-homogeneous system, even though its properties remain without specifying.Naturally, this takes us to a different way of thinking.

Since Poincaré we know that any system that satisfies the principle of stationary or extremal action admits infinite explanations or “causal” descriptions, and, therefore, it makes impossible a unique causal interpretation of such systems; it is mainly because of this that physicists appeal to the equations, more than what they could mean in intuibles terms –even when it is clear that nobody can be deprived of interpretations, and of the most reductionist in particular. Without a doubt, the successful management of consensus within the community of mainstream physicists crucially depends

on the construction of models with the minimum of possible causal interpretation; or with the neutral appearance of it, since, in fact, it is not possible to do without the interpretations; on the contrary, most of the alternative models emphasizes more or less "causal" interpretations, that other people probably don't want share, over the possibilities of calculation. From this situation so many problems arise.

If the separation between action and reaction is the essential and distinguishing premise in order to give to time a real content instead of remaining an imaginary and passive entity, and we can speak another way of the interaction of the objects with the environment and space itself, we would have to be able to change the situation and to begin to use these inertial thrusters like basic instruments of measurement for the mathematical description: like an essential clock that helps us to define what is really interesting for us. Everybody recognizes the underlying but conventional role that the clocks play in modern physics. Since Newton´s absolute time to the conventions of the relativist clocks, the principle of *global synchronization* remains intact; and from this all the more abstract aspects of this discipline arise. Naturally, *the convention for the synchronization has been always chosen based on the most treatable or convenient equations*, instead of looking for mathematical models based on measures of the time with its own variability, independent on the conventional global synchronization. However, anyone of these rotary devices with positive inertial performance is a non-conventional clock by itself, offering to us a conversion of forces, oscillations, and fluctuations of those oscillations: they are quite more absolute clocks, no matter how hard their rates of variability are opposed to the uniform synchronization, and for this reason, indeed. More than a problem, this kind of devices already offers a solution to us. They offer archetypical models of conversion of inertia, mass, force, action, reaction and sensitivity to us.They introduce the temporal separation between action and reaction on a mesoscopic scale, just what it is needed; that separation is what determines the total sensitivity of the system and that must be its very contribution to the control and stability theory.

That same temporal gap between action and reaction, or global sensitivity, is the only thing that promises to us to go beyond the circular reasoning when decomposing the temporal series of the output with its fluctuations in the coupling of different oscillators. It is to suppose that some interesting mathematics underlies here. Will all this be reduced to the detection of patterns and common signatures as usual, or is possible to go farther? Nobody still knows it, of course; but it is necessary to emphasize that these designs have underlying principles of great universality, reason why is

possible to wait for an affirmative answer. Modern mathematical physics works in general with other notions of variability, and contrary to the common supposition, has not explore the full spectrum of possibilities –not even at very elementary levels.

Of course, as much for relativity as for particle physics, intervals between action and reaction exist, although the former are basically space intervals and the later time intervals, as if they alluded to two opposed limits in the scale of causality. It seems evident that between both limits there is room enough to define. Nevertheless, both limits are neutralized in the functional and time series analysis, by virtue of the principle of global synchronization. On the other hand, the same relativists equations are derived from those of Maxwell, that originally are fluid-like equations, and the same may be said of a big part of the formalisms of the quantum mechanics. Any idea of a medium, spatial or temporal, ends naturally at the notion of fluid, more reach and with much more mathematical difficulties.

One usual topic: Are the machines with a gap between action and reaction open systems by definition? Or in other words, Is its non-standard output derived from the interaction with the environment? In the most general sense, it is evident that closed systems do not exist; but that doesn't mean not to consider most of them like basically reversible and stable. But this is not the moment to discuss on the ultimate nature of inertia and the centrifugal forces, no matter how hard nobody is able to represent inertia beyond the rolling ball image; what matters is that these devices seem ideal to study many combinations of linear dynamics and nonlinear dynamics through their net performance.

The basic breakdown of a system in measures of action, reaction, and separation or sensitivity between both takes us to an important problem of *functional* or global hierarchy, different from the structural or purely mechanical hierarchy of the systems. This principle of functional hierarchy, in which the third element –the sensitivity- plays the decisive role for the output and the balance, is the one that make us hope that the mathematical analyses can offer relevant descriptions, beyond the circular description or the mere statistical patterns.

But the same could be applied to infinity of complex systems; the same life and its definition pass through the great although variable difference between inputs and outputs, action and reaction –this is a must feature. The times of reaction and changes of direction conform the in-homogenous synchronization of the activity of the cells and the traffic of signals in their membranes, and without this, hardly we will be able to understand, not only the operations of the neurons and their problems of functional hierarchy, but

even the much more modest "computational" activity –real time and real synchronicity- of the cardiac cells. Curiously enough, now asynchronous integrated circuits without unitary clock-cycle begin to be developed, although far from the flexibility of behavior of nature. The functional and structural asymmetry is also a common element of these devices; and asymmetry is also what we found in most of interesting biological molecules. Nevertheless, while physics is used to extremal principles, in which the time consumption tends to a minimum, the organisms, whose temporal rates are metabolic derivations, which try to save is space, matter and energy, tending to stabilize its thresholds of sensitivity. No matter how much they must have in common, we are before two completely different types of economy.The organized nature ignores time, because nature itself produces it.

Inertial thrust engines as non conventional clocks are in an essential and intriguing double cross between linear, non-linear dynamics, conservative and dissipative; introducing a new variable –a kind of quintessence- on what can or can not be conserved. A whole research program itself. One may suppose that privileged algebras exist to describe these behaviours. The problems of definition of units remind us those of the first attempts in thermodynamics at the early times of Carnot, before the assumption of principles and measurements by Joule and others; although the relation between abstraction and application, the general and the particular, will be also very different in this new dominion.

The non-linearity of these devices can also be described by the fact that the own output is not only a mere result, but part of the reentrant conditions, being not clear enough the feedback loop; of coarse, this aspect is also highly characteristic of living beings. On the other hand, in a system of this kind, and even with its rigid structure, the momentary state of the system is not enough to predict its behaviour, but a necessary reference for some undefined potential or scalar magnitude –that is to say, the punctual and spatial description of time is quite hollow and incomplete. But the temporal separation between the action and reaction would have here to be the measurement of proper reference and the nucleus for any possible standard – or, at least, the starting indicator.

Therefore, these devices reunite ideal conditions to create explicit models of time, the spontaneous synchronization and the nonlinear systems – and if the specialists are not able to advance in their description, hardly they will be able to do it with other much less explicit systems. This already would have to be reason enough to take seriously this class of studies. Maybe we are trying to avoid which is to be searched and identified first of all.

Far from taking to us out of the causality, these devices allow us to go deeper in it and to describe it; far from moving away from the economy and its general balance, these machines and the principles implied are talking to us of the most critical and delicate aspects of the economy of things. We know that the ordinary mechanical description does not allow a univocal identification of causes; if the contemplation of an interval for the third principle and its associate circumstances lead us to it, this notion of the causality must be different from the present spatial representations. The question is if the measurement of the temporal separation for the third principle takes to us to better generalization and predictions, to a selective sieve of the temporal series –Fourier, dimensional analysis, etc. - or not. That an additional selective criterion must exist, seems to be so clear as the fact that better and worse designs exist, more unstable or more sturdy, in addition to the output we could demand to them. Only if new standards of measurement for the third principle were obtained –new clocks -, previously to introduce explanations and interpretations, a fast advance can be expected in this area that must avoid the dispersion of efforts. Besides, the free and creative community of researchers studying these phenomena has many more common than diverging ideas.

That the appearance of the pendulum-clock is consubstantial to the awakening of modern physics, it is well known. Talking about clocks, oscillators and pendulums, few ones stop to consider that Newton laws of dynamics are incapable to explain how a kid seated in a swing obtains increasing oscillations without external impulse –changing only the position of the mass available. This is not obtained without sensitivity, although, on the other hand, this sensitivity can be generated spontaneously in an infinite number of situations. This sensitivity clearly is not magic, and is itself in the middle of actions and reactions; moreover, summarizes in its external efficiency innumerable influences, often impossible to consider in detail. In fact, self-induced amplifications of an oscillator happen in all type of complex behaviors, from Biology to the stock-markets, passing by the hurricanes. In other writing I dealt with how with the appropriate interpolation and measurement of this sensitivity in signals like the sanguineous pulse we can achieve much more comprehensive and rational conclusions in the medical diagnosis. And if certainly theoretical physics is not prone at all to reconsider the properties of a universal medium, time or inertia, equally ubiquitous and more urgent problems exist in applied physics relative to non-linear dynamics, where substantial progresses shine by their absence.

The theoretical physicists make of the gravity the great problem and the great challenge; in this, they remind us many intellectuals, fighting always

against Evil. Far away from those challenges commensurate only with the grandeur of so abstract constructions, many of us think that inertia and the centrifugal forces play a more basic and universal role in the reality; being fundamental, unlike the gravity, on all the scales. Inertia thus considered leads naturally to the subject of mass, and the "mass gaps" of the standard theory also could be speaking about "time gaps" Of course, many people, from the more elementary point of view, consider that the same mass is nothing more than angular motion. But, mainly, the inertia and centrifugal forces are manageable by manhood here and now, and perhaps only for that reason many believe they involve no theoretical interest. Today, like always, within the ideas and within the heart, a fight between the lightness and heaviness seems to exist. And one trusts that lightness will prevail –because that's the vocation of Life.

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Some sites of interest

Alfred Evert website
< http://www.evert.de/>

Jean-Louis Naudin:"Inertial Propulsion Engines"
< http://jnaudin.free.fr/html/IPEmain.htm >

Institute of Time nature explorations
< http://www.chronos.msu.ru/>

Miguel Iradier; "The left hand of Chaos"
http://www.hurqualya.com/samkhya.htm