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COMPLEX IS EASY
A Complex Evolutionary Social System Approach to Global Governance

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Abstract. The goal of this paper is to provide a research based and policy focused general view of a Complex Evolutionary Social System Approach to Global Governance. From this perspective, to frame complex system evolution and global governance it is pivotal to outline two key epistemological distinctions: the one between complex and complicate, and the one between easy and simple. These distinctions will be explained below. Complex is whatever horizon of alternatives whose possible adjacent points require contingent selection according to self-referential coding and programming, nevertheless expanding the self-reproduction of the horizon itself. Complicate means entropy at its highest speed and power – a zero value, time and energy waste organizational model, with an ineffective design, high cost and low return. Examples will be provided also linking these concepts to those of easiness and simplicity.

Keywords: complexity, global governance, sustainability.

Riassunto. L'obiettivo di questo articolo è fornire una visione generale, basata sulla ricerca e incentrata sulle politiche, di un approccio evolutivo complesso dei sistemi sociali alla governance globale. Da questa prospettiva, per inquadrare l'evoluzione dei sistemi complessi e la governance globale è fondamentale delineare due distinzioni epistemologiche chiave: quella tra complesso e complicato e quella tra facile e semplice. Queste distinzioni saranno spiegate di seguito. Complesso è qualsiasi orizzonte di alternative i cui possibili punti adiacenti richiedono una selezione contingente secondo una codifica e una programmazione autoreferenziale, espandendo tuttavia l'autoriproduzione dell'orizzonte stesso. Complicato significa entropia alla massima velocità e potenza – un modello organizzativo a valore zero, con spreco di tempo ed energia, con un design inefficace, ad alto costo e basso rendimento. Verranno forniti esempi che collegano questi concetti a quelli di facilità e semplicità.

Parole chiave: complessità, governance globale, sostenibilità.

1. INTRODUCTION

Scenario 1 (S1) The Metropolitan Lunchtime

Imagine that it is lunchtime and you are in the very heart of a world-class, cosmopolitan metropolis. Within the 500sqm around you, you prob-

ably find plenty of restaurants, cafeterias and similar small stores where you can eat. Suppose they are 40, for instance. You are hungry. Two of them are closed that day; out of the 38 open ones, 3 offer dishes from a sort of cuisine you do not like at all, which narrows your choices to 35. Out of this number, 9 are too expensive for you, leaving out 26 choices. You try to be served in 5 of them, but you do not like their approach to customers. Now you have 21 choices of places and you finally manage to find one to have lunch. The number of food stores is still 40, and tomorrow you will be free to make a different choice. It is complex as you have a variety of options to select from and because you need to use "criteria and standards" to make your choice effective; however, it is very user-friendly and easy as your risk rates to find no food is essentially 0%.

Scenario 2 (S2) The Desert

Now let us talk about complicate.

You are on foot, with no water or food, your mobile is off battery and you are in the middle of the desert under the sun at 50 degrees Celsius. Thus, there is no complexity, no variety of options, no need to draw multiple distinctions of criteria/standards. It is so simple, and yet so complicate. Why and how did you go there? Usually, it is all a matter of need for simplicity and the anxiety to control a still and limited area both physically and metaphorically.

In brief, complex and easy evolutionary social systems have much higher self-reproduction and expansion chances (S1), while complicate and simple systems (S2) are on a very likely implosion and self-destruction trend, depending on their obsolescence. The four key variables to understand if the social system is complex and easy (ECS) or complicate and simple (CSS) are the ones featuring the LEDDET Cycle. Let us now explore the case of sustainability in ECS and CSS.

2. SUSTAINABILITY IN ECS AND CSS

The Legislative function works in a way that the legislator operates at the widest observation and modeling horizon possible – scaling and leveraging to speed up effective sustainable measures. This means that if you think and act globally, you can implement locally only through globally standardized and approved tools. In CSS, sustainable is meant as decomposing the problem into smaller and smaller pieces as illusion of control, which stops or make global processes and flows slower, thus leading to scarcity and rationing, falling into the Malthusian Trap. Stupidity is to make things simpler thus more complicate.

Demography is destiny, a mantra well known to social and political scientists. The vigor of the Hybrid and the advantage of the heterozygous genotype (Cavalli Sforza 1996) do not need much more to be added. In ECS freedom evolves, population expands and evolves horizontally; in CSS population evolves vertically, the oldest are the majority and the ones in power, leading CSS to self-destruction, as obsolescence and blind short-run survival needs are linked.

The development of sustainable conditions in ECS means faster, clearer and stronger wealth, allowing for the action of richness creators by tangible and intangible asset portfolio strategies. In CSS, sustainable means the announcement of the Apocalypse (a kind of boring jingle from the Middle Ages, at least), the repent and praise of scarcity and rationing – the main street to dictatorship and consequently to implosion.

Technology in sustainable ECS means more technological leverage, scaling, faster, cleaner and user-friendly (idiot-proof!) tools. Solutions belong to the present and also to the future. In CSS, sustainable is often meant as a kind of nostalgia of a more natural past. Nobody who knows the agriculture technologies of the XII-XVII centuries can take this idea seriously as those technologies were able to feed ¼ of the world's population of those times, which corresponds to about 1/16 of the population of our time.

We will work on designing an ECS global governance mode for ECS, as CSS is a self-defeating ineffective model, that is, a zero value noise for ECS. ECS is the model framing global governance and policy in the complex evolutionary social system approach. Its starting shape is the LEDDET Cycle following below.

3. THE LEDDET CYCLE

Let us explain the relationship among evolution, knowledge and the legislative function, which is systemic-processual in the form of a spiral, where the evolutionary trend is all the more linear the more the evolutionary spiral is observed from above, i.e. from the macro perspective. Each concrete social context, however, being in a specific fold of the spiral, has the perception of experiencing conditions of great chaos, turbulence and instability. And the interesting thing is that from its scale of observation, this is how things really are, especially because common sense generates noise in the Luhmanian sense (Luhmann 1990, 1990b, 1990c, 1990d, 1995a, 1995b, 2006).

Most of the information overload of McLuhanian emotional-perceptual type can be selected exclusively through knowledge, which to be such is abstract, general and valid. Information can be specific, but the way to filter it, if information is valid and reliable, cannot be specific, certainly not on a 1:1 scale, and not even at a 1:100 scale. A cognitive tool acting as a selective code is feasible if it works on a huge mass N of information. In short, no viable systemic selection is possible by means of factual first order observations. Scientific second-order observation makes a difference:

> *the second order scientific observation is the observation of complexity. Complexity means that there are always more possibilities of operation than what is actualized and that, therefore, the actualization of any operation requires a selection among these possibilities* (Baraldi 2014: 18).

It is not history that consolidates knowledge, it is the lever that shapes the evolutionary scale that performs this job. The legislative function is one of the viable forms of selective knowledge: that which shapes the world order in its global and glocal forms. The trend, indeed the evolutionary megatrend, if not the gigatrend, is inescapably from the infinitely small to the maximally large: our current scenario is that of the Global Players and there are no identifiable shocks that could reverse the trend to date, but there are centripetal and centrifugal forces:

> *whereby, for example, the USA or the EU could implode – as the USSR imploded. The US or the EU could implode – as the USSR imploded – but not to restore the sovereign nation states (whose time has already run out), but to unite their (centrifugal) fragments by attracting them with centripetal forces towards one or the other Global Player. The USSR itself eventually became the Russian Federation and parts of it became the EU. Nation-states or lower entities have no future, as argued at length by the oft-quoted Triffin and as described with clarity by Beck, who refers to a conflict with a foreseen end if only for demographic, anagraphic and generational reasons between "Homo Neanderthal" and "Homo Cosmopoliticus"* (Beck 2016: 199-200).

One of the distinctive features of postmodernity (Ardigò 1988) is the absence of a Grand Narrative (Lyotard 1989). Let us begin by defining what is meant by narrative:

> *is a condensation in cultural forms of the information produced in a social system that allows the production of descriptions within it. Narratives are produced from forms of communication* (Baraldi, 2014: 39).

Today the Grand Narrative is here and powerful: the Planetary Convergence of the world system. It is common sense that finite provinces of meaning are situated on much smaller scales, only apparently reassuringly familiar and they fail to grasp the scale of convergence because "the result of simplistic reasoning is always distortion. As a methodological notebook, in the next section I will provide an example of how comparison has evolved towards convergence.

The legislative function radically changes its epistemological and heuristic framework if it is inserted in a system of systematic political doctrines or in contingent political thought, whose clearest and most banal examples are the electoral slogans that promise everything and the opposite of everything for the mere purpose of winning votes. This makes political thought contingent, *à la carte*, neither scientific nor reliable. A political doctrine is systematic, far-reaching, broad and transformable into falsifying procedures; political thought is mere Orwellian rhetoric that can easily be regarded as noise once it has been systematized in archival form and thus deprived of the baiting effect in the here-and-now of the emotional slogan that saves cognition.

On its turn, a process comparative sociology largely dilutes the decoy effect of the more simplistic contextual and contingent behaviorism, but may still pay the epistemological and heuristic price of believing it has to connect what would appear to be separate, whereas convergent research design makes it clear that it is about seeing the macro interconnections between entities that only too small-scale observations can see as separate i.e the idea that political institutions would come to organize otherwise empty and "wild" free market spaces is one of many behavioral lures based on *horror vacui* and the consequent need for protection it arouses on the target audience.

It is pretty evident the free market is an empty space from its powerful isotropic organizational forms. Three important passages are also apparent: the theory of market functioning is conceptually prioritized over the monetary theory, the study of short-run price and quantity adjustment processes can only be effectively carried out from a theory of market organization and, finally, the bank emerges in evolutionary terms as the pivotal institution of the credit system. In short, where would this leave the much-loved "free market"? In convergence scenarios, the "free market" appears as a zombie category, just like national identity, the state and culture. Knowledge evolutionarily follows the vacuum principle, i.e. it fills all gaps and fills them as a system of procedural rules, possibly but not necessarily legal, much more often isotropic. Thus, knowledge is not a content; at most

it is information that the normative procedure filters, selects and validates, where by valid we can understand a temporally approved but obviously potentially falsifiable content. Metaphysics, in this sense, is belief without knowledge, in essence, the negation of knowledge, as clearly exemplified in theodicy (Berger and Luckmann 1984). Belief does not imply knowledge; on the contrary, the one usually excludes the other, as attested by religions and discourses of political thought, very different from systematic political doctrines. The legislative function thus adopts two specific systemic forms:

a) The production of normative procedures that formalize legal knowledge in the strict and valid sense of the general theory of law (legal system);
b) The production of normative procedures that formalize isotropic and valid knowledge in the sense of a not yet falsified economic system by establishing, for example, financial classification and qualification standards, a scientific system by formalizing the isotropic standards of a research protocol, an educational system by formalizing the evaluation criteria of curricula, a biological system in the codification of DNA).

Knowledge is thus mainly a supersystem of procedures and technologies in the Foucauldian sense of validation through codification and filtering of noise and information, which are not so easy to distinguish from each other. Such a distinction requires an epistemological and heuristic program of cognitive formalization written in binary as a scientific theory must be thought of as a program written in binary to compute observations, which are also written in binary (Chaitin 2007: 79). It is a matter of creating programmed compressions that require far fewer bits than the data they explain. What seems calculable but is not enumerable and cannot be compressed into a program that explains X amount of data with bits much less (<) than X is random, irreducible and, Popperianly, metaphysical. However, it would be naive to attribute ontological foundations to such programs which, instead, are evaluable not by their "nature" but by their evolutionary and applicative feasibility of formal axiomatic systems that are necessarily incomplete due to their at first sight curious evolutionary function of reducing the data/bit relation while maintaining their non-reductionist systemic form. The difference between data and bits is the information in its own sense already filtered by the program. The viable systemic program par excellence makes the information, so to speak, self-diluting:

> *How can information be self-limiting [...] How do we understand where one binary message ends and another one begins, so that it is possible to have many messages in a row without the possibility of misunderstanding? [...] So if we knew the length of each message, we would have no problem. [...] Self-diluvian information is additive* (Chaitin 2007: 96-99).

The algorithmic information theory, in this direction, raises crucial questions:

> *information-calculator-result self-dimensioned. What is the smallest self-control program that produces a given result? The length of that program in bits is the complexity of the result* (Chaitin 2007: 99-102).

The algorithmic information theory shapes the real challenge of knowledge, which in its metaphysics would have posed the following problem: how to predict when phenomenon X will occur? The binary program, on the other hand, systematizes knowledge in this way: how to deal with phenomenon X when it occurs, knowing that sooner or later it will occur without posing superfluous problems such as when will it occur? From this perspective a complex system approach to global governance and policy modeling require, metaphorically, much more the mathematics of astrophysics, as macro and gigatrends can never be directly observed and inductively measured, than the naif and reductionist empiricism od statistics (Pitasi 2023), for example.

4. LEDDET, AGAIN!

The challenge is now to model and systematize a cognitive program that allows selection and filtering by reducing the data/bit ratio and thus increase the analytical leverage and scale. From this perspective, the passages in which Fornari (2014: 45-47) outlines both the challenge of sociology and that of complexity are valuable.

The sociological challenge «sociological knowledge […] will have to dispel the myth of self-sufficiency, with all the presumptions that it entails […] Albert Einstein wrote that without crisis there is no challenge and without challenge life is reduced to pure routine, becoming a slow agony» (Fornari 2014: 45), while that of complexity, in full Edge Foundation style, is the coevolutionary inseparability of cognition and emotion, logic and imagination, etc.

As we will show, Kuznets cycles, if developed as I propose, are very viable cognitive tools in this regard. We will at the same time broaden and deepen my three-mission work program by situating legal sociology, not among the economic sciences, which would be decidedly excessive and forced, but in relation to them, taking as a starting point the works of Simon Kuznets (1990) and

Angus Deaton (2015), Nobel laureates in Economics in 1971 and 2015 respectively.

Deaton (1945) and Kuznets (1901-1985) are also crucial authors, albeit unwittingly, for the development of legal sociology. Kuznets' crucial works are the ones written between 1930 and 1975, for which, of course, Kuznets used the scale of the nation-state, whereas today his principles and models are still strategic but on the global player scale (GPS). Having said that, let us summarize the fundamentals of the economic theory of DTS (Demography - Technology - Development) cycles formulated by Kuznets and the elements that compose it: Secular, secondary and cyclical movements; Measurement of national income (nowadays not on a national scale but in GPS).

5. DEVELOPMENT

Modern is another term consistent with Kuznets' writings, a term that today is more correct to avoid altogether, being easily rephrased in binary when present or absent:

a) High per capita and population rates;
b) High overall productivity growth rate;
c) High speed of structural transformation of the economy;
d) Rapid social change of structures and ideologies;
f) Tendency of the most developed countries to export to the rest of the world;
g) Diffusion of development limited to a minority, usually about ¼ of the world's population (evolutionarily necessary inequality provided it is acquisitive and not upward, in which case there would instead be an implosive tendency).

Demographic trends and economic development are strongly correlated with the technological structural transformations of the economy with the strategic centrality of technological innovation.

– Historical trends in income inequality.
– Capital accumulation.
– Consumption structure.
– Limited international diffusion of development.
– Role of conflicts in economic development (own elaboration based on Kuznets 1990: 91-93).

Kuznets also shows how the Malthusian Trap has always been avoided thanks to radical technological innovation, since otherwise the trap would be triggered every time the rate of demographic development (DE) was greater than the production (PR) of subsistence goods, that is, every time DE>PR. If it were a bivariate world, it would be the apocalypse every two generations. Radical or Reconfigurative Technological Innovation (RTI) transforms the correlation from bi- to tri-variate and it is precisely RTI that, at least since the Industrial Revolution, has always made PR>DE possible.

The legal sociology I propose here, and which I will develop in the next chapter, converts the Kuznetsian cyclical model into a tetra (multivariate) one by introducing as a fourth variable the expansion of legal systems, technically, and mainly but not only, through the expansion of residence and citizenship rights which we link to the great escape from disease and poverty described by Angus Deaton with analytical acuity and wise self-mockery: «the great economist and Nobel laureate James Meade used to describe the infernal internal combustion engine, the demographic explosion and the creation of the Nobel Prize in Economics as the three disasters of the twentieth century» (Deaton 2015: 249).

The trivariate correlation among demography, development and RTI in today's world seems to be, also in Deaton's thinking, the measure of the Heideggerian scope of the human species, i.e.: «if fewer children die, each couple can give birth to fewer children and still have exactly as many children as they wish to ensure the survival of the lineage» (Deaton, 2015: 276). In short, the Kuznetsian cycle finds in Deaton's theory not only a confirmation, but an important breakthrough in both epistemology and politics.

Kuznets and Deaton are both great economists, but without any striking sociological and/or legal background. A synthesis of these insights can provide a potentially viable evolutionary framework for development through the expansion of residence and citizenship policies, the technical outcome of the expansion of legal systems increasingly in GPS. This expansion of legal systems links legal sociology to economic policy and macroeconomics directly and to technical analysis of financial markets indirectly, given the strategic role of technical analysis in describing all sorts of intangibles, including rights!

The evolution of the Kuznetsian DTS cycle into a DTSCIG cycle (where CIG stands for Global Citizenship as a result of the expansion of legal systems over GPS) results in the following trend initiations at the political level by finally reshaping the LEDDET in what we can call the Kuznets-Deaton Theorem:

a) Reduction of contractual, economic and organizational costs with the consequent application of the more with less principle by eliminating or at least reducing intermediate meso and micro levels.
b) To increase standardization and, at the same time, genuine innovation, avoiding the risk of confusion between use value and exchange value, i.e. confus-

ing a very specific self-identity with intrinsic added value.

c) Streamline local procedures and regulations with administrative simplification, greater formal transparency and, at the same time, increase in the intensity of knowledge and science to initiate an active participatory process-deliberation dynamic.
d) Growing cosmopolitanism as a vehicle of memetic recombination and dilution of social, ideological and confessional radicalization. In particular, cosmopolitanism implies the global alignment of platforms, which in Baraldi (2014) takes the form of coordination so that there are no obstacles to the memetic reproduction of communication:

> *cosmopolitanism is the narrative of a specific form of interdependencies between the local and the global, proposed as a project of a hybrid world society in which, […] cosmopolitan coordination is a specific form of reflexivity in a social system. Reflexivity is communication about communication: cosmopolitan coordination is communication about the meaning of actions produced in communication* (*ibidem*: 154-162).

e) Increase the entrepreneurial mindset, in the narrow and broad sense, as a driver of viable RTIs in the public, private and tertiary sectors.
f) Increase of scientific-cultural competences for a participation that is no longer emotional-radical but cognitive-procedural-deliberative.
g) Finally, the initial trend of change of scale and leverage resulting from the expansion of citizenship that creates a happy synthesis with organizational-managerial sciences, specifically with the blue ocean strategy (Chan Kim and Mauborgne 2015) by showing how RTIs in particular, and innovation in general, can adopt the configuration of new large-scale scenarios and not necessarily the form of differentiation that, if it does not create real and intense added value, turns out to be a mere artifice of localist protectionism. Such protectionism tries to give a patina of scientificity and uniqueness to something that is neither specific nor unique but can be tricked into being so by a misunderstood use value.

6. DYNAMICS

Cognitive programs take shape from theories, but not all theories are viable to become programs. The dynamics of theory development encompass the following:

a) Formulation of alternative theories through axiomatic modifications of hypothetico-deductive systems;
b) Knowledge of the laws and modalities governing such theoretical extensions.
c) Their conscious in order to propose new lines of extension and to broaden the context (Bocchi and Ceruti 1981: 34).

It is wiser to search for an approximate and kluge solution to the right question than an exact and elegant answer to the wrong question.

Desires – Beliefs – Opportunities – Actions = DBOA

The four global forces that trigger the megatrends of scale and leverage:

a) Demographics;
b) Demand for investigation;
c) Globalization;
d) Global climate change (Smith 2010: 9-25).

«The point of view of analysis can never be confused with that of the actor. Sociology can never satisfy or give the impression of understanding it, of encountering lived experience» (Touraine 1978: 6) so analysis can also consider the actor's point of view as the object of the research without making the actor a reliable source of knowledge in itself. The actor-object is typical of an experimental and multidimensional approach to research, one of the best known of which is Jean Piaget's (2000) program of genetic epistemology – a scientific, reflexive, historical, more properly evolutionary, transdisciplinary and, of course, experimental and genetic epistemology.

In the epistemological framework of systemic constructivism, which owes so much to Piaget (2000), such decisive conceptual forms as autocatalytic sets, self-organization and selection have evolved. They are epistemologically and heuristically decisive in the emerging scenarios of global civilization (Kauffman 1993, 1995: 273-304).

No all theories are viable to become programs; viable theories are those that emerged from epistemologies that Piaget would have called meta-scientific or those that Piaget would have called scientific, while those that Piaget calls para-scientific are not viable to become programs. In the words of the Genevan epistemologist:

> *theories of knowledge will be classified into three major categories: 1) those that start from a reflection on the sciences and tend to extend it into a general theory of knowledge 2) those that, starting from a critique of the sciences, tend to arrive at a way of knowing distinct from scientific knowledge (therefore, in opposition to it and no longer as a complement) 3) those that are situated within a reflection*

on the sciences. It goes without saying that this trichonomy has as its main objective to show that there is no epistemology that is not linked to the sciences [...] We will call type 1) meta-scientific theories of knowledge, type 2) para-scientific and type 3) scientific (Piaget 2016: 84).

In the general theory of knowledge as a complex evolutionary system that informs this writing of ours, meta-scientific epistemologies are strategic to avoid the risks of scientistic reductionism; scientific epistemologies serve to confer internal reflexivity to the working styles of scientists, and thus both type 1 and type 3 can easily be configured in the form of programs. Type 2, on the other hand, is problematic insofar as its critical character makes it a Popperian metaphysics, and it lacks the features of experimentability that characterize type 1 and type 3. At the same time, however, type 2 can provide objects and cases for type 1 or type 3 research, as long as it is clear that these are heuristic and epistemological objects and cases, but not sources of knowledge.

If prior to the 1960s a certain shoddy intellectual snobbery would have considered it ridiculous to study comics, since Eco's Apocalyptic and Integrated (1964) it has been clear that comics have full social and semiotic dignity. At the same time, however, the study of comics, movies, cartoons, etc. as sources of knowledge would create huge misunderstandings of apparent type 1, i.e., the prospective illusion that type 2 para-scientist could become type 1. In this sense, the limitations of phenomenology as applied to sociology are quite evident when subjective perception becomes a cognitive source. The most prestigious attempt to sanitize the phenomenological approach from type 2 criticalities to place it in a type 1 horizon was that of Achille Ardigò (1988), whose theses are included in a corpus that also includes Luhmann's general theory of complex systems (Luhmann1995a, 1995b, 1989, 2012) as well as the type 3 internal epistemologies of Goedel and Heisenberg, but orthodox phenomenological research is merely para-scientific (Piaget 2016: 100-107). In this sense, the Goedelian theorems constitute both a decisive epistemological turning point for all sciences (Ardigò 1988: 57-84) and the end of all disciplinary isolationism and empty formal logic.

An indirect but eloquent attack on any para-scientific epistemology shows how, for instance, social media can serve to collect information that, if framed in the right epistemological and heuristic tools, can model diagnostic-therapeutic interventions; but social media, phenomenologically understood, cannot be viable. And valid sources of knowledge about, for instance, geopolitical and economic scenarios, with the sole exception of the original pages and groups on social media that can certainly be tracked by institutions and think tanks. Though they are not yet available, in which case social media amplify and disseminate knowledge whose scientific and institutional legitimacy is external to the social media themselves. A different perspective is to study phenomenologically the emotional perceptions that lay users have of that knowledge, but without invalidating those perceptions. Certainly, one can easily argue that, in addition to the "box" of the evolutionary knowledge system, one must study the behavior of guinea pigs, but for this purpose the more advanced forms of behaviorism possess a much more viable epistemological and methodological baggage than phenomenology from the point of view of comparability, compatibility, reliability and convergence, since behaviorism makes operationalization more immediate, which a para-scientific approach, on the other hand, rejects as soon as it arrives at the tautology of the subjectivity of subjectivity.

7. ENLIGHTMENT CONCLUSIONS

The legislative expansion can be either the engine of the LEDDET, by scaling and leveraging and by downsizing transactional costs of any kind, and in this case LEDDET works, or the ball and chain of the LEDDET when expansion is denied and the increase of totally unnecessary political and bureaucratic «symbolic multipliers» (Melucci 1995) leads to institutional fragmentation and implosion. Let us conclude by showing how effective legislative expansion works to empower the LEDDET cycle and the Kuznets-Deaton Theorem effectively in terms of complexity and ease to create the most added value at the lowest transactional costs possible.

How should the relationship between the legislator and the court, which is a continuum between maximum autonomy of the legislator and maximum autonomy of the court in contingency, be dosed, and why?

The answer can be formalized in a few key procedural steps:

a) Exclude any para-scientific argument that is the viaticum of implosive and metaphysical discourses in the Popperian sense.
b) Formalize the axiomatic of the procedural logic of operant thought (Piaget 2016: 184-195) underlying the legal system and its mechanisms of knowledge organization.
c) Legal systemic knowledge obviously belongs to the psychological-social sphere, differentiated from the other three: physical, biological and logical-mathematical.
d) Each area of knowledge is connected more or less directly with the others through domains struc-

tured in four levels: a) material domain, b) conceptual domain, c) internal epistemological domain, d) derived epistemological domain (Piaget 2016).

e) The "dosage" cannot be carried out in the too trivial material domain (MD) which, on the other hand, can create irritating environmental noise in the sense of Luhmann (1989), such as political or media interference in criminal trials), but is defined by the systematization of the other three domains: conceptual, internal epistemological and derived epistemological.

The conceptual domain (CD) of the legal system follows a path that, in essence, goes from Kelsen to Alexy, passing through Luhmann (1995a, 1995b).

The Internal Epistemological Domain (IED) of law is relatively narrow, since the functional differentiation of the legal system declines its operative thinking at a very specific, localized and not very generalizable contextual level: here lies the court's room for maneuver.

The derived epistemological domain (DED) is another domain of expansion, together with the conceptual domain of the axiomatized and formalized logic of the legal system, i.e. another domain of expansion for the legislator. For instance, today, much more than in 1918, the scientific and professional reputation of criminal law depends to a large extent on psychiatry, genetics, etc.

The autonomy of the legislature comes from DC+ DED; that of the courts from IED. Thus, the autonomy of the legislative power (AL) depending on the legal system can be expressed as follows:

$$AL= (DC+ DED) – (IED/MD)$$

The legislator thus operates in the unitas multiplex of the conceptual domain and the derived epistemological domain, granting autonomy to the courts on the basis of the domain of internal epistemology insofar as this domain is not, so to speak, swamped by the material domain in which case the legislator further extends the axiomatic formalization of law to protect it from the noisy irritations of the political system or the media system. Here, then, the contingency of the operative thinking of the court, formalized by the legislator, is reduced to a minimum, revealing that the dosage between the legislative function and the function of the court is in practice Paretian – the legislative function, if feasible, governs 80% of the continuum with 20% of the work (in the Joules sense); the courts manage 20% of the continuum with 80% of the work (always understood as Joules). Hence an important epistemological lesson: «an abstract formulation can unite, without impoverishing it at all, the qualitative sinuosity of the real» (Piaget 2016: 344).

As it has already been said, the 18th-century enlightenment is not replicable today; the past does not return but memes continue to recombine. One of the most powerful Kuhnianly revolutionary and macro sociological theories of the second half of the 20th century, Niklas Luhmann's (1983) General Theory of Complex Systems, not surprisingly presents itself as the sociological enlightenment, which can be conceptualized as follows:

> *the concept of sociological enlightenment indicates the general program of Luhmann's systemic sociology […] To operate in an enlightened way, in a general sense, means to make use of a specific difference scheme in observation: the conscious/unconscious as regards the observation of psychic systems and the manifest/latent as regards the observation of social systems. The scheme of the manifest/latent difference constitutes the specifically of sociological enlightenment […] Sociological enlightenment is understood as the capacity to extend the observation of social systems, that is, their capacity to grasp and reduce the complexity of the world. The instrument of this enlightenment is, therefore, the social systems that are capable of observing through their operations. One has sociological enlightenment when there is the possibility of observing in society what is latent, distinguishing it from what is manifest […] Sociological enlightenment does not only mean making manifest the latent structures and functions in society, but also comparing the different equivalents that can be used as structures and functions* (Baraldi, Corsi and Esposito 1987: 126-127).

Enlightenment at the end of the twentieth century interests us in our study of the research-policy relationship as a specific form of the evolution of knowledge. That of the late twentieth century is an enlightenment already filtered through Vienna in the early twentieth century, in which psychoanalysis, biological sciences, embryonic neuroscience, and artistic-literary creativity flirted a bit and clashed a bit to arrive at a new order of the sources of knowledge (Kandel 2016: 489-491):

> *one of the main characteristics of Viennese Modernism was the attempt to integrate and unify knowledge. The convergence in early twentieth-century Vienna of medical science, psychology, and artistic explorations that delved into the surface of the body and mind in search of hidden meanings led to scientific and artistic discoveries that forever altered our way of perceiving* (*ivi*: 495).

The enlightenment of the late twentieth century is well aware that man is not entirely rational, that reason does not dominate everything; it has already experienced Schnitzler's Bewegungströmung and its Anglo-Saxon counterpart Stream of consciousness by, for example, James Joyce. Man is not totally rational and reason does not dominate everything. The uncon-

scious and the latent exist. Sociological enlightenment also knows that where reason does not rule, catastrophes, tragedies and dramas become very likely; Schnitzler's Miss Else offers a limpid literary example of this. The sociological enlightenment of the late twentieth century is also aware that it is neither a religion nor a secular religion as it was, in its worst social forms of the eighteenth century, those that led to the Terror, nor does it ignore that there are political thoughts adverse to the Enlightenment itself: Romenticism that leads to the laziness of feeling and the somnambulism of Brockian memory, secular ideologies of the right as of the left, and any form of religion dogmatically understood (Pinker 2018: 35-41). It should be noted that «the whole history of science is a history of attempts to unify knowledge» (Kandel 2016: 492). This implies that evolution is a series of attempts to discern between what is meaningful knowledge and meaningless noise: the systemic Luhmannian paradigm in action.

Returning to the famous Piagetian lecture in relation to the Popperian one, we must bear in mind, on the one hand, that there is no certain and verified knowledge but, at most, not yet falsified, there is knowledge that is not such to begin with – what Popper would have called metaphysics and Piaget, para-science. Then there is the set of common sense tendencies that are precisely beliefs, not knowledge.

The enlightenment of the late twentieth and early twenty-first centuries has learned some lessons, evolved from the original Enlightenment of the eighteenth century, which was not exempt from possible totalizing drifts:

a) Man is not only reason, there is much more.
b) If reason does not govern everything, disasters, tragedies and catastrophes are very likely.
c) Without knowledge there is no reason, but knowledge is not simply information accessible to the public as it was with the first newspapers of relative diffusion in the 17th century.
d) Reason without knowledge creates monsters. The Parisian terror of 1789 teaches us that the Enlightenment is today largely obsolete because of its inability to adopt a systemic vision, that is, because of its intrinsic reductionism for which the whole was at most the sum of the parts and which sought, in vain, to understand properties (such as equality, liberty and fraternity) as if they were substances or essences, outside complex evolutionary processes.
e) Science is the most viable tool to realize better worlds today, potential worlds. Science does not know everything, it cannot do everything, but the fact that it is not infallible does not mean that it is not viable: it would be like saying that because you can die of electrocution, you have to go back to the oil lamp, but since the oil lamp can light a fire, it is better to live in the cold and in the dark.
Monsters are generated mostly by CSS stupid models.

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