

Complexity as a metatheory on relations between Law and sustainable development

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Abstract: Traditionally, legal disciplines close themselves in the descriptive study of normativity, restricting their work to mere exposure, although critical, of the legal rules governing a particular field of legal expertise. There is this legal cognition formed in previous period to contemporary constitutionalism that simultaneously delivers new functions to the state apparatus and society, founded in axiological choices that become determinants, and complexifies law, receiving inputs from other areas of study. The theories and metatheories are built before contemporary constitutional moment, when the constitutions were restricted to protecting individual rights and organize the state, so they face difficult or impossibility while dealing with this new law. There is a dysfunction in the relationship between legal science and the transdisciplinary content that run throughout the legal system. In developing societies, one of these contents is sustainable development – that in Brazil is a constitutional determination and one of the fundamental goals of the Republic. The relationship between this subject and the specialized legal disciplines remains unknown when it restricts the possibilities of legal theories to mere description of the supposedly isolated legal system. The new constitutionalism, especially in Latin America and Brazil, demand epistemology and hermeneutics legal that permit dialogue between legal disciplines and between law and the knowledge produced originally in other areas such as Economy, in the case of development, or Ecology, in the case of sustainability. Law, Economy Ecology – as well as other knowledge – are fragmented views that perceive the same complex reality under different and isolated viewpoints. The difference and isolation, however, are more in the study that is done to reality than in reality itself, which consists of all these aspects together. Satisfactory knowledge of contemporary law depends on the recognition of this inherent complexity of social realities and the creation of forms of cognition that are appropriated to face complexity, instead of the traditional disciplines founded on reductionism. The epistemology of complexity presents itself as an appropriate way to deal with the complex reality, conscious of his

XXVI World Congress of Philosophy of Law and Social Philosophy *own limitations, but also their possibilities when reality is faced considering its interconnections. The epistemology of complexity, as developed by Edgar Morin and others, presents categories able to produce legal knowledge closer to reality, such as recursive systems, organization and disorganization from interior and around, dialogic, individuality, diversity, event, ideality, rationalization, reflexivity, and solidarity.*

Keywords: Complexity; Law; Sustainable development.

1. Introduction

Traditionally, legal disciplines close themselves in the descriptive study of normativity, restricting their work to mere exposure, although critical, of the legal rules governing a particular field of legal expertise. There is this legal cognition, formed in previous period to the contemporary constitutionalism that simultaneously delivers new functions to the state apparatus and society, founded in axiological choices that become determinants, and complexifies law, receiving inputs from other areas of study.

The legal theories and metatheories are built before contemporary constitutional moment, in those times where the constitutions were restricted to protecting individual rights and organize the state, so they face difficult or impossibility while dealing with this new law.

This article is about the foundations of the modern model of legal science, including its basis on the ancient modern sciences and its main philosophers – Francis Bacon and Rene Descartes. It goes on trying to understand how these conceptions of science – and also later ones like the Vienna's Circle – influenced the Philosophy of Law of the 20th century, Hans Kelsen's in particular. This paper relates these models of science with the modern Constitutions in the first half of the 20th century and suggests that maybe those models were appropriate to that period of constitutionalism.

Going on, the article exposes how the western Constitutions change in Europe and Latin America after the Second War, becoming much more complex than the ancient Constitutions. So the article shows how inappropriate are those old models of science to face the new complex reality of a Law that does not apart itself from Moral anymore, and assumes the function of somehow influencing social and economical development. When Law complexifies itself, science must assume its Special Workshop: AICOL • 313

need to understand and work with complexity and not to reduce it or try to escape from it.

2. The Model Of Science Of The Early Modernity And Its Influence In Theory Of Law

Among Law theory's objectives during the first half of the 20th century was the construction of a pure theory of Law. It would be an independent Science of Law that would make itself distant from Politics, Economics, Social Sciences and Ethics. The goal was to achieve a true science of Law, according to the model of science in which the early 20th century believed.

The most notorious legal philosopher working in this direction was Hans Kelsen. Kelsen called his theory a "pure theory of law" because of basically two reasons. The first is that law theory should only describe norms as ought-statements, while other sciences describe facts in is-statements – the classic dualism between is and ought, *Sein* and *Sollen*: "...the Pure Theory of Law separates jurisprudence, describing norms in *ought*-statements, from natural science describing facts in is-statements". Law science is a science of the norms and only of the norms, and nothing else. Kelsen continues: "The second reason is that it [the pure theory of law] separates jurisprudence from ethics". Ethics is the other science that works with ought-statements, but it should describe moral norms and not legal norms.¹

While working in this method, legal scientists would restrict their work. They would be only allowed to describe normativity, the mere exposure, although sometimes critical, of the legal rules governing a particular field of legal expertise.

That kind of law theory is justified in an epistemology of the reductionism, the one that takes knowledge as the work of dividing its object and reducing it to its minor part, reducing complexity.

This science model is related to the modern science of the 19th century, which is an evolution of the ancient science that began in the 15th and 16th centuries and theorized by Francis Bacon and Rene Descartes.

Francis Bacon's work was destined to create a secure knowledge about the nature. In his opinion, the knowledge that began with the Greek tradition, Socrates and Plato, was insecure because was based

¹ KELSEN, Hans. What is the pure theory of law? *Tulane Law Review*, 34 (1960): 269-76. 314 • XXVI World Congress of Philosophy of Law and Social Philosophy

mostly in the opinions of the philosophers and not in nature itself. And it was an useless knowledge since it was not enough to dominate nature and make it serve humankind. According to Bacon's thought, science was supposed to control nature and to make human beings its lords or masters. So Bacon began what would be later considered as the paradigm of disjunction. He separated philosophy and science and separated facts and values.

It's interesting to realize that the modern science of Law developed in the 19th and 20th centuries is influenced by Bacon's model and follow its steps in a lot of relevant aspects.

One of the main influences is the wish of provide security to Law knowledge. When legal science claims that the scientist is only allowed to describe Law and not to expose opinions about it, it intends to create an objective knowledge that won't change depending on the values of the scientist himself. An objective and stable science is able to provide law some security and to dominate it.

Also, Bacon's science was empirical.² That means that knowledge must be grounded and justified in the facts of nature. So the scientist must do experimentation and create his theories from experiments. There's this need of a experimental basis on which science can be constructed. Based on experimentations, science could provide a definitive knowledge and the absolute truth about nature. Legal science needs an experimental basis as well. When legal science focuses only in legislated law, this law acts as some kind of experimental basis. Knowledge would only achieve science dignity if it is made about legislated law, which is the same to every scientist that describes the law of the same country and so enable every scientist to test law theories.

Bacon's kind of science is meant to be able to discover all the laws that rule the universe and the nature. Once humankind knows the rules of the universe, and since those are eternal and universal rules, human beings can absolutely dominate nature.

Later, Rene Descartes would develop his theories about science that influenced legal science as well. He would create his own science method that influenced not only legal science but every science made after him. Descartes' science was based in reason and rationality, in the constant question of all truth that came before, in the mathematical way of reasoning and in the reduction of complexity.

Modern legal science also is based on reason and rationality. Le

² BACON, Francis. *Novum organum*. São Paulo: Abril Cultural, 1979, p. 30. Special Workshop: AICOL • 315

gal scientists must guarantee that their work is not influenced by any of the irrational aspects of human life. In Law it is even more important because it is common that legal scientists are also lawyers and judges. So no interest must direct the work of the scientist except finding the truth about law. That includes questioning truth that came before because it's suspected if not made by an objective scientist working under the scientific method.

But the main feature of Descartes' scientific method to the objectives of this paper is the mathematization and the reductionism as a method.³

The mathematics way of reasoning that rules science method put aside any value questioning and excludes values from legal science. To talk about values is to get away from scientific precisionism and rigorism. So if law theory intends to keep itself a real science it must give up on thinking about values. Only the quantitative and structural aspects of law can be treated in the way modern science functions. So law theory develop theories of law rules and norms and of the whole normative system, describing what is a norm and its structural elements and what is a normative system and its structural elements as well. Norm is seen as the connection between an hypothesis and a consequence, and normative system is understood as groups or series of norms related to each other in definite ways. The large use of logic among the legal scientists was very important in that period and still today it is practiced.

Also, if all these norms or the normative system itself are good or bad is a problem that science of law can not solve since it is not able to talk about values. Law theories made in the 19th and in the 20th centuries take the form of general theories, like those "*Allgemeine Theorie*" that were famous on that period.

Descartes' method was based on reducing reality's complexity as a necessary procedure to comprehend it. So he recommended that the scientist would divide his object of study in many parts as it is possible, based on two principles: first, that knowing the small parts is easier than knowing a complex reality, maybe knowing a small part is the only possible knowledge when a complex reality is supposed to be known; second, that knowing all the small parts would allow the scientist to know the whole reality when putting all these minor knowledge together.

It is following this method that law jurists begin their scientific procedure by separating law from its environment, putting apart Law

³DESCARTES, René. Discurso do método. São Paulo: Martins Fontes, 1996, p. 21-25.316 • XXVI World Congress of Philosophy of Law and Social Philosophy

from Economics, Politics, Ethics, Religion etc. With this first reduction, the scientists abstractedly create the object of the scientific law theory.

Then, legal scientists separate one portion of law from the others. So, for example, Tax Law is separated from Criminal Law, Civil Law, Economic Law, Procedural Law and others. Legal scientists now have before them an even smaller part of reality, deepening the reducing procedure.

Inside that portion of law that the scientists decide to work with, another separation is made, by isolating one law or a few laws from the others that would be included in that portion. For example, the Tax Code is separated from the rest of the Tax Law and studied as if it was the whole reality to be known.

Then, proceeding in the complexity's reducing procedure, legal scientists focus on one norm, isolated from others. And law theory even studies the pieces of the norm – for example, studying the norm hypothesis, the consequence, the sanction etc.

So, when law theory separates law from its environment or separates one law portion from others, it reveals itself as a theory governed by Descartes' metatheory of the reduction of complexities.

The *Wiener Kreis*, or the Vienna Circle, influenced Law theory during the 20th century as well. It was an association of scientists and philosophers formed around the University of Vienna from 1922 on and led by Moritz Schlick. Its philosophy and epistemology were created based on the ideas of Ludwig Wittgenstein's *Tractatus Logico-Philosophicus*. Although the group didn't have any jurist, except for a few participations of Hans Kelsen, it had a major influence in general philosophy and epistemology and in Legal Philosophy as well.

This concept of science was called "logical positivism" or "logical empiricism", expressions that demonstrate the two main aspects of its conception: knowledge must derive from experience, so it must be empirical, and must be made from the logical analysis of the scientific propositions. If the logical analysis perceives that some statement is not empirical, logical positivism takes it as a meaningless and irrational statement. So a lot of traditional philosophic problems, such as the ones in metaphysics, were reclassified as false problems because of its supposed absence of meaning. Besides the analytic statements made *a priori* from the experiment, such as the ones from Logics and Mathematics, only the *a posteriori* empirical statements had the scientific dignity.⁴

⁴ CARNAP, Rudolf. Empirism, semantics, ontology. *Revue Internationale de Philosophie* Special Workshop: AICOL • 317

This important conception of science influenced law theory that was made by strictly describing the norms or the normative system. Since the norms or the normative system could be understood as facts, as empirical realities, science made by describing them could be classified as a true science in logical positivism's conception of science. But any valuation of the norms or the system, such as naming them fair and unfair, was not an empirical statement but a metaphysic statement and, in that condition, meaningless and non-scientific. So the traditional problems of Legal Philosophy were excluded from a legal science that could properly use that name.

So the first half of the 20th century saw the rise of a legal science model based on the modern science, including Francis Bacon and Rene Descartes, and the logical empiricism of the Vienna Circle. Somehow Hans Kelsen's theory and metatheory of Law is a peak of this model of science philosophy.

3. The function of the constitutions in the 19TH and early 20TH centuries

This method of law studies is somehow appropriate when law separates itself from its environment. It is explained when we remember that the theory of economic liberalism that was strong in the 19th century recommended the separation between law and state, in one side, and the operation of economy in other side. It is somehow appropriate also when Law, the States and its Constitutions were mainly destined to the conservation of individual rights that must be guaranteed, such as life, property and liberty, and in the limitation of the State power, establishing, for example, de separation of the state functions in different organs – Executive, Legislative and Judiciary – in that well known system of checks and balances.

This is how article 16 of the *Declaration of the Rights of Man and Citizen (Déclaration des droits de l'Homme et du citoyen)* of 1789 defines a country with a Constitution: "A society in which the guarantee of the rights is not assured, nor the separation of powers defined, has no constitution at all".

The Constitution would then have to guarantee certain civil rights to individuals and, within the state apparatus, to impose the sepa

phie 4: 20-40; Scheinprobleme in der Philosophie. Berlin: Weltkreis-Verlag, 1928, p. 23 – disponível em <http://www.blutner.de/philos/Texte/carnap.pdf>, acesso em 13/01/2014.318 • XXVI World Congress of Philosophy of Law and Social Philosophy

modern constitutionalism: protect citizens from those who exercise state power, so that power is neither exercised without internal constraints, even without external constraints. Internal constraints because power would be exercised by the separation of powers, that involves a major system limitation and mutual surveillance among state agencies – the famous checks and balances system. Thus, inside the state power, the person who creates the abstract norm does not apply it to concrete cases, the person who applies the law to specific cases does not create the abrogation of powers or functions. Both aspects denote clearly the intents of abstract norms. If the applicator extends beyond his competence, creating standards, a third one judges such conduct as unlawful. Also, the legislature moves away from its duties to deal with individual cases, the illegality of this behavior will be measured and declared the third one – the judiciary. This system separates the state functions of legislating, administering and judging, and delivery to organs that should be both independent and harmonious. A system of internal constraints. On the other hand, to guarantee rights is a system of external limitations: concerns on the relations between the authorities and the citizens who support the exercise of that power. The power may be exercised up to a point, from which it becomes illegal. This point of limiting the power is found in the rights that the Constitution enshrines and protects. For example, the state power cannot confiscate the property of a citizen or imprison him on a subjective persecution. Property and freedom are rights enshrined in the Constitution and may be opposed to the exercise of power, limiting it and shaping it. These rights can only be overcome in situations where the Constitution admits it.⁵

A historical hermeneutic of that system of internal and external constraints on the exercise of power highlight the situation in Europe of the 18th and 19th centuries, with the rise – social, political and economic – of a new bourgeois class of merchants. This social group would no longer admit unlimited and absolute power, which could suppress their business and projected growth of wealth.

This system of limitations would then be seen philosophically prior to power and legally able to constraint it. It is the Constitution that now allows and regulates the exercise of power. The power ceases to be absolute and self-referential to be relative, conditioned, limited by the Constitution, though there still was quite a wide and extensive presence

⁵ GARVEY, John; ALEINTKOFF, Alexander. *Modern constitutional theory: a reader*. St. Paul: West Publishing, 1991, p. 238. Special Workshop: AICOL •

of discretion and freedom in the production of rules. This is one of the concepts of “rule of law”: a state that not only creates and applies the law, subjecting the conduct of others, but subjects itself to the legal limits of the exercise of power.

The rights guaranteed by the constitution are seen and treated as “civil liberties” or negative rights, which impose abstentions to the State. The Constitution exists to say what power can not do. Outside of that power is allowed to rule in any direction. But the violation of those constitutional rights, the classic “civil rights”, is prevented. Constitutionalism protects the citizen of the State. The idea of fundamental rights in this period is a highly protective idea. Fundamental rights, which are confused with individual rights, are rights protecting citizens against the State, which can not commit certain excesses. The Constitution establishes an area of individual freedom within the holders of state power cannot interfere. It is the consecration of what would become known as “the fundamental rights of the first generation”.

Furthermore, those who hold power in modern constitutionalism become elected as representatives of the people to whom the regulation would return. This means the decline of power legitimized by transcendent forces or family ancestry. No more tolerance with a State power exercised on the basis of religious or hereditary. It is the age of democracy, which wins the monarchy, and the age of the secular state, which supplants the clergy as a forum for legitimate production of legal norms.

Elected by the people as their representatives, those in the power to legislate are in that part which becomes the only legitimate center of production of rules, since this production is made within the constitutional limits. These limits provide minimum protection of fundamental rights of liberty and property, which are formal boundaries. Legitimacy derives from the notion of competence: the members of the legislature may establish rules, because this power is granted to them by the Constitution. But they can not apply or judge, because this is already competence of other parts.

In traditional constitutionalism, the idea of a formal constitution is predominant. Constitutional rules are the ones put in the constitutional text, and only those are constitutional rules. It is only much later that the possibility of implicit constitutional norms is admitted. If everything that is stated in the Constitution is likewise constitutional, there is no normative or axiological hierarchy among the various constitutional contents: all have the same dignity of constitutional rule, with no preference for one over the other. And this is also why it is not possible to admit the possibility of unconstitutional constitutional norms: if all that is written in the Constitution is the Constitution, then it cannot be unconstitutional.

The judiciary, in the constitutionalism tradition of the civil law, has a minor function, and ordinarily connected with private law issues, compared to what occurs in contemporary constitutionalism. Judiciary has the competence to give solution for private issues according to the rules created by the legislature, without questioning them, unless the regulation violate the separation of powers and individual rights. The judiciary should be neutral and impartial: it would verify the existence of the law, created by the competent authority and respecting individual rights, and apply it to private labors, without leaning to either party, as a third party that would be perfectly equidistant. Two neighbors conflict about their properties: the Judiciary apply the law created by the Legislature if it, when disciplining these private relations, has not violated the separation of powers or individual rights. The court will apply the law and its job is done.

With the advent of constitutionalism, the role of jurists mutates drastically. This point is of great importance. In the period prior to constitutionalism, legal doctrine was the science of normative development. Norms were dictated by the theoretical excellence and rational capacity of jurists. The medieval law was an essentially doctrinal law, under the influence of both the university and religious doctrine. Create the standard was much more an activity of rationally understanding what would be the best possible regulation, or to obtain transcendental revelation of these possibilities. The doctrine had the authority to create academic and intellectual standards that would govern society. In the constitutionalism, this legitimacy escapes from the hands of jurists and is delivered to the legislature, made up of people not necessarily versed in law. The law is no longer doctrine; it is now rules made by common people. Rationality could no longer create rules because this is now a work of the freedom of the representatives of the

people, legitimately elected and endowed with powers also legitimized by the Constitution. The doctrine loses its creative legitimacy, and assumes a secondary and derivative role: it would exercise its work after the creation of the law, not before. It becomes the doctrine of understanding and explanation of the rules put the legally competent ones. And if, in exercising their job of explaining the right position, the doctrine try to create rights where none exists, it will be acting without constitutional legitimacy and, Special Workshop: AICOL •

therefore, illegally. Trying to cover the production of rules as it was its simple explanation is a conduct denounced by modern constitutionalism as a subversion of the possibilities of doctrinal work and even an extrapolation of the limits that republican and democratic constitution imposes. Doctrine is not elected; it is not legitimate to create standards. If under the cloak of science it tries to do that, doctrine acts dishonestly and with illegitimacy. Kelsen insisted that point: there is not a reason that may impose certain constraints of conduct as reasonably necessary and that would overcome the freedom of human beings to rule themselves as they want. Being restricted to a description of the legal system, it is appropriate that jurists work in a logical, analytical and instrumental rationality, which put emphasis on syntactic and semantic aspects of the language.

4. The different functions of the constitutions in the 21ST century and the new role of legal theory

During the first half of the 20th century Law and State rarely had the functions of transforming reality and promoting social rights. So Law was mainly destined to maintain rights, creating rules that would punish who violates private property and liberty (criminal Law) and rules that would regulate the use of property and liberty among the citizens (civil Law). Criminal Law and Civil Law were the most important portions of law back then.

But after World War II, the Constitutions began to create new functions to the States and the Law, especially in the not developed countries. The Constitutions began to bring States the function of not only protect rights that were already effective, but the function to promote effectiveness to rights that were not – and still are not, in many countries. Rights such as health, habitation, education, transport and others demand positive activities from State, and it must interfere in the natural operation of society to correct its contradictions and injustices. So State must create economical conditions and social situations that would not happen without its intervention. And these interventions must be effective, in the sense that the economical and social results must be achieved. In this new conception, law must cause effect on economic and social life, transforming them.⁶

⁶BOBBIO, Norberto. *Dalla struttura alla funzione: nuovi studi di teoria del diritto*. Roma: Laterza, 2007, p. 13.322 • XXVI World Congress of Philosophy of Law and Social Philosophy Later, when Constitutions around the world began to worry about environment and ecological issues, State and Law begin to be destined to cause also effect on how the environment is preserved and maintained. And many other issues. From now on, Law must influence social, economic and environment realities.

Brazilian Constitution, for example, includes among the “fundamental objectives” of the Brazilian Republic “to guarantee the national development” (art. 3.º, II) and at the same time includes “ecologically balanced environment” among the “rights

of all”, in a way that it is a “duty of the State and the citizens to protect and preserve it” (art. 225). So this is why legal scientists correctly say that Brazilian Constitution determines that Brazilian State pursues sustainable development.

It is easy to perceive that contemporary law increases its connection with moral. In the traditional constitutionalism, among the few moral decisions converted in law were the protection of individual rights and the restriction of state power. These contents continue present in contemporary Constitutions, but a lot of other moral decisions are admitted by law, such as equality, human dignity, new rights, pluralism, tolerance and others. The Law and Moral are closer now, and the decisions of Legislature are now more restricted because Constitution is now not only formal but also includes material contents that must be respected.⁷

Therefore, Law theories must be made considering this new reality. It is something different than ever before in the history of Law and Law theories. It is easy to notice that law theories based on – and restricted to – subjects like obligation, prohibition, sanction etc., like the ones made until last century, are not appropriate to this new law.

In this new perspective, Philosophy of Law and specific law disciplines begin a new phase in which it is necessary to work with new concepts. One good and important example is the theory of the law principles, its condition of a real legal norm and its relations with other norms, the rules. It is a problem that was absent from legal theories in the 19th century and in the beginning of the 20th century. Some call this new period “post-positivism”, but the theories made under this name are very different from each other and sometimes even opposed.

⁷BARROSO, Luis Roberto. *Constitucionalidade e legitimidade da criação do Conselho Nacional de Justiça*. Revista Interesse público. Belo Horizonte, v. 6, n. 30, mar. 2005.

5. Complexity as a metatheory for the contemporary philosophy of law

This paper suggests that the Epistemology of Complexity, made from the systems and the systemic theories, is a good instrument to deal with this new Law that the 21st century presents. Complexity epistemology brings an interesting vision of reality and of the scientific theories that can be developed to explain and interact with it, and brings as well some concepts and categories that may be useful in law theories. It works as a metatheory, theory of the theories, and a Law Complexity Metatheory can be developed to theorize law theories as well.

Epistemology of Complexity can be based on some statements. One of them is assume that human beings in the 21st century are connected by a new kind of solidarity, since nowadays decisions or actions taken by individuals are able to affect an entire nation and in some cases the whole humanity. We can think of actions that drastically affect environment or cause wars that could kill millions or billions of people, or the whole humanity, like with nuclear bombs. This is a new situation that demands new ethical responsibilities to the scientists – and we can include here the legal scientists. So that choice of not considering values in the scientific activities, which was an important precept in traditional epistemology, is just not acceptable anymore. Scientists must be engaged, which imposes a new approach to scientific procedures.⁸

This new vision of scientific work is especially helpful when legal scientists must act pursuing objectives based on values, such as sustainable development. If the

scientific traditional metatheories would maybe be an obstacle for legal scientists to work pursuing the necessity of actualize realities based on values, the Complexity metatheory enable it.

Other important statement is that, differently from what Descartes and the modern science in its traditional form believed, Epistemology of Complexity assumes that it is often impossible to know a totality by knowing its parts than adding them. It happens like this because in a lot of cases some reality, when divided, loses crucial properties that the study of its parts is not able to comprehend, not even when adding it to the study of other parts. These properties are called “emergences” and are not visible when only one or a few parts of reality is focused. That brings scientist to a paradox: it may be impossible to know the totality

§MORIN, Edgar. *Science avec conscience*. Paris: Fayard, 1982, p. 44.324 • XXVI World Congress of Philosophy of Law and Social Philosophy by knowing its parts, but it is as well impossible to know the parts without knowing the totality. It is the famous Pascal’s paradox of cognition.⁹

This is also a statement that can be useful in the study of a Constitution that determines that the State pursuits sustainable development. In a reality like this, legal scientists must understand how law, economy and environment interact. The scientist has this challenge beyond him, which consists in trying to understand the interactions among realities formerly studied in isolated disciplines. Disciplinary knowledge traditionally forget what lies beyond disciplines, what is in its frontiers. It is not enough to know law or economics, but there is the need to know the relations between law and economics. Traditional modern science would interdict this kind of work, what would impede legal scientist to actually do what is required from him.

Complexity assumes that reality is formed by elements that, since they are part of a totality, its possibilities and potentialities are reduced. This is because totality often imposes conditions and determinations to its elements so they are not able to realize all of its possibilities and potentialities. In this sense, the addition of isolated elements would be more than the totality itself, because if they were not included and determined by this totally, they would have their potentiality not reduced. In other sense, though, those elements only act the way they do, achieving other potentials, because they are involved in a totality and only if involved in a totality. In this sense, the totality, in which new characteristics emerge, is more than the addition of its isolated elements. Totally is more and less than the addition of its isolated elements.

Since law forms totality along with economy and the environment, this way of thinking can bring new possibilities to legal scientists that are involved with sustainable development issues. Law would probably have more possibilities if it was not reduced by the need and duty of sustainable development, and the legal scientist must be able to identify its possibilities and discard them. Otherwise, law has other possibilities that only appear when we think of it as an instrument to pursue sustainable development, and legal scientist must be able to identify these new potentialities as well.

Another important statement is the one that assumes that reality is an organization permanently subject to be disorganized and then reorganized in a new form. This disorganization can be caused by an internal occurrence or by an external occurrence. That is another reason

9PASCAL. *Pensamentos*. São Paulo: Abril Cultural, 1979, p. 35. Special Workshop: AICOL • 325

why scientist must be open to consider realities often studied in other disciplines.¹⁰

When we think of legal science, it is not rare that a disorganization and a reorganization in the economic system is caused by an occurrence in law, and also an occurrence in economy may cause a modification in normative system. This is another reason why legal scientist must be open as well to consider realities traditionally studied in Economics or Ecology.

Things are more interesting than this though. Complex science assumes that the “cause-effect” line is actually not a line, but somehow a circle. Some facts cause effects that function as causes for other effects that affect that first fact, like as if it was a circular “cause-effect-cause” line. Complexity calls it a “recursive circle”.

When the notion of recursive circle is applied to the relations between law and sustainable development it can be useful to perceive that sometimes an occurrence in law can affect development and sustainability but also this new configuration can affect law again.

Actions taken by people or operated machines, including the ones taken by legal scientists, have the potentiality of causing effects not foreseen by the player, and event effects opposed to the ones that were intended by the player. Epistemology of Complexity sometimes call this the “ecology of action”, and it moves us to think about the effects that our actions may cause when they leave us and enter the incessant game of causes-effect-causes of the environment. Sometimes a norm made to achieve a goal happens to not only not achieve this goal but also to produce a contrary effect. This leads to a new kind of perception of the ethical responsibilities of the legal scientists and the way they interpret rules and principles for its application to concrete cases.

Differently from the general theories that governed science in the 19th and 20th centuries, complexity assumes that sometimes reality does not fit in our scientific models, and than a reality occurrence or fact can be different from every other occurrence that happened before and that is going to happen in the future. So Epistemology of Complexity suggests that scientists must learn to work with individualities that would not fit in the general theories.

As well as other sciences, legal science also produced general theories – Kelsen’s pure theory of law was, aside from an epistemology

¹⁰ ALLIGOOD, Kathleen T., SAUER, Tim D., YORKE, James A. Chaos: an introduction to dynamical systems. New York: Springer, 1996, p. 216.326 • XXVI World Congress of Philosophy of Law and Social Philosophy

of law, a general theory of law, the norms and the normative systems.

This is also an important statement for legal theory. Jurists now assume that there are some cases that does not fit in previous cases or legal theories and demand a totally new answer, something that would be very difficult to deal with in the general theories' model of traditional modern science.

All these conceptions of the Epistemology of Complexity can be useful to legal philosophy as an appropriate metatheory to enable legal theories about the relations between law and sustainable development. It can offer to legal scientists a secure basis upon which legal theories can be constructed regarding Law, Ecology and Economics, besides other disciplines that would be necessary for the knowledge of the object of the research, enabling an interdisciplinary knowledge of law and the reality in which it is included and take part.