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The new Path of Law. From Theory of Chaos to Theory of Law

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The New Path of Law
From Theory of Chaos to Theory of Law

Abstract: From chaos to chaos theory, from the primordial perception of the world as disorderly to the scientific research of disorder a long distance has been covered. This path implies openness of mind and scientific boldness which connect mythological perceptions of the world with philosophical and scientific interpretations of phenomena throughout the world in a quite distinctive way resting on the creation of a model and application of computing. Owing to this, for the first time instead of asking What awaits us in the future? we can ask What can be done in the future? and get a reliable scientific answer to the question.
Keywords: Theory of Chaos, Theory of Law, Legal modelling, Legal computing, Fractal scaling.

I. Chaos Theory is a Quite New and Modern Discipline

Theory of chaos is a quite young and modern discipline aimed at studying and explaining irregular behaviour, i.e. discovering order in disorder. Moreover, theory of chaos is suspicious of the firmly established belief and scientific assumption that order alone rules the world. However, theory of chaos does not reject order due to disorder, but studies order in its inherent way by means of special, basically, mathematical methods and computing techniques which request philosophical and theoretical justification. Such goal of chaos theory can be easily recognised in law, because in law as well, along with regular behaviour and process, also exist notably irregular behaviour and irregular processes. That is why law is a particularly befitting phenomenon and a system both for the study and for the application of chaos theory.

Chaos theory denotes the establishment of a different view of the world and a different methodological apparatus, as well as an increasingly wider application of the already achieved results in the new and entirely different scientific fields, rendering possible studying of social and legal phenomena in a quite distinctive way and with completely new possibilities. Theory of

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chaos is thus shown as a universal general theory of complex dynamical systems, which is equally successful in pointing both to the general orderliness of phenomena and systems, behaving randomly and chaotically on a local plan and at general disorderliness and chaoticity of phenomena and systems, displaying orderliness and regularity on a local plan, i.e. as a modern theory initiating in a radical way the re-examination of the existing knowledge of phenomena and their principles and connecting in a new way organisation with chance, purposiveness with spontaneity, order with chaos. In the very foundation of this new approach there stands: *world is a perpetual instability*.[1]

II. The Appropriate Index of Terms Available to Chaos Theory and Theoreticians of Chaos Enables Them to Present Their Results

Owing to the appropriate index of terms available to the theory of chaos and to the theoreticians of chaos, carrying out of their research work and presenting of the obtained results is possible. Index of terms means the existence of appropriate terminology on which theoreticians of chaos explicitly or implicitly count. Index of terms should include, conform and systematically present old and new meanings as more or less accomplished corpus of knowledge available to the theory of chaos. Its existence shows that theoreticians of chaos have a need to be philosophers as much as philosophers in a way have a need to be theoreticians of chaos. Theory of chaos is thus provided with a strong potential while philosophy is given a possibility to resolve its traditional problems by means of an unconventional approach.

In conventional terminology of philosophers, the word world denotes everything that exists, the over-all existence, no matter how the world has come into being and no matter how we explain its origin.[2] In the terminology and in the index of terms of theoreticians of chaos, world represents a statistical case of chaos, while natural and social principles represent the sum of statistical condensations of chances with the proclivity towards an ever-increasing approximation.[3] Also, theoreticians of chaos do not use terms actuality and reality, which denote either entirety of everything there is or entirety of all things. Instead, they use the term

[1] See: Dragan M. Mitrović, *Teorija haosa i pravna teorija* (*Chaos theory and legal theory*), ed. Visio mundi academic press, Novi Sad, 1993, 19–24.
[2] Vladimir Filipović – Branko Bošnjak, *Filozofijski riječnik* (*Dictionary of Philosophy*; ed. Matica hrvatska), Zagreb, 1965, 190–191, 381, 431. See: Maurice Merleau-Ponti, *The World of Perception*, ed. Routledge, London–New York, 2002.
[3] See: Vilem Fluser, *Kašika stvaranja iz supe haosa* (Vilem Flusser, *A Spoon of Creativity from the Soup of Chaos*), in: Treći program, ed. RTV Beograd, Belgrade, vol. I, No. 84, 1990, 276–277.

concreteness, although they are aware, epistemologically viewed, that it also represents just another unreachable value like truth in lieu of which they use the term probability.[4] This is why numerous theoreticians claim that the discussion about truth should be replaced with the discussion about degrees of truthfulness, degrees of rational belief or degrees of probability. In other words, *truthfulness* is an unattainable bordering value on whose other end lies *falseness*, out of which ensues that the discussion about truth should be replaced with the discussion about number, probability and weight of the used arguments. Consequently, the main governing principle of a researcher must be fitness for carrying out work rather than truthfulness of the obtained statements, which in the long run belong to our referential system. This, of course, applies to any theory which should strive towards an ever-increasing approximation. As a result, Copernican theory is not closer to the truth - it is only more fit for work. This should equally apply to social and legal theories, in which fitness for work and research should also constitute the main governing principle.[5]

In the index of terms of theoreticians of chaos, a special place is dedicated to the *concept of certainty* by means of which it is possible to connect theory of chaos with social and legal philosophy and theory, opening thus new epistemological and practical possibilities for research work. Namely, certainty as a measure of probability (*degree of rational belief*) can be expressed by a number which lies between extreme degrees of probability: security (*secure rational belief, knowledge*) and impossibility (*complete rational implausibility, ignorance*), which is a characteristic regular state of law. In other words, certainty denotes the state of every system in between the conceived extremes which can be adequately mathematically expressed. This new reliability in philosophy has become notably evident since the possibility of autonomous mathematical thinking about the world had become strongly affirmed. Behind such possibility stands a belief that universal laws can be mathematically determined and certainty is, consequently, a mathematically verified measure for determination of the degree of probability, predictability and reliability in all natural, social, spiritual and artificial phenomena and systems in which along with regular exist irregular processes as well. This holds especially true for *law*, which is also an *incompletely harmonious system*, particularly suitable for research work in the light of theory of chaos.

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[4] Fluser (note 3), 277.

[5] See: John Maynard Keynees, *A Treatise of Probability*, ed. Macmillan and co., London, 1957, 71; Harold Jeffreys, *Theory of Probability*, ed. Oxford Un. Press, 1948, 341; Hans Reichenbach, *The Rise of Scientific Philosophy*, ed. Barkley Un. Press, 1968, 69; Ludvig Vitgenštajn, *Filozofska istraživanja* (Ludwig Wittgenstein, *Philosophical Research*), Belgrade, 1980, 55, 38.

Owing to this fact, concepts of law, principles of legality and state can be determined in a somewhat different way. Namely, *law* is a *spontaneously or consciously and deliberately created system of certainty which should provide for predictability in behaviour of subjects of law and reliability in functioning of institutions*, while the *principle of legality is a rule or a set of rules dealing with the way in which law is to be exercised*. *State*, on the other hand, on which law relies, is consequently the *main stabiliser and regulator of the accumulated controversies, which should eliminate insecurity and neutralise uncertainty*.[6]

III. The Possibility for Application of Chaos Theory in Law

Bringing into connection theory of chaos with theory of law by means of the concept of certainty found in both theories, opens new practical possibilities for the application of theory of chaos in legal techniques.

The possibility for application of theory of chaos in law is fully expressed only when it is understood that chaos is not one and the same as instability and that chaos implies existence of organisation and order. Moreover, chaos alone enables emergence of order and system where they are non-existent. Chaos therefore does not mean only a disruption of a phenomenon, a system or an organisation, but also the establishment of a system-organisation through randomness (spontaneity) and disorder.

It is not order alone that originates from chaos. Within chaos itself also lies a special type of order, because it has been shown that unpredictability, chaoticity, spontaneity and instability have certain universal characteristics that can be mathematically represented by attractors and fractals. This needs special emphasising, because attractors of fractal composition in chaotic systems show that order and symmetry exist in disorder as well. Consequently, fractal is the measure of orderliness of chaos. In this self-organising way chaos alone arranges itself from within by establishing fractal forms as a distinctive way of orderliness.[7]

The possibility of chaos to cause emergence of order and alone generates order within itself, which can be mathematically expressed, shows chaos also as a chance to create new out of old. Owing to this, chaos also has its own creative power. It originates from spontaneity which provides chaos with power to create order by itself. This creative power of chaos enables

[6] See: Dragan M. Mitrović, *Teorija države i prava* (*Theory of State and Law*, ed. Dosije studio, Belgrade, 2010, 359–361; Gordana Vukadinović, *Teorija države i prava I-II* (*Theory of State and Law I-II*), ed. Futura publikacije, Novi Sad, 2008, 64–88.

[7] Mirko Gaspari, *Holizam, svrhovitost i sklad: povratak smisla u prirodi?* (*Holism, Purposiveness and Harmony: Return of the Meaning in Nature?*), in: Kulture Istoka, Vol. VIII, No. 27, Belgrade, 1991, 33.

philosophers and scientists to understand more easily and to explain better the over-all complexity and versatility of social regulation which is so strongly present in law, even when it looks like arbitrariness and spontaneity. If the blind force of chance is excluded, this impression represents the result of the effect of chaos showing law as a globally stable, as well as a locally unstable system what law is in fact.[8] Yet, this system rests on simple principles, because the vast complexity of phenomena does not request complicated fundamental principles. In other words, practical goal of chaos is aimed at discerning a shorter path, idea or thought in a complex system which will reliably lead us further on.[9]

IV. Practical Application of Chaos Theory

The practical application of chaos theory understands availability and the application of appropriate distinctive means used by theoreticians of chaos. Means applied by theoreticians of chaos include not only the appropriate theoretical and technical methods used for construction of models, but also the proper utilisation of computers as basic tools of theoreticians of chaos and computing of the constructed models. It puts on the agenda an issue of radical research and re-examination of law in which probability replaces truth, and certainty takes the place of security. That practical goal may be achieved by examining law as a determined and as an undetermined system.

Even when law has been established as a determined system, the conventional application of computing techniques must be distinguished from its creative application. Law in the mentioned sense represents a determined system when, for instance, we establish it as a series of rules which exist in the form of legal norms in various legal acts. However, law is an undetermined system when it is exercised, because only a part of what has been prescribed is actually applied. Of course, these are not the only examples of that kind in law. In both mentioned examples, briefly referring to how the law may look like as a determined and an undetermined system, theory of chaos and theory of law are confronted with the problem of dualism within the same phenomena, which in view of the application of theory of chaos in law, requests a selective methodological approach which separates legal creativity problems from law application problems. This is why the apparatus and methodology of theoreticians of chaos should be adapted to the apparatus and methodology used by jurists themselves when creating and applying law. However, whether it is

[8] See: David Bohm, *Woleness and the Implicite Order*, ed. Routledge, New York, 2008.
[9] Miček Fajgenbaum, *Zagonetka haosa* (Mitchel Feighenbaum, *Chaos Mystery*; ed. The New York Times Company), in: Pregled, Belgrade, 1984, 61.

a question of creation or application of law or of methods of theoreticians of chaos or legal methods, as well as whether it is a question of establishing law as a determined or an undetermined system, a valid research of law cannot be carried out in the mentioned sense without the construction of legal models and computing.

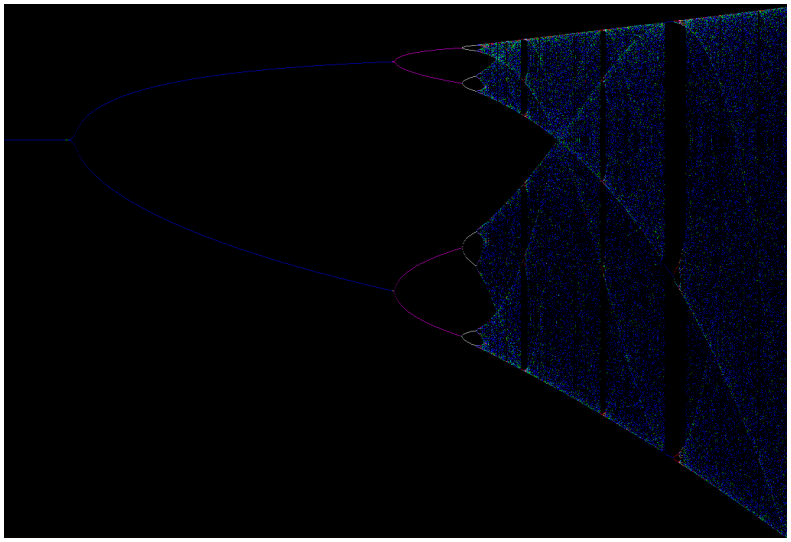
If chaos theory is a new conceptual framework, computing in law may be conceived and determined as a method used for examination of a model of some theory, law, part of law, laws or some other legal acts, as well as for perceiving and studying of consequences which in reality may indeed arise by application of such models.

The application of the computing process itself may be described as follows. The data which are transformed into algorithms are being first studied. Out of algorithms is created software which is thereafter put into the computer "prepared" for that purpose. It is thus possible to obtain an appropriate legal model on the monitor which is to be examined in accordance with relevant principles and facts that exist in real, true world, while letting the model develop by itself. Out of obtained material, i.e. a large number of offered possibilities, we may, according to our interest, select some characteristic part or some characteristic case which we thereafter vary and animate. When it is achieved that such a model, for example a law model, resembles law that exists in reality, interface is being designed enabling the creation of a hologram. Formation of a hologram in plane and in space enables the beginning of true animation. A law model thus begins to live in the computer world, although it has not been applied in reality.

V. Law is an Exceptionally Complex, Multistratified and Multidimensional Dynamical Phenomenon

By computing three characteristic legal models we have shown that the application of the theory of chaos in law is not a Utopian project. We have thus demonstrated that theory of chaos may be successfully connected with results of theory of law, science and technique. Owing to that, one quite young and quite modern interdisciplinary theory universal in its character has been applied in one of the oldest and most developed general theories.[10]

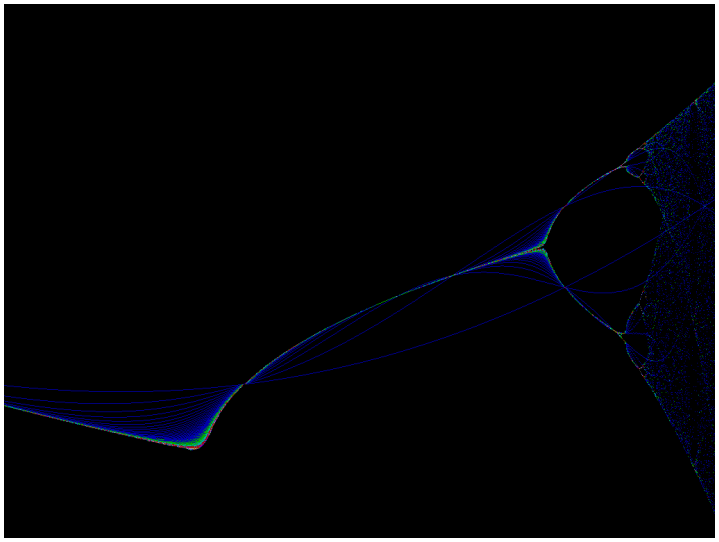
[10] Cited according to Fritjof Kapra, *Tao fizike. Istraživanje paralela između savremene fizike i istočnjačkog misticizma* (Fritjof Capra, *The Tao of Physics. An Exploration of Parallels Between Modern Physics and Eastern Mysticism*), ed. Opus, Belgrade, 1989, 9.



Bifurcation in Kelsen's model of the concept of law

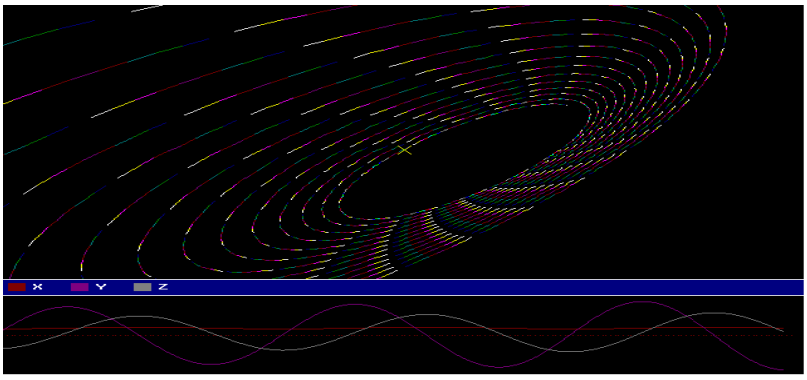
By computing Kelsen's model of the concept of law,[11] which is quite consistently determined and developed in his well-known "pure theory of law", the first principal idea of chaos theory has been presented: that complete order does not exist, that within order itself exists tendency towards disorder, that disorder exists even when it is not observable, that the transition from order to disorder is not a leap into the unknown but that even then there exist regularities owing to which it is possible to explain gradual transformation of order into an ever-increasing disorder, to the complete disappearance of law.

[11] Hans Kelzen, *Opšta teorija prava i države* (Hans Kelsen, *General Theory of Law and State*), ed. Faculty of Law, Belgrade, 1951 (1998, 2010), 17, 116–117, 119–120, 127, 129.



Bifurcation in custom model

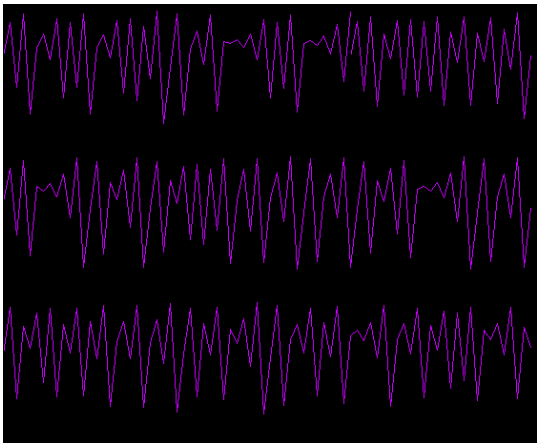
By computing the custom model,[12] showing spontaneous emergence of order out of disorder, the second important idea of chaos theory has been presented: that complete disorder does not exist, that within disorder itself exists tendency towards order, that order exists even when it is not observable, i.e. that chaos is spontaneously organising itself, that spontaneous self-organisation does not occur suddenly, but that even then there exist regularities owing to which it is possible to explain transformation of disorder into an ever-increasing order, to the emergence of a custom norm which is one of the patterns of order.



Legal system model

[12] Radomir D. Lukić, *Uvod u pravo* (*Introduction to Law*), ed. Naučna knjiga, Belgrade, 1978, 26–28. See: Dragan M. Mitrović, *Uvod u pravo* (*Introduction to Law*), ed. Faculty of Law in Belgrade, 2010.

By computing the legal system model,[13] the third important idea of chaos theory has been presented: that order and disorder do not exclude one another, but simultaneously exist, complement and permeate each other in a dynamical balance. On the type and degree of that balance depend the state and quality of law. If, on the other hand, sudden disturbances take place in a system, law is being disrupted, i.e. formal-legal revolution occurs, constituting the foundation for emergence of a new legal system resting on completely different grounds. Furthermore, were the values of variables determined on the basis of statistical data, computing of a legal system model could be used for the construction of reliable prognoses concerning future state, quality and developments of any concrete social and legal system.

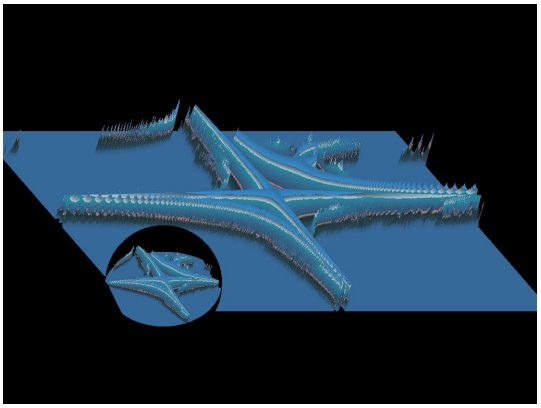


The rhythm of order and chaos

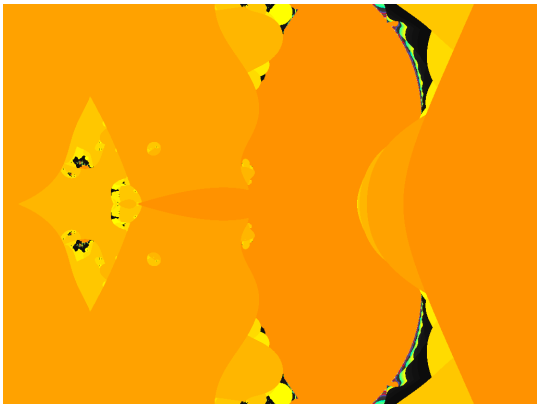
All three characteristic legal models, the computing of which shows three important ideas of chaos theory, support the principal idea: that chaos theory can be used for researching law as a social phenomenon. Owing to that, it is also possible to construct other legal models of any level and type, which can also be examined by computing. The constructed characteristic legal models, their computing and the obtained results confirm the initial idea: that bringing into connection chaos theory with legal theory is not a Utopian project, but a new path revealing entirely new prospects in researching law. This new path must alter our implanted perceptions and pictures of the world of law and of law as a part of the world, because *law pulsates in the universal rhythm of order and disorder!*[14]

[13] See: Lukić (note 12), 199–200; Mitrović (note 12), 205–209.

[14] Dragan M. Mitrović – Ljubiša V. Stanojević, *Teorija haosa i pravna teorija. Modelovanje i računarska simulacija u pravu* (*Chaos theory and legal theory. Modeling and computing in law*), ed. Službeni list, Belgrade, 1996, 65–77, 147–153.



Frozen fractal picture of Kelsen's model of law



Frozen fractal picture of custom model

Frozen fractal picture of legal system model

VI. Computing is not Omnipotent

However valuable it may be for the research of law, computing is not omnipotent. That is why, one has to bear in mind limitations and risks that may arise when computing is being carried out, particularly when its results are being interpreted.

First and foremost, computing provides probable and most probable rather than exact and true results, because our theories are our inventions, our mere conjectures, as well as our bold assumptions out of which we create our "own nets by which we try to capture real world". It is the case with all models that are theoretical and technical in their character. Nevertheless, owing to our theories and models we can acquire new knowledge that so far has been only plain guesswork lacking valid possibilities for testing and verification. By applying computing in this way we can obtain results with a high degree of probability (certainty) and verifiability, which is quite sufficient for the accomplishment of the set out goal. Hence, when examining some social or legal model, we do not expect the obtained results to be true, but rather that they would be the results with a high degree of probability, verifiability and supportability.[15]

Mentioned limitations and risks display the role of a researcher in a completely different light. Namely, a researcher has to take care, before and during computing, whether the formalisation of a model has been carried out correctly, and especially whether the essential has been separated from the non-essential in a model, as well as whether the selected data are sufficient for the creation of the so-called set, short of which formation and computing of models are not possible at all.[16] The first problem is being resolved by the utilisation of paradigms, which enable a researcher to distinguish essential from non-essential. The second problem is being solved by fractal structuralising.[17]

A researcher has to take special care when interpreting obtained results and must always bear in mind that beyond the formalised model there may stand the real phenomenon with consequences which are distant from plain formal and theoretical research work. Thus are modeling and computing displayed in a completely different light - as a means to examine world and law at all by using one of the possible ways, with freedom that has not existed so far.

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[15] Karl Poper, *Traganje bez kraja. Intelektualna autobiografija* (Karl Popper, *Andendid Quest. Intellectual Autobiography*), ed. Nolit, Belgrade, 1977, 283.
[16] Herbert L. Drajfus, *Šta računari ne mogu* (Herbert L. Dreyfus, *What Computers Cannot Do*), ed. Nolit, Belgrade, 1977, 283.
[17] Zoran Bijelić, *Iza reda i nereda* (*Beyond Order and Disorder*), in: Kulture Istoka, Vol. VIII, No. 27, Belgrade, 1991, 18.

Sometimes this freedom may remind of divine creativity.[18] However, even then a researcher must remember that man cannot be replaced by computer in the same way as God cannot be replaced by man. And in the same way as God has his last say in human affairs, man has his last say in computer matters. *Computer therefore only enhances capabilities of human mind, but does not replace human intelligence.*

The application of computers and computing request human adaptation, quite often resulting in utterly wrong and unnecessary comparing of man with computer. It induced many writers to indicate, and quite to the point, actual and potential risks brought about by utilisation of computers.[19] But, all the same, human adaptation to computers is necessary - though only to the extent needed to provide for a desired benefit. Human adaptation is, therefore, both understandable and justifiable because within given limits of a programme computers are more powerful than humans.[20] However, computers are not omnipotent whatsoever, because it is only man who is capable and able to distinguish essential from non-essential. Man, who is in no way a rational being only, can often do it intuitively or completely unconsciously, which computer cannot do in any way. Owing to this precious human source, to this "unconscious" or "superconscious" within himself, man draws from his emanative creative force that doubtlessly makes him superior to the computer as a product of his knowledge and faculties.[21]

Also, in no way can a computer overpower its creator because man has also incorporated, consciously or unconsciously, his over-all deficiencies into the computer. In addition, the more computer preciseness is being improved, the more its limitation is being enhanced. (The unknown limitation of human mind and spirit with less preciseness is always better.) That is why the risk to produce superintelligent computers and sub-intelligent beings is justifiable only to the extent to which the man is prepared to relinquish his role, causing thus harm to himself. However, it has nothing to do with computers but with human nature. It is clear, therefore, that the comparison of man with computer is as appropriate as the comparison of an owner of a tool with a tool itself. Computers are these new accomplished tools that may be used according to our own ideas and needs. Definitely, even today they are bringing about so great changes that they can hardly be compared with the changes caused by usage of plow and appearance of agriculture in human civilisation at the time.

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[18] See: David Bohm, *On creativity*, ed. Routledge, London–New York, 2004.
[19] Drajfus (note 16), 285.
[20] See: Džozef Vajzenbaum, *Moć računara i ljudski um* (Joseph Weizenbaum, *Power of Computers and Human Mind*), ed. Nolit, Belgrade, 1980.
[21] Fluser (note 3, 4), 279–280.

Mentioned limitations and risks, encountered by anyone using computers and appropriate computer techniques (or merely thinking about them), and especially by researchers, should be timely observed and separated. A researcher should especially take care to make a distinction between the epistemological and scientific sides of the computing problem, its validity and justifiability on the one hand, and ethical, social and political consequences that may be produced by the application of computing on the other hand. The former is concerned with the knowledge and imagination, and the latter with the ethical views and intentions of those who are able to use computers and results of computing. Let us recall the previously mentioned plow that can be equally used for tilling soil, as well as for forging weapons and waging war. It equally holds for utilisation of computers and for carrying out computing.

VII. Conclusion

That the link between theory of chaos and theory of law is not a Utopian project, but a new approach towards researching law in both epistemological sense and practical sense, is confirmed by modeling and computing of characteristic legal models in the light of chaos theory, nevertheless the subject of modeling and computing may comprise any aspect or any part of law. Knowledge, imagination and prejudices of a researcher constitute the only true limitation.

However, computing is not omnipotent regardless of its contribution to the research of law in the light of chaos theory. Currently, a decisive pointing to the route towards which we should concentrate our efforts seems to be the greatest value of computing of legal models - and not offering of experience - and this is the factor of the outmost significance, because it accentuates freedom of human will. Owing to this, we need not ask ourselves any more “What awaits us in the future?” Namely, it seems that for the first time we can put to ourselves a more appropriate question “What can we do in the future?”, and get a reliable scientific answer to the question.

On the other hand, the application of computing in the presented sense shows in a completely different light some perpetual questions, to which an answer has not been given yet, nor will be given ever it seems (What is reality? What is the world at all? What is man? [especially Bodriar’s telematic virtual man] What is the place of man in reality and in the world? Until when can the world and man as a part of it go on developing? Does virtual reality release or capture human will? etc.). However, answers that reality is concreteness, that principles are the sum of statistical condensations of chances with the proclivity towards an ever-increasing approximation, that truth is a degree of probability, that the world is “of such kind” that it pulsates and develops until it can

receive no more from the outside and alike answers, which need not be accepted as true, are certainly interesting answers and attempts to perceive and explain from a different perspective problems occupying human curiosity from the time immemorial. Those precious attempts, supported by new computer capabilities and information science technologies suggest the possible new approach towards law. That approach is not the "Tao" of law; it is not the path of true and the only possible law, but the approach towards researching law in a multidisciplinary way as a dynamical phenomenon with the most significant consequences for its actual existence.

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