



EPIGENETICS AS A NEW CHALLENGE IN THE LEGAL FIELD

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Abstract

The discovery of epigenetics as hidden external influences on genes could in the future affect all aspects of our lives. This includes also legal life, both in terms of its different application or enforcement of liability and the understanding of law itself. Epigenetics is a path towards personalised medicine, and with this to personalised and transgenerational justice. The aim of this paper is – based on the literature review and the critical evaluation of the material – to present epigenetics as a new legal perspective that allows a more personal perspective on issues of individual and transgenerational justice which brings to the fore intergenerational solidarity. The result of this is the increased awareness of the importance of changes in genetic profiles that can affect a person's actions and thoughts, which can affect the way cases are handled. As epigenetics is focused on actual rather than chronological age, new discoveries on rejuvenation give us a new basis for a different interpretation and application of legal provisions. If the law changes during use and its violation (as proteins patch the DNA chain), thereby lowering the rule of law, an epigenetic view of the rejuvenation or reprogramming, resetting, and restarting of the DNA backup may offer a new-old, i.e. always baseline, perspective on the understanding of law.

Keywords

Epigenetics, Law, DNA, Epigenetics, Textualism, Personalised Medicine, Personalised Justice Transgenerational Justice

I. Introduction

The concept of regulation is literally and existentially directly linked to life on earth, to DNA. In every natural process, there is a tendency to dissipate energy that is not converted into useful work. In all living things, entropy or energy loss increases, within DNA as a loss of genetic and epigenetic information or instructions.² The notion of entropy as a lack of

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² DNA is also called the “blueprint of life” because it contains the instructions we need to grow, develop, survive, and reproduce. Only about 1 per cent of DNA is made up of genes that code for proteins; the other 99 per cent is non-coding. Non-coding DNA does not contain the instructions for making proteins. Scientists once thought that non-coding DNA was “junk”, with no known purpose. However, it is becoming clear that at least some of this

order or predictability, a gradual descent into disorder, as a measure of the disorderliness of a system, has long been known. According to the second law of thermodynamics, there is a natural tendency in an isolated system to degenerate into a more disordered state. Order cannot arise spontaneously in such a system and, according to this law of thermodynamics, evolution cannot occur in an isolated system. On the downside, there is also a positive side: entropy acts only on isolated systems. Conversely, epigenetic processes are open, environment-dependent, and reversible (as a reversible transition of bodies back to their original form) processes, proving that entropy does not increase with the input of new energy, which is here understood as a constant reprogramming. Epigenetic processes are at least an exception to the established view that only irreversible processes are a source of order:³ epigenetics, in the sense of reverse rejuvenation of the DNA structure (as in the erasure of errors that occur in the repair of breaks in the DNA strand), can also be seen as a source of (new-old) order. Because of the special features of epigenetics (they are briefly described below) that are necessary first to reflect or think on law in this context, the relevance for law is given in the second section of this paper. If epigenetics can affect not only molecules but also the people's bedsides (Legato, Feldberg and Glezerman, 2023), stress or trauma (Youssef, 2022), external experience can affect not only future generations (Carey, 2013), but also legal understanding. To the best of the author of this paper knowledge, there are no specific legal monographs or papers on law and epigenetics. One of the latest works is Alces's *Trialectic: The Confluence of Law, Neuroscience, and Morality*. In it Alces proposes that "legal and sociological disciplines might examine epigenetics as the intermediary between genetic inheritance and environmental influences, advocating for measures that deliver supplementary support to those at a disadvantage" (Alces, 2023, p. 64). Beyond providing solutions to the toughest queries, Alces's work aims to serve as a preliminary discussion that encourages additional exploration on the inference that conscious entities are merely the result of physical interactions. The aim of this paper is also to provide an additional viewpoint on the regulation of social processes; based on the natural laws described above, the paper presents epigenetics as a new legal perspective that despite of physical basis, allows a more personal perspective on the issues of individual and transgenerational justice, which could lead – at least in some areas like the sustainable development or social wellbeing – to intergenerational solidarity. Until now, ageing in cells has been thought to be primarily the result of mutations in DNA that eventually disable the normal functioning of the cell and trigger cell death. Accumulated DNA damage because of genetic mutations (because enzymes or proteins mis repair the DNA chain) causes the body to deteriorate in the way it functions; in short – it gets old. On the other hand, this thinking is not supported by the fact that cells

DNA is important for cell function to control the activity of genes. Non-coding DNA contains sequences that act as regulatory elements, determining when and where genes are switched on or off. Such elements provide sites to which specialised proteins (called transcription factors) can attach (bind) and activate or inhibit the process by which information from genes is converted into proteins (transcription) (National Library of Medicine, 2021). These non-coding RNA parts serve as regulators in epigenetics (Wei, Huang, Yang and Kang, 2017).

³ This is why, for example, Nobel laureate Ilya Prigogine titled his work *Order Out of Chaos* (Prigogine and Stengers, 1984). Prigogine was awarded the Nobel Prize in Chemistry in 1977 for his contributions to nonequilibrium thermodynamics, in particular the theory of dissipative (energy-consuming) structures.

in older people are often not full of mutations and that animals or people with a higher number of mutated cells do not age prematurely. Yang, Sinclair, and others (Yang et al., 2023) therefore focused on another part of the genome, the epigenome, instead of the genome as the whole set of DNA instructions in a cell. The latter is a composite record of chemical changes in the organism's DNA and histone proteins that can be passed on to the organism's offspring through transgenerational epigenetic inheritance.⁴ Changes in the epigenome can lead to changes in chromatin structure and changes in genome function (Bernstein, Meissner and Lander, 2007). “Because all cells share the same DNA blueprint, it is the epigenome that turns skin cells into skin cells and brain cells into brain cells. It does this by giving different cells different instructions on which genes to turn on and which to turn off. Epigenetics (lat. *epi* – outside, i.e., genetics) is like the instructions that seamstresses get from patterns for making shirts, trousers, or jackets. The starting fabric is the same, but the pattern determines the form and function of the final garment. In cells, epigenetic instructions lead to cells with different physical structures and functions in a process called differentiation” (Park, 2023). Yang and colleagues found that the ageing process can be reversed by restarting cells by re-running a backup copy of the epigenetic instructions (which do not change because of mutations). This erases damaged signals (faulty protein patches on the DNA strand) that put cells on the ageing path. The loss of epigenetic information therefore accelerates the characteristics of ageing; these changes can be reversed and are therefore reversible by epigenetic reprogramming (whereas DNA changes such as genetic mutations are not): by manipulating the epigenome, ageing can therefore be accelerated or reversed. The finding follows the fundamental idea of entropy, that to consume energy, information must be continuously fed or, in the context of epigenetics – *reprogrammed*.

The term “epigenetics” was coined by Conrad H. Waddington in 1942 to refer to “the [causal] processes involved in the mechanism by which genes of a genotype [heritable design] produce phenotypic [adult characteristics of an animal] effects”. (Waddington, 1942, p. 18). Epigenetics studies how behaviour and the environment can cause changes that affect the way genes work. Unlike genetic changes, epigenetic changes are reversible and do not change the DNA sequence, but they can change the way the body reads the DNA sequence (CDC, 2022). Environmental factors have also been found to affect gene expression, but do not change the basic DNA transcript. Epigenetics links environmental and genetic influences on the traits and characteristics of individuals and demonstrates that a wide range of environmental, nutritional, behavioural, and medical experiences can have

⁴ The transmission of genetic information from both parents to offspring is accompanied by additional epigenetic marks or stable heritable information that cannot be explained by variations in the DNA sequence. Continuing advances in molecular methods are making it possible to study more precisely the dynamic changes in histone composition and DNA methylation patterns that accompany development and, in particular, how these changes can occur in an individual's germline and be passed on to the next generation (Xavier, Roman, Aitken and Nixon, 2019). Following the tragic events of 11 September 2001, it was found that the effects of stress on a group of women who were pregnant at or near the World Trade Centre at the time could be transmitted from one generation to the next: their offspring were found to have lower levels of cortisol in their saliva at the age of one year, similar to the previously observed lower levels of cortisol in the children of Holocaust survivors (Yehuda and Seckl, 2011).

a significant impact on the future development and health of an individual and his or her offspring – which is currently unprotected.⁵ So, while DNA does not change, a person's gene expression can change with environmental influences. Epigenetics is a reflexion of an individual's DNA, the switching on and off of genes. Gene testing provides insight into a person's possible predispositions, but in this way, we still do not know how a specific environment has influenced gene expression until they are further examined from the perspective of epigenetics as changes in gene expression (where the actual DNA sequence is not changed). At the heart of epigenetics "is the simple but controversial idea that genes have a 'memory'. Your grandparents' lives, the air they breathed, the food they ate, even the things they saw, can have a direct impact on you decades later, even if you never experienced it yourself. And that what you do in your life can affect your grandchildren" (BBC, 2014). With a normal genetic result, the risk of a trait or disease may be quite average, but when epigenetic results are added to the DNA results, we get more in-depth information about the gene's capabilities at that moment in time. If health, dietary, behavioural, in short environmental, i.e., external, influences affect not only the expression of personal genes, but are also passed on to the next generation, epigenetics, as a field of molecular biology, poses new challenges to the legal understanding of what is just, what is right, be it individual health or transgenerational justice.

II. The Importance of Epigenetics for Understanding Law

Epigenetics can also influence the development or understanding of the law: changes in genetic profiles can affect a person's actions and thoughts, which can affect the way cases are handled: epigenetic changes can increase the risk of certain types of deviant behaviour, decisions about child custody or the development of a child and his abilities, decisions about treatment or the effectiveness of certain treatments, decisions about patenting and copyright, or the development and use of certain technologies and therapies. The epigenome is sensitive and responsive to environmental influences, including exposure to toxic substances, dietary factors, and behavioural influences. An important aspect of epigenetic changes is that they are permanent, spread, and can be transmitted from one generation to the next. Charles Dupras, Katie Michelle Saulnier, and Yann Joly

⁵ The Republic of Slovenia has ratified the Convention for the Protection of Human Rights and Dignity of the Human Being with regard to the Application of Biology and Medicine (Convention on Human Rights in relation to Biomedicine) and the Additional Protocol on the Prohibition of the Cloning of Human Beings to the Convention (Official Gazette of the Republic of Slovenia – International Treaties, No 17/98), under which, inter alia, any form of discrimination or disadvantage to an individual on the basis of his or her genetic inheritance, or genome, is prohibited. The question is whether this also applies to the epigenome. Dupras and others point to the gaps and shortcomings of the current human rights declarations focusing on genes, in the light of recent developments in the field of epigenetics. These documents do not provide guidance on the responsible management of epigenetic data (e.g. privacy protection) and the ethical use of individual epigenetic information (e.g. non-discrimination). This is particularly worrying in view of the recent interest shown by insurance companies, forensic scientists, and immigration agencies in the use of epigenetic watch technologies. Epigenetics findings could contribute to the promotion of second- and third-generation human rights, i.e. economic, social, cultural and solidarity rights, by calling on international bioethics and human rights organisations to pay more attention to epigenetics and other post-genomic sciences in the coming years (Dupras, Joly and Rial-Sebbag, 2020).

included 118 peer-reviewed articles, commentaries and editorials published in English academic journals between 2000 and 2017 that had more than 10 citations in the Google Scholar database. On this basis, nine areas of debate were identified at the interface of epigenetics, ethics, law and society: the traditional nature-nurture dichotomy; the embodiment or “biologisation” of the social; public health and other preventive strategies; reproduction, parenting, and the family; political theory (e.g. conceptual analyses of theories of accountability and justice); judicial procedures (e.g. implications for criminal law); the risk of stigmatisation, discrimination or eugenics; privacy protection and knowledge translation (including discourse analyses) (Dupras, Saulnier and Joly, 2019).

Personalised medicine, enabled by pharmacogenomics, molecular imaging, and other molecular biomarkers, promises to optimise treatment while reducing side effects. It also has the potential to dramatically impact the legal system in ways that we are only beginning to understand well. Personalised justice complements personalised medicine and the overlapping practice of translational medicine, which considers that individual differences are primarily due to genetic and environmental factors. Just as molecular DNA fingerprinting for identity verification is already well accepted, future legal applications could include molecular imaging and analysis – genomic, proteomic, metabolomic and epigenetic. The American Academy of Forensic Sciences supports the 13 recommendations of the National Academy of Sciences and the following principles: the need for a strong scientific foundation, accreditation of laboratories, certification of technicians, standardisation of terminology, ethical protocols, government oversight, and education of legal professionals, including judges, in forensic scientific methods and principles (Wong et al., 2010).

Pain, suffering, anguish, and other personal experiences have always been fundamental to civil and criminal law. Despite their importance, we still have limited possibilities to measure experiences, even though, as said, legal proceedings take place on these bases every day. Fortunately, technological advances in neuroscience are improving our ability to measure experiences, and this will be even more pronounced in the so-called experiential future. New technologies will reveal to a greater extent people’s experiences (such as assessments of physical pain, emotional distress, and various psychiatric disorders), which will certainly also be subject to legal protection or consideration (Kolber, 2010). Toxic chemicals, air pollutants, pesticides, diesel exhaust, tobacco smoke and other harmful exposures are not randomly distributed across society exposure is often linked to poverty, discriminatory land use and substandard living and working conditions (Jirtle and Skinner, 2007). If such events can act like the switches mentioned above, switching our genes on and off, creating a “memory” in our DNA, then such events can be passed on from generation to generation. Genes and the environment are thus not mutually exclusive, but inextricably intertwined and influence each other.

Epigenetics could also be of interest for the health of individuals (testing [like genetic testing] to see if people have epigenetic changes due to environmental exposures) and the related protection of personal health data, which insurance companies and employers may also wish to have. People who are more likely to be exposed to hazardous substances (e.g., poorer, minority populations, migrants) are less likely to have regular, timely and

comprehensive access to healthcare (Hadley, 2003). For example, if epigenetic testing proves that a person is actually an adult, even though chronologically still a minor, it raises the question of his or her majority, guardianship and responsibility for his or her actions, if an employee has been exposed to dangerous radiation in the workplace for e.g. five years, but the testing proves that the person has actually aged by fifteen years, if the person has been employed in a particular workplace for e.g. five years, if the employee has been exposed to hazardous radiation in the workplace for e.g. ten years, if a person has experienced a traumatic event that may have a lasting effect on his or her genetic make-up that is passed on to future generations, if the person has otherwise passed on his or her genetic traits to offspring as a result of the harmful effects, if the reliability of witness statements and the truthfulness of confessions can be assessed – how to answer on the questions of tort and other forms of liability? With increasing evidence that dysregulation of epigenetics in addition to genetics is also involved in the pathogenesis of psychiatric disorders (Peedicayil, 2023), how could e.g., legal intent be understood? The role of external elements or experiences in adjusting behaviour is well-known, but can they be transmitted even to future generations?

The epigenetic way of thinking brings also to the fore intergenerational solidarity, which requires considering the often-conflicting interests of the present generation at the expense of future generations. Any current generation – through design or negligence in allowing dangerous exposures – that alters the biological heritage of its successors has in an important way “pre-determined” the lives of future generations. The present generation will weaken future generations, limit their options, and require them to pay with their health or lives for the environmental mistakes of their predecessors (Rothstein, Cai and Marchant, 2009). If testing can be done, it will be possible to find out who, in what way, how, through what form of exposure, foods, drugs or other substances, has affected and thus worsened the epigenetic signature of an individual (possibly for future generations, in terms of increasing the likelihood of cancer or other diseases), the question of liability for damages, or the establishment of a causal link between the act and the damage (which has so far been based mainly on visible damage to tissues and cells when bodies are concerned, and only on other “invisible” genetic damage once it has become visible), will be completely reopened. Epigenetics can therefore clearly influence the way we view and deal with diverse social practices. Epigenetics focuses on the practices through which epigenetic material is modified and passed on to people and their successors. Although health data, or more likely the future health status of individuals, environmental, intergenerational justice, poverty, deprivation, equity of access to health care, and new forms of justice for harms in the epigenetic record are likely to take on greater importance in future legal practice as a result of the understanding and impact of epigenetics, this paper focusses primarily on some of the initial new-old perspectives on understanding the law.

III. Resetting Law

Developing a way to restart (like a computer reset) a backup copy of epigenetic instructions, which inserts/deletes damaged signals and thus causes cell ageing/rejuvenation, raises more questions than it can answer at this stage. Despite the strong emphasis on intergenerational solidarity, equity and personal health conditions and experiences, epigenetics also provides an interesting perspective for the understanding and functioning of public administration, legal and other disciplines: if it is a matter of having, in fact, built-in repair mechanisms, of continuously detecting and correcting, as much as possible, “treating mutations” as the results of methylation added to DNA results, through which we get more detailed information about the gene’s fitness at a given moment in time (Toolbox Genimics, 2023) we could also look at violations, deviations, unintended and harmful consequences, by means of a basic idea, reason, purpose, provision or fundamental rule by which we should act at all times. Epigenetics adds a new idea to genes alongside DNA: we can imagine it as a control system of switches that switch our genes on and off (as an essential factor in ageing and vice versa, as shown by conception), as a kind of relay switch that, when an input quantity is changed, causes the output to change. Epigenetics is based on the idea that things that people experience (diet, stress, work, exercise, etc.) can control these switches and cause heritable effects in humans. Experiments have shown transgenerational effects of the male line on health and development resulting from paternal or ancestral exposures early in life, such as diet or stress. There are transgenerational (male line) effects that cannot simply be attributed to cultural and/or genetic inheritance (Pembrey, Saffery and Bygren, 2014).

In law, similar switches can be imagined as fundamental legal provisions that have a binary “if – then” mode of operation. In the light of epigenetic reprogramming, the main factors in the lowering of the level of the rule of law are thus not violations per se, but “systemic concessions” that do not detect (but should) these violations or allow them to occur in the first place, and that do not correct or return the system to its original state. Such behaviour can result in a loss of the meaning of the basic instructions, which over time (due to the breaches) weakens, in terms of lower awareness or attention. A typical example of lower awareness is, e.g. a loss of awareness of the importance of the key instructions or guiding ideas that the rule of law needs for its initial and every subsequent action (the saying “he who does not know the history is condemned to repeat it” is a case in point), be it the Constitution or the Ten Commandments. Just as ageing is thought to be caused by a lack of information (which is lost in cells, not just by the accumulation of damage), so it could be in public systems. Terry McCaleb says in one of the dialogues in the film *Blood Work* (2002) that “if you can’t protect the integrity of the system, then there is no system at all”. Typical examples are strategies, laws, or other rules that are enacted for their own sake rather than for the sake of objectives they seek to achieve, or laws that at some point cease to achieve objectives for which they were enacted in the first place. After a time has passed, a new decision is taken again, where decision-makers are/will be “the best” again; a decision is solemnly announced because “we are transparent after all”, and then it is forgotten about, until it expires, or even longer. Typical are also strategies that contain indicators

and deadlines without containing all the elements, or without the right order (objectives → principles → indicators → criteria → verifier) written in the text itself and understood in the context of time and place, rather than the legislator, other decision-maker, or other conditions at the time, historically or at each point in time. The principle of interpretation should also be understood in this light: words in their full context mean what they convey to reasonable people at the time they were written with the understanding that generic terms may include later technological innovations, without time loops to check the situation, to react to changes in real time and space in relation to the desired situation, and without reporting. It is about constantly being aware that, in the face of deviations, we always have the right objectives in sight and the appropriate means to achieve them; it is about resetting to the initial situation, about reconciliation, about the desired, original situation, and about understanding the legal provisions through the fundamental principles that are still fundamental, regardless of changes in the environment. Thus, the “action plans” should also give different units, services, or rules (as basic cells) different instructions on which units of regulation or rules of conduct (as “legal genes”) to apply and which to discontinue in the face of perceived deviations, according to the basic idea and the context of the environment. This kind of action plan can be understood as a kind of “control centre”, not necessarily a hierarchical apex (like the centre of government or like an air traffic control tower), but as any mode of operation that is capable of controlling, through switching between different modes of behaviour and connections, that the units and their processes are constantly running according to plan, or at least in the desired, predetermined direction. Epigenetics in the sense of understanding the law continually brings us back to the starting point, e.g., understanding what the rule of law is supposed to be (e.g. “Slovenia is a legal and social state”), and answering this question, largely regardless of what case law has said about it in the meantime. Each case in question is a contextually complete case, which in its individual characteristics can answer what is (wrong) right about it (close to this is the application of the principle of proportionality each time, applied according to the context of the case in question and the specific legal provision in question).

IV. Epinomoetics as a Way of Interpreting Legal Provisions

The term “epinomoetics” is here presented as a compound of the words epigenetics and the Greek word *nomos* for law or custom (the letters “nomo” replace the letters “gene”). The end of the term is represented by the word “ethics”, which comes to be understood as the word ordered to understand what is right from the beginning, from the essence of the individual onwards, towards society, towards morality. In this perspective, the *textual interpretation* (as the method of reading law) appears to be the correct one, before the purposive or teleological, historical, systemic, and other interpretations of the legal text. It is Aristotle’s idea of the rule of laws rather than of men: “it is preferable [...] to be ruled by the law rather than by some individual among the citizens; and although it would be preferable to be ruled by men, it is for the same reason that they should be made the guardians and servants of the laws” (Aristotel, 2010, p. 339). If we want to eliminate as far as possible the subjectivity of decision-makers who “climb the ladder of abstraction”

(Scalia and Garner, 2012) – the true will, purpose or spirit of the law must be sought,⁶ written in the text itself and understood in the context of time and place, rather than the legislator, other decision-maker or other conditions at the time, historically, or at each point in time. The principle of interpretation should also be understood in this light: “words in their full context mean what they convey to reasonable people at the time they were written with the understanding that generic terms may include later technological innovations” (Scalia and Garner, 2012, p. 16). Textualism, unlike originalism which focusses on the original intention of the legislator and the original meaning of the text, is a theory in which the interpretation of the law is based primarily on the ordinary, everyday meaning of the legal text; non-textual sources such as the intention of the law when it was passed, the problem it was intended to remedy, the consequences or other relevant issues relating to the fairness or correctness of the “living” law (i.e., what the legislator would have said if the law had been passed today), are ignored due to the excessive subjectivity of the interpretation. If later, in the implementation of the law, gaps arise which cannot be filled by the established methods (better: the tangential method) of interpretation, the law is thus amended, supplemented, rather than seeking an interpretation drawn from “heaven or earth”. These are the so-called unconstitutional legal gaps that our Constitutional Court has referred to in several of its decisions. Epinomoetics is the understanding of law as something that is outside, but at the same time is always understood from its *beginning*; in this sense, the European system of jurisprudence, which bases its decisions on a legal norm, appears more correct than the Anglo-Saxon system of precedents, which creates case law in time, but unlike European practice, is applied from the time of the case law in question or the precedent decision to all decisions from then on (regardless of the fact that the basic, legal rule is always the same).

Epinomoetically understood, the beginning does not mean a historical abstraction, but the concrete beginning of the formal validity of a rule as a text, from a certain date onwards; from this moment onwards, we “think of the law”, we understand it as said, through a text created at a certain historical moment, adapted to a common understanding, by people who are normally, normally, intellectually sophisticated, educated in the practice of life, who know what is good. This is the beginning of the formal validity of a rule as a text, from a certain date onwards. Aristotelian practical wisdom thus still and always fills in the legal gaps, not according to previous decisions, but according to the fundamental provisions (ethical virtues) applied as the true measure in the concrete circumstances of the case between too much and too little. Aristotle understood ethics as a virtue of personal character (Greek *ēthikē*) (Aristotle, 2004) and politics as a virtue of the community as a whole; in this light, we could understand the unchanged fundamental legal principles as the epinomopolitics of the community, through which we mean the circumstances of each specific decision. While such an understanding is at first sight like Nietzsche’s “eternal

⁶ Montesquieu (Montesquieu, 2004) speaks about the spirit of laws, defining them not as commands to be obeyed but as “necessary relations arising from the nature of things”; this definition applies to human laws, where the nature of things is defined by cultural elements (tradition, religion, etc.). Thus, although sociology had not yet been defined in his time, he set out to study political customs, which Emile Durkheim, a century later, described as a sociological study.

return”, which defines existence as infinitely recurring cycles of good and bad, or of all the behaviours that man has done (and will do again and again, according to Nietzsche), an epigenetic understanding of the eternal return only includes an ideal image of good behaviour.

V. Epigenetic Understanding of Organisations

The genetic/epigenetic view of basic rules/and their changes due to changes in the environment can also be understood in organisational terms of systems, complexity, and cybernetics. For the field of organisations, here come systems theory, complexity theory (as complex adaptive organisations) and cybernetics as “ordered”: the former focuses on the structure of systems and their models, the latter on emergent changes during action (such as self-organisation, complexity, emergence, interdependence, space of possibilities, co-evolution, chaos and self-similarity), and the latter on the controlling action of systems towards achieving desired goals. A system is “a collection of things, units or people that relate to each other in certain ways, are organised, i.e. follow certain rules of interaction, and have a certain common purpose, i.e. strive towards a certain state of equilibrium” (Daellenbach, 1996, p. 5). In this sense, DNA is also a system; the epigenetic view of the basic, “intact” DNA strand can also be understood in terms of systems, i.e. that information is not (in)correct per se, but can become so in the course of its collection, or that the accuracy of its prediction depends on the model of information collection set out.⁷ Systems theory is thus fundamentally about setting criteria, or the principle of legal clarity and certainty. A system is not a thing but a list of selected criteria (Ashby, 1957), against which we judge the same system. This “system reprogramming” allows the organisation to continuously reflect the energetic, successful, and efficient achievement of its desired goals, regardless of any failures in doing so, because in repeated activities it does not start from the failures, but continuously follows the basic, desired goals and the practises that lead to them.

Systems, as connected parts or their relationships, combinations, reflect complexity (lat. *complexus*, “encompassing, all-embracing”). It is a characteristic of the many interactions of a system that they give rise to twisted or *wicked*) consequences, which are characterised by uncertainty, complexity, exponentiality, multiple values, self-organisation, emergence, interdependent processes, structures, and actors, and require continuous adaptation throughout the policy/implementation cycle all of which apply to complex problems. Based on the principle of required diversity, decision-makers could only address complex problems in the context of uncertain and complex challenges (whose scale and nature exceed existing inefficient methods in the presence of despicable problems with only a similar degree of complexity) with the same degree of required diversity (Ashby, 1957).

⁷ For administrative law science, such a starting point means that we cannot build public law systems and their decisions only on the basis of the data we have, because only the system of placing detectors/sensors/criteria and detecting the data (similarly to the way that the installation of sensors in an airplane only allows it to fly properly or to react to its surroundings in a timely manner) makes it possible to draw conclusions about the (in)appropriateness of a particular regulation. It is not a question of making the best decisions based on the actual situation, but rather of designing a reality detection system in such a way that it can detect data from which recurring patterns of behaviour can be identified.

In the context of genetics, it could be said that even this ideal rule for solving complexity leads to “mutations” in practise, so we could also speak of a “rebooting” of the basic rules. A cybernetic understanding of management can provide an answer to detecting, detecting, and correcting errors, “mutations”. One of the most well-known definitions of cybernetics is that it is about “control and communication in animals and machines” (Wiener, 1961). Cybernetics addresses concepts that are key to understanding complex systems such as learning, cognition, adaptation, emergence, communication, and efficiency. Cybernetics deals with circular cause-and-effect processes (in ecological, technological, biological, cognitive, social, and other systems) in the context of practical activities such as planning, learning, management, etc. From the perspective of an epigenetic understanding of organisations, where the latter are influenced by changes in the environment, it is possible to trace the basic idea of the organisation and its desired outcomes, through strategy documents and more operational action plans.

VI. How to Restart Law

The ability to induce cells to become pluripotent (lat. *pluripotentia*, “capacity for many things”) condition was first demonstrated in 2006 using mouse fibroblasts (i.e., biological incised tissues) and four transcription factors (i.e., sequence-specific DNA sequence): Oct4, Sox2, Klf4 and c-Myc; Shinya Yamanaka and John Gurdon won the Nobel Prize in Physiology for this technique, called reprogramming. Young, Sincclair et al. introduced three of these genes into prematurely aged mice using age reversal therapy – Oct4, Sox2 and Klf4, which they have collectively called OSK. Their organs and tissues regained their youthfulness (Elder, 2023). The relaunch was a gene therapy involving three genes that instruct cells to reprogram themselves. If, in the case of epigenetic rejuvenation of mice, the restart was a gene therapy involving three genes instructing cells to reprogramme themselves, one might ask what the legal elements instructing reprogramming might be for an understanding of the law at its most fundamental basis.

Certainly the most famous of the Ten Commandments come to mind, the eight (*desiderata*) formal principles of Lon Fuller’s “internal morality of law”: generality, publicity, rules that apply in advance, intelligibility, consistency, enforceability, stability and coherence of rules (Fuller, 1969, p. 39) and all the other regulatory techniques that “mimic” the human being itself and its fundamental quality of perceiving and responding or adapting to change, such as experimental laws, adaptive norms, suspensive clauses, collective wisdom, participation, cooperation, in short, all the elements that make us human. The epigenetic outside/above view of the fundamental objectives puts popular participation in the management of public affairs, participation, co-creation, and other forms of interaction between decision-makers and the people (information, role definition, cooperation, transparency, openness, accountability and efficiency) in a new light: it is not a question of working or thinking from a certain point onwards, but of “thinking” from the starting point of a provision written down, when a certain situation demanded its record in the first place.

VII. Conclusion

What people do affects not only them but also the health of their children and even their grandchildren for decades to come. What others do also affect others and their descendants. Epigenetics is an important area that will increasingly influence the legal system and its decisions in the years to come. If ageing is the result of the loss of the essential instructions that cells need to continue to function, the erosion of the legal order can similarly be understood as the loss of the basic instructions, the fundamental ideas on which it was founded in the first place. This paper pointed on the importance of epigenetics for understanding and/or reflection on law from a biological perspective, on resetting law based on the new notion of epimonoetics as a way of interpretation of legal provisions, and on epigenetic understanding of organisations. To reset the law (or put on hold many layers of interpretation that were put on an original provision), one must think on it from the starting point of a legal provision when it has been written down *vis-à-vis* current position. It is a search for the fundamental values and rules through which law, like the proverbial phoenix, rises again and again from the ashes and regains its identity. For the Republic of Slovenia, these rules, which do not even have a formal status, can be united by the Preamble to the Constitution of the Republic of Slovenia (based on the Fundamental Constitutional Charter of the Independence and Independence of the Republic of Slovenia, the fundamental human rights and freedoms, the fundamental and permanent right of the Slovenian nation to self-determination, and from the historical fact that Slovenians have forged their national identity and asserted their statehood during the centuries-long struggle for national liberation), or the chapter of the Constitution on fundamental human rights and freedoms, weighed against each other and against the public interest, or the wider community of citizens.

An information theory of the erosion of law (if it existed) would thus be based on the finding that the loss of information from the environment is a reversible and restorative cause, leading to a restored, correct structure. In the context of legal science, evidence-based, or as objective and evidence-based as possible, fact-finding comes to mind as the source of the real factual situation to which the legal norm is applied. There is often a misconception that new legal norms need to be adopted, whereas in many cases existing ones are simply inactive, inapplicable and only need to be reactivated by a reboot (a typical example of a “Sleeping Beauty” is Article 106 of the Treaty on the Functioning of the European Union, which was already present in the 1957 Treaty of Rome but became applicable at the beginning of the 1990s). This is also a different way of thinking about law: when there are existing problems, new rules do not always need to be changed or adopted, but existing ones simply need to be enforced through reflection on the Constitution and the fundamental constitutional legal principles, or the latter laid down in the relevant law itself. The Romans would have said *acta non verba*: deeds, not words.

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