# LAW IN THE BIOSPHERE: CHALLENGES TO LEGAL PRACTICE IN THE 21ST CENTURY

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## Introduction

If the title of this essay appears to be more like science fiction than everyday fact, then we have a problem, for, even if we are slow in coming to recognize or accept it, the site of law, here and now, more and more, is the biosphere. In what follows, I wish to explain what it means for the law to reside in the biosphere, in terms of both the fundamental meaning of legal notions as well as the ordinary, everyday practice of law. This explanation will take a little time and require some reflection on 'extra-legal' matters, for the situation of law in the biosphere is thoroughly new and, as such, thoroughly challenging.

From a traditional perspective, the normative space of the law is constituted or formed by relations between persons. Thomas Hobbes' early formulation of social contract theory, still influential in conceptions of the nature of law today, makes the obliging aspect of positive law reside in a relation of promise among a collectivity of human beings.[1] The ground of positive law is found, even for the materialist and allegedly atheist Hobbes, in the natural law of divine reason, as persons are promising animals by way of our divine reasoning ability. Immanuel Kant is even clearer on the normative space of law: the rational understanding of obligation is possible only for persons, and persons exist in a realm other than the natural world of creatures (i.e., in the *noumenal* realm of ends-in-themselves and not the phenomenal, causal, spatio-temporal world). In short, for the major philosophical justifications of positive law, reason serves as both the ground of the force of law and a description of the space within which law is located; reason is the extra-natural site for relations between persons in terms of law, and usually also for ethics. It is this claim, apparently self-evident to generations of philosophers, lawyers, and citizens, that is challenged by situating law in the biosphere.

The biosphere is the relatively thin stratum of the globe which supports life, stretching from deep sea thermal vents approximately 10,000 meters below sea-level

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[1] T. Hobbes, *Leviathan* (Cambridge: Cambridge University Press, 1991).

to the insects and microorganisms living in the atmosphere just above the earth's highest mountain peaks, approximately 10,000 meters above sea-level.[2] This band of life is relatively thin in global terms, constituting approximately .1% of the planet's thickness. If we are interested in demarcating the area within which life is *commonly* found or reproduced our band contracts dramatically, from a matter of a dozen miles or so to a matter of dozens of meters.[3]

From one perspective, of course, the law must and has always resided in the biosphere as law, and at least positive law is a human construct. Something more, however, might fall under the situation of law in the biosphere. Firstly, this view may contradict grounding law in something transcendent to the biosphere; namely, a divine law or reason. Secondly, what may be at stake is a redrawing of the normative space of law, i.e., the terrain of reasons relevant to the licit or illicit character of an activity.

Locating law in the biosphere may be explained in simple geographic terms as a claim concerning the site in which persons creative of and obliged by law reside. The location of law may also be understood by way of the terms or variables connected by the normative force of law. To conceive of the terms of law as located in the biosphere brings the interpretation of the normative space of law together with the question of the law's ground, immanent or transcendent. Accordingly, to conceive of the terms of law as located in the biosphere opens the question of what may be brought under the law, or of who or what may be subject to, and a subject of, the law.

**Law as a Profession among Professions**

I have outlined above what some might take as an outlandish account of the place of law today. To remove some suspicion from my location of law in the biosphere, let me begin another way; by thinking of law as a contemporary profession among professions, and of legal practice by analogy to the activities, rights, and responsibilities of physicians, psychiatrists, social workers, professors, and other professionals. The now overwhelming body of literature on professional ethics may be less useful for our purposes here than a few historical notes. Ivan Illich focused his work on the consequences of the social ascendancy of the professional classes

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[2] C.H. Southwick, *Global Ecology in Human Perspective* (New York: Oxford University Press, 1996) at 22.

[3] *Ibid.*

in this century. In *Limits to Medicine,* Illich criticizes the medical profession for doing the opposite of what it claims to do, and explains this ironic or tragic situation by appeal to the professional interests and regulations that govern medical practice.[4] In other words, while medicine is touted as the key to improving health, the very mechanisms of professionalized medicine lead to a decline in health. The claims on behalf of medicine in the 19th and 20th centuries are overrated, according to Illich, and praise for progress in health should be given instead to the social and municipal reform efforts that anticipated medical discoveries. Furthermore, the development of a professional cadre of health workers has the deleterious effects of removing responsibility for health from the individual and creating the illusion that specialized care is a more important factor in health than one's general environment. Such negative consequences are not a necessary result of either the science or technology of medicine but are related to the extension of necessarily accredited and purportedly expert activity to more and more realms of everyday life.

Illich has generalized this thesis to cover all modern professional categories, including, among others, social work, teaching, and engineering. Michel Foucault's work is similar in emphasis and approach, and Illich has noted this confluence of thought. In *Discipline and Punish*, Foucault provides an analysis of the criminal justice system and argues that the ideology of modernity does not fit well with our professional practices. Specifically, he holds that the belief in citizens as free and rational individuals is in tension with the criminal justice system and other analogous social institutions, each of which is the result of a homologous development from military forms of life as the barracks provide the experimental laboratory, so to speak, for other disciplinary social institutions, including the prison.[5] In short, our professional codes and institutional practices contrast with our everyday beliefs about who and what we are.

Our failure or lack of will in understanding our professional practice is shown in law, according to Foucault, by the masking of judgment and punishment with the concepts of knowledge and correction. On this theory, contemporary courts are more interested in gathering knowledge than passing judgment. Consequently, persons are more the subject of claims about being or not being a certain thing than they are praised or blamed; the implied *corrections* to personal characters take the place of punishment. Foucault characterizes this contemporary development as an

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[4] I. Illich, *Limits to Medicine* (London: Marion & Boyars, 1976).

[5] M. Foucault, *Discipline and Punish: the Birth of the Prison*, Trans. A. Sheridan, (New York: Vintage Press, 1979). Orig. French *Surveiller et Punir: Naissance de la prison*, (Paris: Gallimard, 1975) at 22.

incursion of the extra-legal into the legal:

> [E]ver since the new penal system - that defined by the great codes of the eighteenth and nineteenth centuries - has been in operation, a general process has led judges to judge something other than crimes; they have been led in their sentences to do some-thing other than judge; and the power of judging has been transferred, in part, to other authorities than the judges of the offence. The whole penal operation has taken on extra-juridical elements and personnel. It will be said that there is nothing extraordinary in this, that it is part of the destiny of the law to absorb little by little elements that are alien to it. But what is odd about modern criminal justice is that, although it has taken on so many extra-juridical elements, it has done so not in order to be able to define them juridically and gradually to integrate them into the actual power to punish: on the contrary, it has done so in order to make them function within the penal operation as non-juridical elements; in order to stop this operation being simply a legal punishment; in order to exculpate the judge from being purely and simply he who punishes.[6]

Foucault continues by putting words into the mouth of a hypothetical, though purportedly typical, judge; the judge's words indicate the confusion of law with medicine with which Foucault is explicitly concerned and which is emblematic of the contemporary professional status of law:

> 'Of course, we pass sentence, but this sentence is not in direct relation to the crime. It is quite clear that for us it functions as a way of treating a criminal. We punish, but this is a way of saying that we wish to obtain a cure.' Today, criminal justice functions and justifies itself only by this perpetual reference to something other than itself, by this unceasing reinscription in non-juridical systems. Its fate is to be redefined by knowledge.[7]

Medicine, especially psychiatry, is the mode of knowledge and corresponding professional class of most concern as it has a strong hold over concepts and practices related to cures and corrections. Psychiatry, bridging physical science, psychology, and sociology, epitomizes the rise of the scientific-based professions against which law is more and more defined, and, perhaps, more and more confined rather than refined.

Is Foucault right? How would we determine if he is? Measuring the incursion of the extra-legal into the legal would be one test; in terms of the content of legal argument and the types of persons involved in legal decisions. But we would also have to determine whether this is a 'normal' extension of the law to previously

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[6] *Supra* note 5.

[7] *Ibid.*

non-legal spheres or a substitution of the law by other discourses. Such a test is more difficult, but equally or even more necessary. How, for example, does the testimony of expert forensic psychiatrists alter the decisions of juries and judges? That such evidence occasions major revisions in judgments may be supported by looking at common phrases concerning contemporary scientific innovations. A recent volume published by the American Psychological Association, for example, shows off one set of professionals alongside another, lawyers, both in a (mad) scramble to figure out what to do in terms of their expert beliefs given another set of phrases from other professionals, namely, genetic and genomic scientists, to the effect that criminal behaviour may be significantly biological in origin.

On various fronts, the legal profession is engaged in disputes with specialized professionals of other designations about what is or is not known. The interesting questions in law are, or are becoming, extra-legal, or, more specifically, scientific inquiries which replace legal judgment rather than form another arena for judgment. In principle, any of the other professions may be able to usurp the status of the legal and inscribe its own categories in place of the law, but the professions that seem to be doing this are within the social and natural sciences (and today more so the latter than the former). If this is the case, we have reentered the biosphere through a discussion of professional life; for it is the questions of the nature of biological life that are filling our legal time: DNA evidence in criminal trials, patent applications on cell lines, disclosure obligations for genetically modified foods, global warming estimates, and prognostics for ecological change to name a few.[8]

In what follows, I consider genetic and genomic engineering as illustrative of some of the challenges the biosciences will pose to the law. The analysis is in no way complete. The intent, rather, is to sketch the range of problems that this important area of biological science introduces to the legal, ethical, social, and cultural forms of life in which we live. Similar problems for normative systems lie elsewhere in biology, biochemistry, climatology, meteorology, and earth science in general. The case of genetics is particularly apt, given the well-established significance of DNA testing in criminal law and, what shall be the focus of the balance of this piece, the great interest, both scholarly and monetary, in the prospects of patents or property in gene sequences, techniques related to gene sequencing, and the biological forms produced by genetic engineering.

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[8] If Illich is right about the environmental determinants of health, medical practice should consider the biosphere, and not the laboratory or clinic, as the space of health.

**Contracts and the Construction of Life**

Genetic engineering and other forms of biotechnology are well hyped. The grandiose claims associated with related scientific and business practices have also, however, been subject to continuous and informed criticism, such that two opposing bodies of well-received opinion have simultaneously developed. First is the view that pharmaceuticals developed in line with genomic sequencing and other biotechnological products will entirely revolutionize the world and human health. The second is that the importance of genetics is rather minimal when it comes to major human diseases and illnesses such that the hype is just that, though with significant economic and institutional consequences, especially in health care and natural science.

Part of the allure of genetic explanations of disease is their simplicity. While multifactorial analyses of disease are becoming widely accepted, the reduction of disease to one of its contributing components grabs the popular imagination. These two movements in understanding health overlap to some extent, but different members of the medical community are attached to one strand or the other. The reductive picture is useful for providing simple explanations, justifying exclusive pharmaceutical treatments, and strengthening the social force of the medical and natural scientific research community. The simple theory is likely to hold even more sway in non-medical spheres, such as the legal practice, where there is normally less understanding and patience for working through the complexities of an 'extra-legal' issue:

> The strong contemporary bias in public discourse today towards the simplification of the genetics of disease - a bias reflected in a steady flow of headlines about the discovery of an ever greater number of genes causally linked to an ever greater number of diseases, with explanations about the complexity and uncertainties of causation confined to the fine print if included in print at all - could find its cultural mate in an ethics *cum* politics for simplification, a simplification that would base restrictive and possibly coercive policies on inadequately understood genotypes alone.[9]

The fervor concerning genomics and health illustrates a major feature of the account of law and the biosphere affirmed in this essay: the biosphere is an ecological notion, akin to and equally as complex as the idea of ecosystem. Reductive, simplifying explanations are seductive in the ease of their imperatives

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[9] D. Roy, et al "Ethics for Complexity" in B.M. Knoppers, (ed) *Human DNA: Law and Policy.* (The Hague: Kluwer Law International, 1997) at 198-9.

and, more insidiously, in the ease with which their imperatives may be commodified.

The notion of the biosphere is central, according to this analysis, because it requires a global or total point of view in the analysis of life. The complexity of the conditions of the biosphere in an age where life is itself the product of laboratory invention is vast indeed. If these claims seem other worldly or irrelevant to practical life, a look at the issue of patents related to biological life forms should remove such doubts. Such patents are an integral feature of the medical revolution linked to genetic and genomic science.

Once one delves into the patenting issue, the nature of fundamental questions about the definition of life and the environment in which living beings reside loses the appearance of what might be taken as irrelevant or impractical philosophy and takes on the character of an everyday issue in contemporary life. The practice of providing patents (exclusive rights for the commercial use of a particular product for a particular duration) raises, in an age of life-production, the question of appropriate and inappropriate 'objects' for licencing. The criteria for patents differ from country to country, as Canadian practice does from American, though there are major similarities. The patent must be for a human innovation: "any new and useful art, process, machine, manufacture or composition of matter, or any new and useful improvement in any art, process, machine, manufacture or composition of matter."[10]

Patents related to forms of life are particularly sensitive and confusing. While patents in natural forms of life are prohibited, forms of life that are the product of human innovation, or the processes leading to such forms of life, and perhaps the environment necessary for the preservation of such forms of life (laboratory micro-ecological niches) are patentable. As we shall see, the distinction between a natural form of life and a product of innovation is more and more difficult to sustain, especially as the natural environment itself, the biosphere, takes on the character of a laboratory.

Consider the following account, by a prominent Canadian cultural anthropologist, of the issues involved in patents of microorganisms:

> Incidents such as the patenting of a virus found in the blood of certain Hagahai individuals reverberate around the world causing consternation and resentment. ... Neither isolated cells nor the techniques by themselves could qualify for patenting, but only the hybrid, the DNA sequence, a product of cultural incursions into nature.

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[10] *Canadian Patent Act*, R.S.C. 1985, c. P-4, s.2.

> Once the DNA is reproduced in the laboratory the original item, the cells to which an individual could lay claim as coming directly from their body, have been transformed into something different, partially artificial and no longer simply human in origin. An added complication arises because in the Hagahai case it was a virus found in the blood sample which was patented, forcing us to pose the question of whether organisms housed in individual bodies belong to the body or not. We are rapidly entering an era where technological incursions into biology urgently require prolonged moral reflection and institutionalized monitoring systems ...[11]

The principles which might help us figure out how to proceed in this terrain are unclear. Opponents of patenting are often criticized for misunderstanding the character of patents[12] and objecting wrongly to ownership in life when the real issue is licensed, exclusive use to techniques or products. While technically such criticisms are coherent, the practical world makes such distinctions less plausible, as the dividing line between nature and culture, between a natural and an invented form of life, is narrowing. From another perspective, the environment in which we live, the biosphere, is becoming less a matter of found or discovered nature and more a managed and controlled product of human activity.

A full examination of the conditions of the biosphere, the relation between nature and technology, between untampered and engineered life, is required; yet it is a dauntingly complex and contentious task. It is precisely because of the difficulty of normative thought in the face of these radical challenges to the constitution of the biosphere that leads some to advocate non-normative, or extra-ethical and extra-legal, solutions. Ryan Iwasaka, in a recent Note in the *Yale Law Journal,* illustrates this contemporary fork very well, as he both calls for the kind of understanding of science and the natural world in which the contracts and licenses we draw are located, and yet avoids a normative solution to the problems raised thereby, in favour of a formalist and scientific explanation.[13] Iwasaka calls for an expert, formal, professionalized involvement of science, in this case evolutionary theory, in the law. Reminiscent of Foucault's warning regarding the substitution of scientific for legal categories, Iwasaka advocates adopting an expert, scientific approach that is supposedly objective and avoids the purportedly subjective normative debate.

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[11] M. Lock, "The Human Genome Diversity Project: A Perspective from Cultural Anthropology" in B.M. Knoppers (ed), *Human DNA: Law and Policy* (The Hague: Kluwer Law International, 1997) at 236.

[12] See, for example, R.W. Marusyk, and A. Athanassiadis, "Patenting of Human Genetic Sequences in Canada" in B.M. Knoppers (ed), *Human DNA: Law and Policy* (The Hague: Kluwer Law International, 1997) 343.

[13] R.M.T. Iwasaka, "From *Chakrabarty* to Chimeras: The Growing Need for Evolutionary Biology in Patent Law" (April 2000) 109:6 Yale L. J. 1505.

Iwasaka's account of recent developments in American patent law provides good empirical evidence of the predominance of scientific patent applications, especially those related to genetic engineering, and the absence of scientific theories and competence in assessing such applications. The current backlog in patent applications indicates a severe problem, accordingly, in terms of the meaning and value of patents.[14] The backlog contains 1900 applications specifically concerning genetically altered animals and "one highly controversial application: a request for a patent on the process by which scientists can create 'chimeras,' hybrid organisms that are part animal and part human.[15] The science-fiction character of the latter should not lull us into dismissing these matters. The creation of new forms of life in biotechnological products is not only real but a massive research and design effort of commodified natural, scientific, and engineering work. At the same time as we are creating an interconnected and vulnerable global environment, we are producing the living organisms that will share our habitat. The artifice required for patenting and profiting from biological life is part and parcel of a research program responsible for the construction of the habitats for such life, the laboratories which constitute the 'natural' confines of the habitable environments for such animals and plants.

The American case law regarding such patents begins in 1980 with *Diamond v. Chakrabarty* in which "the Court ordered the issuance of a patent for a genetically engineered, oil-digesting bacterium - the first patent granted on a nonbotanic living organism."[16] This case is notable specifically because the patent on a bacterium is pursued initially by way of an argument that the bacterium is a plant and not an animal. Although this argument fails, the patent is granted; setting a precedent for the patentability of animals. The classic statement in the American context of patentability in living organisms is found in *Animal Legal Defense Fund v. Quigg*, where the criteria for a patent are determined as human ingenuity applied to non-human, non-naturally occurring product or assemblage of matter.[17]

For Iwasaka, the fact that science, and specifically biotechnology, is so heavily represented in the patents race with no discussion of evolutionary biology is

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[14] *Supra* note 13 at 1507.

[15] *Ibid.*

[16] 447 U.S. 303 (U.S.S.C. 1980); *ibid.* at 1517.

[17] 932 F.2d 920 (Fed. Cir. 1991).

"stunning."[18] As an antidote, Iwasaka "attempts to address the need for clear standards by proposing the introduction of rules and tests based on principles of evolutionary biology."[19] He proposes that "patents be granted only on those non-naturally occurring organisms that exist in some tangible form and that are theoretically favored due to the intervention of, and their utility to, humans.[20] It is not my purpose here to support or refute this specific proposal but, rather, to point to the assumptions upon which it rests. For these presumptions are telling in terms of the methods and structures with which these and other science-based questions will be resolved in the future.

Iwasaka's proposal is instructive in that while it addresses what organisms should be patentable,[21] the sense of this "should" is not moral or ethical;[22] rather, the purport of the argument is that the legal tradition, to some extent, and scientific theory, for the most part, may suffice to fill out the meaning of normative claims. The reason for this is the seemingly irresolvable multiplicity and contentiousness of moral and ethical claims: "[i]nstead of becoming mired in moral and ethical controversy, this Note addresses real and immediate deficiencies in the patent-application process."[23] The implication of this is that normative debates are not real and immediate, nor do they have a chance of solving problems that are.

Iwasaka develops a two-pronged, quantifiable, objective scientific test of patentability: (1) the organism must have "little chance of developing naturally", and (2) "natural selection would actually work against the organism but for the intervention of human interest and technology."[24] Such probability calculations are made against the backdrop of a normal or natural environmental field, but the assumption of such a normal field bears longer scrutiny, even if it is standard within genetic science and notwithstanding Iwasaka's own qualifications about the surprises that natural genetic mutation and environmental variability may bring. The background field, or biosphere, is an important consideration, since part of his proposal is aimed at ensuring that organisms that would occur naturally cannot be

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[18] *Supra* note 13 at 1509.

[19] *Ibid.* at 1508.

[20] *Ibid.* at 1509.

[21] *Ibid.*

[22] *Ibid.* at 1510.

[23] *Ibid.*

[24] *Ibid.* at 1519.

patented.[25] Yet how this done? As he recognizes, factors to be included in analysis/calculation range from the genetic and ecological to the behavioural.[26] However, it is difficult to conceive of what is nature, in terms of a naturally occurring organism, a natural habitat, or a natural rate of selection, in a biosphere that is more and more unnatural.

Iwasaka's two-pronged test will contain "a self-imposed limit on the scope of animal- and plant-patent protection."[27] Why?

> [T]his small step is taken in response to the ethical and moral criticism leveled against plant and animal patents that ... was to be avoided in this Note. ... Simply having defined limits on the scope of a potentially powerful set of rights is, objectively speaking, favorable to a system in which the boundaries are arbitrary. ... [I]t is a statement in favor of formalism in the patent-review process for live organisms.[28]

Such an analysis will replace the *ad hoc* nature of existing decision-making with "quantifiable standards that are consistent with the practices of science and ultimately beneficial to the operation of law;" such standards will form "a more uniform and objective doctrine", entail "processual clarity" and "add formality and legitimacy."[29] Whether they reduce law and ethics to an objective science, and whether such a science is as objective and normatively free as is suggested, are questions that remain.

**A Natural Contract**

I may only, in what follows, outline the reasons for an alternative direction in the face of what is unarguably a great need to consider the impact of science, and specifically, evolutionary biology and genetics, on the law. To accept Iwasaka's proposal is to fall into the tendency to give judgment, legal and ethical, over to science. Such a move is suspect for various reasons. First, the scientific realm may exercise its own form of judgment, and yet such appears to be objective knowledge rather than a normative position. Second, the allegations that normative judgments are arbitrary and subjective may be a way of discrediting the whole enterprise of

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[25] *Supra* note 13 at 1525.

[26] *Ibid.* at 1526.

[27] *Ibid.* at 1520.

[28] *Ibid.* at 1520, fn. 64.

[29] *Ibid.* at 1531-32.

ethical and legal decision-making; that is, if scientific, objective knowledge is the only good basis upon which to decide, then normative choices are no better than ignorant ones. Such a view, grounded, in this author's opinion, in a mistaken reading of science, proposes a sharp and antagonistic relation between the scientific and the human. In contrast to such a view, Michel Serres has proposed, quite recently, that we need to rethink the nature of law and ethics, precisely because of the new challenge of science and the biosphere, without giving up the normative.

Serres, recognizing the trend to give over the normative to the scientific, comments as follows: "Yes, science is prevailing over law; and that means that the laws of the world of things are prevailing over the laws of the world of men. In the end, that will mean that people will look down on the world of men."[30] To ward off such a world, the relation between judgment, the terms of social contract, and the bonds of nature needs to be rethought, and for such an exercise, we require knowledge of the biosphere and a thinking of the normative bonds that the biosphere introduces. The highest sense of the natural contract, for Serres, is "the precisely metaphysical recognition, by each collectivity, that it lives and works in the same global world as all the others."[31] Such a proposal is on the way to a marriage of science, law, and ethics.

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[30] M. Serres, *The Natural Contract*, Trans. E. MacArthur and W. Paulson. (Michigan: University of Michigan Press, 1995) (Orig. French *Le Contrat naturel*, Francis Bourin, 1992) at 81.

[31] *Ibid.* at 46.