"What We Could Do Is . . .": The Relation of Education to Legal Obligations to Protect Public Health and the Environment

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ABSTRACT

This article considers the role of law as an active force in educating citizens on norms of the society. The norms are created and enforced in the law in general, but of particular importance are those in environmental law. In environmental law the environment is not protected only for the sake of serving human beings. To learn this lesson, however, one must look at the specifics of the law and its application. Some laws purport to be concerned with the environment for its own sake, but a review of the language of that law shows it to be indirectly benefitting humans.

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Innovation and Action through Politics, Education, and Popular Beliefs

The title that I have chosen contains four elements: education, health, law and the environment. The theme that I will be using to connect these four elements is that of innovation and action through education and popular beliefs. I am reminded here at the outset of a favorite phrase of Professor Klaus Klein, himself an innovator in science education at the University of Cologne. Professor Klein is fond of introducing a project for action with the phrase "what we could do is . . .." It is precisely this way of thinking—that is, thinking about doing—that drives useful inquiry in health and the environment. In the following, I wish to discuss education as doing, and the role of law in providing that education regarding the environment. By this phrase, "education as doing," I am referring to theory in action or how actual practices reflect an educational attitude or even an educational agenda.

Inherent in the notion of law is that in its action of proscribing behaviour, it prescribes norms. So in the area of environmental law, for instance, pollution limits can proscribe behavior that is detrimental to human health or the natural environment, and in so doing, teach a society that first, protecting health is a direct good for human beings, as legislation will reflect, that second we protect the environment because indirectly that protects human beings, and legislation will also reflect that. But more surprising is the amount of legislation already in place that protects the environment for environments's sake, for which the legislation also serves as an educator. For the purposes of this paper, I want to focus upon the fact that law distinguishes taking actions on behalf of the environment because we depend upon the environment, and taking actions that benefit the environment, or what I will call "ecology" in and of itself, perhaps even at the expense of our interests.

As a final introductory comment, I should like to raise some questions about what we mean by "health." Human health—what is it and how do we know? Once we know what it is, how do we maintain it? Maintaining health is in some part a question of maintenance in the face of external threats. For the physician or public health practitioner, this would be known as "environmental" illnesses or threats. The physician understands "environment" then, as a dialectical term. When a human is physically unwell, it is either due to congenital problems or the introduction of problems from the "environment." In that sense, the environment is a threat—it is that which is outside of the human. Are we part of it, or separate from it? Is it part of us, or separate from us? This seemingly simple parallel question in fact is however built into the way in which we talk about the environment and human health in general, but also in the law.

Element 1: Education

We might first think of education in its formal sense of schools and universities with lesson plans and classroom instruction. Even if we include new and social media, we must further expand our sense of education if we are to consider law as a tool of education, however. An expanded sense of education might include the notions we borrow concerning learning in the field of cognitive psychology. There, so long as persons are making observations, remembering observations and making causal connections with new stimuli from these observations, we might comfortably conclude that learning is in process.

Having arrived at an expanded notion of education, we must confront several of the common and one or two of the not-so-common problems that are not solved by the expanded notion of education. As with all acts of communication, education must make assumptions about its audiences. In formal education, we therefore segregate the audiences by age or abilities in school, and by interest level at university. This problem of multiple audiences is not so easily solved in informal education. Moreover, all education—formal and informal—must face the reality of limited media access due to poverty and infrastructure, when people do not have electricity or computers or internet access, or even the ability to get to a school or library. And the audience presents a further challenge to both formal and informal education when it is illiterate. Even when these shortcomings can be overcome, there are deeper limitations based upon what we do once we gain access to an audience for education, such as assuming the deficit model and the limited benefits of force.

The Deficit Model

What assumptions do we make in the process called education (especially if we find ourselves in the position of educators, without having formally studied education itself)? One set of assumptions that is often used comes to us from what is known as the deficit model. The deficit model assumes that there is a set of knowledge out there in the world that an audience should know, and that the job of education is to get the audience to supplement its store of knowledge by adding knowledge that someone has determined to be missing, so as to get one's store of knowledge to the pre-determined quantity and quality. Several difficulties with the deficit model leap out immediately. First, the deficit concept leads us to treat knowledge as some tangible, countable pile of material goods. Second, and much more important, is the notion that the desired and complete store of knowledge is known and is known in advance. What is the final, defined set of things that all must know? By whom is that set of knowledge known and what is meant to be accomplished if one does achieve that knowledge? Here, we find all the critiques of the canon of classical education. But in addition, there are problems in the very idea that all persons need to know these same things, and the further we go in accumulating more facts of knowledge under some sort of progressive notion of science, the more selective we must be in selecting what things one can know in that same period of education, among the ever-increasing and expanding list of possibilities.

Not so far from the deficit model is what philosopher of science David Bloor, one of the founders of the so-called "strong programme" in the sociology of scientific knowledge in the Science Studies Unit at the University of Edinburgh, has criticized as a "jug to mug" educational model.[1] In jug to mug education, the assumption is that the teacher is like a jug of water and the job of education is to fill the mugs—that is the minds of the students—with equal portions of water from the jug. That model treats education as a transfer process, using a metaphor that demonstrates the false assumption of the tangibility of knowledge. Even within that metaphor, the problems are obvious—not all jugs are created equally, not all receive liquid in the same way or amounts (think of illiteracy or learning problems) not all need the same liquid (if in fact, liquid at all), the teacher may not be pouring equally, the teacher may be empty or not have enough for all, but most importantly, knowledge is not water, wisdom is not water and education is not a transfer process. Neither can be transferred as if tangible material. Even within these faulty models and some better ones, there are the common problems of different audiences and multiple audiences. This brings me to an alternative model of education as persuasion, not as transfer or the supplementing of a deficiency. Educational theory often addresses the audience as an ignorant audience, but not a resistant audience. When law must act as educator, the job is much more difficult. And when it comes to our area of concern here—the natural environment—environmental law can function as education, but the audiences often must be persuaded to change from behaviors that have immediate personal benefits, such as driving private cars, and that are detrimental to the health of others, through such problems as air pollution.

Law as Education in the Information Age

An additional problem of education is to confuse education with information. Education must lead to decision-making and cannot simply be considered fulfilled by accumulating information. Of course it is a provocation to mainstream thinking to say that the information age is a bad thing. I expect that anyone reading such a statement will react from the dialectic trap of assuming that I would say ignorance of information is therefore a good thing. Not at all. This false dichotomy already assumes away the issue. If information in the information age is a bad thing, it is because it allows us to replace teaching with providing information, and to replace learning with acquiring information. In that process, we lose the ability to make judgments intelligently and wisely and instead acquire more information.[2] It has

[1] David Bloor, *Knowledge and Social Imager*, 2d edition (University of Chicago Press, 1991).

[2] Jakob Bronowski wisely noted that today's secondary school

been demonstrated however, that in addition to the other problems of treating information as knowledge, we now live in a post-factual world in which one can find "facts" on the internet to support just about any position that one wants to take, without questioning why one wants to take that position.[3] How often in the past 20 or more years have educators banged the drum of "critical thinking" only to hear it echo back to them off the walls of information? Yet in both English and German, the Saxon root of this critical thinking—*kritikos*—comes from the Greek word to make judgment. Making a judgment is not just making a choice and certainly is not simply making a consumer choice. Making a judgment is to evaluate. One evaluates past actions for government, economy, education and more, and sets new courses for those phenomena. Making judgment is in fact what judges do—they are not making consumer choices for the society or individuals, but rather exercising judgment or from the Latin tradition, "prudence," hence the term "jurisprudence." To do so, one needs not only to have a value framework from which to make the judgments, but to be able to question one's own value framework in making those judgments. And this does not simply direct us toward ethics. All categories of thought—ethics, aesthetics, ontology, epistemology and of course axiology, are concerned with intelligent judgment, not simply with information accumulation and selection. From epistemology, for example, we might see that learning also involves being able to make a causal connection between new stimuli and judgment structures already in mind.[4] In the information age, we have come to believe that choices will make themselves, once sufficient information is accumulated in the bin. That overly-simple process ignores questions concerning the particular bins one is filling, what the sources of the information are, where one looks for information, who has created the information, why the information was created, why one looks for information, the relative weight of any piece of information and so on.[5]

The Role of Force in Law as Education

I turn now to confront the popular belief that law is force; a belief connected to what legal philosophers call "positivist philosophy." In positivist philosophy, law is understood as the will of the sovereign, backed by the threat of force. (A very different legal philosophy would be that of the natural philosopher who believes law is innate behaviour in humans or divinely inspired, and that humans therefore desire to behave according to the law without threats of force.) But law understood as force does not work. Law needs to be understood and internalized in order to have effect. Let me provide an example. Some years ago my automobile was stolen. During the investigation of the theft, a police officer made a statement to me that I thought was police officer bravado at the time, but I have come to see subtle wisdom in it since then. He said "the law only works for those who would obey it anyway." I thought to myself, "then what good is it?" The subtlety here is that there is a large proportion of the population "who would obey it anyway" if it in fact was the law and they knew about it. But if not, expediency, convenience or luxury becomes the factor that determines one's choices.[6] In addition, this statement suggests that those who would not be inclined to obey the law, even if they did know about it, will also not do so given a threat of force. Force can capture and imprison the criminal, but not educate him or her. Thus a positivist description of all law, such as that of Hans Kelsen[7]—that law is the rule of the sovereign backed by force—does not provide for an account of law as educator for those who would obey the law, if they knew it. Thus we need to consider an alternative theory of law if we are to understand how law works as educator. To do so, we should first ask, what the relationship between education and law is.

We might typically think of education in the formal sense of planned lessons for children or adults. Even when demanding these two criteria for education—planning and lessons—there exist opportunities, however, for the human who is capable of observing and memory. These opportunities to learn are in the workplace, the home and on the city streets. For example, the standard notions of law, in both common law jurisdictions and civil law jurisdictions include theories of criminal sanction that in turn, include education. The five

student knows more facts of science than Isaac Newton himself, but has far less wisdom. Jacob Bronowski *The Ascent of Man.* (Little, Brown & Company: 1976). Of interest to the theme of this volume and the work of Professor Klein, is perhaps the fact that Bronowski is also attributed to have said "The world can only be grasped by action, not by contemplation."

[3] See, Farhad Manjoo, *True Enough: Learning to Live in a Post-Fact Society*, John Wiley and Sons, 2008.

[4] See, Alla Keselman et al., "Educating Young People about Enviromental Health for Informed Social Action," *Umwelt und Gesundheit Online, 4,* 1-8.

[5] See fn 22 in Howarth, specifically J.R. Des Jardins, and Don Brown, American Heat: Ethical Problems with the United States' Response to Global Warming, Rowman & Littlefield, 2002.

[6] As Dostoyevsky points out in The Brothers Karamazov, when the Inquisitor recalls how Christ rejected his pragmatism by saying, "Man cannot live on bread alone," the Inquisitor responded to Christ by saying "Feed men, and then ask of them virtue! That's what they'll write on the banner they'll raise against Thee."
Fyodor Dostoyevsky, *The Brothers Karamazov,* Chapter 5, "The Grand Inquisitor."

[7] Hans Kelsen, *Pure Theory of Law* (1960; Knight trans.), Berkeley 1967.

commonly-accepted reasons for criminal sanction include specific deterrence, general deterrence, rehabilitation, punishment and removal from society. The first three of these are in fact forms of education. The concept of specific deterrence is the notion that an individual can learn not to repeat a prohibited act if he or she is made to feel the displeasure of society through fines or imprisonment. General deterrence suggests that individuals other than the one who is imprisoned or fined can also learn not to engage in the prohibited acts from observing the sanctions on the individual who did. And finally, rehabilitation is in fact a planned lesson with learning outcomes and measurable objectives that make it look in form quite a bit like adult education.

What is the relationship between law and health? One would hope that the rational animal, provided sufficient education, would do that which for him and those about whom he cares, is most healthy. But in fact we have abundant evidence all around us in personal health and public health that demonstrates unhealthy choices. The spirit may be willing, but the body is weak and instead we make choices out of expedience, convenience, perceived luxury or even just because if feels good at the moment. Thus, our rationality alone, as part of the decision-making process, is insufficient. Consequently I arrive at a position not unlike that of Plato in his *Republic*. Education must be offered to all, including in the areas of health and environment. But beyond Plato's sense of open *paideia*, I would like to add the educative role of law. Because we do not always make rational choices on health for ourselves and others, law's invented penalties on one hand, and order on the other hand, are needed to achieve social goals in health and environment.

These limitations on the use of force lead one to a more generalizable conclusion regarding the use of persuasion. It would be my contention that one can regard education as an act of persuasion. With the traditional student, one could say that first he or she must be persuaded to want to learn because it pleases the parents or teachers, shows positively among his or her peers, or even helps to gain economic or material advantage at some point. In informal education situations, such as when someone is researching the best price on a consumer product on the internet, there is the obvious benefit to that person's personal finances. These education situations all work because either the student recognizes an indirect benefit from learning or an adult enjoys a direct benefit from learning. But when it comes to education regarding environmental matters and ecology, the persuasion is much more difficult. These audiences typically have immediate benefit from acts that harm others, such as when a mining company sells coal at a monetary profit to itself, but destroys the water sources of others during mining and pollutes the air of others when the coal is burned.

Element II: Law

If law is to educate a society on the norms of behavior, how does it do so? We might have a general sense that there is likely to be a law prohibiting murder, but we would not know what the exceptions are to that prohibition and what penalties change with those exceptions. Is a physician's negligence during surgery equivalent to murder? In American culture, one often hears one say (usually in defiance of a command that one does not wish to obey) "I know my rights!" Really? Where and how do one's rights arise? What is the nature of a right compared to a privilege? A license? What are the limits of the rights? Whereas the right-declaring individual may neither not have read the constitution nor the court opinions interpreting it, he or she has somehow heard percolated through the society what rights are included and might well also have a sense of what rights are not included. Thus, although one does not know with legal precision the specifics of rights and liabilities as set forth in the law, it is in fact the law that sets these rights and liabilities in a secular and heterogeneous society. In a well-managed formal educational system, the citizen may come to learn the law formally. But it is equally as likely, if not more so, that the citizen will learn secular societal norms as reflected by, or set by the law, through less formal means.

Rights, as affirmative powers asserted by citizens over and against the state, and legally recognized by the state are not the only source of one's legal powers and the norms of behavior created by them. True, some constitutions, which are typically the legal statement (for natural law theorists) or creation (for legal positivists) of rights, do provide environmental rights. For example, there are environmental prescriptions (couched as rights) as well, as found in the Turkish Constitution. Therein, article 56 states that "Everyone has the right to live in a healthy, balanced environment. It is the duty of the state and citizens to improve the natural environment, and to prevent environmental pollution." Yet, the more common place that one finds explicit normative discussion of the environment in the law is in legislation or regulation. And, those two types of law are typically not prescriptive in form, but rather, like Moses' Decalogue, proscriptive in form—the citizen is told what one shall not do.

As we have briefly seen, public law clearly sees the role of several criminal sanctions to be that of education. But what is the role of private law in education? In the two main areas of private law

obligations—tort and contract—one can find the same educational role from the state that one finds in public law. In the law of contracts, obligations are set by the individuals who agree to the contract. Thus, the norms of behavior are learned through the agreement. In tort law, the norms are set by the state. Although both torts and contracts are considered to be private law, one must consider that private law is ultimately only enforceable if the state supports a judicial finding of liability in tort or contract. Otherwise, negligent or injurious behavior or broken promises have no sanction and therefore lose some or much of their force, according to positivist theories of law. And for legal naturalists, the argument is even stronger—people only obey private obligations because they want to do so, and that desire is put in place by some form of education. But there is something more subtle about the role of education through law in both contract and tort. And although it is the inductive examples of behavior of the "reasonable man" that creates the standard for obligations, it is the court that ultimately settles upon the particular standards of what reasonableness is. And that changes from time to time as well. Moreover, while the state directly sets the norms for private obligations in tort, it also observes, records and standardizes the behavior of individuals in their contractual obligations, even in the common law system where the legal system is comfortable in divorcing contracts from moral obligation.

In both tort and contract, law enters the picture with carrots and sticks, or as one says in Germany, with sugar bread and whips. For those who make use of the education made available, the sugar bread is the promise of enjoying health, or of receiving public health care for one's congenital problems and accidents. For those who choose unhealthy practices, the whip, in its mildest form means being sent outside to smoke cigarettes, or not receiving public funds when one is involved in an automobile accident without a safety belt or when one is involved in a motorcycle accident without a helmet. Generally, this is what the private market whip already does, largely through insurance penalties, revocation, or minimally higher premiums. But the problem with that simple economic tool is that it can teach nothing to those with sufficient funds to simply solve problems by "throwing money at them." Just helmets, seat belts and abstinence from smoking can be made conditions of an insurance contract, we can make those same conditions part of legislation for all. That said, it is however clear that in both public law and private law, there is a role for law in education. Simply stated—norms are learned.

Even in criminal law, one knows of the role of education in the law. In addition to the traditional reasons for criminal sanction as punishment and removal from society, one must recall that there are the notions of general deterrence, specific deterrence and rehabilitation. As mentioned above, theories of deterrence can certainly be looked upon as education. It is difficult enough then to educate persons sufficiently such that they make rational choices regarding health, which in effect ought to be a selfish choice. It is that much more difficult to educate persons to make choices to favor ecology or the environment. Yet the law does make this distinction and does provide for human choices to benefit ecology even when that is not an indirect benefit to humans.[8] A useful shorthand to make this distinction is to refer to the law of the environment, when speaking of the protection of the natural world for the sake of humans, and the law of ecology, when speaking of the protection of the natural world for the sake of itself.[9] Law makes this distinction regarding biodiversity, drinking water and more. Abraham Maslow designed a pyramid of needs which suggested that we can only meet higher needs after lower needs are satisfied.[10] The first level of needs is food, water, clothing and a place to sleep. The second level is physical safety, including material-economic security. One would not find the luxury of aesthetics until the third, fourth or fifth levels. It has taken some time and effort to educate society that a clean environment is necessary for basic-level needs. When ecology is part of human needs, one can argue it belongs at the basic level as well. But when ecology is regarded instead as a third, fourth or fifth level need, it will be sufficiently ignored so as to damage or destroy it

However, learning the norms does not mean necessarily following the prescripts of the norms. The history of tort law—that is the obligations of private individuals—has demonstrated that with industrialism, for example, society has been willing and able to shift burdens of payment for accidents and injuries from the individual to a dangerous industry more capable of handling the costs or which in fact enjoys making a profit from the injury of others, such as guns and tobacco. For improvement

[8] Elsewhere I have made the point that the legal idea of a human right is a human creation, and therefore, ought perhaps not be looked upon as something that humans would grant to non-human beings, especially if it is against human interest, unless humans are indeed altruistic animals. Kirk W. Junker, "Making Rights from What's Left of Darwin," *Futures* Volume 36, Issue 10, December 2004, pp. 1111-1117

[9] This distinction is of course also fraught with definitional problems. Humans are of course part of the natural world. One might even go so far as to say the products of human thinking, such as atomic weapons and pesticides are natural in that sense. As I say, this is a shorthand. The full distinction might be something like "the non-human elements of the natural world" but that would be cumbersome for me and bothersome for the reader to repeat over and over.

[10] A.H. Maslow, A Theory of Human Motivation, *Psychological Review* 50(4) (1943):370-96.

of either health or the environment, the public must understand the problems and be willing and interested in correcting them. Legislation alone, to an unwilling audience is rather ineffective. It would be interesting to know, for example, whether the ban on cigarette smoking in restaurants and other public places has caused any smokers to pause and consider the ill-health effects on them and those who must breathe their smoke secondarily. So, it would appear that the selfish nature of the individual would dictate that it would be easier to persuade a public to change its practices concerning personal health than it would be to get that same public to change its practices concerning other living things or even ecology in general, if selfish concerns are the only motivators. Thus, one can see that the public must be educated on the difference between the environment and health.

Let us then turn specifically to the role of law in education on health and environment given the nature of both law and education, then. What is the role of law? To persuade citizens to do what formal education has failed to persuade them to do. Why is law necessary--has education failed? Education has too often been degraded to information rather than the ability and practice of making judgments. As an example, we can see that in the history of science, the ideology of "neutrality" or "objectivity" has produced scientists who are incapable of making judgments, uninterested in making judgments or who actively run away from making judgments. Consider how this plays out in law. If law has an educative function, what is the substance of the norms which it introduces?

As an example of the norms that law introduces, one can look to biodiversity, an area rich in claims of protecting the environment for its own sake. One of the most-cited and respected authors in international environmental law, Philippe Sands, writes "The reasons for conserving nature and biodiversity are essentially threefold. First, biodiversity provides an actual and potential source of biological resources (including food, pharmaceutical, and other material values which support fisheries, soil conditions and parks). Secondly, biodiversity contributes to the maintenance of the biosphere in a condition which supports human and other life. Thirdly, biodiversity is worth maintaining for non-scientific reasons of ethical and aesthetic value."[11] We can immediately recognize Sands' first two reasons as being for human benefit only. I want instead therefore to focus upon his third reason—the one that he calls "non-scientific." I would suggest that in our era, to call something non-scientific is tantamount to saying it is without value. Indeed, the 117 pages that Sands devotes to biodiversity in his well-known and respected treatise on international environmental law then go on to avoid discussing these "non-scientific reasons of ethical and aesthetic value." That categorization suggests that ethics and aesthetics are inherently non-scientific. If they are, can we honestly say that means they simply have "other" value, or in fact does it mean they have less value or no value? In writing on the American Constitution, Kenneth Burke has forcefully made the point that as soon as we separate things and name them differently, we necessarily create a hierarchy.[12]

The most important and forward-thinking lesson that we can learn from the law is that we do value the environment for the environment's sake, and the law shows that we have committed to this value. So when the citizen says "I know my rights," one would hope that the law would educate him or her to know that the society has also awarded protections to the environment for its own sake and the citizen must be aware of those protections as well. And here we must be careful, for even the focus on biodiversity, when it comes to the question of protecting ecology from us for ecology's own sake, is misleading. To some, perhaps from the outside, biodiversity is the obvious if not the only place in which one is likely to find any law—if in fact, any discussion at all—on the protection of ecology for its own sake. The year of 2010 had been announced as the year of biodiversity. Even at what is perhaps the most obvious example of environmental law for the protection of the environment's own sake—that is, the law of biodiversity—we find a reliance upon defending biodiversity as a positive thing because of medicine and food that humans can make from diverse biological species. So for example, when discussing what he calls "The Progression Towards Ecological Quality Standards," Prof. William Howarth writes: "In essence, the issue to be addressed is the extent to which is feasible for biodiversity law to parallel regulatory strategies that have been adopted in relation to pollution control?"[13] But in fact, simple domestic statutes and regulations that one might otherwise see as part of what has been critiqued as the "environmental" regime of maximum tolerance, do in fact have thresholds and standards designed to protect other flora and fauna for their own sake, as for example, Pennsylvania's water quality standards for toxics, which will be discussed later, and from which a sample are offered in Appendix A.

A second example would be the European Union's Water Framework Directive (WFD), Directive 2000/60/EC of the European Parliament

[11] Philippe Sands, *Principles of International Law*, second edition (Cambridge University Press, 2003) p. 500.

[12] Kenneth Burke, *A Grammar of Motives* (University of California Press, 1969).

[13] Howarth, 3.

and of the Council establishing a framework for Community action in the field of water policy establishes "normative definitions of ecological status classifications." In considering an example from European law, it is worth taking note of the character of European law. As a legal entity, the European Union is unique. It is not a superstate such as the United States of America, but it is more than a treaty union of independent sovereigns, such as the United Nations or World Trade Organization would be. Each of the 27 member states has given a small amount of its sovereign independence to the Union, but yet retains most of its independence. Consequently, among the various sources of law, there are Directives from the Union to the member states in which each member state must meet a goal by a certain date, but it is fully within the discretion of that member state as to how it achieves that goal. Most often, it is accomplished by enacting domestic legislation that achieves the same or a stricter goal on or before the date required by the Union. Directives are neither direct regulation of the member states nor of the citizens of those member states. "The WFD sets out the aim of achieving a "good status" for European waters. The Member States should accomplish this by 2015 through the river basin management approach. Some say that this is too ambitious, even though European regulation on water quality has existed since the 1970s and the WFD only adds the ecological protection of the aquatic environment."[14]

"The ultimate aim of the WFD is that the European surface waters achieve 'good chemical and ecological status'[15] and the European ground waters achieve 'good chemical and quantitative status.'[16] This requires meeting environmental objectives. These consist, on one hand, of ecological objectives, such as salinity, transparency, the presence of aquatic flora and fauna, and, on the other hand, of chemical objectives, such as a maximum concentration of dangerous substances in water bodies. What we see here with ecological objectives are norms put in place by law that do not directly benefit the health of the human being. What remains to be seen is whether they indirectly benefit the health of the human being (and are put in place for that reason) or are they truly pure ecological objectives, put in place without regard to their impact on humans, and potentially even detrimental to humans in their efforts to benefit other species or environments. The chemical objectives are set at EU level, while the ecological objectives, including the objectives for substances that influence the ecological status—comparable with the formal list II substances of Directive 2006/11/EC[17]—are set by the Member States. The Member States have to elaborate the environmental objectives for their water bodies in river basin management plans (RBMP), while the measures to attain these objectives have to be established by the Programme of Measures (PoM).[18] "Both the presence of ecological goals and exemptions created uncertainty among the Members States about the status of the objectives, even of those objectives that were translated into environmental quality standards and thus specifically set at EU level. Indeed, the WFD allows Member States a considerable degree of freedom in both the process and outcome of implementation. However, it compels member states to act within the boundaries of pre-existing water directives and other relevant European legislation, in particular those pieces of legislation concerning nature conservation, agricultural sources and so on."[19] Thus, we see that the norms operate to educate an audience of not only individual citizens on norms for the sake of the environment (i.e., "ecological" norms) but to educate member states of the EU on the same.

To attain the aim of good chemical and good ecological status, specific objectives have to be met. Continuing a long tradition in European water law, the chemical objectives are set at the EU level, in the Annexes to the WFD or in its daughter Directives. These objectives concern substances and are set with the aim of protecting the environment and the health of human beings. . . . By contrast, some ecological objectives, such as the presence of fish, are new and are usually not clearly prescribed by the WFD. Those ecological objectives which would constitute chemical objectives, except that they are specifically determined for the protection of floral and fauna, could be set at the EU level. Other ecological objectives could be morphology or the desired presence of a certain fish, differ in each type of water body and therefore would be practically impossible to set at EU level. Thus, in general, the WFD leaves it to the member states to set the ecological objectives for their water bodies. [20]

For further evidence of norms set for the sake of the environment, we should also consider the additional norm of quantity-setting, and not just quality identification. For instance, one can see the difference between putting an upward limit on laissez-faire practices at the point of demonstrable

[14] Andrea Keessen, Jasper J.H. van Kempen, Marleen van Rijswick, Jan Robbe and Chris W. Backes., European river district basins: are they swimming in the same implementation pool?" 22(2) *Journal of Environmental Law* 197-221, 198 (2010)
[15] Article 1, WFD.
[16] Article 4, WFD.
[17] Directive (EC) 2006/11 on pollution caused by certain dangerous substances discharged into the aquatic environment of the Community [2006] OJ L 64/52. See especially Section 3.
[18] Keessen, et al., 200.
[19] Keesson, 201.
[20] Keesson, 201-02.

harm and instead putting a goal on those same practices designed to maximize the point at which they are doing some good. More succinctly, we could assign the first approach the term "pollution prevention" and the second term "ecology protection." This ecology approach has been advocated by philosopher of science, Peter Singer:

> Despite spectacular twentieth century scientific and technological progress, the world is more inequitable than it was fifty years ago. This is evident both in terms of access to health care for individuals, and in relation to the health of whole populations. Disparities in wealth and health within and between nations are widening inexorably and the rapidly expanding global economy has failed to reduce poverty among those with little if any access to health care. In this context the Universal Declaration of Human Rights remains an unrealized aspiration for the majority of the world's people. Given these realities, no single discipline, or body of knowledge is likely to make much difference. For example, approaches based only on neo–liberal economics, as exemplified by the structural adjustment programmes of the World Bank, have not been successful in promoting health equity. The authors believe that an interdisciplinary approach is required, and that bioethics, an interdisciplinary field, can make a contribution towards improving health globally. To do this, the scope of bioethics should be expanded towards a results–oriented global health ethics, based upon widely shared and foundational values that could be carried forward through five transformational approaches.[21]

Which of these two are actually in action in the WFD? The WFD requires precise ecological criteria to be formulated to determine what should count as a satisfactory state of aquatic quality. WFD Annex V catalogues European waterways based upon levels of distortion resulting from human activity.

These protections may come to the citizen as a surprise, and if he or she wants to understand or question them, the endeavour will be unsuccessful through an information search. The reasons for ways in which we should protect ecology are not science or information-based, when science and information are only in the service of humans. In addition, we need ethical decision-making first to decide to protect ecology for its own sake—and then use information approach with the science that is instrumental to determine such things as "eco-minimums" rather than "enviro-maximums."

> Although examples of environmental quality standards are now familiar and manifold in . . . European Community Legislation, the concept of an 'ecological quality standard' is less clearly understood, and some observations are needed upon the rather uncompromising sense in which the term is used here. . . . [A]n environmental quality standard is a scientifically-formulated and numerically expressed specification of the maximum level of contamination that is legally permissible in a given part of the physical environment. As a direct counterpart of this, an ecological quality standard should be a statement of the minimum acceptable state of ecosystems and their biological components, with a corresponding legal obligation that no deterioration below that standard should be permissible. Hence, for flora, fauna and habitats, ecological quality standards are intended to serve as a mandatory baseline for minimal levels of diversity and abundance, specified quantitatively for each component, and backed by legal obligations to ensure their realisation.[22]

It is the contention of Howarth that "the approach of using the law purposively, to achieve

[21] Solomon R. Benatar, Abdallah S. Daar, and Peter A. Singer, "Global health ethics: the rationale for mutual caring," *Journal of International Affairs* Volume 79, Issue 1, pages 107–138, January 2003.

[22] William Howarth, "The Progression Towards Ecological Quality Standards," 18(1) *Journal of Environmental Law*, 3-35, 9 (2006)

defined objectives, rather than simply as a means of prohibiting miscellaneous instances of undesired conduct, has progressed much further in environmental quality law than in ecological law."[23]

Elements III and IV: Obligations to Public Health and Environment

One often hears the terms "health" and "environment" paired together. And of course they are related. But they must not be the same thing, or else we would not need to have them as two separate terms. So just how is "health" different from "environment"? Let us first consider standards named "ecology" that in fact are really health standards. "The history of environmental quality law is a sequence of responses to progressively identified adversities needing a legal response. Broadly, these have been the need to prevent transmission of disease (through public or environmental health legislation); to prevent human beings being poisoned by water, air or land (through pollution-control restrictions); the need to preserver public amenity in land use (through planning law); and to meet aesthetic and cultural requirements for both the built and the natural environment (trough protection of buildings and landscapes.)"[24] In and of itself, this does not appear to present any problem and in fact looks to be a rather positive way of addressing problems. However, as Howarth points out: "What purports to be an 'environmental quality standard,' on closer examination, often actually turns out to be a public health standard, almost entirely orientated towards the protection of human welfare and neglecting the requirements of non-humans. Howarth supports this challenge with language from the European Community Directive concerned with limit values and quality objectives for mercury discharged by the chloralkali industry.[25] The Directive has as its purpose "to protect the aquatic environment of the Community against pollution by certain dangerous substances." One of the quality objectives set under the Directive is a 'biological standard' set for fish, so that the concentration of mercury in fish flesh is not to exceed 0.3 mg/kg. Howarth observes that "Despite first impressions, this limit is actually set purely to protect the health of human consumers, not to protect fish or the aquatic ecosystems of which they form a part. This is not to suggest that legislating to secure human-centred goals for the environment is never beneficial to its non-human living constituents, but merely that such benefits tend to be incidental rather than purposeful."[26] Even when EU legislation has attempted to legislate to protect ecology for its own sake, the European Court of Justice has interpreted the legislation as being for the benefit of humans, as when the primarily ecological objective of the freshwater fish directive[27] was interpreted to have a human health purposes because the salmonid and cyprinid species covered by the directive may be consumed.[28]

"The new challenge arises where elements of the environment and ecosystem are recognised to have a value that is not purely dependent upon their capacity to provide human benefit. Perhaps the ultimate environmental quality standard [and one that would demonstrate a ecological advantage rather than a human tolerance] is that the environmental media should be contaminated by a level of human-produced pollutants set at zero."[29] Howarth uses this example from the Drinking Water Quality Directive[30] in setting a limit of 0.1 ppb for a pesticide in drinking water. This limit was set even beyond the limits of measurability at the time of its adoption.[31]

Another role for education can simply be to educate ourselves scientifically regarding the needs of other flora and fauna. Consider the EU's Nitrates Directive. Designation of nitrate-vulnerable zones is determined by three criteria: (1) whether surface waters contain more nitrate than the concentration allowed by the Drinking Water Abstraction Directive [Directive 75/440/EEC]; (2) whether ground waters contain more than 50 mg/l nitrates; and (3) whether natural freshwater lakes or other bodies, estuaries, coastal waters and marine waters are found to be 'eutrophic'. "This third criterion . . . for designation of nitrate-vulnerable zones is motivated by more directly ecological concerns. . . . However, the issue of what kind and degree of disturbance should be considered 'undesirable' is unspecified and seems to require an intricate ecological value judgment to be made. The reasons for the seemingly evasive approach towards ecological quality criteria under the Directive appear in the lack of consensus as to what level of protection is actually needed for living resources and aquatic ecosystems."[32]

[23] Howarth, 4.
[24] Howarth, 5, citing two standard textbooks in the field: D. Hughes et al., *Environmental Law* (4th ed. 2002) Chapter 1 and S. Bell and D. McGillivray, *Environmental Law* (6th ed. 2005) Chapter 2.
[25] Directive 82/176/EEC.
[26] Howarth, 7.
[27] Directive 78/659/EEC
[28] See Case C-298/95 *Commission v. Germany* (1996) ECR I-6747.
[29] Howarth, 7.
[30] Directive 80/778/EEC as amended by 98/83/EC
[31] Howarth, 7, fn 17. On the notion of setting limits beyond detection limits, or beyond the ability of technology to control, see Junker, "Can Courts 'Force' Technology," ISSSE, 1998.
[32] Howarth, 15-16.

Elements III and IV: Law, the Environment and Ecology

When combining the notions of law, the environment and ecology, it is well worth first reflecting upon how it is that obligations are set through law. The U.S. Federal Water Pollution Control Act, 33 U.S.C. §1311(a), simply says that with a few exceptions such as permits, "the discharge of any pollutant by any person shall be unlawful."

Section 1342 (a)1 then provides that the Environmental Protection Agency "Administrator may, after opportunity for public hearing issue a permit for the discharge of any pollutant, or combination of pollutants, notwithstanding section 1311 (a). These two simple sections educate a would-be polluter that first of all, water pollution is prohibited, and then only may the pollution be permitted as an exception to the rule upon the acquiescence of the Administrator and the public. In structure, this means it is not for the would-be polluter, the state or any individual to determine whether some pollution practice should be permitted, but rather the society who must bear the pollution. (Some environmental law even recognizes that since future generations will bear the burden of pollution, the interests of future generations should be represented in the present decisions by an ombudsman or some similar representative. In practice, of course, the structure does not make the practice automatic or easy. The public must first know what is proposed and be fully educated not just by information, but by the ability to know that this sense of obligation is set by citizens through the law and in theory, can be changed by citizens through the law. I say "in theory" because one must also recognize the inequitable power afforded to interest groups and lobbies to change the law or keep it silent. But on the whole, it is this system that in fact establishes the obligations of the citizen that all discharges are unlawful and that secondly, if the society deems a particular discharge to be acceptable because we are so dependent upon a particular practice or industry that we accept pollution as a necessary cost.

How does one know what one's obligations are? Whereas the Water Pollution Control Act's §1311(a) ("the discharge of any pollutant by any person shall be unlawful") may resemble a "common sense" norm such as that prohibiting murder or the obligation to pay a debt, when it comes to whether the continuous concentration limit for antimony is 220 micrograms per liter or 1100 micrograms per liter, a citizen needs more than a sense that is common to understand his own obligations and the obligations of others.

Environmental law uses science-based standards to state objectives and set outcome goals. An example would be that the explicit purpose of the U.S. Federal Water Pollution Control Act, 33 U.S.C. §§1251-1387 is to "restore and maintain the chemical, physical and biological integrity of [the] Nation's waters. "An example of outcomes would be that 33 U.S.C. §1251(a)(1) required the state to eliminate "the discharge of pollutants into navigable waters . . . by 1985. "

So if law does educate by creating and enforcing norms, what specific norms may we observe that were created by law? Some are more obvious as when the legislative bodies act. In addition to education through the obligations established by legislation, it has been recognized that the judiciary may interpret legislation in such a way as to "force technology." Technology-forcing is not technology-creating; rather, it is setting the agenda of private (and public) technological research according to social norms. In practice, it re-directs research from the economy to either the environment or social problems. For example, in early air and water pollution law, much was written and debated on whether the state could insist upon water or air quality limits for which there had been no extant technology to clean the industries and practices in operation. When industries challenged the government's ability to enforce these technologically-impossible standards, courts responded that if the standards were set for the benefit of human health or the environment, then industries must begin to redirect research and funding to creating technologies that would meet legal standards for air and water. Consider two very famous examples of technology-forcing, the cases of *Union Electric Company v. US Environmental Protection Agency* and *Commonwealth of Pennsylvania, Department of Environmental Resources v. Pennsylvania Power*. In the Union Electric case, an electric power producer failed to meet state sulphur dioxide emissions limits from three of its coal-fired boilers. The trial court and the appeals court both found that despite the fact that extant technology in electric power production could not meet the health and environment limits imposed by regulation, violation of the health and environment limits was not excused and the power producer would need to re-direct its research and development efforts to the goal of meeting those limits. The United States Supreme Court upheld the lower courts saying "Technology forcing is a concept somewhat new to our national experience and it necessarily entails certain risks. But Congress considered those risks in passing the 1970 Amendments [to the Clean Air Act] and decided the dangers posed by uncontrolled air pollution made them worth taking."[33] Did this

[33] *Union Electric Company v. US Environmental Protection Agency*, 427 US 246 (1976) p. 269. See, Kirk W. Junker, "Can Courts 'Force' Technological Discovery to Occur?" in Technology and

action of the court teach industries that technological impossibility was no excuse? Well, yes, but it required considerable repetition. Since the *Union Electric* case, at least 45 times federal U.S. courts have affirmed technology-forcing when industry has tested it. In the 2001 case of *Whitman v. American Trucking*, 531 U.S. 457, 2001, the US Supreme Court wrote: "this Court, after reviewing the entire legislative history, concluded that the 1970 Clean Air Act amendments were 'expressly designed to force regulated sources to develop pollution control devices that might at the time appear to be economically or technologically infeasible,' "quoting the *Union Electric* case.[34]

Then in the case of Commonwealth of Pennsylvania, Department of Environmental Resources v. Pennsylvania Power,[35] Pennsylvania Power argued that it was "technologically impossible" to control sulphur dioxide within the limits imposed by the state, and therefore, the State's exacting of a monetary penalty from the power company for its failure to comply would result in an unconstitutional taking of its property. The Pennsylvania Supreme Court did not accept that argument and instead concluded that technology forcing "recognizes the ingenuity and innovativeness of American industry."[36]

Above, I made use of the shorthand that when we protect the non-human environment for its own sake, we should distinguish that legal move by calling it "ecology" and when we do so for our own sake, we could call it environmental protection. A further distinction is necessary, however and that is a lesson from innovation and action whereby we see the difference in language between physicians and the health sciences on one hand, and lawyers, hydrologists, and aquatic biologists on the other—"environment" means something like "external factors affecting health" for the former group and not the latter. For the latter, "environment" indeed means concerns outside the human's, but not insofar as they relate to the human, much as we have distinguished "ecology" from "environment" above. Here are a few examples of lessons to be learned from the law in making this distinction.

The first example would be that of the Federal Water Pollution Control Act, as discussed above. But in addition there are U.S. state standards, such as Pennsylvania's Guidelines for Development of Aquatic Life Criteria, found in 25 Pa.Code §16.22, where it is written that "The Department [of Environmental Protection] will establish criteria for toxic substances to provide for protection of aquatic life . . .." Those criteria are then established in the 25 Pa. Code § 93.8c, where two clearly separate numeric limits on set on a number of toxics under the very clearly different headings of "Fish and Aquatic Life Criteria" and "Human Health" (Appendix A). From this one can clearly and graphically learn that human health and non-human well-being are two concerns, even if one does not understand the chemistry involved in setting these differences. A third example comes from Europe. In Title I, Chapter 1, Article 1.3 of the Regulation (EC) No. 1907/2006 of the European Parliament and Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals, known as "REACH," we find the self-explanatory note that "This Regulation is based on the principle that it is for manufacturers, importers and downstream users to ensure that they manufacture, place on the market or use such substances that do not adversely affect human health or the environment." With the simple grammatical tool of the disjunctive "or," any citizen can learn that human health is not the same as the environment.

Conclusions: Measureable Outcomes in Setting Norms?

In conclusion, what might we say that environmental law has taught us? Pollution limits can and should be based upon a number of different measurable factors, including human health and ecology, and not just technology. Human health or ecology limits can successfully guide research and development of technologies that comply. Recent legislation in US and Europe teaches us that we can and do protect ecology for ecology's sake. A large category of questions that remains, however is similar to the one raised regarding whether a ban on

Society at a Time of Sweeping Change (Institute of Electrical and Electronics Engineers, 1997) pp.313-321

[34] *Whitman v. American Trucking*, 531 U.S. 457, 2001.

[35] *Commonwealth of Pennsylvania, Department of Environmental Resources v. Pennsylvania Power*, 416 A.2d 995 (1980).

[36] *Penn Power*, p. 999.

cigarette smoking in public places has influenced anyone to stop smoking. That is to say, can the norms in the law that protect ecology for ecology's sake persuade persons to protect ecology, if they would not do so without the law? If yes, then the law is ironically effective, just as my police officer in the stolen car episode foretold. If no, then the law is only capable of operating as the positivist's threat of force, and it is going to take a very, very large police force to threaten all whose actions are detrimental to ecology.

And finally, I am reminded of having once spent a summer laboring for a stone mason named Tomaso. He was quite skilled and "semi-retired," so he would only do what he felt he wanted to do. One morning after the labourers had already begun working on the site, and Tomaso was lingering a few minutes longer with his coffee, one of the laborers chided him with "Come on Tommy, get to work—you get paid for what you do, not what you know!" When law makes the distinctions between protecting ecology for ecology's sake and protecting ecology for humans' sake, it has the potential, as all law does, to be an educational tool. Of course, no educational tool is automatic or immediate. The question remaining as to whether the laws of biodiversity or drinking water, for examples, have in fact changed the minds of anyone not about what we should think, but about "what we could do."

Appendix A

25 Pa. Code 93.8c. Human health and aquatic life criteria for toxic substances.

TABLE 5
WATER QUALITY CRITERIA FOR TOXIC SUBSTANCES

			Fish and Aquatic Life Criteria		Human Health	
PP NO	*Chemical Name*	*CAS Number*	*Criteria Continuous Concentrations (ug/L)*	*Criteria Maximum Concentration (ug/L)*	*Health Criteria (ug/L)*	
1M	ANTIMONY	07440360	220	1100	5.6	H
2M	ARSENIC	07440382	150 (As3+)	340 (As3+)	10	H
3M	BERYLLI-UM	07440417	N/A	N/A	N/A	-
4M	CADMIUM	07440439	*{1.101672-(ln[H]x0.041838)} xExp (0.7409xln[H]-4.719) (ex:@H=100,CCC=0.25)	*{1.136672-(ln[H]x0.041838)} xExp (1.0166xln[H]-3.924) (ex:@H=100,CMC=2.0)	N/A	-

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