

Transboundary Harm to Biological Diversity:
Liability Under the Convention on Biological Diversity

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Dedication

This dissertation is dedicated to the memory of Robert Quentin Quentin-Baxter, who saw the topic whole.

Table of Contents

List of Figures	iv
Introduction	1
Chapter One	20
Chapter Two	73
Chapter Three	132
Chapter Four	184
Chapter Five	237
Conclusion	311
Bibliography	324

List of Figures

Figure 1	6
Figure 2.1	91
Figure 2.2	94
Figure 2.3	100
Figure 2.4	102
Figure 2.5	103
Figure 2.6	105
Figure 2.7	107
Figure 2.8	115
Figure 2.9	117
Figure 2.10	121
Figure 2.11	123
Figure 2.12	124
Figure 2.13	126
Figure 2.14	127
Figure 2.15	128

Introduction

A. Two Standpoints

The United Nations Convention on Biological Diversity calls upon the parties to examine the issue of liability for transboundary damage to biological diversity. Many multilateral environmental agreements contain provisions on liability. However, few of these agreements have come into force. There has been modest progress at the international level regarding prevention of damage. Yet something about taking responsibility for the harmful environmental consequences of economic activities stands in the way of implementing agreements on liability. One might say that the obstacle is simple: money, the stuff that makes the world go round. I don't deny that money is part of the story. But I don't think it's the whole story, or even necessarily the most important part. The psychology of responsibility as revealed in the behavior of nations is complicated. My reasons for studying it are primarily practical in nature. I hope that thinking about the meaning of environmental responsibility in a transboundary context will help nations to act more responsibly, which includes taking steps both to prevent harm *and* to make appropriate reparations for it. I believe that the lack of progress in developing international liability for transboundary environmental damage is due primarily to the tendency to view these responsibilities as separate. If the parties to the Convention on Biological Diversity can manage to see responsibility as a whole, they may be able to design a workable framework for dealing with concrete cases of transboundary harm to biological diversity.

A set of blueprints exists for constructing such a framework. The architect, Robert Quentin Quentin-Baxter, drew them up in 1982 during his brief tenure as Special Rapporteur for the International Law Commission's study of international liability. I believe that Quentin-Baxter's plans could be adapted for the purpose of implementing liability under the Convention on Biological Diversity. However, before construction can begin, the ground must be cleared. Quentin-Baxter thought that the main reason why States failed to achieve their policy goals in the area of the human environment was due to compartmentalized thinking. States view prevention of environmental harm as a worthy goal, but reparation for loss or injury conjures up visions of becoming entrapped

in a mechanized legal process embodying an alien system of values. Arresting the tendencies toward compartmentalized thinking in international law will require imagination.

We can only imagine the finished work Quentin-Baxter would have created on the basis of his schematic outline of the topic. However, several general features would have been apparent. Introducing the schematic outline, Quentin-Baxter described it as a mosaic. The proposed articles correspond to the individual pieces or *tesserae* juxtaposed to create a unified whole. The legal value of any individual piece can only be assessed with an eye to how the pieces fit together within the pattern of the mosaic. Underlying the pattern is the surface to which the pieces are glued. Quentin-Baxter believed that the foundation for the set of draft articles and principles touching upon international liability is State practice. Whatever its specific content, the finished set of draft articles would have been both artistic and practical.

Long before he took up the topic of international liability, Quentin-Baxter was thinking and writing about humanitarian law and human rights. His habits of non-compartmental thinking suggest that he saw a connection between the two topics. He believed that “all law—including international law—has the ultimate purpose of preserving human dignity and promoting human welfare.”¹ An emphasis upon humanity pervades his reports on international liability. In place of an absolute and automatic commitment to a mechanized legal process, the procedural sections of the schematic outline propose a humanized one based on communication and negotiation. Liability for acts not wrongful under international law is nothing more than an obligation to pay a fair price. The liability topic is a method of ensuring that legal balance of interest tests are based on all the elements that go into making an honest bargain. States seeking the freedom to act and those seeking freedom from the adverse effects of such actions have equal protection under international law. So, in addition to being artistic and practical, the finished set of draft articles would have been humane.

¹ See R. Quentin-Baxter, *Human Rights and Humanitarian Law—Confluence or Conflict?*, 9 Australian Year Book of International Law, 94-105 (1985), at 105.

Quentin-Baxter's schematic outline provided my point of departure for thinking about responsibility for transboundary harm to biological diversity. My goal is not to complete his barely-begun mosaic of rules and principles, although I hope that what I have to say will encourage international lawyers to take up that task within the context of the Convention on Biological Diversity. My goal is to provide a conceptual foundation for the mosaic. By that I mean most immediately a theory or philosophy of law, a jurisprudence. When Quentin-Baxter says that the ultimate purpose of the law is to preserve human dignity and to promote human welfare, he's touching upon matters of jurisprudence. However, he never developed his philosophy of law in his writings. So I had to "try out" various alternatives in the literature of jurisprudence looking for one compatible with the artistic, practical, and humane qualities of the schematic outline. After much searching, I found such a philosophy of law in the writings of another professor of law, Lon L. Fuller, whose ideas seem to be undergoing a renaissance among some international lawyers today. I don't know if Fuller influenced Quentin-Baxter's thinking about the law. However, Fuller's idea that the law emerges gradually through a process of human interaction with the goal of solving concrete social problems is implicit in the mosaic of the schematic outline.

However, we must dive deeper than the literature of jurisprudence in order to arrest the tendencies to compartmentalized thinking in the law. Both Quentin-Baxter and Fuller realized that moral and psychological forces underlie the phenomena of law and give law efficacy in human affairs. A philosophy of law ultimately derives from a philosophy of human nature. So the scope of the search for an adequate foundation must be extended to include a view of human nature that has the artistic, practical, and humane features of the schematic outline.

When I came upon Fuller's writings, I discovered that his thinking had been shaped by many of the same philosophical works I'd been reading, which made me think that we were on to something. However, he didn't refer to these philosophical sources in his articles and books on jurisprudence. It took some detective work by his literary executor, Kenneth I. Winston, following Fuller's death in 1978 to discover the influence. Although Fuller wove a number of sources into his legal philosophy, the warp strands

came from classical American pragmatism, primarily the writings of William James and John Dewey.

In addition to being artistic, practical, and humane, the pragmatic philosophy of James and Dewey shared another quality with Quentin-Baxter's schematic outline: vitality. As James might have said, there's a "go" to it. One thought leads to the next, and to the next, and to the next. Forms emerge, endure for a period of time, and recede as new forms take their place. Process is the primary reality. No philosophers are better at process thinking than James and Dewey. If we want to arrest the tendency to compartmentalized thinking, there's no better place to begin than their writings.

Robert Quentin-Baxter, Lon Fuller, William James, and John Dewey were all essentially process thinkers. Perhaps I can best express what that means by considering a process they were all deeply concerned with in various ways, the process of bringing order out of chaos. Imagine that in the ordinary course of our activities, we come face to face with something that gives us pause. We tentatively try to bring about order in the situation. We're provoked to think, to classify our impressions in some way, to try out our classifications, and often to revise them depending on how the surrounding world reacts. Eventually, we succeed in putting our impressions into mental compartments stable enough to allow us to get on with our ordinary activities. We've restored order in the world around us, not the same order as existed before our experience but a more complex one. Moreover, as a result of the process we've become more complex creatures.

If we're not careful, we may find ourselves ensnared in what William James called the "psychologist's fallacy." We fall into this trap when we confuse two points of view. Since much of what follows is written from one of these points of view, it's worthwhile taking the time to distinguish them. Take, for example, the simple sensation of something—an orange color, an odor of violets, a cheesy taste, a thunderous sound. The sensation is a mental fact, the kind of thing James and other professional psychologists studied. In his psychology textbook, James distinguished between two ways of describing the object, which he called "subjective" and "objective." In the subjective approach, an individual tries to describe, as accurately as possible, how the

phenomenon is experienced concretely, from the “inside” as it were. Using the method of introspection, psychologists may describe their own experiences in this way. However, in their role as scientists, psychologists also look at mental facts “objectively” from a natural-science point of view, “from the outside” as it were.

Unlike the subject, the psychologist looking on thinks compartmentally. James put the irreducible data of psychology into four boxes (Figure 1). In the first box is the psychologist. In two other boxes are the thought studied and the thought’s object respectively. In the fourth box is the psychologist’s reality. Whereas the subject is aware solely of a particular sensation—*e.g.*, the smell of violets—the psychologist’s compartmentalized view of reality includes the latter three boxes containing both subjective and objective facts.

The peculiarities of the psychologist’s compartmental point of view, which is outside of the mental state he is reporting on, expose him to certain fallacies. “The *great snare of the psychologist*,” James says, “is the *confusion of his own standpoint with that of the mental fact* about which he is making his report.”² From the psychologist’s standpoint, both the subject’s mental state and the physical odor, which a machine might detect, are treated as objects. Moreover, the psychologist may be able to explain the odor as characteristic of a certain class of chemical compounds. In the light of his own unquestioned knowledge of reality, the psychologist may describe the subject’s account of the mental fact as an error. James warned that we must be very careful when discussing states of mind from the psychologist’s point of view to avoid foisting such knowledge upon the individual subject’s consciousness. “We must avoid substituting what we know the consciousness *is*, for what it is a consciousness *of*, and counting its outward, and so to speak physical, relations with other facts of the world, in among the objects of which we set it down as aware.”³ For James, there was always the possibility that an individual’s consciousness of reality might lead to a revision of some of the facts in the psychologist’s reality box.

² William James, *The Principles of Psychology* (The Works of William James, ed. by Frederick H. Burkhardt, Fredson Bowers, Ignas K. Skrupskelis, Harvard University Press, 1981) at 195 (emphasis in original).

³ *Id.* at 196.

1	2	3	4
The Psychologist	The Thought Studied	The Thought's Object	The Psychologist's Reality

Figure 1. William James's Diagram Showing the Assumptions of Psychology.
From William James, *The Principles of Psychology*, 1890.

James blamed the psychologist's fallacy in part on language. The vocabulary used to describe psychological facts comes from ordinary language and therefore is largely the vocabulary of outward things. We have special terms for only the most general kinds of subjective facts. Among the passions we speak of anger, love, fear, hate, hope; among intellectual activities, we denote things such as remembering, expecting, thinking, knowing, dreaming; among aesthetic feelings we talk of joy, sorrow, pleasure, pain. Lack of a special vocabulary for subjective facts hinders the investigation of the detailed structure of mental life. Absence of a word for some phenomenon often leads us to suppose that there is nothing there to study. It's hard to focus attention on the nameless. As a result, James found the descriptive parts of most psychologies to be vacuous.

However, in James's view, the most serious problem to result from the dependence of psychology on ordinary language is the assumption that as our conceptual or compartmental thinking is so must reality be. The thought of several distinct things must consist of several distinct "bits" of thought. The thought of an abstract or universal object must have its basis in an abstract or universal idea. What's lost in the psychologists' atomistic view of the mind's structure is the notion of thinking as fundamentally a process. James used the metaphor of a stream to describe the continuing flow of mental life as experienced from within. The first fact of his psychology is that thinking of some sort goes on. If we could say in English "it thinks" as we say "it rains" or "it blows," we'd be stating the fundamental psychological fact most simply and with the fewest assumptions. However, because we can't, we must simply say that thought goes on.

James developed the process model of the mind in his great work *The Principles of Psychology*. The psychologist and philosopher whom the book most influenced was John Dewey. Dewey generalized James's idea of the psychologist's fallacy to cover all processes in which organization emerges from a disordered or chaotic situation. He described the "psychological or historical fallacy" this way: "A set of considerations which hold good only because of a completed process, is read into the process which

conditions this completed result.”⁴ A description of the outcome of the process is treated as a description of the process leading up to the outcome. However, Dewey pointed out, if the outcome had already been in existence, there would have been no need for the process. The feeling that there is something lacking, that some piece of the puzzle is missing, prompts us to search for a way to satisfy our desire for order. An observer looking on may attempt to make sense of our behavior in terms of the distinction between means and ends. However, such descriptions from an outside perspective assume that the end is fixed in reality. Historians generally work with fixed outcomes, namely whatever happened in a certain sequence of events. However, for the actors in a historical drama, or for an individual or group struggling to bring some kind of order to a problematic situation, the outcome appears far from fixed. Viewed from the inside, the end is constantly changing, as are the means. Even for runners in a race, who know where the finish line is, the thought of the finish line changes during the race depending upon where they are on the course and what their body is telling them.

It’s not just psychologists or historians who are susceptible to the confusion of standpoints described by James and Dewey. International lawyers may be prone to it as well. Introducing the schematic outline, Quentin-Baxter raised the question how to assess the value of a set of articles containing many guidelines but only one obligation whose breach would engage international responsibility for a wrongful act. He found the justification in the subject matter of the topic. The wrongfulness of causing loss or injury in another State is not, in principle, doubtful; but it’s equally unclear that a State carrying out its legitimate business in a reasonable manner can be found responsible under international law for incidental loss or injury in another State. “Between these opposite poles,” Quentin-Baxter said, “there is a wilderness that cannot be reduced to order by prohibitory rules of general application. The boundaries of each State’s rights and

⁴ John Dewey, *The Reflex Arc Concept*, in *The Early Works of John Dewey*, Vol. 5: 1895-1898 (Ed. by Jo Ann Boydston, Southern Illinois University Press, 1972), at 96-109. The Modern Language Association edition of Dewey’s collected writings published by the Southern Illinois University Press consists of three series: The Early Works: 1882-1898; The Middle Works: 1899-1924; and The Later Works: 1925-1953. The standard three-part citation of Dewey’s works, used throughout, consists of the series abbreviation, the volume number, and the page number(s). For example, the citation above would be: EW.5.96-109.

responsibilities have to be charted in some detail and with mutual accommodation.”⁵ Ultimately, the charting depends upon the free play of negotiation between States, guided by shared principles and a sense of the practical need to accommodate interests. Looking at the situation abstractly from the international lawyer’s perspective is apt to prove unhelpful. Attempts to find some “objective” point of view, often based on an appeal to natural science, from which to view problems of transboundary harm have generally failed. Worse, in Quentin-Baxter’s view, the law has a tendency to “retreat into a labyrinth of its own devising.” International lawyers often agonize over the doctrinal basis of obligations that do not arise from a breach of State responsibility. Quentin-Baxter believed that the search for practical solutions to concrete problems of transboundary harm must start with the concrete points of view of the parties involved. Any objective point of view must arise by seeking a consensus embracing the subjective experience of individual States. Objectivity in international law is the successful outcome of an orderly legal process.

To say that the legal process is orderly is not to suggest that it’s mechanical. Ishmael, in Melville’s novel *Moby-Dick*, says: “There are some enterprises in which a careful disorderliness is the true method.”⁶ Although Ishmael is talking about his research into the matter of whaling, one can hear the voice of Melville speaking about the process of composing the novel. In an early scene, Ishmael encounters a marvelous painting whose unaccountable masses of shades and shadows suggest to him an attempt by the artist to delineate chaos bewitched. He describes it as a “boggy, soggy, squitchy picture” with a sort of indefinite, half-attained, unimaginable sublimity to it that freezes you until, involuntarily, you take an oath with yourself to find out what the painting means. After several conjectures, Ishmael proposes a “final theory” of his own, but I think one can hear Melville saying that there is no final theory about its meaning. The continual effort to find meaning in the surrounding chaos, to express the discovered

⁵ Robert Quentin-Baxter, *Third Report on International Liability for Injurious Consequences Arising Out of Acts Not Prohibited by International Law*, U.N. Doc. A/CN.4/360, in *Yearbook of the International Law Commission* 1982, vol. II (Part One), para. 50, p. 62.

⁶ Herman Melville, *Moby-Dick*, Chapter 82, *The Honor and Glory of Whaling* (W.W. Norton & Company, 2002), at 284.

meanings in palpable forms, and continually to reconstruct the meaning of those forms is what makes us human.

Like Ishmael in his effort to classify the leviathan, I have swam through libraries in preparation for the work of laying a foundation for the schematic outline. I have groped my way down to the bottom of hundreds of books and articles on law, psychology, economics, ecology, history, mathematics, philosophy, and even great literature in search of useful information and ideas. I have had my hands among the unspeakable foundations of the universe, and at times it has been a fearful thing. Like Ishmael, I have asked myself: what am I that I should essay to hook the nose of this leviathan called international liability? I have studied at the law schools of Columbia, and Yale, and Harvard, but only in my imagination. As a student, I have listened to the voices of William James, John Dewey, and Lon Fuller—but again only in my imagination. Still, like Ishmael, I was in earnest, and I vowed to try. I would try out in my imagination the value of their ideas and those of others to extract the precious oil that can illuminate the lower layers of human responsibility. If Melville could find philosophy in whales and poetry in blubber, perhaps even the International Law Commission's topic of international liability for injurious consequences of acts not prohibited by international law could profitably be squeezed.

The drama's done. I achieved what I could. It remains to tell the tale with all its unaccountable swerves. My end being but vaguely foreseen, it would not do to describe my path toward it as laid with iron rails upon which I, like Ahab, was grooved to run. For years, international lawyers have pursued the ungraspable phantom of international liability with monomaniacal visions of killing it with strict, sharp-pointed rules of general application. Their quarry has eluded them. It's time to try an approach more suited to the pursuit of meaningful order amid the vagaries of the mind's watery world where the deeper meanings of things reside. Call it Ishmael's approach, the method of careful disorderliness, which creates order out of chaos. Something like Ishmael's method guides the free yet constrained play of negotiation between States in Quentin-Baxter's schematic outline. Each negotiation is a drama. In telling the story of what happened, interpretation enters in, and, with interpretation, meaning. Surely all this is not without

meaning, but discovering it will require much earnest contemplation and repeated ponderings. And, especially, lawyers will have to throw open the windows in the rigidly intellectualized compartments of the law and try carefully to describe the concrete experience of international responsibility for transboundary environmental harm from an internal point of view.

B. Dramatis Personae

Before giving a synopsis of the drama, I'll briefly introduce the five main characters in the order of their appearance. Robert Quentin Quentin-Baxter, a professor of law at Victoria University of Wellington in New Zealand, saw the subject of liability for transboundary environmental harm as a whole. In 1978, the International Law Commission appointed him as Special Rapporteur for the topic of liability for injurious consequences of acts not prohibited by international law and charged him with developing draft articles for a possible convention. He died suddenly in 1984 before finishing the set of articles, but he left behind a record of his vision of the topic in the form of a schematic outline. The plan was to propose only general obligations of conduct, mainly procedural in nature, which would be substituted by more precise rules—including liability rules if appropriate—based on negotiation and tailored to the needs of the particular situation. Traditionally in international law, rules of prevention and rules of liability are conceptually distinct. Reparation for damage is a “secondary” obligation incurred for a wrongful act that breached a “primary” obligation of conduct. Quentin-Baxter eliminated the dualism from the liability topic by interpreting obligations of prevention and reparation as a continuum. Consistent with certain general principles as well as other obligations under international law, nations could agree to balance their interests by combining specific duties of prevention and reparation in a way that met the demands of the situation. Quentin-Baxter's work on international liability introduces a general theme of the dissertation: the need to find non-compartmentalized ways of thinking about the world, ways that can deal with the vagueness inherent in matters of degree, as part of the creative process of bringing order out of chaos.

Lotfi Asker Zadeh, a professor of electrical engineering and computer science at Berkeley, invented mathematical tools for thinking fairly precisely about matters of

degree. In 1965, he published a paper on fuzzy sets, which are classes or groups whose elements have degrees of membership. Fuzzy set theory is particularly useful for dealing with the type of uncertainty associated with the mental operation of grouping things or events as opposed to the probabilistic type of uncertainty about whether or not a particular event will occur in the future. Zadeh went on to develop fuzzy logic, a multi-valued logic that uses fuzzy sets to carry out approximate, as opposed to precise, reasoning. Through the use of linguistic variables, the behavior of a complex system can be computed using words rather than numbers. The rules governing the behavior of the system are formulated as a collection of fuzzy *if-then* statements. Although fuzzy set theory and fuzzy logic have their primary application in the field of engineering, they can be used to model any kind of system, including legal systems, involving inherently vague concepts. I include Zadeh among the main characters because I believe that his ideas can be useful to those grappling with concrete problems of liability for something as fuzzy as damage to biological diversity.

The three remaining main characters are like torchbearers in a relay of ideas through the intellectual wilderness of twentieth century philosophy. The first of the trio, William James, was a professor of psychology and philosophy at Harvard in the late nineteenth and early twentieth century. He once said that a man's vision is the great fact about him. James is the intellectual giant upon whose shoulders I have struggled to stand so that I might see a way around the impasse in the discussion of liability for transboundary environmental damage. When I say that I've struggled, I don't mean to suggest that James wrote in an esoteric, technical way difficult to penetrate. Most of his philosophical writings are in the form of lectures intended for a generally educated scholarly audience. The difficulty lies in learning to see the world in the non-dualistic way that James saw it. He is most well known as one of the founders of American pragmatism. However, the core of his philosophical vision is his philosophy of radical empiricism. The "secret," so to speak, is to learn to take our experience of the world at face value. We can always change our mind in the light of later experience (provided that our mis-takes of reality aren't fatal). The one thing we can't do is to get beyond our concrete experience, to reach some vision or insight into Truth with a capital T or Good

with a capital G. As finite, temporal beings, whose mental powers have evolved over time in response to the unique demands of the human environment, we have only points of view, bounded by a horizon, and focused on something in our concrete experience of the world that interests us, something that attracts our attention so that we think about it for more than a passing moment. The topic of liability for transboundary damage to biological diversity held my attention for an extended period during which I tried to see it more clearly, as one tries to see a star more clearly, by looking at it not directly but slightly to one side.

A wise man⁷ once said that to the extent that there is a single key to John Dewey's way of thinking it's the principle of *responsibility*. Although what it means to be responsible depends upon the context—for example, the word is used in a relatively narrow sense in the law—the basic idea as Dewey saw it is simple. All human actions, including the special activity of thinking, have consequences. The important decision which all humans, but especially philosophers, are concerned with is whether or not to accept responsibility for those consequences. Dewey saw that acting responsibly is a habit, a social function, something that we learn to do—or fail to learn. The process of learning can be facilitated, or impeded, by the surrounding circumstances, which to some extent can be manipulated to encourage individuals to become more responsible. Holding the potentially responsible party liable for monetary damages is one way the law seeks to make actors accountable for the harmful consequences of their actions, but it is only one way and not necessarily the best way in all circumstances. Obligations arise from the demands of the situation, and responsibility is essentially the habit of being responsive to those demands. That something is owed to innocent victims who suffer harm from an activity is generally true; the difficulty lies in determining *what* is the appropriate response to meet the unique demands each situation imposes. That determination requires thinking, moreover thinking anew with each case of injury, each new set of facts. It's an arduous undertaking but, as Dewey reminds us, an entirely

⁷ See Edwin A. Burt, *The Core of Dewey's Way of Thinking*, 57 *The Journal of Philosophy*: 401-419 (1960).

human one, indeed the only truly human response to the fundamental concrete fact of harm.

Lon Luvois Fuller, a professor of law and legal philosophy at Harvard from the late thirties to the early seventies, probably got from Dewey the idea that law is a kind of formulated morality. In any case, Fuller deserves credit for developing the moral conception of law in the twentieth century. He is sometimes mistaken for a traditional natural law theorist because of his “debate” in the late 1950s and early 1960s with the English legal philosopher and positivist H.L.A. Hart, who advocated the strict separation of law and morals. History is not kind to losers, which is how most judged Fuller. As a result, his ideas about the morality of law tended to be neglected, when they were not caricatured. With the discovery of Fuller’s private papers after his death in 1978, the pragmatic roots of his legal philosophy, particularly the influence of James and, even more so, of Dewey became apparent. There are signs that legal thinkers are “re-discovering” Fuller’s ideas, even in the area of international law which is far—and yet near—to the topics of contract law and jurisprudence that Fuller most often wrote about. It’s near because Fuller was a great believer in customary law, a quaint idea from an earlier world perhaps but one that has undeniable staying power, perhaps because it expresses something deeply rooted in the human psychology of responsibility, moral or legal, call it what you will. Lon Fuller, like the other professor of law in the play, Robert Quentin-Baxter, is someone whose ideas have unjustly suffered an eclipse, a condition I hope the following pages will help to ensure is only temporary. Permanent eclipses of creative works of legal imagination are much like extinctions of species. Both are worth the effort to remember and to conserve.

C. Synopsis

I suggested that the dissertation is a deliberation, a kind of *dramatic rehearsal* to use Dewey’s phrase, in which various ideas are taken up, tried on, some selected, others discarded, with the aim of reaching a practical plan for realizing liability for transboundary damage to biological diversity on the world stage. The law review format lends itself to the dramatic purpose. Each chapter represents a separate act, and each

major subheadings a separate scene. As with any play, the scenes shift, but each should contribute to moving the story along. The following is a brief synopsis of the plot.

Chapter One: I tell three stories that provide an historical and conceptual context. The first is about the *Trail Smelter* case, which serves as a paradigm of the kind of transboundary environmental damage in question here even though the facts of the case did not involve harm to biological diversity as such. The dispute involved damage to crops and forest trees around the town of Northport, Washington due to smoke from a privately owned smelter in Trail, British Columbia during the 1920s and 1930s. In 1941, the Trail Smelter Arbitral Tribunal found Canada responsible for the damage under international law and imposed an operating régime on the smelter that included elements of prevention and liability.

The second story is about Robert Quentin-Baxter's work from 1978 to 1984 as the Special Rapporteur for the International Law Commission's study of international liability. Quentin-Baxter struggled to develop the topic in the face of skepticism from, on the one hand, members of the Commission who thought that it lacked a basis in international law and, on the other hand, members who favored an approach based on strict liability. Basing his work largely on the *Trail Smelter* case, Quentin-Baxter devised a pragmatic working model of the liability topic that emphasized the duty to prevent harm within the context of a responsibility to make adequate reparation for significant damage. Although Quentin-Baxter died before he could complete his work, his schematic outline of the topic provides a blueprint for constructing an international framework agreement to deal with transboundary environmental harm.

The third story is about a meeting I attended in Montréal in October 2005 to discuss the feasibility of an international liability régime under the Convention on Biological Diversity. Although the meeting ended inconclusively, I believe that it's possible under the Convention to design a practical framework for constructing specific régimes to prevent transboundary harm to biological diversity and to make reparation for damage should it occur. Article 3 of the Convention enshrines the basic principle of the *Trail Smelter* case that in developing its natural resources each State has a responsibility not to harm the environment of other States. The most promising path toward developing

this general principle is the soft approach outlined by Quentin-Baxter, based on negotiating specific rules of prevention and liability appropriate to a particular context. The greatest obstacle is overcoming the kind of compartmentalized thinking that led the International Law Commission in the 1990s to abandon Quentin-Baxter's conception of prevention and liability as a continuum.

Chapter Two: I discuss the idea of *biological diversity*, how it came to be formulated as the focal concept of the conservation biology movement in the early 1980s, how scientists have attempted to define and to measure it, and how State parties to the Convention on Biological Diversity propose to achieve a significant reduction in the rate at which it is being lost. An important concept for the subject of liability is *injury* to biological diversity or to biological systems in general. The theory that smelter smoke caused "invisible injury" to plants played a large part in the litigation strategies of Canada and the United States in the *Trail Smelter* case. Discriminating between adverse and non-adverse effects on living organisms is a tricky business even for toxicologists in a laboratory setting. It's doubly difficult for environmental scientists to make such determinations with regard to something as elusive as injury to biological diversity. At the heart of the problem is how to classify vaguely defined or "fuzzy" objects and events. Methods based on binary logic run into the difficulty of drawing boundary lines in a non-arbitrary way. Non-binary thinking allows a way of dealing with borderline cases. Lotfi Zadeh's theory of fuzzy sets and the techniques for approximate reasoning with them known as fuzzy logic offer a useful method for treating in a fairly precise way the type of uncertainty presented by the phenomenon of injury to biological diversity.

Chapter Three: The discussion of non-binary mathematical techniques such as fuzzy logic for dealing with vague phenomena leads to a search for a non-dualistic way of looking at the world in general. A practical point of view is needed from which to look afresh at the problem of liability for transboundary harm to biological diversity. The path leading to this point of view turns out to be one less traveled by in twentieth century philosophy: classical American pragmatism as expressed by William James and John Dewey. Someone once described pragmatism as more an attitude than a philosophy, an attitude born out of frustration with the sterility of meaningless debates between the main

schools of philosophy over abstract issues that had no grounding in life as we experience it. At the end of the day, we must be able to redeem our concepts in the coin of concrete experience. But here it is just the start of the new day, of the search for a non-dualistic point of view. So, the chapter steers clear, as much as possible, of epistemological and metaphysical questions, although we will have to ford those more technically challenging streams of thought at some point if we are to understand James's and Dewey's radically non-dualistic way of seeing the world. For now, the discussion remains pretty much on the level of psychology. For James, the fundamental metaphor for our mental life was the "stream of consciousness." For Dewey, the unifying principle and main working hypothesis of psychology was the concept of the reflex arc. I believe that understanding something about the way James and Dewey thought that the human mind functions on a fundamental level will pay off, if we persist along the pragmatic path they blazed, in practical solutions to concrete problems of protecting biological diversity across national boundaries.

Chapter Four: If we accept that pragmatism is fundamentally an attitude, how does that attitude reveal itself in the theory and practice of law? The chapter attempts to answer that question, but it fails. Still, something valuable is learned in the search for a pragmatic philosophy of law that will be useful later. The pragmatic nature of the law cannot be discovered by looking at the phenomena of law from above and outside as the scholars known as "legal realists" in the first half of the twentieth century attempted to do. The rationality underlying forms of legal and social order can only be seen from within, from the point of view one engaged in the practice of law. What that means will become clearer in the following chapter. The current chapter describes the intellectual adventures of a student of the law in search of a pragmatic philosophy of law for his thesis on liability for transboundary harm to biological diversity. He knocks about several elite law schools—Harvard, Columbia, and Yale—in the quest. He takes courses from such eminent teachers of law as Roscoe Pound, Karl Llewellyn, Myres McDougal and Harold Lasswell (who was actually a sociologist, part of the problem), trying on various ideas, projecting them on the screen of imagination, only to come away dissatisfied with the results. In the meantime, he continues to penetrate to the core of

James's and Dewey's visions of reality, James's philosophy of radical empiricism and Dewey's logic or method of inquiry. They slayed the dragon of dualistic thinking a century ago, but for some reason we insist on keeping it alive, creating all kinds of problems in the law and elsewhere that are more theoretical than practical. James called the habit of taking our definitions of things as the whole of reality "vicious intellectualism," and we're still struggling with it. Night descends on the forest.

Chapter Five: There is something wondrous strange about the topic of responsibility for transboundary damage to biological diversity. We approach it a little too much like Horatio and not enough like Hamlet. Horatio is a model of rationality whose philosophy does not allow for the existence of ghosts, but the topic of liability is, to borrow a phrase from James, "spook-haunted." To put it in testable scientific terms, I suggest that the patterns of neural activity in our brain when we're talking about responsibility for damage are distinctly different from the neural patterns when talking about prevention of damage. But it is still one brain, a functional unity, interacting with the surrounding environment in rational ways, though not necessarily in accordance with the canons of rationality based on binary logic. The chapter looks at several behavioral models of rationality developed by cognitive psychologists and behavioral economists based on the metaphor of the mind as a kind of computer. However, to develop a workable model of rationality for the international liability topic, we need to reboot—or better still, change the metaphor. Liability is ultimately a drama about restoring a broken moral order in a particular part of the world. James and Dewey saw that the human mind is actively engaged with the world at every moment bringing order out of chaos. Their accounts of practical rationality enlist the full range of our active powers, not just the logical or scientific ones, in the struggle to create forms of order that embody the moral aspects of human nature. Among legal thinkers, Lon Fuller alone seems to have understood what they were trying to do. He saw the law as a continuing process of bringing order out of chaos, an achievement that needs constantly to be renewed. If those with a technical knowledge of the law can re-capture his pragmatic vision, there is hope that we may yet see the dawn with regard to liability for transboundary harm to biological diversity. Thanks to the work of Robert Quentin-Baxter, the blueprints exist for an

international framework to facilitate the creation of workable legal arrangements tailored to the needs of the situation and encompassing both prevention and liability. What's needed is the will to build upon his vision of the whole.

Chapter One

I. *The Trail Smelter Case*

A travel writer visiting the new town of Trail, British Columbia in the late 1890s described the smelter furnace on the hill as looking like “an outcrop of hell.”¹ Noxious fumes from smokestacks made the surrounding landscape look “mean, sordid, and depraved—a veritable blot on the face of nature.” About nineteen miles south of Trail, on the other side of the Columbia River and the other side of the international boundary, was the new town of Northport, Washington. Northport also had a smelter, but that’s about all the two towns had in common. By the 1920s, Trail was a thriving industrial community of twelve thousand souls, the fourth-largest city in British Columbia, with a vibrant cultural life.² Northport, with its population of several hundred after the smelter finally shut down for good in 1922, was the center of a struggling agrarian community of “stump ranchers” on its way to becoming a ghost town.³

To farmers living near smelters, periodic “fumigations” of smoke were a never-ending nuisance, particularly during the growing season. Smelter smoke contains sulfur dioxide, the primary ingredient of what we call “acid rain.” Intense fumigations produce spots on the leaves of crops and trees, visible marks of acute injury. As we now know, there can also be injury due to chronic exposure to lower concentrations of sulfur dioxide. Farmers and loggers frequently sued both the Trail and Northport smelters for damages.⁴ Consolidated Mining and Smelting Company, which operated the Trail Smelter, could rely on the deep pockets of its parent corporation, the Canadian Pacific Railroad, to settle the claims. Smelting companies generally tried to settle out of court, either by direct payments to farmers or by purchasing long-term “smoke easements.” Consolidated

¹ James R. Allum, “*An Outcrop of Hell*”: *History, Environment, and the Politics of the Trail Smelter Dispute*, in *Transboundary Harm in International Law: Lessons Learned from the Trail Smelter Arbitration* (Rebecca M. Bratspies and Russell A. Miller, eds., Cambridge University Press, 2006), 13-26, at 14, (citing Frances McNab, *British Columbia for Settlers: Its Mines, Trade and Agriculture* (1898) at 271-272).

² See John D. Wirth, *Smelter Smoke in North America: The Politics of Transborder Pollution* (University Press of Kansas, 2000); see also Trail Historical Society, *History of Trail*, at <http://www.trailhistory.com/history.php> (accessed 18 August, 2011).

³ See Wirth, *id.*; see also HistoryLink.org Online Encyclopedia of Washington State History, “Stevens County—Thumbnail History” (by David Wilma), at <http://www.historylink.org/> (accessed 18 August 2011).

⁴ Wirth, *id.*, at 14.

Mining also bought out aggrieved farmers, so that by the early 1920s it owned most of the land along the Columbia River from Trail to the border.⁵

When cases went to trial, free-lance “experts” on the harmful effects of smelter smoke often hired themselves out to farmers. For their part, smelting companies claimed that the damage was due primarily to natural conditions and to poor farming practices. Consolidated Mining viewed the plaintiffs as “smoke farmers” who believed they had more to gain by suing than by farming.⁶ Farmers should be grateful to the smelting companies because without the booming economy created by mining and smelting, they’d have no market for their crops. Generally, the law favored the smelting companies. Cases were decided through the legal test known as “beneficial use” which weighed the farmers’ losses against the productive value of the smelter and its benefit to the community.⁷ Under this rule, the farmers got something, but not much. In the early 1920s, a binding arbitration under the provincial law of British Columbia awarded sixty farmers near the Trail Smelter a total of \$60,000.⁸ However, the court did not require the smelter to regulate its emissions. Consolidated Mining viewed the payment simply as part of the cost of doing business.

In 1925 and 1927, Consolidated Mining raised two smokestacks at the smelter to 409 feet and greatly increased its daily smelting of lead and zinc ores.⁹ New smelting techniques developed by the company almost doubled the tons of sulfur emitted monthly. The plan was to discharge the smoke higher in the atmosphere where air currents would carry it away from the fields of local farmers. In 1925, farmers in the State of Washington began noticing brown lesions on the leaves of their crops following periods of intense fumigation. Meteorological conditions in the Upper Columbia River Basin had unexpectedly expanded the “local smoke zone” around the Trail Smelter into an international one.

⁵ *Id.*

⁶ *Id.*

⁷ Allum, *supra* note 1, at 15.

⁸ *Id.*

⁹ Trail Smelter Case (United States v. Canada), Decision reported on April 16, 1938, *in* Reports of International Arbitral Awards, Vol. III: 1911-1937, at 1917 (United Nations, 2006). [Hereinafter, Trail Smelter Case, 1938 Decision]

Responding to complaints by farmers around Northport, Consolidated Mining negotiated a number of settlements. However, Washington state law prohibited foreign companies from owning land or purchasing smoke easements, and farmers were not keen to pursue claims for damages in the courts of British Columbia. It was unlikely that a British Columbia court would take jurisdiction over a case involving damages outside Canada,¹⁰ and even if it would, American farmers remembered the meager sum awarded their Canadian counterparts in the arbitration a few years earlier. In 1925, settlers around Northport formed a committee to petition the Governor and the State legislature about the “invasion of our rights and homes by this rich foreign corporation.”¹¹ The committee evolved into a grassroots organization, the Citizens Protective Association, whose by-laws prohibited members from settling claims individually without the consent of the Board of Directors. Consolidated Mining refused to negotiate a collective settlement with the Association, calling it a group of agrarian radicals and agitators.¹² By 1927, the Governor of Washington and the State’s congressional delegation were pleading with the United States government to step in and find a diplomatic solution to the smoke problem. With the Canadian government’s agreement, the matter was referred to the International Joint Commission, an institution set up by the Boundary Waters Treaty of 1909 to resolve boundary and water issues between the two countries.¹³ What was essentially a local nuisance had become an international affair.

¹⁰ See, Stephen C. McCaffrey, *Of Paradoxes, Precedents, and Progeny: The Trail Smelter Arbitration 65 Years Later*, in *Transboundary Harm in International Law*, *supra* note 1, at 35 (noting that the old English “local action rule”, still around today, prevented courts in British Columbia from hearing suits for damage to foreign land; and the State of Washington lacked a “long-arm” statute that would have permitted landowners to sue the Trail smelter in Washington state courts).

¹¹ Wirth, *supra* note 2, at 15 (citing a petition of December 1, 1925 from John Leaden, head of the Citizens Protective Association, to the Governor and Legislature of the State of Washington).

¹² *Id.* at 16.

¹³ For a good account of the diplomatic and political aspects of the decision to refer the matter to the IJC see D.H. Dinwoodie, *The Politics of International Pollution Control: The Trail Smelter Case*, 27 *International Journal*, 219-235 (1972). For a persuasive argument for reading the *Trail Smelter Case* as a case study containing a framework for a multi-dimensional contextual analysis of interstate disputes with environmental aspects see Karin Mickelson, *Rereading Trail Smelter*, 31 *Canadian Yearbook of International Law*, 219-234 (1993).

Although the Canadian government welcomed the intervention of the International Joint Commission,¹⁴ it was reluctant to agree to terms of reference that might jeopardize future operations at the Trail Smelter. The Canadian Pacific Railroad, one of the most powerful corporations in Canada, owned the majority of stock in Consolidated Mining.¹⁵ The United States government also had other reasons for getting involved besides helping a small group of down-on-their-luck farmers and loggers in upstate Washington. The State Department was looking to establish general principles to settle damage claims by United States property owners against corporations in Canada.¹⁶ Moreover, the Forest Service of the Department of Agriculture had scores to settle with the smelting industry whose activities at a number of sites had damaged crops and national forests. Government scientists hoped to produce a new report on sulfur dioxide's effect on vegetation to replace the 1915 Selby Smelter Report¹⁷ as the industry standard for pollution abatement. There were also personal reasons. In the course of their investigations, several scientists came to sympathize with the cause of the Citizens Protective Association to the extent that they essentially became scientific advocates.

At the heart of the scientific dispute was the nature of the injury to plants caused by exposure to sulfur dioxide. No one doubted that the brown, necrotic lesions of leaf tissue appearing after intense fumigations constituted a form of injury. The scientific debate concerned the reality of a more subtle form of injury called "invisible injury" because it left no marks on the leaves. Whereas visible injury resulted from exposure to high concentrations of sulfur dioxide, invisible injury supposedly resulted from chronic or long-term exposure to low concentrations. Contrary to the general belief that plants recovered quickly from such episodes, the invisible injury thesis held that chronic

¹⁴ See Wirth, *supra* note 2, at 21-22. Canada believed that, as the smaller country, it stood more to gain from mediation by the IJC. Nationalizing the dispute put Canadian interests on a par with those of their powerful neighbor.

¹⁵ *Id.* at 22 (citing a letter, Ottawa, December 27, 1927 from O.D. Skelton, undersecretary of state at External Affairs to J.H. King, minister of health).

¹⁶ *Id.*

¹⁷ J. A. Holmes, Edward C. Franklin, & Ralph A. Gould, Report of the Selby Smelter Commission, with Accompanying Papers (Govt. Printing Office, 1915), available at <http://digital.library.unt.edu/ark:/67531/metadc12308/m/> (accessed 19 August 1011). For a summary of the report see *Report of the Selby Smelter Commission*, 7 *Journal of Industrial and Engineering Chemistry*, 41-45 (1915).

exposure to low levels of sulfur dioxide resulted in cumulative adverse effects on plant growth. Today, plant physiologists classify sulfur dioxide injury into acute and chronic forms,¹⁸ but the research establishing the distinction came later in the twentieth century. In the early 1930s, the thesis of “invisible injury” was a novel, largely untested, hypothesis.¹⁹ In connection with the International Joint Commission investigation, plant physiologists at the U.S. Department of Agriculture set about to find experimental evidence demonstrating the existence of this form of injury. Given the potential impact of the research both on awards for smelter smoke damage and on pollution abatement régimes, the scientific debate attracted much attention.

Not to be outdone, the Canadian government established its own scientific team under the direction of the National Research Council to conduct a parallel investigation into invisible injury. Their mission was to check, and where possible to rebut, experimental evidence produced by U. S. Department of Agriculture scientists. In addition, the International Joint Commission appointed its own pair of scientific experts to verify the findings of both teams of government scientists and to make independent investigations. From 1927 to 1930, the area around Trail and Northport became a hotbed of scientific activity. As one historian put it, “[t]he farmers’ ordeal by experts had only just begun.”²⁰

¹⁸ See, e.g., G.B. Wilson & J.N.B. Bell, *Studies on the Tolerance to Sulphur Dioxide of Grass Populations in Polluted Areas. IV. The Spatial Relationship Between Tolerance and a Point Source of Pollution*, 102 *New Phytologist*, 563-574 (1986), at 563 (“Sulphur dioxide (SO₂) is a widespread phytotoxic atmospheric pollutant, arising principally from the combustion of fossil fuels and the smelting of sulphide ores. It can cause two main types of injury: acute injury, where necrosis is produced on foliage by a high concentration of the gas over a short period; and chronic injury, which results from prolonged exposure to a lower concentration and is manifested in the form of reduced growth and/or yield, sometimes accompanied by chlorosis and premature senescence.”).

¹⁹ German chemists and plant scientists first proposed the hypothesis of “invisible injury” (“unsichtbare Beschädigungen”) in the 1880s. Their work was summarized in Paul Sorauer’s *Handbuch der Pflanzenkrankheiten*, translated into English as *Manual of Plant Diseases* in 1922. See Wirth, *supra* note 2, at 49.

²⁰ Wirth, *id.* at 23.

In February 1931, the International Joint Commission issued its recommendations in a unanimous report to the two governments.²¹ It found evidence of injury in varying degrees and awarded \$350,000 for all damages up to January 1, 1932.²² The award was only half of what the United States had sought, but more than the \$250,000 that Consolidated Mining had offered in settlement. As to future operations of the smelter, the Commission noted that damage from fumes should be greatly reduced, if not eliminated, provided that Consolidated Mining followed through on measures designed to reduce sulfur dioxide emissions. The main component of the abatement program was a technologically advanced sulfuric acid absorption process, in which recovered acid was used to produce ammonium sulfide for use in fertilizer. Consolidated Mining planned to sell the fertilizer to prairie farmers along the route of the Canadian Pacific railroad.²³ It was surely easier for the company to go along with the recommendations to install pollution abatement technology when it could make a handsome profit selling the by-products. On the central question of the meaning of *damage*, the report stated that the term meant such damage as the governments of the United States and Canada deem appreciable. Specifically, the term did not include occasional damage caused by sulfur dioxide fumes carried across the boundary in air pockets or by unusual atmospheric conditions. All things considered, the report was a victory for Consolidated Mining on the issue that mattered most—avoiding a restrictive operating régime.

Nothing happened for two years after the International Joint Commission submitted its recommendations to the governments. No award money was paid. The farmers were not satisfied with the amount. They thought that the award should be greater, given the claims of scientists at the Department of Agriculture about the existence of invisible injury to crops. Moreover, Consolidated Mining did not guarantee that fumigations would cease after January 1, 1932. The International Joint Commission recommended that if a complaint arose after this date and the company did not adjust the

²¹ *Report of the International Joint Commission, United States and Canada*, (Signed at Toronto, February 28, 1931), 25 *American Journal of International Law*, 540-543 (1931). According to the treaty establishing the IJC, reports of the Commission were non-binding.

²² *Id.* at 541.

²³ See Wirth, *supra* note 2, at 24.

claim within a reasonable time, the two governments should determine the amount of damages. Despite continuing fumigations, no complaints were made. In February 1933, the U.S. State Department, under pressure from the State of Washington's congressional delegation, notified the Canadian government that damage was still occurring and the situation was entirely unsatisfactory. On the American side, there was talk of setting aside the International Joint Commission award and reconsidering the question of damages prior to 1932. Consolidated Mining realized that the situation had changed in a way that put future operations of the Trail smelter in jeopardy.²⁴ The company faced the possibility of a much higher damage award based on the notion of invisible sulfur dioxide injury to plants. Even more worrisome was the possibility of an operating régime based on an air quality rule specifying the maximum permissible levels of sulfur dioxide emissions.

In 1933, the Canadian government agreed to the request of the United States to negotiate a convention to find a permanent solution to the Trail Smelter problem, which threatened to impede progress on more important matters between the two countries.²⁵ However, the Canadians insisted that any agreement incorporate the recommendations in the International Joint Commission report.²⁶ The United States would not accept the proposal simply to adopt the Commission report, partly because of its vague definition of *damage*. However, it was prepared to negotiate a convention that would include the Commission's recommended \$350,000 award as full payment for damages prior to 1932. This suggestion met part of the Canadian demands while leaving open the question of the meaning of *damage* for the purpose of adjusting future claims and determining the nature of a control régime, if any, to be imposed on the Trail Smelter. The United States wanted

²⁴ See Wirth, *supra* note 2, at 37-38.

²⁵ Among the most important of these other agreements was a treaty concerning the construction of the St. Lawrence Seaway and a trade agreement that would reduce tariff barriers.

²⁶ See Letter from R.B. Bennett, Canadian Secretary of State for External Affairs, to Warren D. Robbins, United States Ambassador to Canada (Dec. 26, 1933), in *Foreign Relations of the United States, 1933, Vol. II* (U.S. Gov. Printing Office, 1933), 62-67, at 64 ("The Canadian government has come to the conclusion that no convention or agreement dealing with this matter would be satisfactory, if it did not accept, incorporate and implement the unanimous report of the International Joint Commission."). The diplomatic correspondence is available at <http://digital.library.wisc.edu/1711.dl/FRUS.FRUS1933v02> (accessed 19 August 2011).

the arbitral panel established by the convention to determine the maximum frequency, duration and concentration of sulfur dioxide fumigations that could be permitted in the State of Washington without causing injury. However, in the diplomatic back-and-forth, the Canadians suggested that in setting such standards it would be necessary to take into consideration other places along the international boundary, such as areas around Detroit and Buffalo, where preliminary studies had shown that fumes from industries on the American side were polluting the air in Canada.²⁷ Sensing the threat to its economic interests, the United States dropped the language about imposing mandatory air quality standards and agreed to give the arbitral panel broad discretion regarding what, if any, operating régime to impose upon the Trail Smelter. Negotiations teetered on the brink of collapse as the United States withdrew its consent to accept the \$350,000 damage award and Canada, at the urging of the smelter, threatened not to allow the arbitral panel the power to impose an operating régime.²⁸ It took a letter²⁹ from President Roosevelt to Prime Minister Bennett of Canada to get things back on track, but by the end of 1934, both sides reached an agreement on the terms of reference.

The Trail Smelter Convention,³⁰ signed in April 1935, submitted the dispute to binding arbitration by an Arbitral Tribunal. Under Article 1, the United States agreed to accept the \$350,000 settlement proposed by the International Joint Commission for damage that occurred prior to January 1, 1932. To decide the case, the governments established an Arbitral Tribunal consisting of a chairman—who could be neither a British

²⁷ See Letter from R.B. Bennett, Canadian Secretary of State for External Affairs, to Warren D. Robbins, United States Ambassador to Canada (Apr. 10, 1934), *in* *Foreign Relations of the United States*, Vol. 1 (U.S. Gov. Printing Office, 1934), 923-924, at 924 (“It would obviously be a serious matter for the industrial communities at Detroit, Buffalo, and elsewhere on the international boundary-line, to have established a rule which would make it impossible for them to continue their industrial activity. There may well be instances where Canadian industries, other than that conducted at the Trail Smelter, might equally be prejudiced by the establishment of such a rule.”).

²⁸ See Memorandum by Jacob A. Metzger, Legal Adviser to U.S. State Dept., (Sept. 25, 1934), *in* *Foreign Relations of the United States*, Vol. 1 (U.S. Gov. Printing Office, 1934), 946-954.

²⁹ See Letter from Franklin D. Roosevelt, President of the United States, to Richard B. Bennett, Prime Minister of Canada (Oct. 25, 1934) *in* *Foreign Relations of the United States*, Vol. 1 (U.S. Gov. Printing Office, 1934), 955.

³⁰ Convention for Settlement of Difficulties Arising from Operation of Smelter at Trail, B.C., April 15, 1935, U.S.-Can., U.S.T.S. No. 893; *in* *Reports of International Arbitral Awards*, Vol. III: 1907-1910 [hereinafter *Trail Smelter Convention*].

nor a United States citizen—and two national members, one selected by each government.³¹ Article III of the Convention set out the four questions to be decided. The first and least difficult question (although the most important one from the farmers’ perspective) was whether damage had occurred after January 1, 1932 and, if so, what compensation was due. The remaining series of questions addressed the problem of how to abate the nuisance. The second question asked “whether the Trail Smelter should be required to refrain from causing damage in the State of Washington in the future, and, if so, to what extent?” The last part of the question anticipated that it might not be possible to eliminate damage completely without shutting down the smelter. Since closure was unacceptable to the Canadians, the third question instructed the Tribunal to consider “what measures or régime, if any, should be adopted or maintained by the Trail Smelter?” Finding an answer to this question would prove to be the Tribunal’s most difficult task. However, even with a preventive régime, damage might still occur. So, in the fourth question, the Tribunal was asked to decide, based on its decisions with regard to the two preceding questions, what indemnity or compensation, if any, should be paid.

The *Trail Smelter* arbitration was the first international case involving transboundary air pollution.³² There were few cases in international law dealing with transboundary nuisance from which to draw legal principles relevant to the facts of the Trail Smelter case. Canadian and American negotiators wanted to find a permanent solution to the dispute. The Tribunal could be instructed to apply municipal laws the two countries had in common. However, Canadian lawyers thought that the case law of nuisance developed by their provincial courts in disputes involving industrial and agricultural enterprises was unfavorable to industry,³³ whereas United States case law, including the law of the Supreme Court, seemed to be more evenly balanced. Therefore, Article IV of the Convention provided that in addition to international law, the Tribunal

³¹ The chairman of the Tribunal was Jan Frans Hostie of Belgium, and the national members were Robert A.E. Greenshields of the Province of Quebec and Charles Warren of Massachusetts.

³² See Rebecca M. Bratspies and Russell A. Miller, *Introduction*, in *Transboundary Harm in International Law: Lessons from the Trail Smelter Arbitration*, *supra* note 1, at 2-4.

³³ See, John E. Read, *The Trail Smelter Dispute*, 1 *Canadian Yearbook of International Law*, 213-229 (1963), at 227.

should apply the law and practice followed in dealing with “cognate questions” in the United States. Such questions arose primarily in cases of interstate air and water pollution involving States as parties, which under the United States Constitution fall exclusively within the jurisdiction of the Supreme Court.³⁴

Article IV also directed the Tribunal to “give consideration to the desire of the high contracting parties to reach a solution just to all parties concerned.”³⁵ Some legal scholars have interpreted these words as little more than a platitude,³⁶ but at least for those who participated in the litigation the idea of a fair solution within the law was a working principle. John Read, chief legal adviser to the Canadian government, remarked upon the meaning of the phrase for the negotiators of the Trail Smelter Convention:

The writer [John Read] was the Legal Adviser of Mr. MacKenzie King for twelve years and of Mr. R.B. Bennett for five years, in both instances in their capacity as Secretary of State for External Affairs. There were matters, such as party politics, in which they differed; but, in the fundamentals of international relationships, they thought alike. Both eschewed the “horse-trading” approach to negotiation. Neither regarded an international negotiation as a matter in which it was desirable to reach a result profitable to our side and unprofitable to the adversary. Both considered that the only acceptable result of an international negotiation was one in which the outcome was permanently profitable to all parties concerned. This fundamental principle of Canadian foreign policy found its expression in the words quoted above. The words were the words of Mr. Bennett, but they would have been the same if the Convention had been drafted a year later.³⁷

It’s easy to be cynical and view international relations as a game with each party striving solely to maximize its gains. Read’s words serve as a reminder that, at least from the

³⁴ U.S. Constitution, art. III, § 2, cl. 2 (“In all cases . . . in which a State shall be Party, the supreme Court shall have original Jurisdiction.”).

³⁵ Trail Smelter Convention, art. IV, *supra* note 30, at 1908.

³⁶ *See, e.g.*, Alfred P. Rubin, *Pollution by Analogy: The Trail Smelter Arbitration*, 50 Oregon Law Review 259-282, (1971) at 271 (“This platitude was interpreted by the tribunal to indicate that the parties would not stand on absolute rights as sovereigns, but were concerned with balancing the interests of, in the tribunal’s phrases, ‘the agricultural community’ with ‘the interest of industry.’”).

³⁷ Read, *The Trail Smelter Dispute*, *supra* note 33, at 225. In 1935, McKenzie King’s Liberal Party defeated R.B. Bennett’s Conservatives in the general election, and King succeeded Bennett as Prime Minister of Canada.

point of view of some players in the game, phrases such as *a solution just to all parties concerned* have genuine meaning.

For a week in July 1937, members of the Arbitral Tribunal inspected the area around Northport in northern Stevens County, Washington and also the smelter at Trail. They closely examined crops and orchards, and made surveys or “cruises” of forests to see conditions in the field and to look for signs of injury. As a result, when they met later that month to hear testimony, they were familiar with the places and conditions described by the witnesses and experts.

Finding that injury had occurred, the Tribunal turned to the scientists and experts from each side for opinions about the cause. In general, these witnesses “expressed contrary views and arrived at opposite conclusions, on most of the questions relating to cause of injury.”³⁸ The Tribunal said that it believed that the witnesses were completely honest and sincere and had arrived at their conclusions as a result of “high technical skill.” At the same time, they recalled the observation of a judge in a recent federal case involving smelter smoke damage that “witnesses who give opinion evidence are sometimes unconsciously influenced by their environment, and their evidence colored, if not determined, by their point of view.”³⁹ The real value in the testimony of such opinion witnesses lay “in their description of appearances and statement of the surrounding circumstances rather than in their ultimate expressed opinions.”⁴⁰ The Tribunal chose not to wade into the treacherous scientific waters of causation. The issue of “invisible injury” to plants from chronic exposure to low concentrations of sulfur dioxide does not explicitly appear in their decision. The experimental evidence produced by scientists at the U.S. Department of Agriculture supporting the theory of invisible injury had been effectively countered by the more extensive evidence against the hypothesis produced by Canadian National Research Council scientists. In the end, the Tribunal found too much uncertainty in the science to draw any positive conclusions. Without a convincing scientific case, the settlers’ hopes for a large damage award evaporated.

³⁸ Trail Smelter Case, 1938 decision, *supra* note 9, at 1922.

³⁹ *Id.* (citing Judge Johnson, *Anderson v. American Smelting & Refining Co.*, 265 Federal Reporter 928 (1919)).

⁴⁰ *Id.*

On the question of indemnity, the Tribunal cited a principle of law applied by the United States Supreme Court in similar cases that uncertainty over the exact amount of damages should not be used as grounds to deny all relief.⁴¹ Such a result would pervert fundamental principles of justice and let the wrongdoer get off scot-free. While damages should not be determined by speculation or guessing, they could be determined by just and reasonable inference from the evidence, even though the final result was only approximate. Of the several items of damage claimed by the United States,⁴² the Tribunal recognized only two types—damage to cleared and to uncleared land (*i.e.*, forests). In determining the amount of money owed, the Tribunal used the same measure of indemnity as that applied in American courts in similar cases of nuisance or trespass—for cleared land, reduction in the use value or rental value; for uncleared land, reduction in the value of the land itself. At the end of the day, the settlers received only \$78,000 of the nearly two million dollars in damages claimed.

To answer the main questions in the case—(1) whether the Trail Smelter must refrain from causing damage and, if so, to what extent? and (2) what regime, if any, should be imposed upon the Smelter?—the Tribunal said that it needed time to gather scientific data. To assist it, the Tribunal had appointed two scientific advisors, Dr. Robert Eckles Swain of Stanford University and Dr. Reginald Scott Dean of the U.S. Bureau of Mines.⁴³ Rejecting the views of scientific experts on both sides, Swain and Dean had their own theory about dispersal of smelter smoke in the Upper Columbia River Valley based on observed patterns of fumigations.⁴⁴ Rather than being dispersed by surface winds, smoke emitted from the smelter’s high smokestacks accumulated in upper air

⁴¹ *Id.* at 1920 (citing *Story Parchment Company v. Paterson Parchment Paper Company*, 282 U.S. 555 (1931)).

⁴² The indemnity covered damages to cleared land (\$62,000) and uncleared land (\$16,000). The United States had claimed total damages of \$1,849,156.16 with interest of \$250,855.01. Damages were itemized under seven categories: (a) cleared land, (b) uncleared land, (c) livestock, (d) property in the town of Northport, (e) wrong done to the United States in violation of sovereignty, (f) interest on the \$350,000 accepted in satisfaction of damages to January 1, 1932 but not paid on that date, and (g) business enterprises. The Tribunal disallowed the claims under all but the first two categories. The existence of damage, if any, occurring after October 1, 1937 and the indemnity for it was to be determined in the Tribunal’s second decision.

⁴³ Swain was recommended to the Tribunal by the United States and Dean by Canada.

⁴⁴ Trail Smelter Case, 1938 decision, *supra* note 9, at 1923ff.

levels. As smoke drifted down the valley, sudden downdrafts resulted in sulfur dioxide “hotspots,” producing acute injury to plants. This complex hypothesis of smoke dispersion needed to be tested over several growing seasons before a permanent operating régime could be established. During the experimental period, the Tribunal set up a temporary régime. Consolidated Mining was required to hire a meteorologist, to install monitoring devices for measuring atmospheric conditions, and to apply the information promptly in controlling the plant’s operations. Swain and Dean were given pretty much a free hand to modify the operation of the régime as circumstances required.

Before announcing its decisions in its final report in 1941,⁴⁵ the Tribunal mentioned certain considerations it had kept in mind. Although, in this case, the United States had asserted its interests against a Canadian corporation, it was equally possible that someday Canadians might assert a similar claim against an American corporation. The point was not lost on either side, particularly the United States government. It explains why the United States, with a number of industrial plants located in cities near the Canadian border, did not, as the settlers wished, press for complete cessation of damage from the Trail Smelter. As John Read, the chief legal adviser to the Canadian government, noted, “[t]he acceptance of absolute cessation of damage might have shut down the Trail Smelter; but it would also have brought Detroit, Buffalo, and Niagara Falls to an untimely end.”⁴⁶ The Tribunal also noted that the phrasing of the questions in the Trail Smelter Convention indicated a desire of both sides to find a just solution to the problem of adjusting conflicting interests. Such a solution would “allow the continuance of the operation of the Trail Smelter but under such restrictions and limitations as would, as far as foreseeable, prevent damage in the United States, and as would enable indemnity to be obtained, if in spite of such restrictions and limitations, damage should occur in the future in the United States.”⁴⁷ The Tribunal thus indicated that in reaching its decisions, it was necessary to consider the expectations of the parties as expressed in the Convention.

⁴⁵ Trail Smelter Case (United States v. Canada), Decision reported on March 11, 1941, *in* Reports of International Arbitral Awards, Vol. III: 1938-1982 [hereinafter Trail Smelter Case, 1941 Decision].

⁴⁶ Read, *supra* note 33, at 224-225.

⁴⁷ Trail Smelter Case, 1941 Decision, *supra* note 45, at 1939.

Although no cases of transboundary air pollution or water pollution decided by an international tribunal existed to provide guidance,⁴⁸ there were decisions in analogous cases before the United States Supreme Court that could be used as a guide. Following precedents from this court in international cases was reasonable, in the Tribunal's view, provided that no contrary rule existed in international law and no reason existed to reject the precedent based on limitations of State sovereignty found in the United States Constitution. Reasoning by analogy to municipal law in international cases is fraught with peril, but if the Tribunal was to satisfy the desire of the parties to find a permanent settlement of the Trail Smelter problem, it's difficult to see what else it could have done.

The leading Supreme Court case of interstate air pollution was a 1907 suit by the State of Georgia to enjoin two copper-smelting companies in Tennessee from discharging sulfur fumes that caused damage to crops, orchards, and forests in several Georgia counties.⁴⁹ A settlement based on annual compensation was reached with the larger of the two smelters, but in a follow-on action, the Court enjoined some operations of the other smelter, which had refused to settle.⁵⁰ The decree did not shut the smelter down completely, as Georgia had wanted, but in the Court's view, the measures would be adequate to diminish significantly the probability of damage. The Arbitral Tribunal also noted that science had made great progress in controlling fumes within the last few years, which should be taken into account. Based on these scientific advances and on the Supreme Court decisions taken as a whole, the Tribunal concluded, in words that continue to reverberate in international environmental law, that

under the principles of international law, as well as the law of the United States, no State has the right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another or the properties of persons therein, when the case is of serious consequence and the injury is established by clear and convincing evidence.⁵¹

⁴⁸ The most relevant case was one decided by the Federal Court of Switzerland involving a suit by one of the country's cantons (States) to enjoin a shooting establishment in a neighboring canton that threatened its territory. *See* Trail Smelter Case, 1941 Decision, *supra* note 45, at 1963.

⁴⁹ *Georgia v. Tennessee Copper Company*, 206 U.S. 230 (1906).

⁵⁰ *State of Georgia v. Tennessee Copper Company and Ducktown Sulphur, Copper and Iron Company, Limited*, 237 U.S. 474 (1915).

⁵¹ Trail Smelter Case, 1941 Decision, *supra* note 45, at 1965.

In the diplomatic exchanges leading up to the signing of the Trail Smelter Convention, the Canadian government frequently asserted that under international law it could disclaim any responsibility for the operation of the Trail smelter, which was regulated by provincial law. Apart from the question how serious the government was—its agreement to negotiate the dispute might suggest some sense of responsibility—the question of Canada’s obligations under international law remained open. In holding Canada responsible for the operation of the Trail Smelter, the Tribunal answered a question not explicitly posed in the Convention but implicitly present in the circumstances or context of the Convention. From a narrow legal perspective, the Tribunal’s words may be viewed as dicta, but if one considers the *Trail Smelter* case as a whole, the words speak to the central question of State responsibility raised by the case. The Tribunal’s authority rests upon the expectations of the parties that it try to find a permanent and just solution to the problem. The Tribunal believed that it had succeeded. If Canada were to ignore the Tribunal’s decision, it would be violating not just the terms of the Convention but also a principle of international law.

Having clarified Canada’s obligations under international law, the Tribunal proceeded to render its decision on the explicit question in the Convention regarding whether the Trail Smelter should refrain from causing damage in the State of Washington, and if so to what extent. It was careful not to express the duties in absolute terms.

So long as the present conditions in the Columbia River Valley prevail, the Trail Smelter shall be required to refrain from causing any damage through fumes in the State of Washington; the damage herein referred to and its extent being such as would be recoverable under the decisions of the courts of the United States in suits between private individuals.⁵²

By qualifying the decision to hold only as long as present conditions in the Columbia River Valley prevail, the Tribunal acknowledged that a permanent solution to the problem was not possible. If conditions changed sufficiently, the question of the

⁵² *Id.* at 1966.

Smelter's obligations would have to be revisited. Still, one could reasonably expect that the Tribunal's solution to the problem would enjoy quasi-permanence.

The third question concerned what régime, if any, should be adopted and maintained by the Trail Smelter. The Tribunal's experimental régime had generated scientific data that allowed it to construct a permanent one. The Tribunal noted that its investigations were probably "the most thorough study ever made of any area subject to industrial smoke."⁵³ Some factors such as atmospheric turbulence and movement of upper air currents had been considered for the first time. All the relevant factors for controlling damage had been studied: wind direction and velocity, atmospheric temperatures, lapse rates, turbulence, geostrophic winds, barometric pressures, sunlight, humidity, along with sulfur dioxide concentrations. The goal was to "throttle at the source" the expected daytime fumigations during the growing season so that the concentrations of sulfur dioxide would not cause injury to plants. *Throttle* is a good word to express the intended flexibility of the régime. On the basis of visual observations of the patterns of smoke diffusion, trained observers could, within limits, alter the emission levels dictated by instrumental readings.⁵⁴ There was a human hand on the throttle. In addition to carefully designing an operating régime, the Tribunal also made provision for modifying it should prevailing conditions change. The United States had argued for fixed, quantitative emissions standards with automatic fines for exceeding the limits.⁵⁵ The Tribunal noted that after carefully considering this suggestion, it was unable to adopt the idea because this régime "would unduly and unnecessarily hamper the operations of the Trail Smelter and would not constitute a 'solution fair to all parties concerned.'"⁵⁶ A mechanical régime based on numerical air quality standards was not in the best interests of either side given the development of industry along both sides of the international boundary.

⁵³ *Id.* at 1973.

⁵⁴ *Id.* at 1977.

⁵⁵ *See id.*

⁵⁶ *Id.*

The Tribunal believed that the régime would probably prevent significant future damage in the State of Washington. However, there were no guarantees. The scientific advisors devised the régime on the basis of their observations of meteorological conditions over three growing seasons, a relatively short period of time. If damage did occur despite compliance with the preventive régime, what indemnity or compensation, if any, should be paid? This question was raised rather late in the negotiations of the Trail Smelter Convention. At the time, the draft Convention had a provision for compensating only damage that occurred from January 1, 1932 to the date of the final decision but not beyond. The United States raised the point that the broad powers conferred on the Arbitral Tribunal to decide on a future régime practically gave it the power to condemn land in the State of Washington.⁵⁷ However, there was nothing in the agreement authorizing it to award indemnity coextensive with this power of condemnation. The United States felt that this was a matter of such importance that a provision should be made for it, and the Canadian government agreed. As a result, Question Four concerning indemnity owed as a result of the Tribunal's decisions with regard to Questions Two and Three was added to the list of questions.

The Tribunal began its answer by noting that in answering Question Two, it had required the smelter to refrain from causing damage, and in Question Three it had prescribed regulations on the smelter's operations to achieve this result. In the light of these answers, it decided that if damage occurred in the future, an indemnity shall be paid, whether or not the damage was due to failure to comply with the régime. Its decision amounted in principle to a kind of strict liability, although in practical terms it allowed the two governments to decide how to adjust the claims for indemnity, or even to decide not to set up a mechanism for adjusting them. The Tribunal said simply that an indemnity "shall be paid but only when and if the two Governments shall make arrangements for the disposition of claims for indemnity under Article XI of the Convention." In effect, the Tribunal left it to the two governments to decide how to determine the degree of liability in the context of a new set of circumstances.

⁵⁷ See Memorandum by Jacob A. Metzger, Legal Adviser to U.S. State Dept., (Sept. 25, 1934), in *Foreign Relations of the United States*, Vol. 1 (U.S. Gov. Printing Office, 1934), 946-954, at 951.

International lawyers may find the Tribunal's answer to Question Four a bit shocking, perhaps even outrageous. The Tribunal had determined that Canada was responsible under international law for the operation of the Trail Smelter, a private corporation. And the Tribunal had fixed the precise measure of the Trail Smelter's obligation in a detailed set of operating regulations. If Canada carried out its duties to oversee the operations of the Trail Smelter, and if the Trail Smelter complied with the regulations, and damage still occurred, what legal grounds were there for any additional obligations? The Tribunal seems to find an answer by looking to the ultimate purpose of the Trail Smelter Convention, which was to find "a solution just to all parties concerned." The fact of damage would upset the delicate balance of interests established in its answers to Questions Two and Three. Responsibility to find appropriate redress for future damage lies in the factual circumstance of significant injury. To deny any obligation in the matter would be to take the position that Canada took—although never very seriously—throughout the negotiations of the Trail Smelter Convention. To some international lawyers, the *Trail Smelter* case may appear disturbingly at odds with the traditional view of State responsibility. To others, the decision may seem like a supremely logical response to a problem that would be increasingly common in the modern world. Those conflicting attitudes constitute the two poles in the debate over international liability that played out a few years later in the International Law Commission study of the topic.

II. Quentin's Topic

"A great man will find a great subject or which is the same thing make any subject great."

Ralph Waldo Emerson

Emerson wrote these words about the Renaissance artist and architect Raphael,⁵⁸ but they can be applied to other types of artists, including legal ones. The way the *Trail Smelter* Arbitral Tribunal transformed an ordinary nuisance problem with an international

⁵⁸ See Ralph Waldo Emerson, *Journals of Ralph Waldo Emerson, with Annotations*, Vol. III: 1833-1835 (ed. by Edward Waldo Emerson and Waldo Emerson Forbes, Houghton Mifflin Co., 1910, at 132-33. I'm indebted to M.C.W. Pinto for the quotation. See M.C.W. Pinto, *Reflections on Injurious Consequences of International Law Arising Out of Acts Not Prohibited by International Law*, 16 *Netherlands Yearbook of International Law*, 17-48 (1985), at 18.

twist into a classic case of international environmental law certainly qualifies as a fine work of legal art. The same can be said for what Robert Quentin-Baxter did with the topic of international liability, although he died before he could complete the work. Still, he left a sketch of the whole, from which we can clearly see the outlines of the finished composition. Referring to the *Trail Smelter* awards, Quentin-Baxter noted that they “appear to be undergoing the same kind of eclipse that attends the work of some artists of good reputation in the period after their deaths.”⁵⁹ Unfortunately, a similar eclipse has attended Quentin-Baxter’s work on international liability.

The international liability topic began as a spin-off from discussions of State responsibility. When the United Nations established the International Law Commission in 1948 for the purpose of codifying the principles in particular areas of international law, one of the first topics on the Commission’s agenda was State responsibility. After several years of wandering in the wilderness of the vast topic,⁶⁰ the Commission decided to take a more general theoretical approach based on the notion of an internationally wrongful act as the source of State responsibility. At the same time, the Commission, and the Sixth (Legal) Committee of the U.N. General Assembly to which it reports, recognized that there could also be responsibility for acts *not* wrongful under international law. In 1973, the General Assembly recommended that, at an appropriate time, the Commission undertake a parallel study of international liability for such acts. In 1978, after several years of recommending, the General Assembly invited the Commission to begin the parallel study, and the topic of “International Liability for Injurious Consequences of Acts Not Prohibited by International Law” was finally put on the Commission’s active agenda. Robert Quentin-Baxter, a diplomat and a professor of law at Victoria University in Wellington, New Zealand, was appointed as

⁵⁹ Robert Q. Quentin-Baxter, *Second report on international liability for injurious consequences arising out of acts not prohibited by international law*, U.N. Doc. A/CN.4/346 and Add. 1 and 2, para. 22, in *Yearbook of the International Law Commission 1981*, vol. II (Part One), U.N. Doc A/CN.4/SER. A/1981, p. 108.

⁶⁰ For a summary of the previous work see Roberto Ago, Special Rapporteur, *First Report on State Responsibility: Review of Previous Work on Codification of the Topic of International Responsibility of States*, U.N. Doc. A/CN.4/217 and Corr.1 and Add. 1, paras. 41-107, in *Yearbook of the International Law Commission 1969*, vol. II, U.N. Doc. A/CN.4/SER A/1969/Add.1., pp. 132-141.

Special Rapporteur. Within the Commission, the international liability topic soon became known as “Quentin’s topic.”⁶¹

The reason for the abbreviation was not just that it was easier to say. For Quentin-Baxter, the topic touched on one of the fundamental tasks of lawyers. Most often, lawyers were called upon to give a legal formulation to the policies of officials. However, occasionally, “[l]awyers could be called upon to play a truly creative role, comparable to that of scientists, by deriving legal norms from the observation of existing practice.”⁶² Quentin-Baxter perceived the international liability topic as one of those occasions demanding legal creativity. He felt the general sense of urgency underlying the topic. In the years since the United Nations was created, worries about such things as pollutants from a smelter had given way to concerns about far more dangerous kinds of industrial chemicals, including radioactive ones. Everyone recognized that the world had become a more crowded place as a result of technology, but no one knew what the legal rights and responsibilities of States in this modern world order were or should be. Quentin-Baxter saw the international liability topic as an opportunity to map this uncharted terrain. He’d found a great subject, or, at least he saw the possibility of making it great.

In developing the topic, Quentin-Baxter had three basic aims:⁶³ (1) aligning it with the régime of State responsibility, (2) emphasizing prevention rather than reparation, and (3) using a balance of interest test to determine the appropriate balance between the freedom to act and the duty not to injure. His first two reports in 1980 and 1981 looked at the subject from the outside, identifying its boundaries, its relationship with the régime of State responsibility, and its motivations and dynamic principles. These reports constituted the preliminary phase of his work as Special Rapporteur.

⁶¹ M.C.W. Pinto, *supra* note 58, at 18.

⁶² Official Records of the General Assembly, Thirty-fifth session, Sixth Committee, 71st meeting, para. 35, U.N. Doc. A/C.6/35/SR. 71, at 10.

⁶³ See Robert Q. Quentin-Baxter, *Third report on international liability for injurious consequences arising out of acts not prohibited by international law*, U.N. Doc. A/CN.4/360, paras. 6-10, in *Yearbook of the International Law Commission 1982*, vol. II (Part One), U.N. Doc A/CN.4/SER. A/1982, p. 52-53.

Quentin-Baxter noted that the international liability topic had often been portrayed as a challenger in certain areas of international law to the traditional régime of State responsibility for wrongful acts.⁶⁴ However, the International Law Commission had adopted a position of neutrality in the debate, and the Sixth Committee had generally endorsed the Commission's stance. In re-defining the topic of State responsibility more generally, the Commission had distinguished between "primary" rules, which impose specific obligations on States, and "secondary rules," which come into play when States violate one these obligations. The topic of State responsibility focused exclusively on "secondary" obligations incurred by States for wrongful acts, and left the international liability topic to deal exclusively with "primary" obligations. By definition, the topics existed on different planes of international law and therefore did not compete with each other.

However, such abstract conceptual distinctions did not allay all the fears. On the one hand, proponents of the traditional doctrine of State responsibility within the Commission were worried that the international liability topic would result in the creation of an independent legal régime based on the principle of strict liability. They argued that the topic had no basis in international law and should not be on the Commission's agenda. On the other hand, some members of the Commission saw the topic as an opportunity to develop the principle of strict liability at the international level to regulate a growing category of hazardous or "ultra-hazardous" industrial and technological activities. They feared that conventional ways of thinking in terms of State responsibility would prevent the liability topic from being developed into an effective body of international law for dealing with transnational problems in an age of interdependence. Finding a way around the doctrinal impasse between these opposing groups was a large part of Quentin-Baxter's task.

⁶⁴ See Robert Quentin-Baxter, *Preliminary report on international liability for injurious consequences arising out of acts not prohibited by international law*, U.N. Doc. A/CN.4/334 and Add. 1 and 2, para. 19, in *Yearbook of the International Law Commission 1980*, vol. II (Part One), U.N. Doc A/CN.4/SER. A/1980, pp. 253.

In Quentin-Baxter's view, each of the opposing positions had intrinsic difficulties.⁶⁵ He shared the view of many that it was simply not possible to draw a clear line around the group of "ultra-hazardous" activities.⁶⁶ Despite efforts to derive the principle of strict liability from customary law, it is based primarily on an analogy with municipal laws developed to deal with environmental hazards. The doctrine of strict liability for hazardous activities goes back to the 1868 English common law case *Rylands v. Fletcher*. The *Rylands* court held that, in determining liability, the manner in which a person conducts an intrinsically risky activity is irrelevant.⁶⁷ A natural causal connection between the hazardous activity and the injury suffered is the sole criterion for liability. A number of policy arguments were advanced to support the use of strict liability to regulate certain activities, particularly the claim that strict liability was a means for implementing the "polluter should pay" principle.

Assertion of the strict liability doctrine tended to generate and fuel its own opposition, the view that customary law obligations to avoid and prevent harm are always based on responsibility for wrongfulness. However, in Quentin-Baxter's view, there were two main problems with this traditional position. First, the relationship between wrongfulness and the occurrence of harm is subtle and cannot easily be formulated in a universal way. Second, wrongfulness is predicated on the occurrence of harm, and therefore the traditional principle of State responsibility does not explain obligations of prevention, which are an important part of the international liability topic. Quentin-Baxter hoped to offer a pragmatic solution that would avoid the doctrinal difficulties in each of the opposing positions. By making it clear that strict liability was not an ungovernable encroachment upon the traditional régime of State responsibility, the

⁶⁵ See Quentin-Baxter, *Second Report*, *supra* note 59, paras 11-14, p. 106.

⁶⁶ See Yearbook of the International Law Commission 1980, vol. I, Summary Records of the Meetings of the Thirty-Second Session, U.N. Doc. A/CN.4/SER.A/1980, *Summary Record of the 1633rd Meeting*, para. 21, p. 258 (responding to the comments made by Mr [Julio] Barboza (1632 meeting) calling for the study to delimit the concept of hazardous activities to which strict liability should apply).

⁶⁷ As stated by Justice Colin Blackburn for the court: "We think that the true rule of law is, that the person who for his own purposes brings on his lands and collects and keeps there anything likely to do mischief, if it escapes, must keep it at his peril, and if he does not do so, is *prima facie* answerable for all the damage which is the natural consequence of its escape." *Fletcher v. Rylands*, L.R. 1 Exch. 265, 278 (1866); affirmed, *Rylands v. Fletcher*, L.R. 3 H.L. 330 (1868).

principle could be used alongside other measures in dealing with beneficial activities that had the risk of substantial risks of transboundary harm. And proponents of State responsibility would not have to perform doctrinal contortions to show that a shadow of wrongfulness attaches to the failure to take preventive measures although no harm has yet occurred.

To understand why governments hesitate to commit themselves to specific liability rules in new and rapidly changing areas of law, Quentin-Baxter looked to history. Until the twentieth century, there were relatively few occasions when governments had to grapple with the conflict between a State's sovereign right to act freely within its own borders and its duty to do no harm within the borders of other States. The *Trail Smelter* case was one of the hard cases. The most difficult problem arises when the harm is potential—a more or less foreseeable consequence of some activity. The legal criterion of wrongfulness offers only the binary choice between prohibiting the activity or accepting it as a legitimate manifestation of State sovereignty. Precisely at this point, Quentin-Baxter says, doctrine parts ways with State practice.

The simple dichotomy of what is allowed or not allowed by the general rules of customary international law fails to account for the diversity of rights and interests that must be reconciled in the regime of any international river or of any intrinsically beneficial, but dangerous, activity that has transnational effects. Legal theory chokes upon the sheer variability of the concept of “harm” as a determinant of illegality; but State practice testifies to the potency of that concept as a principle governing legal development. The maxim “*sic utere tuo ut alienum non laedas*” describes the other face of the coin of sovereignty. It has become the mainspring both of developments in customary law and of a hundred intergovernmental negotiations in a dozen different fields.⁶⁸

The criterion of harm, expressed in the Roman legal maxim *sic utere tuo ut alienum non laedas*, provided a pragmatic principle upon which to develop the “primary” rules of international liability. Unlike the principle of wrongfulness underlying the régime of State responsibility, or the principle of causality underlying the doctrine of strict liability, the principle of harm allowed one to weigh the full range of legitimate interests and multiple factors in a particular context. One might have a yearning for a world in which

⁶⁸ Quentin-Baxter, *Preliminary Report*, *supra* note 64, para. 38, p. 258.

everything were simpler and law and politics were more easily separated, but in Quentin-Baxter's view that was not the interdependent world of the late twentieth century. He saw in his topic a chance for international law to adapt to the new conditions, at least in the area of the law pertaining to the physical environment.

However, at least in the beginning, it was not clear the scope of the topic was confined to the physical environment. Quentin-Baxter had twice suggested that it should be.⁶⁹ Most of the materials on which he based his first two reports were drawn from the field of the environment. However, members of the International Law Commission and the Sixth Committee were reluctant to limit the scope in the early stages of the topic's development. The title of the topic was completely general, wide enough to include harmful consequences of economic policies as well as harmful uses of the physical environment. Quentin-Baxter was content to take a pragmatic, empirical approach to the question of scope, allowing it to be dictated by the nature of the source materials.⁷⁰ Meanwhile, uncertainty about the scope added to the anxieties of both sides in the debate over the future of the topic.

By the time the Commission's met in July 1981, Quentin-Baxter had come up with a working model for the topic based on the *Trail Smelter* case, including the negotiations leading to the establishment of the Arbitral Tribunal.⁷¹ He summarized the themes of the Tribunal's second (1941) decision that touched directly the topic of international liability. Because the policy of the law is to minimize and repair transboundary harm while preserving the greatest possible freedom of action of sovereign States, the criteria of "wrong" and "harm" are interlocked but not fused. Not all

⁶⁹ See Report of the International Law Commission on the Work of Its Thirtieth Session, U.N. Doc A/33/10, in *Yearbook of the International Law Commission 1978*, Vol. II (Part Two), U.N. Doc A/CN.4/SER.A/1978/Add.1 (Part 2), Annex, para 13, pp. 150-51. See also Quentin-Baxter, *Preliminary Report*, *supra* note 64, para. 65, pp. 265-66.

⁷⁰ See Quentin-Baxter, *Third Report*, *supra* note 63, para. 48, p. 61 ("The best course was to suspend judgment about the unresolved questions of scope until the content of the topic has been more fully explored. Meanwhile it should be recognized that the materials on which the Special Rapporteur must rely would largely be found in the area of the use of the physical environment. With this pragmatic approach to the question of scope, the Special Rapporteur is very content.").

⁷¹ See Quentin-Baxter, *Second Report*, *supra* note 59, para. 64, p. 118 ("The negotiation between the parties, and the reasoning by which the tribunal arrived at its decisions, have been traversed above in chapter II, and could reasonably be regarded as a working model of basic themes in this report.").

transboundary harm is wrongful, but harm is never legally negligible. Quentin-Baxter spoke of a “point of intersection” of wrong and harm. What lies on the far side of the point of wrongfulness is prohibited, and disobedience of that prohibition engages the rules of State responsibility. On the near side, activities that cause, or threaten to cause, substantial transboundary harm are permitted subject to obligations that arise, *ipso facto*, in customary international law. Legitimate interests of other States must be taken into account. Those interests may have as much substance as a right arising in consequence of a wrongful action, or they may amount to no more than a right to be informed and consulted and to have submissions considered in good faith. The international liability topic was not concerned with determining the precise point of intersection of wrong and harm, or the appropriate proportions of the duties of prevention and the promises of indemnification in any given context. However, such a point of intersection could not be fixed without reference to the content of the international liability topic. Quentin-Baxter spoke of a “double régime,” or double system, of obligations in which the rules as to wrongfulness occupy a central place within a larger, equitable framework of obligations arising out of acts not prohibited by international law.⁷² This double system left a good deal of latitude for accommodating competing interests while ensuring that no State had to submit to unlimited harmful intrusions upon its territory, even if compensation is offered. States are entitled to insist that some kinds and degrees of transboundary harm are intolerable and must stop.

Another important theme drawn from the *Trail Smelter* case was that prevention and reparation are part of a single scale, a continuum of primary obligations. Duties to prevent harm have priority, but again a balance of interests is involved in determining the content of the duty in any particular context. The appropriate level of prevention must be determined by considering the ability of beneficial activities to sustain the burden. States may agree to modify their customary law obligations through agreements. However, if a State does not strive conscientiously to reach an agreement when it is needed, it may be in breach not only of a specific rule of obligation embodying a balance of interest test but

⁷² *See id.*, at para. 58, p. 117.

also of a concomitant general rule of obligation in customary law. As the source of this general rule, Quentin-Baxter cited the words of Professor Clyde Eagleton, adopted by the *Trail Smelter* Tribunal, that “[a] State owes at all times a duty to protect other States against injurious acts by individuals from within its jurisdiction.”⁷³ The Tribunal relied upon this general obligation in finding Canada responsible under international law for the injurious transboundary consequences flowing from the operations of the Trail Smelter.

Use of the *Trail Smelter* case as a model from which to develop the international liability topic shifted the focus from the legal concept of negligence to the concept of nuisance. Some legal scholars questioned whether the common law doctrine of nuisance was general enough to be part of international law.⁷⁴ Although Quentin-Baxter recognized the objection, he believed that there were a couple of points in favor of using the concept of nuisance.⁷⁵ First, the branch of international law he was dealing with rested on shared values and promoted diverse solutions. The policy of the law was to permit the greatest amount of freedom to acting States compatible with a reasonable regard for the protection of other states, and solutions that worked in one context could not automatically be transferred to other contexts. Second, the concept of nuisance was useful because, unlike negligence, it did not dwell exclusively on the causes of loss or injury. Nuisance cases always entailed a balance of interest test in which the degree of inconvenience is weighed against the value of the activity and the reasonableness of how it’s carried out. Psychologically, the doctrine of nuisance prepared parties to accept an adjustment of interests they may not have contemplated in the beginning. Relevant factors and elements involved in striking a balance of interests depended primarily upon the factual circumstances of the case, and finding a solution to a particular problem required a process of negotiation.

The end of the preliminary phase of Quentin-Baxter’s work on the international liability topic coincided with the end of the five-year term for members of the

⁷³ *See id.*, at para. 40, p. 112 (citing Clyde Eagleton, *The Responsibility of States Under International Law* (New York University Press, 1928), at 80.).

⁷⁴ *See, e.g.*, L.F.E. Goldie, *Liability for Damage and the Progressive Development of International Law*, 14 *International and Comparative Law Quarterly*, 1189-1264 (1965).

⁷⁵ *See* Quentin-Baxter, *Second Report*, *supra* note 59, para, 41, p. 112.

International Law Commission. In the new term beginning in 1982, the question of the topic's scope and contents needed to be resolved. There continued to be some members of the Commission who had doubts about the validity of the topic as well as others who thought that Quentin-Baxter's approach was too conservative and who favored a strict liability approach. However, there was sufficiently broad support in both the Commission and the Sixth Committee for work on the topic to continue. At the Sixth Committee's meeting in the fall of 1981, several representatives suggested that the Special Rapporteur had received enough guidance that he could produce a schematic outline of a possible set of draft articles.⁷⁶ Quentin-Baxter agreed that this was the best way to proceed. Such an outline would provide a bridge between his preliminary work and the more substantive work the new Commission must undertake.

The schematic outline is like an architectural blueprint, or, to use Quentin-Baxter's metaphor, a mosaic. To appreciate it, one must consider the relationship of the parts both to each other and to the whole. There are eight sections. The first deals with the scope, definitions of key terms, and a savings clause stating that nothing in the articles affects any rights or obligations arising independently. Sections Two, Three, and Four contain a series of obligations, essentially procedural in nature, to inform, consult, and negotiate in order to prevent, minimize, and, if necessary, repair transboundary harm. Section Five sets out some of the principles underlying the negotiations, beginning with the primary purpose of balancing the rights of States to act freely within their territory with the rights of States to be free from the harmful consequences of activities in other States. Section Six contains a list of some factors that may be relevant to balancing interests. Section Seven is organized around the architectural choices that States have in designing institutions for preventing and repairing transboundary damage. Finally, Section Eight refers to a mechanism for settling disputes arising under the framework.

The schematic outline represents a working model of the international liability topic. To understand it, one should read it with the *Trail Smelter* arbitration in mind. In his prefatory remarks introducing the schematic outline, Quentin-Baxter raised the

⁷⁶ See Official Records of the General Assembly, Thirty-sixth session, Sixth Committee, 45th meeting, para. 73, U.N. Doc. A/C.6/36/SR. 45, at 21 (Mr. Rosenstock, representative of the United States).

question of how to assess its value. The articles contain many guidelines, but only one obligation the breach of which will entail international responsibility for a wrongful act. The justification for this soft approach comes from the subject matter. As in the *Trail Smelter* case, there are two absolute points of view regarding the responsibility of States in a situation involving transboundary harm. On the one hand, the view that it is wrong to cause loss or injury to another State is not in doubt, at least in principle. This was the initial position of the United States government in demanding a complete cessation of damage from the Trail smelter smoke. On the other hand, if an enterprise in one State carries on its legitimate business in a reasonable way, and incidental harm results in another State, it is not immediately clear that the acting State is responsible under international law. This was the position the Canadian government maintained throughout the negotiations to set up the *Trail Smelter* Tribunal. Between these two absolute poles lies “a wilderness that cannot be reduced to order by prohibitory rules of general application. The boundaries of each State’s rights and obligations towards others have to be charted in some detail and with mutual accommodation.”⁷⁷ The value of the proposed set of draft articles comes from its capacity to facilitate the efforts of States, through negotiation guided by a shared sense of principle and a practical need to accommodate interests, to bring some kind of legal order out of a chaotic situation.

In formulating the duties of States in the procedural sections of the schematic outline, Quentin-Baxter used the Trail Smelter case as a model. The first duty of the acting State is to inform potentially affected States about the kinds and degrees of foreseeable loss or injury and the proposed remedial measures. If a potentially affected State believes that it may suffer harm, it may request such information, and the acting State has a duty to provide it, although some information may be withheld for reasons of national or industrial security. If the potentially affected State is not satisfied that the preventive measures are adequate to protect its interests, it may request that joint fact-finding be undertaken, as in the reference of the Trail Smelter dispute to the International Joint Commission. The acting State has a duty to co-operate in good faith to negotiate

⁷⁷ Quentin-Baxter, *Third Report*, *supra* note 63, para. 48, p. 61.

the terms of reference to the joint fact-finding body. The fact-finding body would then issue an advisory report to each government, recommending a solution to the problem.

If, within a reasonable time, it is not possible to establish a fact-finding body, or one of the parties is not satisfied with its findings, or if the fact-finding body recommends it, the States have a duty to enter negotiations to determine if a régime is necessary. The negotiations would examine the need for preventive measures and measures of reparation should loss or injury or occur despite compliance with the preventive régime. Any specific agreement reached in the negotiations would settle the rights and obligations of the parties. In effect, the legal framework set up by the schematic outline would do for the parties what the Arbitral Tribunal did for Canada and the United States in the *Trail Smelter* case. It would provide an orderly process for the parties to work things out themselves. Under the framework, failure to take any of the procedural steps did not give rise to any right of action, although the acting State has a continuing duty to take any measures it considers necessary and feasible to protect the interests of the affected State. Absent harm, there was no recourse under the framework to the rules of State responsibility for a wrongful act. This feature struck many critics of the schematic outline as paradoxical. The idea of obligations without sanctions for their violation was unorthodox, but Quentin-Baxter emphasized the need for unorthodox, or non-compartmentalized, thinking in dealing with the international liability topic.

If an activity gives rise to transboundary loss or injury and the parties involved had not previously specified their rights and obligations, the parties have an obligation to negotiate in good faith to determine them. The acting State must make reparation unless it is established that such reparation would not be in accord with the “shared expectations” of the two States. The reparation due is to be determined in accordance with those shared expectations, taking into account the reasonableness of the conduct of the parties throughout the process, the record of any exchanges or negotiations between them, and the remedial measures taken by the acting State. Also, the negotiations should take into account any relevant factors, including those in the list set out in section 6 of the schematic outline.

In proposing the concept of shared expectations, Quentin-Baxter again relied upon the *Trail Smelter* case. Through diplomatic correspondence, each side had reached at least a tacit understanding of how the other side viewed the problem. That some compensation was due the settlers was part of the shared expectations of the two governments; the expectation that the compensation would cover “invisible injury” was not. In the course of the Trail Smelter dispute, the Tribunal had developed a sufficient understanding of the two governments’ shared expectations that they were able to render a decision just to both Canada and the United States. Quentin-Baxter believed that ordinary techniques of legal interpretation applied in good faith would be able to establish the set of common expectations governing the resolution of a particular case. Only if there was no prospect of reaching agreement would the dispute go to a third party dispute-resolution mechanism.

Although the schematic outline was a complete conceptual model of the topic, the task of fleshing it out still remained. The key document upon which Quentin-Baxter planned to draw was an analytic study of State practice in the areas set out in the outline.⁷⁸ Section 5 on the basic principles and section 6 on the factors relevant to a balancing of interests needed to be developed in the light of what States carrying out activities with potentially harmful transboundary effects were actually doing to protect the physical environment of other States. In commenting on the schematic outline in the Sixth Committee in 1982, Quentin-Baxter remarked: “It should be remembered that the matter was still at the blueprint stage; only when the evidence of State practice was brought to bear on it would the topic take on life.”⁷⁹ The analytic study was finally completed in 1984, the year that Quentin-Baxter died.

The first meeting of the newly constituted Commission in the summer of 1982 produced a lively exchange of views about the future of the international liability topic. Summarizing the discussion, Quentin-Baxter noted that if, as had been suggested, he had

⁷⁸ See Survey of State Practice Relevant to International Liability for Injurious Consequences Arising Out of Acts Not Prohibited by International Law, Prepared by the Secretariat, U.N. Doc. A/CN.4/384, in Yearbook of the International Law Commission 1985, vol. II (Part 1)/Add.1, U.N. Doc. A/CN.4/SER.A/Add.1 (Part 1/Add.1), pp. 1-143.

⁷⁹ Official Records of the General Assembly, Thirty-seventh session, Sixth Committee, 39th meeting, para. 20, U.N. Doc. A/C.6/37/SR. 39, at 7.

a tiger by the tail, it was probably only a paper tiger and, with a little assistance, could probably be dealt with effectively.⁸⁰ However, he didn't wish to paper over the differences that had surfaced in the discussion. Within the Commission, there was a certain pull between the desire to include rules of prevention, as in the schematic outline, and the desire to focus solely on rules of reparation. Similarly, there was a pull between the notion that the articles should be broad in scope and the notion that they should be directed toward matters having to do with physical uses of the environment.

Quentin-Baxter's starting point was pragmatic. He saw little point in rules of law that had no means of being applied to particular problematic situations. Each situation had to be viewed as a whole in order to determine how the costs and benefits should be distributed. The schematic outline aimed to give a legal structure to the procedures actually used by governments in dealing with each other. It was necessary to consider the quality of the actions leading to harm and the quality of the responses by those on the receiving end. Only from a broad estimate of the balance between those factors could one draw conclusions about a State's obligation to make reparation. Although the draft articles would not provide for clear and automatic rights of reparation, neither would they weaken the protection that could be derived from rules of responsibility based on wrongfulness. The schematic outline tried to introduce some flexibility into those rules and to provide for co-operation based on duties.

Quentin-Baxter agreed with the view expressed by several members of the Commission that the notion of "shared expectations" had not been adequately defined, although he thought that it was absolutely essential. In the *Trail Smelter* case, Canada found security in the expectation it shared with the United States, which the Arbitral Tribunal applied. As for the scope of the articles, there were two possibilities. Either the scope could be arbitrarily foreclosed before all the materials were examined—an option the Commission and the Sixth Committee had rejected—or the Commission's work on the topic could be governed by the materials, which were derived almost entirely from

⁸⁰ See Yearbook of the International Law Commission 1982, vol. I, Summary Records of the Meetings of the Thirty-Fourth Session, U.N. Doc. A/CN.4/SER.A/1982, *Summary Record of the 1744th Meeting*, para. 3, p. 286.

areas involving the physical uses of the human environment. Quentin-Baxter believed that it was the Commission's duty simply to approach its work honestly, to assess the materials to see where they supported the rules, and to promote the idea of a duty to cooperate.

In the discussion, almost all members of the Commission intervened to express their views about the future of the international liability topic. It was the first opportunity for new members to assess the general sentiment of the group. Members who had doubts about the viability of the topic expressed their opinions forcefully, arguing that to continue discussing it would detract from the Commission's prestige. They insisted that at least the Chairman should mention their doubts in the report to the Sixth Committee so that the General Assembly could make a decision about whether or not to remove the topic from the Commission's agenda. More moderate members took a wait-and-see attitude, suggesting that the Commission could prepare guidelines for recommendation to the General assembly covering both prevention and reparation. The Chairman compared the Commission to an oil prospecting company that had discovered a small deposit but didn't quite know what to do with it.⁸¹ Perhaps the final product would not be marketable as a convention, or guidelines, or even a framework agreement. He was not sure that the Commission would solve the problem, but neither was he sure that it would fail. In his own view, the Special Rapporteur had not come up with "dry holes" but had really found something. He suggested that the Commission should inform the General Assembly that in spite of its disagreements, it believed that it was worth continuing the work in the hope of arriving at a clearer position the following year. The Chairman's report contains a section on the "make or break" questions about the future of the topic.⁸² It suggested that behind the divergence of opinion within the Commission was the unsettled question of the topic's scope. It had been agreed that the ideas of scope and content must be developed in relation with each other. With a schematic outline of the contents in hand, the question of scope needed to be addressed.

⁸¹ *Id.*, at 291 (comment of Mr. Reuter of France, Chairman).

⁸² See Report of the International Law Commission on the Work of Its Thirty-fourth Session, U.N. Doc A/37/10, in Yearbook of the International Law Commission 1982, Vol. II (Part Two), U.N. Doc A/CN.4/SER.A/1982/Add.1 (Part 2), pp. 88-90.

The predominant view in both the Commission and the Sixth Committee was that problems in the economic sector had to be put aside and the topic limited to acts with a physical consequence on the environment. Quentin-Baxter summarized the debate by saying that it had become clear that the unity of purpose would collapse if either of two boundary lines were crossed.⁸³ One boundary line forbids the abrupt adoption of a new system of obligation in international law based on the principle of causality or strict liability. The other forbids the wholesale transfer of experience in regulating physical uses of the environment to the less developed field of economic regulation. The two boundary lines are related. The basic reason for invoking a system of strict liability is that the traditional system of State responsibility is too crude a tool for adjusting rights and interests in some problematic situations. States seeking to limit the power of some transnational corporations believe that the principle of strict liability is a potentially useful instrument. However, it was clear from statement in the debates in 1982 that merely to raise the question was to redouble the anxiety that the principle of strict liability arouses. The resulting deadlock is contrary to the spirit of good neighborliness so evident in State practice relating to the adverse transboundary effects on the physical environment. Within the two boundary lines, the topic takes its shape. The only requirement is that States act conscientiously to reconcile their separate interests, so that the freedom of one State to act does not become the involuntary burden of other States and their citizens. When States have a will to regulate some area of international conduct, and their representatives bring to the table all their experiences as lawyers or technologists, they tend to find practical solutions based on the similarity in their domestic situations.

In his second report, Quentin-Baxter had compared the doctrine of strict liability to a rocky outcrop upon which the wave of legal doctrine breaks and scatters.⁸⁴ It might seem that by the time he presented his fourth report in 1983, he had succeeded in navigating safely around the hazard and had clear sailing to develop the topic along the

⁸³ See Robert Quentin-Baxter, *Fourth Report on International Liability for Injurious Consequences Arising out of Acts Not Prohibited by International Law*, U.N. Doc. A/CN.4/373, in *Yearbook of the International Law Commission* 1983, vol. II (Part One), U.N. Doc A/CN.4/SER. A/1983, paras. 12-13, p. 205.

⁸⁴ See Quentin-Baxter, *Second Report*, *supra* note 59, para. 11., p. 106.

lines of the schematic outline using the analytic study of State practice. However, that study was not ready to be used in time for the fourth report. Even more unsettling was the attitude of the Commission toward the topic. In setting the agenda for its 1983 meeting, it had left almost no time—only two meetings—for discussing international liability, only enough, as Quentin-Baxter put it, to confirm the existing opinions of members about the worth of the topic. In his brief remarks on the fourth report, he addressed his colleagues on the Commission directly.⁸⁵ A Special Rapporteur is not an advocate. His duty is to suggest the best way to approach the topic, to marshal information and arguments, and to let the Commission and the General Assembly decide how to proceed. At its next session in 1984, the Commission should decide what further it could accomplish on the international liability topic and form a definite view of its feasibility. It was not clear that the Commission could deal with a topic having a larger policy content or a greater novelty than those it had dealt with in the past.

Quentin-Baxter said that when he was appointed Special Rapporteur, he'd visited the headquarters of the United Nations Environment Programme to ascertain the views of senior officials on the topic of liability. It appeared that whenever questions of liability were raised in that context, there were three reactions: (1) the subject should be avoided; (2) if any work was done on the subject, it should be done by the International Law Commission; (3) if the Commission decided to undertake the topic, it would remain buried for twenty years. Quentin-Baxter said that he did not intend to be part of the burying process. He hoped the Commission would have the courage to make a firm decision either to take up the topic or to leave it to be developed in other forums. Moreover, he wished to facilitate that decision. Eleven years after the Commission had identified the international liability topic, six years after it was described by a working group and placed on the active agenda, and one year after an initial set of materials was completed, 1984 was the earliest and the latest year in which such a decision should be made. The Commission's work often involved a collegial commitment to topics for

⁸⁵ See Yearbook of the International Law Commission 1983, vol. I, Summary Records of the Meetings of the Thirty-fifth Session, U.N. Doc. A/CN.4/SER.A/1983, *Summary Record of the 1800th Meeting*, paras. 1-15, pp. 260-63.

which individual members had little enthusiasm, but such a commitment had to be made, or the Commission should seek the General Assembly's agreement to remove the topic from its agenda.

One feature of the schematic outline that attracted much comment in both the Commission and the Sixth Committee was the relationship between the obligations of prevention and those of reparation. Some members, used to thinking in terms of reparation as a "secondary" obligation, thought that topic should not include duties of prevention. Others, again used to thinking in traditional ways, wondered why the schematic outline did not impose a legal right of action for violating the "primary" obligations to inform, consult, and negotiate mentioned in sections 2 and 3. In his fourth report,⁸⁶ Quentin-Baxter attempted to address these theoretical and practical difficulties with the concept of a "compound primary obligation" to prevent, minimize, and repair transboundary loss or injury. The duties to inform, consult, and negotiate constitute a *continuum of prevention and reparation*. The duties mentioned in the schematic outline were analogous to the obligations in international law relating to the treatment of aliens, which allowed the host State many opportunities to repair an injury to foreign citizens and their governments and thereby avoid wrongfulness. Similarly, a failure to consult or to provide proper regulation of an activity is only one of the elements to be taken into account should transboundary harm actually result. No penalty attaches to this failure, except that the acting State's ultimate liability may depend upon the reasonableness of its course of conduct in the entire interaction. Such judgments would necessarily be matters of equity.

Quentin-Baxter noted that the parallel with responsibility for the treatment of aliens could be carried a bit further. Experience with the topic of responsibility shows that States may set aside law making if they feel that the proposals require too great a sacrifice of their discretionary sovereign powers over their what they consider essentially domestic affairs. The schematic outline's soft approach, with its emphasis upon prevention, may prove to be more pragmatic by facilitating the discovery of moderate and

⁸⁶ See Quentin-Baxter, *Fourth Report*, *supra* note 83, paras. 40-50, pp. 212-16.

mutually acceptable solutions to transboundary problems involving the environment. “In a very real sense,” Quentin-Baxter concluded, “the principle embodied in the schematic outline can do more for the principle of strict liability than the latter can do for itself.”⁸⁷

Regarding the future of the international liability topic, Quentin-Baxter believed that there was a way to go forward without undue risk.⁸⁸ The real difference of opinion within the Commission did not lie between East and West, or North and South, or between practitioners of civil and common law, but between the old world and the new. There are essentially three positions that needed to be taken into account. One is the old world view that no new principle of international law beyond State responsibility for wrongfulness could be admitted. Another is the position of developing countries that want the principle of strict liability to extend to economic matters as well as to physical transboundary harm. Finally, there is the view, expressed by the United States, that the scope of the international liability topic must be limited to matters related to the physical environment.

Quentin-Baxter pointed out that if strict liability were applied to the physical environment but excluded from economic matters, it would be damaging to the interests of peoples on their way to the new international economic order. However, relations in the economic sphere are too complicated to be regulated by simple prohibition. He thought that the schematic outline offers a solution. There is a considerable amount of State practice related to transboundary issues. The goal should be to construct a set of obligations that allowed as much latitude to States as the old rules governing the treatment of aliens. Within that framework, the scope should be limited to physical transboundary harm. The international liability topic would set a precedent for how to develop needed rules in new areas of law while maintaining the old principles of State responsibility upon which international law was founded.

One member of the Commission remarked that “the Special Rapporteur was sailing a dangerous course in not very hospitable waters.”⁸⁹ By the following summer at

⁸⁷ *Id.*, at para. 68, p. 221.

⁸⁸ *See Summary Record of the 1800th Meeting*, *supra* note 85, para. 6, p. 261.

⁸⁹ *Id.*, para. 29, p. 264.

the 1984 meeting, the waters had become more welcoming. Although some members continued to raise questions about the nature of the topic and its future consideration by the Commission, there was an almost unanimous agreement to pursue the topic as limited to harmful consequences on the physical environment.⁹⁰ There was talk of changing the title of the topic to reflect its essential focus, but that was a question for the future. Quentin-Baxter had drawn the proposed draft article on scope very broadly so as to include all activities and situations that give rise, or may give rise, to physical consequences affecting the use or enjoyment of areas within the territory or control of another State. Any disputes about whether the consequences were adverse or not would be carried on within the framework of the procedural rules to come. As the rules progressed, shades of qualification would be added in the later sections.⁹¹ How to draw reasonable limits, supported by State practice, was another question for the future. The most important thing, not just for the Special Rapporteur, or for the Commission and the Sixth Committee, but for the interests of humanity in an increasingly crowded and dangerous technological world, was that the topic had survived to have a future.

In his six-year tenure as Special Rapporteur of the international liability topic, Quentin-Baxter steered it safely along a pragmatic and principled middle course between extreme views that threatened to polarize the debate and undermine the spirit of cooperation. He had come up with a workable plan for helping States to solve problems of the present that would only grow more urgent over time. By almost everyone's admission, traditional rules of State responsibility based on prohibition of wrongful acts did not provide sufficiently flexible legal tools for dealing with the harmful transboundary consequences of activities affecting the physical environment. Strict liability could be useful in some cases, but it was not an accepted principle of customary international law, and any set of draft articles based on it was guaranteed to remain indefinitely in the United Nation's freezer of unused legal documents.

⁹⁰ See Report of the International Law Commission on the Work of Its Thirty-sixth Session, U.N. Doc A/39/10, in *Yearbook of the International Law Commission 1984*, Vol. II (Part Two), U.N. Doc A/CN.4/SER.A/1984/Add.1 (Part 2), paras. 221-236, pp. 74-77.

⁹¹ See Robert Quentin-Baxter, *Fifth Report on International Liability for Injurious Consequences Arising out of Acts Not Prohibited by International Law*, U.N. Doc. A/CN.4/383 and Add. 1, in *Yearbook of the International Law Commission 1984*, vol. II (Part One), U.N. Doc A/CN.4/SER. A/1984, para. 47, p. 173.

In summing up the Commission’s discussion of his fifth—and, as fate would have it, his last—report at the meeting in 1984, Quentin-Baxter remarked that if the scope of the topic remained as broad as he had proposed in his first draft article, large areas would be covered, and it would not be possible to make rules that could be applied precisely and mechanically. “There was something to be said, however, for the power of ideas, for in law, as in philosophy or any other learned discipline, the manner of looking at things sometimes had more influence than the precise rule to be applied in a given situation.”⁹² William James, another pragmatic philosopher who knew the power of ideas, once said, “a man’s vision is the great fact about him.”⁹³ It’s impossible to kill the vision expressed in the schematic outline. It may be forgotten for a while, until someone remembers it and again tries to find a practical way to put it to work to aid States struggling with the great problem of how to balance the freedom to act and the duty not to injure other States. As Robert Quentin-Baxter clearly saw, this delicate balancing act lies at the heart of the international liability topic.

III. Loomings

The temperature was in the low 40s in Montréal on the morning of Wednesday, October 14, 2005 when I crashed the Experts Meeting on Liability and Redress under the Convention on Biological Diversity. I hadn’t intended to barge in. In my inexperience with diplomatic protocol, I didn’t know that one needed a formal invitation to attend. Fortunately, someone (I suspect it was the Chair of the Meeting, Anne Daniel from the Canadian government) intervened on my behalf, and I was issued a badge certifying my expert credentials. I wasn’t looking forward to driving back to Minnesota that day, although the foliage in Ontario and Québec on the journey to Montréal was gorgeous.

The meeting of legal and technical experts was supposed to have taken place in 2003, but it got postponed due to lack of money. However, the group had been given a

⁹² Yearbook of the International Law Commission 1984, vol. I, Summary Records of the Meetings of the Thirty-fifth Session, U.N. Doc. A/CN.4/SER.A/1984, *Summary Record of the 1852nd Meeting*, para. 44, p. 228.

⁹³ William James, *A Pluralistic Universe* (Works of William James, ed. by Fredson Bowers and Ignas K. Skrupskelis, Harvard University Press, 1977), at 14.

specific mandate⁹⁴ that included a list of items the Conference of the Parties to the Convention wanted the experts to discuss. The recommendation to establish the group had come from a workshop held in Paris in June 2001 on liability and redress in the context of the Convention.⁹⁵ Underlying all the activity was the basic question how to implement Article 14(2), which requires the Conference of the Parties to examine the issue of liability and redress for damage to biological diversity “on the basis of studies to be carried out.”

I wasn’t really an expert, legal or technical, and obviously I wasn’t a diplomat either. During my years as a student—never mind how many precisely—I’d acquired an advanced degree in biology, studying the molecular systematics of plants.⁹⁶ So, I was familiar with some of the wonderful biotechnology used to modify the genomes of living organisms. After teaching biology to students at community colleges for a while, I found myself growing grim about the mouth and hazy about the eyes, so I decided to embark on a Ph.D. program in conservation biology at the University of Minnesota. Being interested in the policy side of the field, I also applied to the law school. Although judged unfit for the profession by the recruitment officers, I still took classes in environmental law and international law, in which I picked up some of a lawyer’s ways of thinking and talking, in a non-sharkish way.

As to why, of all the topics in international environmental law, I chose to study liability is harder to say. In the opening chapter of *Moby-Dick*, Ishmael attempts to explain what exactly led him to go to sea as a sailor on a whaling ship rather than some other kind of ship. He first attributes his decision, perhaps facetiously, to the grand program of Providence drawn up a long time ago. But recalling all the circumstances, he says that he can see a little into the hidden springs and motivations underlying his decision. Chief among his motives was “the overwhelming idea of the great whale

⁹⁴ See Conference of the Parties 6, Convention on Biological Diversity, Decision VI/11, paragraph 1.

⁹⁵ See *Report of the Workshop on Liability and Redress in the Context of the Convention on Biological Diversity*, U.N. Doc. UNEP/CBD/WS-L&R/3 (29 June 2001).

⁹⁶ See Ronny S. Millen, Richard G. Olmstead, Keith L. Adams, Jeffrey D. Palmer, Nga T. Lao, Laura Heggie, Tony A. Kavanagh, Julian M. Hibberd, John C. Gray, Clifford W. Morden, Patrick J. Calie, Lars S. Jermin and Kenneth H. Wolfe, *Many Parallel Losses of *infA* from Chloroplast DNA during Angiosperm Evolution with Multiple Independent Transfers to the Nucleus*, 13 *The Plant Cell*, 645-658 (2001).

himself. Such a portentous and mysterious monster roused all my curiosity.”⁹⁷ So too, I was drawn, perhaps, by the overwhelming idea underlying the international liability topic, the idea of responsibility. Pursuing the meaning of *responsibility* requires one to dive deep into the wonder-world of the human mind.

I’d been a diver after great ideas long before I became a master of biology or an official expert in international environmental law. As an undergraduate, I was a student of the Great Books at St. John’s College in that wonderful port city of Annapolis, where you’re far more likely to see a sleek sailboat in the harbor than a whaling ship. Later, I taught for a while in a Great Books program and got paid to dive instead of paying. As Ishmael says, “there is all the difference in the world between paying and being paid. The act of paying is perhaps the most uncomfortable infliction that the two orchard thieves entailed upon us. But *being paid*—what will compare with it?” Still, even though I had to pay my way to Montréal, when I had the opportunity to dive into the topic of international liability in the company of experienced international lawyers, I didn’t hesitate.

I’d been to Montréal twice before to observe the liability discussions under the Cartagena Protocol to the Convention on Biological Diversity. The Cartagena Protocol is a supplementary treaty to the Convention dealing with “biosafety,”—the safe handling and use of genetically modified organisms, or “living modified organisms” as they are described within the Protocol. When the treaty was being negotiated in the late 1990s, no agreement could be reached on the issue of liability and redress for environmental damage due to the transboundary movement of genetically modified organism, primarily through the international grain trade. So, a provision was inserted into the Protocol pledging to take up the subject of liability and redress once the treaty entered into force, which occurred in 2003. The timing seemed perfect. I was searching for a dissertation topic for my doctorate in conservation biology, and I had an interest in environmental law plus some background in molecular biology. When the first meeting of the parties to the

⁹⁷ Herman Melville, *Moby-Dick*, Chapter 1, *Loomings* (W.W. Norton & Company, 2002), at 22.

Protocol took place in Kuala Lumpur in February 2004, I stuffed a shirt or two into my old carpet-bag, tucked it under my arm, and started for Malaysia and the Pacific.

There were no substantive discussions of liability at the meeting in Kuala Lumpur, but a Technical Group of Experts was organized to meet at Montréal in the fall to prepare for the negotiations. Observers from non-governmental organizations, including universities, were invited to attend, so I went as a representative from the University of Minnesota. As it happened, in the seats designated for observers from academe, I found myself sitting next to Katharina Kummer Peiry, professor of law at the University of Bern. Katharina was working on a series of issue papers dealing with important concepts pertaining to liability and redress in the context of the Protocol, which she sent out periodically to those interested in the negotiations.⁹⁸ She invited comments and criticism from readers as the papers were distributed and posted on the Internet. One habit I'd acquired as a student and teacher of the Great Books was the ability to read texts closely, a prerequisite for diving deeply in pursuit of meanings. In the months leading up to the beginning of the formal negotiations in May 2005, Katharina and I developed a routine. She'd send out her latest paper, and I'd go over it with my editorial gimlet eye and send my comments back, which usually was an occasion for a brief exchange of e-mails. It was also a wonderful opportunity to develop my legal education on substantive issues such as the distinction between state and civil liability, the burden of proof, strict liability, and the notion of channeling liability to particular persons. I enjoyed our interaction immensely.

At the opening round of negotiations in May, Katharina invited me to participate as one of a panel of legal experts at a side event⁹⁹ she'd organized, "Key Concepts of Liability: Questions, Answers, Discussion." I believe that I was the only non-lawyer on the panel. I remember asking myself, while waiting my turn to speak briefly about the burden of proof, how in the world I'd gotten myself into this. Fortunately, I'd been in front of classes enough that I'd developed a knack of "winging it," and things went fairly

⁹⁸ See Katharina Kummer Peiry, Biosafety Protocol Process on Liability and Redress: Food for Thought on Key Issues, available at www.ecoconsult.ch. (accessed 29 August 2011).

⁹⁹ A side event is an informal presentation, usually held during the lunch break between the negotiation sessions.

smoothly. As it happened, Anne Daniel, representing the Canadian government, was sitting beside me on the panel so we had a chance to chat briefly, which may be why, when I showed up unannounced at the meeting of experts the following October, she felt confident enough that I would behave myself that she told someone to let me in. I recall her saying as we were leaving one of the sessions that she thought the topic of liability for damage to biological diversity belonged within the general context of the Convention. I agreed that there's nothing in principle that makes environmental damage due to genetically modified organisms different from damage due to other sources. Liability discussions under the Convention and the Protocol were proceeding on parallel tracks for historical reasons, but it made sense, at the time, that the tracks should converge at some point.

Could I have seen several years ahead, perhaps I would have thought differently. Katharina and I assumed that the liability régime most likely to emerge from the negotiations would, in keeping with the recent trend in international environmental law, be some kind of civil liability régime. The two basic types of liability régimes are the liability of States under public international law—as in the *Trail Smelter* case—and the liability of actors, including States, under national laws of civil liability. Through multilateral negotiation, these national laws are harmonized to reflect an international consensus on certain substantive and procedural elements.¹⁰⁰ Katharina's issue papers attempted to clarify the alternative choices under these various elements. However, the difficulty of reaching a consensus in negotiating multilateral environmental agreements, and the dismal record of ratification of existing international civil liability treaties, led to a search for other mechanisms of achieving the underlying policy goals.¹⁰¹

¹⁰⁰ See Philippe Sands, *Principles of International Environmental Law* (2nd ed. Cambridge University Press, 2003), at 869-939.

¹⁰¹ See Anne Daniel, *Civil Liability Regimes as a Complement to Multilateral Environmental Agreements: Sound International Policy or False Comfort?*, 12 *Review of European Community and International Environmental Law*, 225-241 (2003).

The European Union was in the process of implementing its environmental liability directive of 2004 on the prevention and remedying of environmental damage.¹⁰² The directive was inspired by the 1980 Superfund Law of the United States,¹⁰³ designed to clean up sites contaminated with hazardous wastes. Unlike the Superfund Law, the EU directive provides for preventive measures and includes the deliberate release of genetically modified organisms into the environment as well as their transport and placing on the market among the regulated activities. However, the basic approach in both laws—the so-called “administrative approach”—is the same. Under the EU directive, a government agency within each Member State is authorized to order an operator whose activities threaten to cause environmental damage to take preventive action and, if damage occurs, to take the necessary remedial action. The operator bears the cost of these preventive and remedial measures. The only exceptions are for environmental damage due to armed conflicts or natural phenomena of exceptional, inevitable, and irresistible character.

In developing the environmental liability directive, the European Commission originally envisioned that compensation for environmental damage would be based on traditional civil liability systems.¹⁰⁴ However, Member States resisted the idea of harmonizing their national systems of tort laws, which had been built up gradually over many years. As a result, the Commission distinguished between traditional forms of damage—such as damage to property, economic loss, and personal injury—and damage to biological diversity and the contamination of sites. In the directive, traditional damage remained under the national civil liability systems of Member States, while “pure ecological damage” fell within the administrative law framework established by the directive. The Commission considered dropping the word *liability* from the title of the

¹⁰² See Directive 2004/35/CE of the European Parliament and of the Council of 21 April 2004 on Environmental Liability with Regard to the Prevention and Remedying of Environmental Damage, 2004 O.J. (L. 143), 56-75.

¹⁰³ Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 42 U.S.C. § 9601.

¹⁰⁴ See Gerd Winter, Jan H. Jans, Richard McCrory, & Ludwig Krämer, *Weighing Up the EC Environmental Liability Directive*, 20 *Journal of Environmental Law*: 163-191 (2008).

directive but decided to retain it because the notion of “environmental liability” was considered politically attractive.¹⁰⁵

Among the papers Katharina and I discussed before the beginning of the liability negotiations under the Cartagena Protocol, there was no mention of an administrative approach, which in hindsight seems a major oversight. The question whether to adopt a civil liability régime or to take the administrative approach became the main bone of contention in the negotiations.¹⁰⁶ In general, developed countries favored a system based on a “national competent authority” in each country responsible for monitoring the transboundary movement of genetically modified organisms and for taking the necessary steps to prevent and repair any environmental damage. Most developing countries called for an international régime based on legally binding rules of civil liability, harmonized to meet minimum standards, and using existing national court systems.

Had I foreseen the course the negotiations would take, I might have contributed a paper of my own to Katharina’s collection, some philosophical food for thought:

**The Meaning of *Responsibility*:
International Civil Liability and the Administrative Approach**

In a civil liability system, responsibility is a horizontal relationship between private entities—persons or companies—whereas in the administrative approach, it is a vertical relationship between a private entity and the State. In a civil liability system, clarifying the responsibilities of private parties is a judicial function, whereas in the administrative approach, determining the responsibilities of the parties is an administrative function carried out by a national competent authority.

In an international civil liability régime, responsibility originates in a claim by a private party that they have been, or may be, injured by the action of a private party in another country. The claim does not *ipso facto* entail responsibility, which can only arise through a process of judgment in the courts. Because each party has an equal interest in asserting its claim—the horizontal dimension of the problem—a judicial solution requires a process of adjusting the conflicting interests. A sense of responsibility arises from the perception that the process is fair and results in a stable equilibrium.

¹⁰⁵ *Id.* at 125.

¹⁰⁶ See Stefan Jungcurt & Nicole Schabus, *Liability and Redress in the Context of the Cartagena Protocol on Biosafety*, 19 *Review of European Community and International Environmental Law*: 197-206 (2010).

In the administrative approach, responsibility originates in a finding by a national competent authority that significant injury to biological diversity has occurred or may occur. In defining damage to biological diversity, a national competent authority will have to rely on the opinion of scientific experts, including “biodiversity experts.” Once the risk, or the reality, of significant injury is established, the national competent authority channels the costs of preventing, or remedying, the damage to a responsible party, usually the operator.

In Herman Melville’s novel *Moby-Dick*, the horizontal type of responsibility is demonstrated by Ishmael’s friend Queequeg, a native of an island in the South Pacific near New Zealand. On the voyage to Nantucket, a local bumpkin mocks Queequeg’s outlandish appearance. Queequeg responds with an amazing display of strength tempered by good humor. He flips the bumpkin into the air, taps him on the bottom in mid-somersault, and lands him safely, but rather shaken, on his feet. Shortly afterward, the bumpkin is accidentally knocked overboard, and Queequeg dives into the freezing water to save him. Later, observing Queequeg calmly smoking his pipe, with no apparent sense that he had done anything particularly heroic, Ishmael imagines Queequeg saying to himself—“It’s a mutual joint-stock world, in all meridians. We cannibals must help these Christians.”

The character of Ahab in *Moby-Dick* illustrates how the administrative approach can run off the rails at the hands of an arbitrary and capricious administrator.

Shortly into the whaling expedition, Captain Ahab convenes the crew of the *Pequod* in order to bend them to his monomaniacal purpose—killing the white whale, Moby Dick, who had bitten off part of his leg on the previous voyage. Skilled in manipulating men, Ahab stages an elaborate, rum-fueled, ceremony, which ends with the whole crew (including Ishmael) in a frenzy, shouting Death to Moby Dick! Later, in his cabin, Ahab reflects that the task of suborning was not so hard—his one cogged circle fits into all the various wheels of the crew, and they revolve. The path to his fixed purpose is laid with iron rails, whereon his soul is grooved to run, and he cannot be swerved. “Over unsounded gorges, through the rifled hearts of mountains, under torrents’ beds, unerringly I rush! Naught’s an obstacle, naught’s an angle to the iron way!”

With regard to the human environment, it seems that more and more we find ourselves living in a mutual joint-stock world,¹⁰⁷ although we’re more likely to describe it by a word such as *interdependent*. A civil liability system expresses a society’s evolving sense of what constitutes responsible behavior of a person toward others. By analogy, an

¹⁰⁷ Melville may have in mind the description of society in Emerson’s essay *Self-Reliance*: “Society is a joint-stock company, in which the members agree, for the better securing of his bread to each shareholder, to surrender the liberty and culture of the eater. The virtue most in request is conformity. Self-reliance is its aversion.” *The Selected Writings of Ralph Waldo Emerson* (Ed. by Brooks Atkinson, The Modern Library, 1950), at 148.

international civil liability régime, or a state liability régime—the two are closely related—ultimately expresses the international community’s sense of what constitutes responsible behavior of a state toward other states. Encouraging that sense of responsibility with regard to the human environment should be a policy goal of international environmental law. The historical difficulty in designing and implementing international civil or state liability régimes does not imply that the goal is unattainable. That lawyers in each state may regard their own system of civil liability as the best is only natural; the system reflects their sense of national identity. The problem for the legal architect is how to use those natural sentiments to build a framework for dealing with particular cases of transboundary harm to biological diversity.

The crews of whaling ships such as the *Pequod* came largely from islands. Ishmael says that, for some reason he can’t explain, islanders make the best whalers. He calls the crewmembers *Isolatoes*, “not acknowledging the common continent of men, but each *Isolato* living on a separate continent of his own. Yet now, federated along one keel, what a set these Isolatoes were!”¹⁰⁸ Perhaps the image of legal isolatoes federated along one keel provides a useful way of looking at the business of constructing international liability régimes for transboundary environmental damage. The notion of federating suggests a functional unity in which national legal systems are preserved intact yet coordinated with each other to accomplish a specific task. For the crew of the *Pequod*, the task was to catch whales—until Captain Ahab diverted them to the pursuit of one particular whale. For lawyers on an international crew pursuing a looming problem involving transboundary harm to the environment, the task is to use their legal skills to fashion a mutually acceptable solution including, if appropriate, elements of civil or state liability. There is no need to make global changes to national systems of civil liability, which legal isolatoes naturally resist. Instead, the lawyerly harpooners chasing the problem at hand should coordinate their efforts in an effective way that reflects their deepest sense of responsibility.

¹⁰⁸ Herman Melville, *Moby-Dick*, Chapter 27, *Knights and Squires*, (W.W. Norton & Company, 2002), at 107.

A strange metaphor, lawyer as harpooner! We're accustomed to think of lawyers as landspeople, "tied to counters, nailed to benches, clinched to desks." It's true that in pursuing liability for traditional forms of damage—injury to persons or property, or economic loss—lawyers are not often called upon to venture far from the *terra firma* of the law with its fixed categories and established customs. But chasing liability for damage to biological diversity requires pushing off from landed ways of thinking, for the concept of biological diversity is something like a whale. Can it be an accident that the first person to define it was a marine biologist? We shall meet him in the next chapter; here the story is about a group of international lawyers trying to figure out how to use the weapon of liability for the beneficent purpose of protecting biological diversity.

Our meeting in October to discuss liability under the Convention on Biological Diversity began with a kind of lawyerly gam.¹⁰⁹ The co-chairs of the group pursuing liability under the Cartagena Protocol made a brief presentation in which they mentioned the difficulties they'd encountered with the notion of damage to biological diversity, as well as issues relating to the valuation of damage and to thresholds.¹¹⁰ They hoped that our discussion of liability under Article 14(2) of the Convention might clarify some of these issues.

One of the papers Katharina and I had discussed was titled *A Precise Definition of Damage is Essential to the Function of Liability Rules*. The essential argument is that liability rules can only serve a useful function if the negative impact on some good or interest is (1) concrete and quantifiable in monetary terms; (2) attributable to some specific person or entity; and (3) recognized as damage by the applicable law (*e.g.*, as a negative impact due to some unlawful behavior). Without a clear definition of damage, it would be impossible to determine who must compensate whom, and under what

¹⁰⁹ Ishmael defines a gam as "[a] social meeting of two (or more) Whale-ships, generally on a cruising-ground; when, after exchanging hails, they exchange visits by boats; crews: the two captains remaining for the time, on board of one ship and the two chief mates on the other. Melville, *Moby-Dick*, Chapter 53, *The Gam*, (W.W. Norton & Company, 2002), at 198.

¹¹⁰ See *Report of the Group of Legal and Technical Experts on Liability and Redress in the Context of Paragraph 2 of Article 14 of the Convention on Biological Diversity*, U.N. Doc. UNEP/CBD/COP 8/27/Add.3 (18 October 2005), paras. 13-14, p. 4 (Remarks of Ms. Jimena Nieto, Co-Chair of the Open-ended Ad-Hoc Working Group on Liability and Redress under the Cartagena Protocol on Biosafety).

conditions. A vague or fuzzy definition would make it impossible for a person to determine whether or not they could be held liable for certain actions, and this could discourage innovation, trade, and investment. Negative impacts of an ethical, non-monetary nature, such as undesirable changes in social or cultural behavior or loss of spiritual values, do not meet the criteria, and therefore are not considered to be the kind of damage that liability rules can address. National and international legislation may provide regulatory and other policy measures for dealing with these more elusive kinds of negative impacts.

What assumptions underlie the dichotomy between negative impacts of a non-ethical, monetizable kind, for which liability rules are suited, and negative impacts of an ethical, non-monetary nature, for which they are inappropriate? And into which box should we put damage to biological diversity? It seems to belong in both. Ambiguities abound in the concept of biological diversity—as well as in the novel *Moby-Dick*. Ambiguity calls for interpretation as much as measurement. We measure a thing by means of attributes that appear on its surface. To discover the meaning of some thing we must dive beneath its surface, where what we see is always in part a reflection of our subjective self.

Nailed to the mainmast of the *Pequod* was a gold doubloon from Ecuador, which Captain Ahab promised to the first member of the crew to sight the white whale. Stamped upon the coin was a rich profusion of curious images so that, Ishmael says, “the precious gold seems almost to derive an added preciousness and enhancing glories, by passing through those fancy mints, so Spanishly poetic.”¹¹¹ In one scene, various characters pause alone before the coin and try to puzzle out the meaning of the images. Ahab interprets all of them as symbols representing him, whereas Starbuck, the most religious mate, provides a somewhat melancholy spiritual interpretation. Stubb, a philosophical mate, who’d been observing them, wonders what is so killing wonderful about this particular doubloon and decides to try his hand at raising a meaning from the queer symbols. First, he gets a book—the Massachusetts almanac—to help him identify

¹¹¹ Melville, *Moby-Dick*, Chapter 99, *The Doubloon*, (W.W. Norton & Company, 2002), at 332.

the signs of the zodiac. Then he puts the book down, saying: “the fact is, you books must know your places. You’ll do to give us the bare words and facts, but we come in to supply the thoughts.” He then proceeds to conjure up a reading of the zodiac as the life of man. Flask, a rather shallow mate, takes his turn at interpretation and sees nothing but a round thing made of gold that will belong to the first person to see a certain whale. It’s worth sixteen dollars and, given the price of a cigar at two cents, that amounts to nine hundred and sixty cigars. Finally, a superstitious sailor from the Isle of Man, interprets the coin as a prophecy that the whale will be spotted when the sun is in the sign of Leo because there is a horseshoe nailed to the mast directly opposite the coin. To which, Stubb replies: “There’s another rendering now; but still one text. All sorts of men in one kind of world, you see.”

Today, the newly minted coin of *biological diversity* has become the precious gold nailed to the mast by conservation biologists, a sign that things have grown desperate. If one is in search of a precise definition, there are many sources one may consult, including the Convention on Biological Diversity. If one wants to measure it, there are many statistical indices one may use. However, such definitions and measures but give us the bare words and facts; for each particular place and time we must supply the thoughts that express the meaning of *biological diversity*. That is the biological diversity we are responsible for. As the gold of the coin derived an added preciousness and enhanced glory from the images stamped upon it, the gold of biological diversity must pass through the mints of imagination that alone can invest it with added meaning and value. We must interpret the meaning, not one-by-one but together, looking at the coin from many points of view—economic, scientific, spiritual, pragmatic—keeping in mind that each is a rendering of one text. The multi-faceted interpretations are the product of all sorts of people in one kind of world. It may be possible, in this or that corner of the world, to agree about the meaning of *biological diversity* and on the basis of such shared interpretations to devise institutions to protect it. Liability rules, in conjunction with preventive regulations, could be an important component of these legal mechanisms.

If we view the biological diversity of a place more as a text to be interpreted than as something to be measured, what implications does that perspective have for an approach to liability under the Convention on Biological Diversity? I think that it suggests the need for something like a seminar approach. Imagine Captain Ahab, the mates Starbuck, Stubb, and Flask, the old Manxman, and even the less articulate souls of the *Pequod*—Queequeg and Pip—sitting around the mast, looking at the doubloon, and talking about the meaning of the images stamped on it. We should include Ishmael, of course, who narrates the story of the doubloon. He's there to remind us that "some certain significance lurks in all things." Now, transpose this imagined conversation about the doubloon to an imaginary discussion of the meaning of *biological diversity* in a particular place where it's threatened by the activities of some person in another country. Of the approaches to international liability, which seems the most likely to provide the conditions for a meaningful conversation about the values involved and a way to accommodate conflicting interests?

Neither the administrative approach nor the judicial approach using civil liability laws is conducive to a meeting of minds. Their formal procedures are not a genuine inquiry. However, I remembered another, essentially diplomatic, approach proposed in the 1980s by Robert Quentin-Baxter, a professor of international law from New Zealand, which I thought could work. It was based on negotiation among the States concerned with a particular problem involving possible transboundary harm to the environment. Quentin-Baxter had used the *Trail Smelter* case¹¹² as a model for specifying the procedural obligations of States to consult and share information and, if necessary, to establish a régime to prevent and repair damage. He'd developed this approach during his tenure as Special Rapporteur for the International Law Commission's study of the topic of international liability.¹¹³ However, he'd died before he could complete the set of draft articles, and his successors did not have his vision of how an approach based largely on the obligations of States to talk with each other to solve transboundary problems could work effectively. It was insufficiently sharkish in the eyes of some international lawyers.

¹¹² See *supra*, Part I.

¹¹³ See *supra*, Part II.

The final item on the agenda of our meeting was a consideration of preventive measures based on Article 3 of the Convention on Biological Diversity, which reads:

States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.

The wording is identical to Principle 21 of the 1972 Stockholm Declaration on the Human Environment. However, the lineage of the principle can be traced back even further to the *Trail Smelter* case and the declaration by the Arbitral Tribunal that, under the principles of international law, “no State has the right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another or the properties or persons therein.”¹¹⁴ Article 3 of the Convention is a direct descendant of the principle of international environmental law enunciated in the *Trail Smelter* case.

During the negotiation of the Convention, there was a debate about whether or not to include the principle as an operative article.¹¹⁵ Some delegations favored including it as a guiding principle in the preamble because it wasn’t clear how the principle could be implemented if it were included as an operative provision. Others insisted that a statement of the responsibility of a State not to harm the environment of other States belonged among the operative articles of the text. In the end, advocates of including an article on environmental responsibility in the Convention prevailed. Article 3 sits there quietly, waiting to be developed. At our meeting, some experts suggested that the part about responsibility might provide a basis for preventive measures. They mentioned the International Law Commission’s draft articles on prevention of transboundary damage from hazardous activities and suggested that the Convention should closely follow developments in that forum.

¹¹⁴ *Trail Smelter Case*, 1941 Decision, *supra* note 45, at 1965. The Tribunal restricts the scope of the principle by the qualifying phrase “when the case is of serious consequence and the injury is established by clear and convincing evidence.”

¹¹⁵ See Fiona McConnell, *The Biodiversity Convention: A Negotiating History* (Kluwer Law International, 1996) at 89.

I agreed that it would be useful to note the work of the International Law Commission, but it would be most helpful to remember the vision of its first Special Rapporteur on international liability. Robert Quentin-Baxter's schematic outline contains a pragmatic approach to developing the principle of environmental responsibility in Article 3 of the Convention on Biological Diversity. He saw the obligations to prevent damage and to make reparation for it as forming a continuum. However reasonable the Commission's decision to split the international liability topic into the two subtopics of prevention and of allocation of costs for damage may have seemed at the time, I think that it was a mistake. There is no way to put the fragments back together again. A more fruitful way forward lies in developing the ideas of the one who dove most deeply into the topic.

The meeting of experts ended indecisively. The report of the meeting stated that that it would be premature to conclude that an international régime focused on damage to biological diversity should either be developed or not developed.¹¹⁶ This conclusion held regardless of the régime's form or its nature, binding or non-binding. Given the complexity of the issues and the history of failure to implement liability in international environmental law, I understood the reasons for the hesitation to push off from shore. Yet, at some deeper level of my mind where these things are decided for reasons I can only wonder about, I had already pushed off. "Wonderfullest things are ever the unmentionable." What you'll find here is the story of an intellectual voyage, a sea-story if you will, as told by a survivor. The topic comes from the field of international environmental law, but I examine it in many lights, weigh it in all sorts of scales. The inquiry has a practical purpose that goes beyond the bounds of any academic discipline or field of study. Ultimately, I hope that it will help to soften the behavior of nations toward each other in situations where interests conflict and resort to administrative or judicial procedures and principles will only harden the opposition. It's possible to answer a difficult question or to solve a complex problem by talking with each other in ordinary words. Nations interested in preserving biological diversity should do what they can to

¹¹⁶ See *Report of the Group of Legal and Technical Experts on Liability and Redress in the Context of Paragraph 2 of Article 14 of the Convention on Biological Diversity*, *supra* note 99, Annex, para. 1, p. 11.

provide favorable conditions for such conversations. Among the wild conceits that moved me to write this work, that belief loomed above them “like a snow hill in the air.”

Chapter Two

I. *The Biological Diversity River*

The concept of biological diversity was first formally defined in 1980. The explosive growth in popularity of the term since then—particularly the shortened form *biodiversity*—indicates that it filled, and continues to fill, a vital need within our system of discourse about the living world. One way to clarify the meaning of the term *biological diversity* is to look at the purpose it was intended to serve. Why was it invented? However, it is not enough just to look at the moment of a concept's birth if we are to get a sense of its trajectory in life. We must also ask where has it come from and where is it going?

Elliott A. Norse, a marine ecologist who first defined *biological diversity*, compared intellectual and cultural movements in society to rivers.

A movement in human society is like a river system with many beginnings, in which tiny droplets of water form and then coalesce within tiny catchments as rivulets that join within progressively larger catchments as small streams, larger creeks, and rivers that ultimately flow to the sea or into basins with no outlet, where they dry up.¹

Norse saw the marine biodiversity movement as the confluence of two major tributaries, movements focused on biological diversity and on the sea. Writing in 1996, he foresaw that a third movement—conservation biology—would soon be joining the marine biodiversity river. Since then, the tributaries that flowed into the biodiversity movement have been mapped. In a recent book on the origins of the idea of biological diversity, Timothy J. Farnham took an “aerial view” of the landscape and waterways that made the biodiversity river possible, tracing its sources to significant streams of conservation earlier in the century.² As a result, we have a pretty good map showing where the modern concept of biological diversity came from.

Let's start at the point of confluence where various conservation streams converged on the goal of conserving something new called “biological diversity.” By the

¹ Elliott A. Norse, *A River That Flows to the Sea: The Marine Biological Diversity Conservation Movement*, 9 *Oceanography*, 5-9 (1996), at 5.

² See Timothy J. Farnham, *Saving Nature's Legacy: Origin of the Idea of Biological Diversity* (Yale University Press, 2007).

early 1980s, the idea of diversity was in the air. There was increasing recognition of cultural diversity as a normative good and a source of strength in human communities.³ Heightened awareness of the value of cultural diversity reinforced the idea that diversity is important in biological communities as well. Between 1980 and 1988, the concept of biological diversity emerged as the dominant conservation paradigm.

The story begins with a vague writing assignment. In 1979, Norse and his colleague Roger McManus, new staff members of the President's Council on Environmental Quality, were asked to write a chapter of the Council's 1980 *Annual Report* on "the status of life on Earth." A senior staff member noted that someone⁴ had recently described how tropical rainforests were being cut down at unprecedented rates, putting many species at risk of extinction. When Norse asked for clarification of the topic, it became clear that his superiors were primarily interested in the fate of species. However, to him, it seemed that the crisis went far beyond the disappearance of species; it also included the loss of genes and whole ecosystems. Norse and McManus didn't know any term that encompassed everything in the living world being lost, so they invented one: *biological diversity*.

The definition included two related concepts—(1) genetic diversity (genetic variability within a species) and (2) ecological diversity or species richness (the number of species in a community of organisms). Norse and McManus thought about including a category of diversity above the community level but decided not to because there were no readily identifiable units by which variety at this higher level could be described and measured. Norse came to regard the omission as a mistake, and in a subsequent version

³ See, e.g., *id.* at 7 ("In addition, especially in the latter half of the twentieth century, there was a growing recognition of the value of diversity in general. Not only were conservationists and scientists expressing interest in the protection and generation of diversity in the natural world, but many outside of conservation had begun to value diversity in human society as well—diversity in schools, diversity in the workplace, diversity in the citizenry of the country. In all contexts, diversity was seen as a strengthening characteristic."); see also David Takacs, *The Idea of Biodiversity: Philosophies of Paradise* (The Johns Hopkins University Press, 1996) at 45 ("Within the academy and out in society, canons and prototypes have given way to pluralities and multiplicities; we laud diversity everywhere. Some biologists who boldly assert that biodiversity is a normative good associate the claim with the more widely familiar one that cultural diversity is a normative good.")

⁴ See Norman Myers, *The Sinking Ark: A New Look at the Problem of Disappearing Species*, (Pergamon Press, 1979).

of the definition published in 1986, he and his colleagues revised the earlier definition to include ecosystem diversity (different physical settings with more or less different communities of species).⁵ This all-encompassing three-tier concept of biological diversity (the triumvirate of genes, species, and ecosystems) became the standard, and it is essentially the same as the one used in the Convention on Biological Diversity.⁶

A metaphor commonly used to describe the function of the term *biological diversity* is that of an umbrella concept, which groups several related concepts into a single comprehensive category or set. The unifying function of the biological diversity concept worked on both a scientific and a social, cultural level. From a scientific perspective, the term drew attention to the fact that the threats to life on Earth are not confined to the loss of species but encompass the entire hierarchical organization of life from genes to ecosystems. Norse emphasized that the concept of biological diversity is a real advance in conservation thinking in part because its hierarchical structure deals with the loss of diversity at different levels of biological organization.⁷ However, the real reason the concept caught on was that it articulated a more comprehensive conservation goal than merely preserving individual species that may be in danger of disappearing. In Norse's words, the goal was "to conserve the functional integrity of populations, species and ecosystems."⁸ The emphasis was upon seeing the various forms of the living world as a functional whole. It was a vague goal, but perhaps the fuzziness contributed to the concept's power to move people to act. The concept of biological diversity was designed to bring isolated, and therefore less politically powerful, movements narrowly focused on conserving particular genes, or species, or ecosystems, under the banner of a unified conservation movement that could achieve practical results on a grand scale.

⁵ See Elliott A. Norse, Kenneth L. Rosenbaum, David S. Wilcove, Bruce A. Wilcox, William H. Romme, David W. Johnston, Martha L. Stout, *Conserving Biological Diversity in Our National Forests* (The Wilderness Society, 1986), at 3.

⁶ Article 2 of the Convention defines *biological diversity* as "the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems."

⁷ See Norse, *A River That Flows to the Sea*, *supra* note 1, at 7.

⁸ *Id.*

The United States government played a key role in helping the biological diversity movement to establish itself. Two events during the 1980s stand out as particularly significant: the U.S. Strategy Conference on Biological Diversity in November 1981, and the National Forum on BioDiversity in September of 1986. In November of 1981, the State Department and the U.S. Agency for International Development sponsored a three-day Strategy Conference on Biological Diversity attended by about 300 individuals from government agencies, Congress, universities, and non-governmental organizations. Its stated purpose was to promote public awareness of linkages among diversity issues; to engage federal agencies in a dialogue with business, academic, and scientific sectors; and to make recommendations for specific national and international responses.⁹ Among the principal conclusions and recommendations, the concerns over loss of genetic diversity predominate, although a wide variety of viewpoints are represented in the published proceedings.¹⁰ One recommendation called for the United States to support research in conservation biology, and graduate programs in the new discipline soon began to appear in many universities, including the University of Minnesota.

The 1986 National Forum on BioDiversity introduced the concept of *biological diversity* to a large public audience outside of government and led to the coining of the more media-friendly term *biodiversity*. Walter G. Rosen, who invented the term, organized the conference, which he described as an “exercise in consciousness-raising.”¹¹ His superiors at the National Academy of Sciences were concerned that, by providing a forum for advocacy, it might become an exercise in the wrong kind of consciousness-raising and tarnish the Academy’s reputation for scientific objectivity. Rosen recalls how he had to “walk on eggshells” to keep the Academy from squashing the idea of the conference. In the end, however, it proved to be a great success. About 14,000 people

⁹ See U.S. Strategy Conference on Biological Diversity (1981: Washington, D.C.), *Proceedings of the U.S. Strategy Conference on Biological Diversity, November 16-18, 1981* (Dept. of State, 1982), at iii.

¹⁰ See, e.g., *id.* at 59 (“I would like to submit that one important reason for conserving species is because people like them. There is an aesthetic side to all of this, a side that is admittedly difficult to work with, but one that is important not to ignore, because in the long run it is perhaps the greatest motivation for public support.”) (Comment of Dr. Archie Carr III, of the New York Botanical Society).

¹¹ See Takacs, *supra* note 3 at 38 (interview with Walter G. Rosen).

attended, including many high-profile scientists, and a teleconference was beamed to more than one hundred venues, with as many as 10,000 people watching the event live around the world.¹² In 1988, papers from the forum were published in a book edited by the distinguished Harvard biologist Edward O. Wilson titled *BioDiversity*, which became a bestseller.¹³ As for inventing the word *biodiversity*, Rosen, tongue-in-cheek, recalls that “it was easy to do—all you do is take the ‘logical’ out of ‘biological’.”¹⁴ Wilson at first opposed the term *biodiversity* as “too glitzy,” although he later admitted that Rosen’s instincts turned out to be completely right.¹⁵

In his history of the biological diversity concept, Farnham asks why the three hierarchical levels of genes, species, and ecosystems were selected over other possible levels as the basis for the definition. One reason he suggests is related to biological diversity’s implicit connection with environmental values. These three categories best capture the various ways we value living things, their products and the places where they live. But even more fundamentally, he says, “the respective interests in genes, species, and ecosystems have clear histories in which the evolution of concern for their conservation plays a prominent role.”¹⁶ It seems that the organizational structure of the biological diversity concept was not so much invented as discovered. To use Norse’s metaphor, there were tributaries flowing into the biological diversity river above the point of confluence in the 1980s, and to discover them we must go “upstream” or back in time. The moving force of the river is generated from these sources. Unlike the concept of biological diversity, the categories of genes, species, and ecosystems are not umbrella groups; they are close to our concrete experience of the natural world. Our concerns for preserving different kinds of genes, species, and ecosystems are rooted in our existence as biological beings interacting with the world around us.

¹² *Id.*

¹³ See National Forum on Biodiversity (1986 : Washington, D.C.), *Biodiversity* (Edward O. Wilson & Francis M. Peter eds) (National Academy Press, 1988).

¹⁴ See Takacs, *supra* note 3 at 37 (interview with Walter G. Rosen).

¹⁵ *Id.*

¹⁶ See Farnham, *Saving Nature’s Legacy*, *supra* note 2 at 6.

If one were to take a birds-eye view of the landscape upstream from the confluence, at least two things would stand out. First, each of the three separate tributaries to the biological diversity concept gradually grew wider during the twentieth century. Farnham notes that each of the separate conservation histories shows a broadening awareness of the benefits humans derive from the natural world. In the early years, the focus was on utilitarian and scientific values. However, the range of environmental values mentioned in the conservation literature gradually expanded over the course of the century to include others such as aesthetic, recreational, and ethical values.¹⁷ The second thing that would stand out is the gradual convergence of the genes, species, and ecosystem conservation streams. As the range of environmental values expanded, awareness of linkages between the various values increased. Farnham mentions several examples of this growing awareness of the interdependency of the natural world. Recognition of the ecological benefits of intact natural systems led to increased interest in the role of species diversity in maintaining ecosystem stability. As the potential utilitarian value of genetic diversity became more apparent, the movement to protect ecosystems and species with valuable genes accelerated. And as scientific interest in preserving representative samples of the world's ecosystems grew, it provided impetus to efforts to preserve both genetic variety and species diversity. At the same time that society was becoming aware of these interconnections in the natural world, there was a growing emphasis in the 1960s and 1970s on the general cultural importance of diversity. By the 1980s, previously separate conservation groups were ready to gather under the umbrella of concern for saving the world's biological diversity.

Downstream from the confluence, the biological diversity river widened. Biologists asked the fundamental questions what biodiversity is and how it could be measured.¹⁸ Ecologists began to develop research agendas around the concept of biological diversity. They wanted to know the answers to questions such as how the diversity of genes and of species in ecological communities affects the stability and the

¹⁷ Farnham proposes a typology of nine values based primarily on the value schema of Stephen Kellert in his book *The Value of Life* (Island Press, 1996). *See id.* 37-40.

¹⁸ *See, e.g.,* John L. Harper & David L. Hawksworth, *Biodiversity: Measurement and Estimation, Preface*, 345 *Philosophical Transactions: Biological Sciences*, 5-12 (1994), at 5.

productivity of these communities? Does biological diversity reflect ecosystem sustainability? And, given the importance of biological diversity for ecosystem functioning, what are the economic costs to society due to the loss of diversity? Conservation biologists developed a strategy for making the public more aware of the magnitude of the loss using the concept of ecosystem services—the human benefits of resources and processes supplied by natural ecosystems.¹⁹ How much would it cost to find substitutes for these “goods and services” that nature provides for free? Although estimates vary, the short answer is: quite a lot. Proponents of the ecosystem services concept hope that greater recognition of the costs will provide an effective incentive to conserve biological diversity. Considerations of cost raise another fundamental question in addition to what diversity is and how it can be measured, the question how humans value biological diversity?

After more than two decades of discussion and debate, there is still no consensus of opinion on the fundamental questions of the meaning, the measure, and the value of biological diversity. By one biologist’s count in the mid 1990s, there existed more than eighty-five definitions in the literature.²⁰ Academic ecologists seemed to regard the task of developing biodiversity measures and indicators as a special challenge to the profession. As one of them put it, there exists a “plethora of indices” (far more than eighty-five) to choose from.²¹ Faced with this bewildering “diversity of diversity measures,” the most important question for a potential user of these measures to ask is what are the study’s objectives?²² Moreover, most ecologists agree that a single measure

¹⁹ See Gretchen C. Daily (ed.), *Nature’s Services: Societal Dependence on Natural Ecosystems* (Island Press, 1997) at 3 (“*Ecosystem services* are the conditions and processes through which natural ecosystems and the species that make them up, sustain and fulfill human life.”). For a brief history of the concept by the two ecologists behind its early development in the 1980s see Harold A. Mooney & Paul R. Ehrlich, *Ecosystem Services: A Fragmentary History*, *id.* at 11-19.

²⁰ See Don C. DeLong, Jr., *Defining Biodiversity*, 24 *Wildlife Society Bulletin*, 738-749 (1996).

²¹ Anne E. McGurran, *Measuring Biological Diversity* (Blackwell Publishers, 2004) at 100 (“None the less, as the literature testifies, the challenge of devising ever better measures has been taken up by many ecologists over the years. As a result, there are a plethora of indices from which to choose and this diversity of diversity measures can make it difficult to select the best approach.”).

²² *Id.* at 101 (“Since even the most elegant methodology cannot redeem an ill-conceived investigation, the single most important consideration in the measurement of diversity is that the user has a clear idea of the objectives of the study.”)

is inadequate; to capture the biological diversity of a particular area several measures are necessary.²³ As for systems of value, there are a number of typologies to choose from.²⁴ Again, the problem lies in selecting from them a set of values appropriate to the task at hand.

In Norse's metaphor of conservation movements as river systems, rivers ultimately flow to the sea or into basins with no outlet where they dry up. As we enter the next millennium, the biological diversity river has not dried up, but it may have lost its name. There is a growing tendency to think of it as a stream of ecological goods and services that flow into the larger river of concern for human well-being. This view of biological diversity is embodied in the conceptual framework that guided the recent Millennium Ecosystem Assessment.

The Millennium Ecosystem Assessment was a UN-sponsored initiative carried out between 2001 and 2005 by more than a thousand experts around the world. Its goals were "to assess the consequences of ecosystem change for human well-being and to establish the scientific basis for policies designed to enhance the conservation and sustainable use of ecosystems and their contributions to human-well-being."²⁵ The project led to the identification of a number of research needs²⁶ that should keep the biological diversity river flowing for a number of years, although perhaps it should be named the sustainable development river. The focus of the Millennium Assessment is clearly on the goal of human well-being and poverty reduction. Concern for biological diversity is linked to this goal through the mediating concept of ecosystem services. Biodiversity—the diversity of life on Earth—is "essential for the functioning of

²³ See, e.g., Kevin J. Gaston & John I. Spicer, *Biodiversity: An Introduction* (2nd ed. 2004) at 9 ("From the definition alone, it is clear that no single measure of biodiversity will be adequate. Indeed, given its great complexity, it would be foolish to believe that the variety of life in an area, however small or large that area might be, could be captured in a single number.")

²⁴ See, e.g., Holmes Rolston III, *Conserving Natural Value* (Columbia University Press, 1994); Stephen R. Kellert, *The Value of Life* (Island Press, 1996).

²⁵ Millennium Ecosystem Assessment, *Ecosystems and Human Well-being: Synthesis* (Island Press, 2005), at ii. All the reports produced by the Millennium Assessment are available at <http://www.maweb.org/en/index.aspx>.

²⁶ For a summary of the research needs see Stephen R. Carpenter, Ruth DeFries, Thomas Dietz, Harold A. Mooney, Stephen Polasky, Walter Reid, Robert J. Scholes, *Millennium Ecosystem Assessment: Research Needs*, 314 *Science*, 257-258 (2006).

ecosystems that underpin the provisioning of ecosystem services that ultimately affect human well being.”²⁷ The emphasis upon ecosystem services is consistent with the general ecosystem approach to conservation under the Convention on Biological Diversity.

The authors of the Millennium Ecosystem Assessment synthesis on biological diversity recognized that different interpretations of the concept could lead to confusion in understanding both the science and the policy recommendations, so they included a box on avoiding two main conceptual pitfalls.²⁸ The first mistake to avoid is confusing the value of the diversity of genes, species, or ecosystem *per se* with the value of particular components of that diversity. For example, species diversity is valuable because a variety of species increases ecosystem resiliency to changes in the environment. At the same time, a particular species in the ecosystem may be valuable as a food resource. Human consequences of changes in biodiversity result from changes both in diversity *per se* and in its elements. As a result, each component deserves separate consideration from policymakers and resource managers. The second pitfall can better be expressed in positive terms. Biodiversity refers to diversity at multiple scales of biological organization—genes, species, and ecosystems—and can be considered on any geographic scale, local, regional, or global. Therefore, it’s generally important to specify the level of organization and the scale of concern.

These two considerations help to illuminate the meaning of *biodiversity loss*. The meaning of *biodiversity loss* in the liability context will probably differ from the meaning used to assess progress toward more general targets set by the Convention on Biological Diversity. However, there may be some features of the definitions in common. In 2004, for the purpose of assessing progress toward the 2010 targets, the Convention on Biological Diversity adopted a definition of *biodiversity loss* as “the long term or permanent qualitative or quantitative reduction in components of biodiversity and their potential to provide goods and services, as measured at global regional and national

²⁷ Millennium Ecosystem Assessment, *Ecosystems and Human Well-being: Biodiversity Synthesis* (Island Press, 2005), at 1.

²⁸ See Box 1. “Biodiversity and Its Loss—Avoiding Conceptual Pitfalls,” *in id.* at 2.

levels.”²⁹ Biodiversity can be lost either by reduction in diversity *per se*, (*e.g.*, through extinction of a species) or by reduction in the potential of the components of diversity to provide a particular service (*e.g.*, through over-harvesting a food fish).³⁰ Also, homogenization of biological diversity (*e.g.*, through spread of invasive species or introduction of a monoculture crop) represents a loss of biological diversity on a global scale. Although the number of species at a particular place may increase through invasion by an exotic species, biological diversity is reduced on a global scale as previously distinct groups of species in different parts of the world become more uniform. In short, determining the meaning of *biodiversity loss*, in any context, is a tricky business. We can’t rely on technology to do the job for us, although technology is necessary to do the job.

Even with many technological tools and data sources available, the challenges of measuring biological diversity and its loss are formidable. However, the authors of the Millenium Ecosystem Assessment biodiversity synthesis point out that “precise answers are seldom needed to devise an effective understanding of where biodiversity is, how it is changing over space and time, the drivers responsible for such change, the consequences of such change for ecosystem services and human well-being and the response options available.”³¹ As we noted, ecologists have responded to the challenges of measuring the multidimensional concept of biological diversity by developing a variety of surrogate or proxy measures called *indicators*. Unfortunately, the available indicators are poorly aligned with the aspects of biological diversity significant for the delivery of ecosystem services. The Millennium Ecosystem Assessment identified the development of indicators specifically tailored to monitor biological, physical, and social changes as a research priority.³² In using a particular indicator, it’s important to convey something about the confidence associated with it. The Millennium Ecosystem Assessment generally found itself unable to quantify uncertainties and suggested the need for more

²⁹ Convention on Biological Diversity, Decision VII/30, *Strategic Plan: Future Evaluation of Progress* (2004)

³⁰ See Millenium Ecosystem Assessment, *Biodiversity Synthesis*, *supra* note 25, at 2.

³¹ *Id.* at 18.

³² See Carpenter et al. *Millennium Ecosystem Assessment*, *supra* note 26.

work to improve the identification, quantification, and communication of uncertainties.³³ I'll discuss certain techniques for handling some of the uncertainties associated with the concept of biological diversity and its measurement in the second half of the chapter.

As for the future, one can only speculate about the course of the biological diversity river. Will it keep rolling along? Will it split due to a fundamental divergence of interests between those concerned primarily with conserving nature and those concerned primarily with improving the human condition? One would like to think that the two goals are compatible, perhaps even mutually reinforcing. However, as we saw in the negotiation of the Convention on Biological Diversity, there's a tension between them. The concept of biological diversity was designed to be an umbrella big enough to include both interests. Its capacity to unify many separate conservation groups under one banner is its great strength. It provides no specific guidance on how to strike the right balance between conservation and sustainable use. One must interpret its meaning, decide how to measure it, and appraise its value before we the concept of biological diversity can be used in any particular situation. At the end of his book, Farnham predicted that someday another term will replace *biodiversity* as the focus of a new cause for conservation. Society constantly needs to renew its ideas, and the words we choose to express those ideas are the symbolic carriers of meaning. However, he didn't expect the paradigm of thinking about the living world as biological diversity to be pushed aside anytime soon.

II. Invisible Injury Revealed

Any agreement to prevent and to make reparation for transboundary harm to biological diversity must define not only the meaning of *biological diversity* in the particular context but the meaning of *harm* as well. Moreover, the definition of *harm* for the purpose of prevention may differ from the definition of *compensable damage*.³⁴ The

³³ *Id.* at 258.

³⁴ See International Law Commission, *Survey of State practice relevant to international liability for injurious consequences arising out of facts not prohibited by international law, prepared by the Secretariat* (Extract from the Yearbook of the International Law Commission (1985, vol. II(1) Add.1), U.N. Doc. A/CN.4/384, at 26, para. 114, ("The characterization of harm or injury for the purpose of impact assessment may differ from that of harm or injury entailing liability; harm or injury requiring prior consultations may or may not be compensable as a consequence of liability.")).

dispute over “invisible injury” in the *Trail Smelter* case illustrates the difficulties in deciding what constitutes harm to a biological system. Classifying certain effects as harmful or adverse involves not just measuring but also techniques for dealing with the inherent vagueness of a fuzzy concept.

The concept of invisible injury first appeared in the literature in 1899 in a series of investigations by German scientists on how low concentrations of sulfur dioxide gas, a component of smelter smoke, affected pine trees.³⁵ From the start, the theory was controversial. The injury was described as “invisible” because no symptoms could be seen by the naked eye. However, with the aid of a microscope one could detect abnormalities in chloroplasts, the photosynthetic organelles of plant cells that ultimately feed the plant. Invisible injury was characterized as a disturbance in the life of the plant due to disruption of cellular processes, and its measurable symptom was decreased plant growth. Critics of the theory pointed out that there was no clear causal mechanism linking damage at the cellular level with harm at the organism level. Even defenders of the invisible injury hypothesis conceded that the symptoms of diminished plant growth could be produced by environmental causes other than pollution. Moreover, there was variability among experimentally treated plants and even among needles of the same tree. Thus, observations of cellular abnormalities did not provide a basis for predicting whether or not chronic exposure to low concentrations of sulfur dioxide would harm the growth of the tree.

The version of the invisible injury hypothesis best known to the scientists involved in the *Trail Smelter* case was proposed in 1923 by Julius Stoklasa, a Czech agricultural chemist.³⁶ Stoklasa classified smoke injury to plants into three types: acute, chronic, and invisible. In classifying, he used two main criteria: (1) concentration of

³⁵ For a good summary of the history and analysis of the theory of invisible injury—or hidden injury as it was also called—see D.C. McCune, L.H. Weinstein, D.C. MacLean, & J.S. Jacobson, *The Concept of Hidden Injury in Plants* (A Symposium Presented at the 133rd meeting of the American Association for the Advancement of Science, December 1966), in *Agriculture and the Quality of Our Environment*, (Nyle C. Brady ed., AAAS 1967) 33-44. McCune *et al.* note that the term *invisible injury* had appeared in print before, but the first definition is usually credited to Paul Sorauer and Emil Ramann in their series of investigations *Sogennante Unsichtbare Rauchbeschädigungen* published in 1899. *Id.* at 33.

³⁶ J. Stoklasa, *Die Beschädigungen der Vegetation Dur Rauchgase und Fabriksexhalationen* (Urban & Schwarzenberg, 1923). See McCune *et al.*, *id.* at 34.

sulfur dioxide gas and duration of exposure, and (2) manifestation of sulfur dioxide-induced effects. Acute and chronic forms of injury were both visible. They were distinguished by the type of symptom manifested and the degree of its severity, both of which reflected differences in exposure to the gas. The category of invisible injury was characterized by a suite of symptoms including decreased growth, accelerated aging of foliage, accumulation of sulfates in the tissues, reduction in photosynthesis, and increased susceptibility to plant pathogens and insects. These symptoms were produced by prolonged or recurrent exposure to low levels of sulfur dioxide. Moreover, Stoklasa's classification implied that there was no safe level of exposure. Prolonged or recurrent exposure to *any* concentration of sulfur dioxide, however low, produced invisible injury to plants.

The scientific debate in the *Trail Smelter* investigations focused on the question whether the class Stoklasa called *invisible injury* really existed. Opponents of the theory argued that all injury could be classified as either acute or chronic with each type having characteristic visible symptoms. The first scientific study in the United States to address the question of invisible injury resulted from an investigation of claims regarding smoke damage to crops near a smelter operated by the Selby Smelting and Refining Company near San Francisco. The Selby Commission's 1915 report³⁷ found no evidence in experimentally treated barley plants of invisible injury, defined as reduction in yield without concomitant visible lesions. The report quickly became a landmark in the literature on smoke damage to plants because of the innovative experimental technique of using portable cabinets to control the level of sulfur dioxide exposure of plants in the field.³⁸

However, the theory of invisible injury was not so easily discredited. As technology improved, things previously hidden became visible. In the late 1920s scientists from the U.S. Department of Agriculture began experimental investigations to support claims by farmers in upstate Washington that smoke from the Trail Smelter in

³⁷ J.A. Holmes, E.C. Franklin, & R.A. Gould, Report of the Selby Smelter Commission (Bureau of Mines Bulletin 98, 1915).

³⁸ For a discussion of the method see Harold Wolozin & Emanuel Landau, *Crop Damage from Sulfur Dioxide*, 48 *Journal of Farm Economics*, 394-405 (1966), at 397.

Canada had injured their crops and orchards. Scientists working for the smelting industry were equally determined to find conclusive evidence refuting the invisible injury hypothesis. Years later, one of the scientists who provided seemingly strong evidence against the invisible injury hypothesis described what was at stake:

The “invisible injury” theory as applied to sulfur dioxide has been of great concern to industry, particularly the smelting industry, in the United States and Canada for the past 40 yr. This industry, faced with claims for crop damage and with litigation, was puzzled to know how to define its responsibility if the area of plant injury was actually greater than the area with visible lesions.³⁹

Representatives of the smelting industry in both Canada and the United States believed that the invisible injury theory made it virtually impossible to determine the industry’s legal responsibilities. They argued that visible foliar markings were not an unambiguous sign of smoke damage; other things, such as disease, drought, or pathogens could produce similar lesions. Distinguishing specific symptoms indicative of smoke damage from those produced by other environmental factors required expert judgment.⁴⁰ A common litigation strategy was to argue that crop damage was due to causes other than smoke.⁴¹ Injury attributable to smoke must be evident in visible symptoms. The Selby Commission Report gave scientific sanction to the view that as long as a smelter operated so as to avoid producing visible signs of injury to plants, legally it was in the clear.⁴²

³⁹ Moyer D. Thomas, *The Invisible Injury Theory to Plant Damage*, 5 *Journal of the Air Pollution Control Association*, 205-208 (1956), at 205.

⁴⁰ See Morris Katz, *Sulfur Dioxide in the Atmosphere and Its Relation to Plant Life*, 41 *Industrial and Engineering Chemistry*, 2450-2465 (1949), at 2451 (“The damaging character of high concentrations [of sulfur dioxide] on vegetation can be readily ascertained by the trained observer because of the visible and specific symptoms produced on the foliage of sensitive plants.”); see also Clive L. Spash, *Assessing the Economic Benefits to Agriculture from Air Pollution Control*, 11 *Journal of Economic Surveys*, 47-70 (1997), at 53 (“Early work in this area [i.e. economic assessment of ozone damage to agricultural crops] depended upon trained field observers using their judgment to estimate crop damage from visible symptoms.”).

⁴¹ See, e.g., John D. Wirth, *Smelter Smoke in North America: The Politics of Transborder Pollution* (University Press of Kansas, 2000), at 27 (“In smelter litigations it was the usual practice for both sides to hire their own experts.. It would be easy to agree with the *Globe and Mail’s* mining editor who commented that in litigation of this sort the ‘experts in every line usually give evidence that is valuable to the side that employs them.’ ”).

⁴² One feature of the early litigation over air pollution that particularly strikes the sensibilities of a modern observer is how little the effects on human health appear to have been considered.

And when smoke clearly did harm plants, one could measure the maximum extent of the damage by the area of visible foliar markings.

Because of the high stakes involved and the length of the dispute, scientists had plenty of time, money, and motivation to perform a careful series of laboratory and field investigations focused on the reality of “invisible injury.” The pressure to produce evidence that would stand up in court had a tendency, as one historian of the case John Wirth put it, to “channel results and blur uncertainties.”⁴³ Most of those involved in the dispute agreed that Canadian scientists did a better job than their American counterparts of making their case before the *Trail Smelter* Arbitral Tribunal. In part, the Canadians succeeded because of superior funding and support from government as well as industry.⁴⁴ It’s difficult to compare the scientific merits of the opposing arguments because scientists from the U.S. Department of Agriculture never published most of their results.⁴⁵ In contrast, the Canadian team produced an impressive volume of studies⁴⁶ that represented the orthodox scientific view on invisible injury until interest in the subject of air pollution re-awakened in the 1960s. In this rather one-sided scientific dispute, the consensus of opinion was that injury to plants did not occur without visible foliar markings.

In awarding damages, the *Trail Smelter* Tribunal did not give legal recognition to the theory of invisible injury, but neither did it bar the possibility of eventual recognition. On the basis of the evidence of visible injury, it accepted the claim that between 1932 and 1936, crops and timber had been injured in varying degrees by smoke from the Trail

⁴³ For a good account of the scientific dispute see John Wirth, *Smelter Smoke in North America*, *supra* note 41, Ch. 2: “This Most Illusive of Problems”: The Scientific Dispute.”

⁴⁴ For a table comparing the relative expenditures of the two governments during this period see *id.* at 65.

⁴⁵ The only substantive paper to come from the United States team is S.W. Griffin & W.W. Skinner, *Small Amounts of Sulfur Dioxide in the Atmosphere. I. Improved Method for Determination of Sulfur Dioxide When Present in Low Concentration in Air*, 24 *Industrial and Engineering Chemistry* 862 (1932). This methodological report was the first in a planned series of papers on evidence supporting the invisible injury hypothesis.

⁴⁶ National Research Council of Canada, *Effect of Sulphur Dioxide on Vegetation* (Prepared for The Associate Committee on Trail Smelter Smoke of the National Research Council of Canada) (Ottawa, 1939).

Smelter.⁴⁷ In determining the indemnity owed, the Tribunal applied the measure of damage that American courts used in similar cases of smoke nuisance, namely reduction in the use value or the rental value of land due to fumigations. In the Tribunal's decision requiring the Trail Smelter to refrain from causing future damage, damage was defined as what "would be recoverable under the decisions of the courts of the United States in suits between private individuals."⁴⁸ This definition did not rule out the possibility that someday courts in the United States might recognize claims for invisible injury. If such claims were allowed, the Trail Smelter would be liable for an indemnity to be determined in a manner agreed upon by the two governments. In essence, the Tribunal's ruling in the *Trail Smelter* case made the definition of injury and the appropriate damages owed a matter for Canada and the United States to decide. In the case at hand, the Canadians had agreed to have the dispute resolved using standards based on rulings of the United States Supreme Court. However, the countries were free to adjust the standards to changing circumstances, including new scientific findings about effects of low levels of air pollutants on plants.

By the early 1960s, the time had come to take a closer look at the theory of invisible injury. Rachel Carson's book *Silent Spring*, published in 1962, highlighted the adverse effects of toxic chemicals in the environment and helped to make the word *environment* as popular as *biodiversity* was to become later. On December 17, 1963, Congress passed the first federal air pollution law, the *Clean Air Act*.⁴⁹ Air quality became a concern for everyone, not just those living near smelters and factories. The primary cause of concern was the effect of pollutants on human health, and the pollutant of greatest concern was ozone, an ingredient in smog. However, the environmentalist winds sweeping the country by the late 1960s also rekindled interest in the effects of sulfur dioxide and other pollutants on crops.

⁴⁷ See *Trail Smelter Case (United States v. Canada)*, Decision reported on April 16, 1938, in *Reports of International Arbitral Awards*, Vol. III: 1911-1937, (United Nations, 2006).

⁴⁸ *Trail Smelter Case (United States v. Canada)*, Decision reported on March 11, 1941, in *Reports of International Arbitral Awards*, Vol. III: 1938-1982, at 1966.

⁴⁹ Pub. L. No. 88-206, 77 Stat. 392 (1963), codified as amended at 42 U.S.C. §§7401-7671q (2000).

Some researchers proposed abandoning the concept of hidden injury because it was no longer adequate to describe the complexities of air pollutant effects on plants.⁵⁰ However, the term *hidden injury* still appears in air pollution literature today, and its basic symptoms are similar to those Stoklasa described in 1923: reduction in yield or growth due to depressed photosynthetic activity, a buildup of toxic substances (e.g. sulfates) in leaves, and decreased resistance to disease and pathogens.⁵¹ It would appear that proponents of the invisible injury theory in the *Trail Smelter* case have finally been vindicated.

However, it's too simple to view the change in scientific opinion as vindication of the concept of invisible injury *as* it was understood earlier. The meaning of *injury* itself had changed as its complexity became clearer. Injury is now seen as a process or continuum of changes characterized by a gradual transition from hidden to visible injury.⁵² Plant physiologists interested in the effects of pollutants attempted to elucidate the biochemical and physiological alterations responsible for lowering plant productivity

⁵⁰ See, e.g., McCune *et al.*, *supra* note 35, at 40 (“A brief consideration of some aspects of air pollutant effects indicates that the terms and concepts that have been characteristic of hidden injury are no longer adequate. Our current knowledge can be expressed in other ways that are more accurate descriptions of the mode of action of air pollutants and the complex nature of the evidence.”); see also E.F. Darley & J.T. Middleton, *Problems of Air Pollution in Plant Pathology*, 4 Annual Review of Phytopathology, 103-118 (1966) at 108 (“Since growth inhibition produces plants of inferior size and reduces crop production, there is no basis for use of the terms “invisible injury” and “hidden injury” for the growth suppression effects of air pollution. Growth suppression from air pollution is a result of alterations in photosynthesis, respiration, interference with enzyme activity, and changes in cell wall permeability; surely the terms “invisible” or “hidden injury” are no longer scientifically tenable.”).

⁵¹ See, e.g., Johan C. I. Kuylenskierna, W. Kevin Hicks, Michael J. Chadwick, *A Perspective on Global Air Pollution Problems*, in *Global Environmental Change (Issues in Environmental Science and Technology 17)* (R.E. Hester & R.M. Harrison, eds., The Royal Society of Chemistry, 2002), 21, 30 (“Gaseous air pollutants may affect vegetation through visible injury and/or effects on growth and yield (invisible injury) and through subtle physiological, chemical or anatomical changes.”); see also Spash, *supra* note 40, at 53 (“Generally, three types of response to air pollution can be defined; visible injury symptoms, growth responses and quality changes. Foliar injury models ignore ‘hidden injury’ which may occur with the latter two responses. Hidden injury includes reduced photosynthetic activity, accumulation of a pollutant within a leaf, an unhealthy appearance without necrotic lesions, reduced growth or yield, and increased susceptibility to disease, particularly insect invasion.”).

⁵² See, e.g., Robert L. Heath, *Initial Events in Injury to Plants by Air Pollutants*, 31 Annual Review of Plant Physiology 395, 398 (1980) (“It is obvious that visible injury is the result of a series of events (hidden injury?) beginning at the primary site of damage within the leaf and leading to the final collapse of whole cellular regions. Some findings indicate that the course of development of visible injury can be modified, i.e. by feeding of sugars to the leaves . . . , though the amount of damage that can be mitigated during this transition time between hidden and visible injury is unknown.”).

without producing visible injury. *Invisible injury* was interpreted as a kind of “black box” representing complex mechanisms of action at lower levels of biological organization that ultimately produce visible symptoms at the level of the organism.

By the latter part of the twentieth century, the experimental approach to air pollution effects on plants had also advanced beyond the methods used in the *Trail Smelter* investigations. It was not just a matter of more sophisticated technology; the conceptual framework had changed even more dramatically. Recognizing the complexity of the problem, researchers turned to a systems approach.⁵³ The basic goal was to understand the “air pollution system” by breaking it down into a series of subsystems for which experimental models could be devised. Models ranged from simple conceptual schemes representing linkages between components to complex mathematical descriptions that make precise predictions about the functioning of biological systems. As the complexity of the system increased, it became more difficult to discover the mechanistic sequence of events or the mathematical laws governing its operation. In this case, conceptual models diagramming a general sequence of events served as useful heuristic tools for structuring research programs. Figure 2.1 shows a simplified model for initial steps in pollution injury to plants.⁵⁴ Uptake of a pollutant by receptors on plant cells sets off an internal series of biochemical and physiological events whose precise mechanisms can be studied by plant physiologists. Such a diagram is a kind of fuzzy picture of the course of invisible injury. In the systems approach, injury or death is modeled as varying degrees of breakdown in a biological system such as a cell, an organ, or a whole organism. System function depends upon both internal factors (such as developmental age, genetics, nutrient and hormone status) as well as environmental factors. When conditions are favorable, internal mechanisms maintain a physiological

⁵³ See, e.g., Walter W. Heck, *Future Directions in Air Pollution Research, in* Effects of Gaseous Air Pollution in Agriculture and Horticulture (M.H. Unsworth & D.P. Ormrod eds., Butterworth Scientific, 1982), 411-435, at 412 (“The major challenge to the agricultural specialist over the next decade is to treat air pollution and its effects as an integrated system. It is no longer sufficient to understand the effects of given pollutants or combinations of pollutants on specific biological systems; the entire air-pollution system must be understood.”); see also, Heath, *id.* at 399 (“Air pollution injury is actually a complex series of physiological events involving the whole plant. The whole system of air pollution injury is better understood by separating it in a series of related subsystems or sets, as is done for system analysis.”).

⁵⁴ The figure is from Heath, *id.*, at 424.

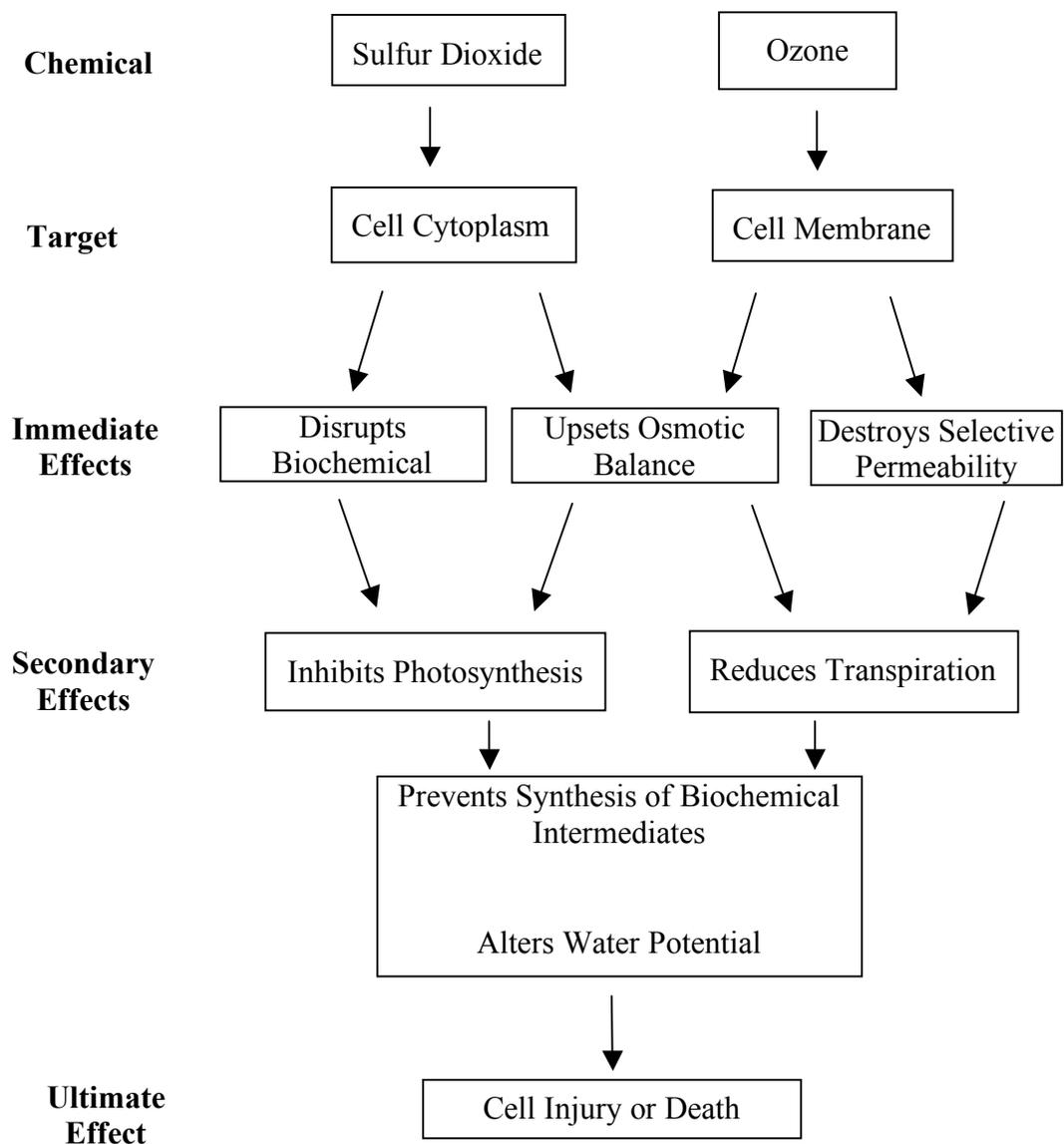


Figure 2.1. Initial Events in Injury to Plants from Sulfur Dioxide and Ozone. From Heath, 1980.

balance, called *homeostasis*, resulting in normal functioning of the system. External stresses, such as pollutants, disrupt important physiological mechanisms such as photosynthesis and transpiration in the model of the plant cell. Plants have evolved ways of coping with a certain degree of environmental stresses, but if the stress becomes too great, they begin to show signs of injury.

Implicit in the systems model is the concept of a threshold—a point below which a plant, or any biological system, can counteract externally induced disruptions in function and above which the organism begins to suffer adverse effects. Although the exact mechanisms determining a threshold are often not clearly understood, it's possible to develop mathematical models of injury using dose-response experimental methods. Constructing a meaningful functional relationship between levels of exposure to a given stress and degrees of an adverse effect requires a reasonably clear understanding of the meaning of *adverse effect* in the particular context.

The Dose Response Specialty Group of the Society for Risk Analysis recently requested research on the meaning of *adverse effect* and similar terms in United States law. After combing through various federal statutes, regulations, and federal court opinions, the authors of the study reported their findings:

Our major finding is that the federal statutes themselves give little or no definition or guidance regarding the precise meanings or intended interpretations of 'adverse effect' and related terms. Though some statutes purport to define these terms, the definitions are often circular and of little value because they include the term being defined as part of its definition. The statutes generally do not speak to the scientific methods to be used to calculate adverse effects. Agency regulations and judicial interpretations add some clarity, but still leave basic questions of meaning and methodology unaddressed.⁵⁵

Words and phrases included in the five basic search categories—*adverse effect*, *adversely affect*, *risk*, *endanger*, and *threat*—could be found everywhere in the literature.

However, almost nowhere was there a discussion of what the words mean. These

⁵⁵ See Jonathan B. Wiener, Mark Marvelli, Kelley Stansell, "*Adverse Effects*" and *Similar Terms in U.S. Law* (A Report Prepared by the Duke Center for Environmental Solutions for the Dose Response Specialty Group of the Society for Risk Analysis, July, 2005) at 3; available at www.sra.org/drsg/docs/Adverse_Effects_Report.pdf.

findings are consistent with views expressed in scientific and regulatory toxicology literature.⁵⁶ The situation is reminiscent of the earlier discussion⁵⁷ regarding the meaning and measurement of biological diversity.

Recently, several industry toxicologists proposed generic decision algorithms for discriminating between adverse and non-adverse effects in toxicological and drug safety evaluations.⁵⁸ With some modifications, such algorithms might be adapted for use in environmental contexts as well. The basic idea is first to define the set of outcomes labeled *effects*, or more specifically, *biological effects* (Figure 2.2). Deciding whether a particular difference between the treatment and control represents a genuine effect requires statistical analysis—calculating the likelihood that the outcome could be explained by chance. However, the more difficult task of deciding whether a statistically significant effect is also a *biologically* significant effect requires experienced judgment. Several criteria of evaluation are used to structure the decision-making process.⁵⁹ A weight-of-the-evidence or balancing approach combines all the criteria in some way to

⁵⁶ See, e.g. Richard W. Lewis, Richard Billington, Eric Debryune, Armin Gamer, B. Lang, Francis Carpanini, *Recognition of Adverse and Nonadverse Effects in Toxicity Studies*, 30 *Toxicologic Pathology* 66-74 (2002), at 74. (“Review of existing definitions of terms such as adverse and of approaches to interpretation of toxicology studies (ie, consistent recognition of adverse effects), revealed considerable inadequacy and confusion.”). See also, World Health Organization, *Air Quality Guidelines for Europe* (WHO Regional Publications, European Series, No. 91, Copenhagen) (2nd ed., 2000) at 14-15 (“Definition of a distinction between adverse and non-adverse effects poses considerable difficulties. Any observable biological change might be considered an adverse effect under certain circumstances. An adverse effect has been defined as ‘any effect resulting in functional impairment and/or pathological lesions that may affect the performance of the whole organism or which contributes to a reduced ability to respond to an additional challenge.’ Even with such a definition, a significant degree of subjectivity and uncertainty remains. Ambient levels of major air pollutants frequently cause subtle effects that are typically detected only by sensitive methods. This makes it exceedingly difficult, if not impossible, to achieve a broad consensus as to which effects are adverse.”); see also Michael A. Dorato & Jeffrey A. Engelhardt, *The No-Observed-Adverse-Effect-Level in Drug Safety Evaluations: Use, Issues, and Definitions*, 42 *Regulatory Toxicology and Pharmacology* 265-274 (2005), at 266 (“From the literature and regulatory guidelines, it may be concluded that there is no consistent definition of the terms used by many toxicologists to indicate presence or absence of undesired responses, e.g., no-observed-effect-level (NOEL), no-observed-adverse-effect-level (NOAEL), adverse or non-adverse, biologically significant, and toxicologically significant/relevant.”).

⁵⁷ See *supra*, Part II.

⁵⁸ See Lewis *et al.*, and Dorato & Englehardt, *supra* note 56.

⁵⁹ The criteria proposed by Lewis *et al.* for use in toxicity studies are: dose response, spurious measurements in individual parameters, the precision of the measurement under evaluation, ranges of natural variation, and the overall biological plausibility of the observation. *Id.* at 66.

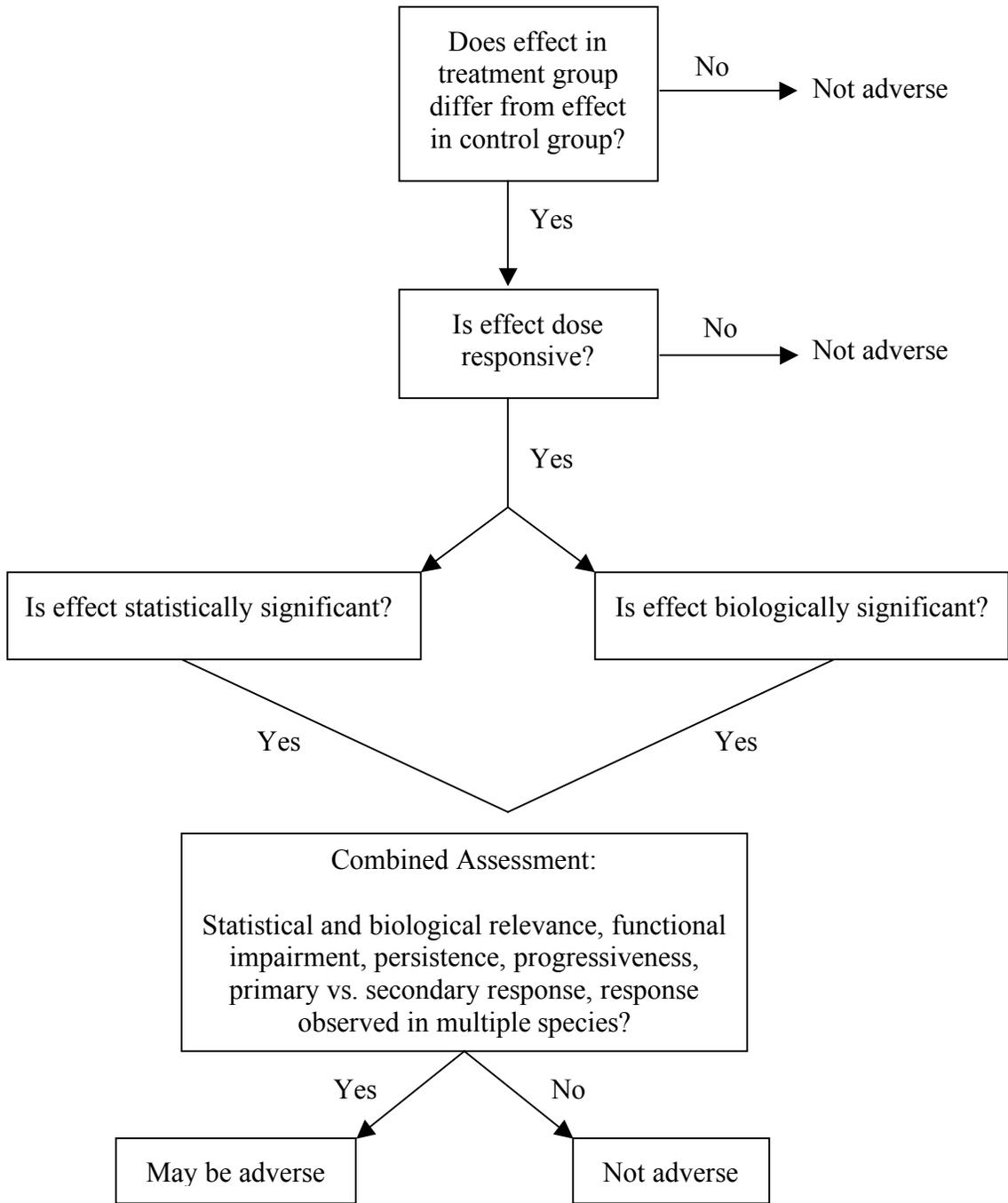


Figure 2.2. Adverse Effect Decision Algorithm. After Dorato & Engelhardt, 2005

reach an overall judgment. If it's decided that the outcome of an experiment is a member of the set *biological effects*, the evaluation process moves on to consider whether it's a member of the subset labeled *adverse*. Again, several criteria are used to evaluate the effect, and a balancing test applied to reach a final decision.⁶⁰ By structuring the process of decision-making in a logically sequential way and by using explicit criteria of evaluation, there is a better chance of achieving reasonable consistency in differentiating adverse from non-adverse effects. Such uniformity (if it could be achieved) would constitute a fairly clear, pragmatic definition of *adverse effect*.⁶¹

Looking back over the discussions of biological diversity and injury, it appears that we find ourselves challenged when it comes to saying what the words mean and how to measure them. Such is our faith in the power of science to make things precise and certain that we often tend to overlook the irreducible vagueness in the words we use to describe the world around us. Such vagueness seems to make us somewhat uncomfortable, perhaps because it reminds us of our distant past. Long ago, humans learned to recognize the diversity of life, and we came to know what it meant to be injured. We knew the meanings of such phenomena well enough to recognize where there was more biological diversity and where there was less, or when the injuries we sustained were minor and when they were severe. If we hadn't been pretty good at making those judgments, and communicating them, it's doubtful that the human species would be around to contribute to the biodiversity of the world today.

As we learned ways to measure biological diversity—say by counting the number of species—and as we learned ways to measure injury to living things—say by measuring the lesions on leaves—we seem to have forgotten, or at least de-valued, how good we are at making those earlier kinds of assessments. As the complexity of the phenomena we

⁶⁰ The criteria proposed by Lewis *et al.*, *id.*, are: whether the effect is an adaptive response, whether it is transient, the magnitude of the effect, its association with effects in other related endpoints, whether it is a precursor to a more significant effect, whether it has an effect on the overall function of the organism, whether it is a specific effect on an organ or organ system or secondary to general toxicity or whether the effect is a practical consequence of the experimental model.

⁶¹ The decision-making process described is obviously not a closed system, and there could be—perhaps likely would be—pressures from outside the system acting to distort a tendency toward consensus on a practical definition of *adverse effect*. Again, it is necessary to consider the context.

wish to understand—and control—increases, we place our faith in ever more sophisticated models, ideally mathematical models, to tame the beast of uncertainty. Perhaps it's time we try to tame the beast by addressing it in ordinary words.

In a recent essay titled *Technologies of Humility*,⁶² Sheila Jasanoff, a professor of Science and Technology Studies at Harvard University, spoke of what she called the “great mystery of modernity”—the belief that certainty is an attainable state. Uncertainty is viewed as “the disease that knowledge must cure,” a condition that “must be reduced at any cost; that is tamed with scenarios and assessments.” For a long time we accepted uncertainty as natural to the human condition. Why have we lost that presumption? Jasanoff points to the recent proliferation of binary thinking. Boolean algebra and binary logics not only pervade our computers, our mobile phones, our information and communication technologies, they have also come to dominate how we see social problems and our options for dealing with them. However, she observes:

Life, as we know from experience, seldom unfolds in binaries. We rarely confront Hamlet's choice—to act or not to act. There are always added considerations. Which action is best, by what criteria, how soon, with what provisos, with what cost and with what allowance for error? Even the half-mad prince recognized that second-order consequences might complicate his first-order decision: to be or not to be.⁶³

How should policy makers deal with multiple layers of uncertainty? The short answer, Jasanoff says, is “with humility, about both the limits of scientific knowledge and about when to stop turning to science to solve problems.” She recommends that we develop “technologies of humility,” which she describes as “disciplined methods to accommodate the partiality of scientific knowledge and to act under irredeemable uncertainty.” She concludes with the following words:

This call for humility is a plea for policy-makers to cultivate, and for universities to teach, modes of knowing that are often pushed aside in expanding scientific understanding and technological capacity. It is a request for research on what people value and why they value it. It is a prescription to supplement science with the analysis of those aspects of the human condition that science cannot easily illuminate. It is a call for

⁶² Sheila Jasanoff, *Technologies of Humility*, 450 *Nature* 33 (2007).

⁶³ *Id.*

policy analysts and policy-makers to re-engage with the moral foundations for acting in the face of inevitable scientific uncertainty.⁶⁴

In later chapters, I attempt to re-engage with the moral foundations for acting in the face of scientific uncertainties associated with transboundary harm to biological diversity. In the remainder of this chapter, I'll discuss one of the non-binary technologies of humility that deals with uncertainty on a technical, mathematical level.

III. Fuzzy Thinking

Lotfi Asker Zadeh, a professor of computer science and electrical engineering at Berkeley, introduced the modern concept of a fuzzy set in 1965.⁶⁵ Partly to get attention, he preferred the word *fuzzy* to the traditional term *vague*. Modern interest in vagueness as a subject of philosophical inquiry goes back to the early twentieth century. In 1923, Bertrand Russell published a lecture titled *Vagueness* in which, speaking as clearly as he could, he attempted to prove that all language is more or less vague.⁶⁶ Vagueness was like a blurry photograph that might equally well be seen as a picture of Brown, or Jones, or Robinson; or a small-scale map that doesn't show all the twists and turns of the roads and rivers. Similarly, in language, a word can mean more than one object and a proposition can be verified by more than one fact. Vagueness is a particular case of a general law of physics that "the appearances of a thing at different places are less and less differentiated as we get further away from the thing."⁶⁷ Russell viewed as unfortunate the habit of treating knowledge as something particularly mysterious and wonderful.

Russell drew a response from the philosopher Max Black, who thought that Russell sacrificed logic in his treatment of vagueness. Black pointedly titled his reply: *Vagueness: An Exercise in Logical Analysis*.⁶⁸ He regarded Russell's claim that all language is unfortunately more or less vague as evading the analytical problems involved. Black argued that deviations from logical or mathematical standards of

⁶⁴ *Id.*

⁶⁵ Lotfi Zadeh, *Fuzzy Sets*, 8 *Information and Control*, 338-353 (1965).

⁶⁶ Bertrand Russell, *Vagueness*, 1 *Australasian Journal of Psychology and Philosophy*, 84-92 (1923).

⁶⁷ *Id.* at 91.

⁶⁸ Max Black, *Vagueness: An Exercise in Logical Analysis*, 4 *Philosophy of Science*, 427-455 (1937); see also Max Black, *Reasoning with Loose Concepts*, 2 *Dialogue*, 1-12 (1963).

precision pervade the symbolism used to express ideas. Labeling these deviations as subjective aberrations creates an impassable gulf between formal laws and experience and leaves the usefulness of the formal sciences a mystery. Black attempted to outline an appropriate symbolism for vagueness in which the traditional laws of logic are special or limiting cases. Although his notation has been superseded, his approach is the immediate precursor of fuzzy set theory and fuzzy logic.⁶⁹ As a distinguished analytic philosopher in the first half of the twentieth century, Black made the concept of vagueness seem almost respectable.

As I noted with respect to the concept of biological diversity, in trying to understand the meaning of a concept, it helps to know why it was invented. What led Zadeh to propose the idea of a fuzzy set in 1965? As Zadeh tells the story, although he was an electrical engineer by training, he had always been a strong believer in the power of mathematics.⁷⁰ It was an article of faith to him that almost any problem had a mathematical solution. Like many of his colleagues in systems analysis, he was driven by a quest for precision, rigor, and mathematical sophistication. However, while writing a book on system theory, he gradually realized that many of its traditional concepts don't lend themselves to precise definition. He concluded that the problem lies in the Aristotelian framework of classical mathematics, which is intolerant of imprecision and partial truth. Mathematics assumes that a concept necessarily has a precise definition that partitions the domain of objects into two mutually exclusive classes with no "borderline cases." This idealized mathematical universe contrasts with the world we perceive, which is described by concepts lacking clearly defined boundaries, such as *tall*, *warm*, *larger than*, *beautiful*, *significant*. Recognizing the need in system theory for a formal method of reasoning with the imprecise, qualitative concepts associated with perception, Zadeh introduced the theory of fuzzy sets.

Perhaps the best way to understand the idea of a fuzzy set is with a concrete example of how to construct one. Imagine that we're in a university classroom and we

⁶⁹ Curiously, both Black and Zadeh were born in Baku, Azerbaijan; Black in 1909 when Baku was a city of the Russian Empire, Zadeh in 1921 when it was a city in the Soviet Union.

⁷⁰ See Lotfi Zadeh, *The Birth and Evolution of Fuzzy Logic*, 17 International Journal of General Systems, 95-105 (1990), at 99.

want to form a group consisting of tall students. Typically, we would need to specify what we mean by the word *tall*, say those students over a certain height (Figure 2.3, *Top*). However, this method of classification might include some students just barely over that height and exclude others just barely under, even though they appeared to be the same height. A fuzzy way of forming the group would be to say that students above a certain height are definitely members of the group and those under a certain height are definitely not members. Students in the “borderline” region are *partly* members of the group. The notion of partial set membership is the key to the concept of a fuzzy set. We can express the idea of partial membership using a scale from 0 to 1, the same scale used in probability theory. To students above a certain height we assign a value of 1 while to those under a certain height we assign a 0. To classify the other students, we come up with a way of mapping the borderline region onto the scale from 0 to 1 that expresses the degree of membership in the fuzzy set of tall students (Figure 2.3, *Bottom*). A sigmoid function, represented by the S-shaped curve, is used here, but there are other types of functions that might serve, as well as other ways of mapping that do not rely on precise mathematical equations. Once we have assigned a degree of set membership to each individual in the borderline region, we’ve constructed the fuzzy set of tall students.

Set theory provides the foundation for all of logic and mathematics. To model the logic of propositions in natural language, we need three basic operations of set theory—complement, intersection, and union. The complement operation is analogous to the logical operation of negation expressed by the term *not*. Intersection corresponds to the logical operation of conjunction expressed by the term *and*, while union is analogous to the logical operation of disjunction expressed by the term *or*. In propositional logic, we can express the truth of propositions produced by these logical operations as a function of the truth of the constituent proposition(s). For example, we can symbolize the truth of a proposition by the number 1, and its falsity by 0, which are the only possible truth-values in binary logic. The negation of a proposition always has the opposite truth-value from that of the proposition. If a proposition p has a truth-value of 1, $\text{not-}p$ has a value of 0. A conjunction always has the *minimum* truth-value of the two conjoined

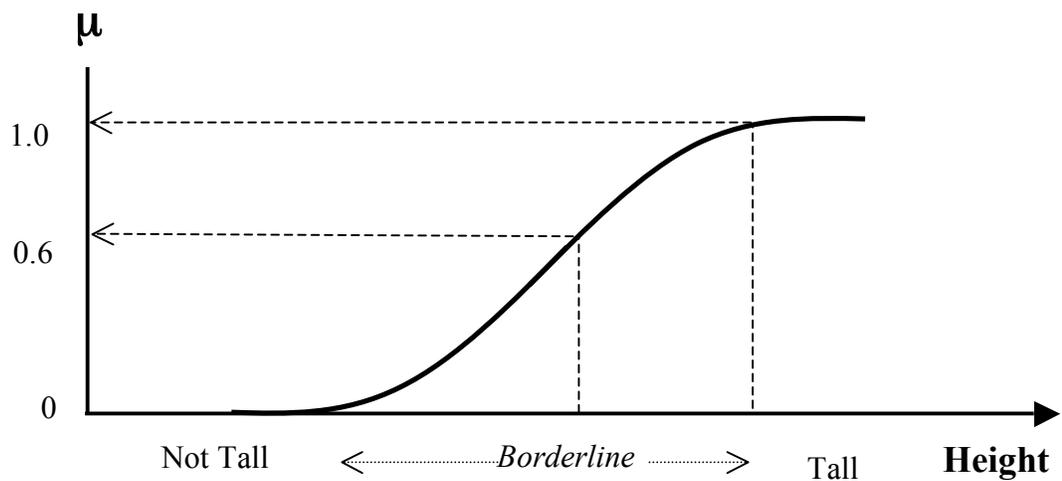
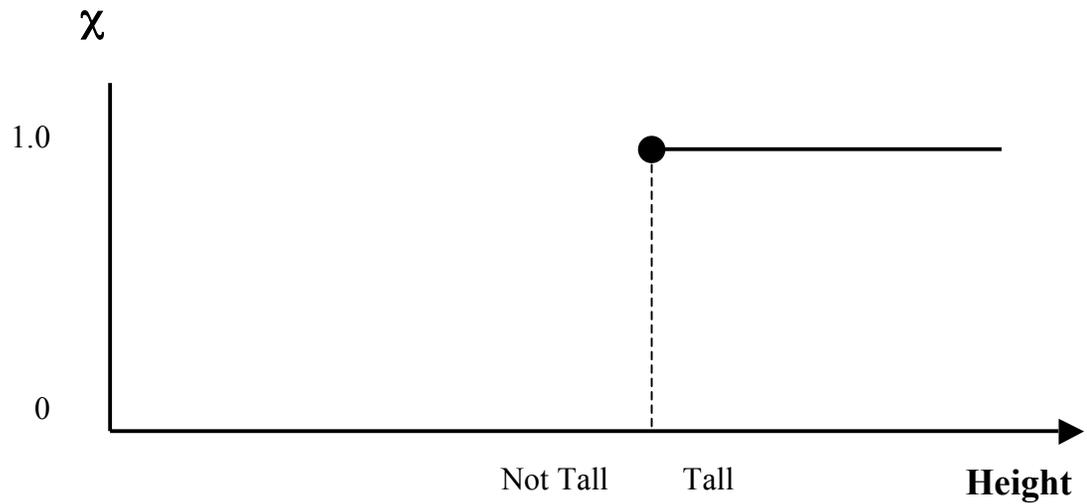


Figure 2.3. Top: Classical Set of Tall Individuals. Classical sets are defined by a characteristic function χ , which assigns a value of 1 to elements having the characteristic and a value of 0 to elements lacking it.

Bottom: Fuzzy set of Tall Individuals. Fuzzy sets are defined by a membership function μ . The membership function assigns a value of 0 to elements completely lacking the trait and a value of 1 to elements fully having it. Elements partly having the trait are assigned partial degrees of set membership on a scale between 0 and 1.

propositions, so that if proposition p has a truth-value of 1 (true) and proposition q has a value of 0, the conjunction p and q has a truth-value of 0 (false). A disjunction always has the *maximum* truth-value of the two propositions, so the disjunction p or q of the same two propositions has a truth-value of 1 (true). There are other formulas besides the minimum and maximum rules for calculating the truth-value of conjunctions and disjunctions respectively, but in classical logic, all the formulas for a particular operation yield the same result.

In fuzzy logic, the fuzzy complement, fuzzy intersection and fuzzy union operations each have several non-equivalent forms. However, within each of the three classes there is one operation that has come to be known as the standard form,⁷¹ which are the ones most commonly used in practical applications of fuzzy set theory. For example, the standard fuzzy complement of the fuzzy set *Tall* is the fuzzy set *Not-tall* (Figure 2.4, *Top*). Each element in *Not-tall* has a degree of membership equal to 1 minus its degree of membership in *Tall*. The standard fuzzy intersection of the two fuzzy sets *Tall* and *Not-Tall* consists of a fuzzy set *Tall and Not-tall*, and each element in this set has a degree of membership equal to its minimum degree of membership in the sets *Tall* and *Not-tall* (Figure 2.4, *Middle*). Similarly, each element in the fuzzy set *Tall or Not-tall*, produced by the operation of standard fuzzy union, has a degree of membership equal to its maximum degree of membership in the fuzzy sets *Tall* and *Not-tall* (Figure 2.4, *Bottom*).

If you look at Figure 2.4 long enough, you can see the radical nature of fuzzy set theory. It violates the fundamental laws of classical logic upon which all of mathematics, including statistics, is based (Figure 2.5). Because a fuzzy set and its complement overlap, fuzzy set theory can be used to model situations in which the logical law of identity—which says that a thing is the same as itself—is relaxed (Figure 2.5, *Top*). As the example with the fuzzy set of tall students suggests, natural language is a system

⁷¹ See George J. Klir & Bo Yuan, *Fuzzy Sets and Fuzzy Logic: Theory and Applications* (Prentice Hall PTR, 1995), at 50-51. The latter is a good introductory text on fuzzy logic at the graduate level. For a good introductory text at the undergraduate level see George J. Klir, Ute St. Clair, & Bo Yuan, *Fuzzy Set Theory: Foundations and Applications* (Prentice Hall PTR, 1997); see also Kazuo Tanaka, *An Introduction to Fuzzy Logic for Practical Applications* (Springer, 1991).

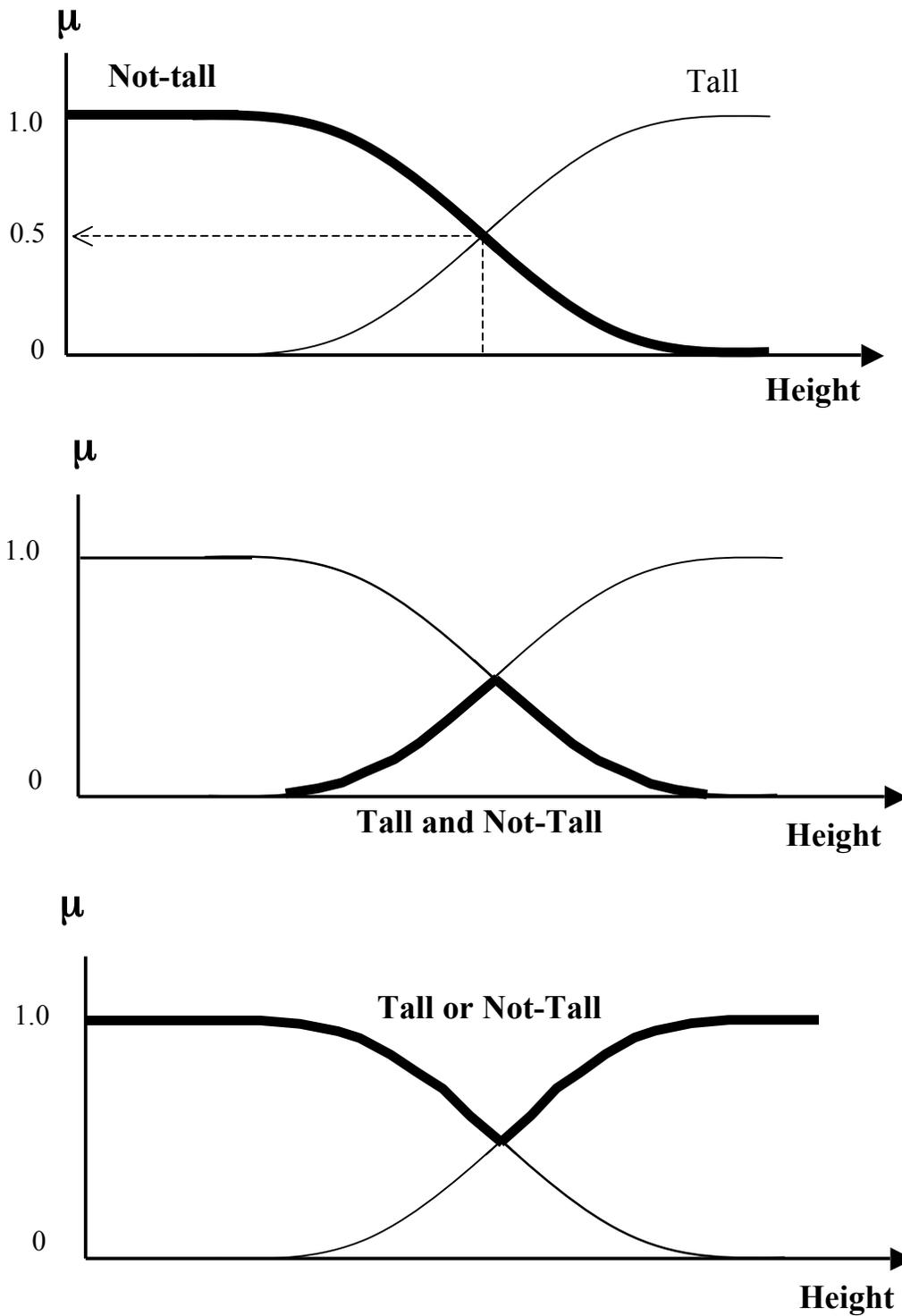


Figure 2.4. Fuzzy Set Operations. *Top:* Complement. *Middle:* Intersection. *Bottom:* Union.

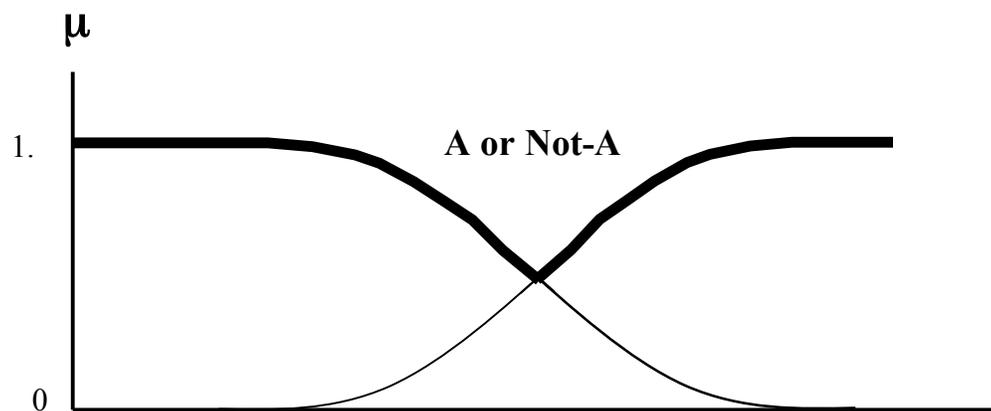
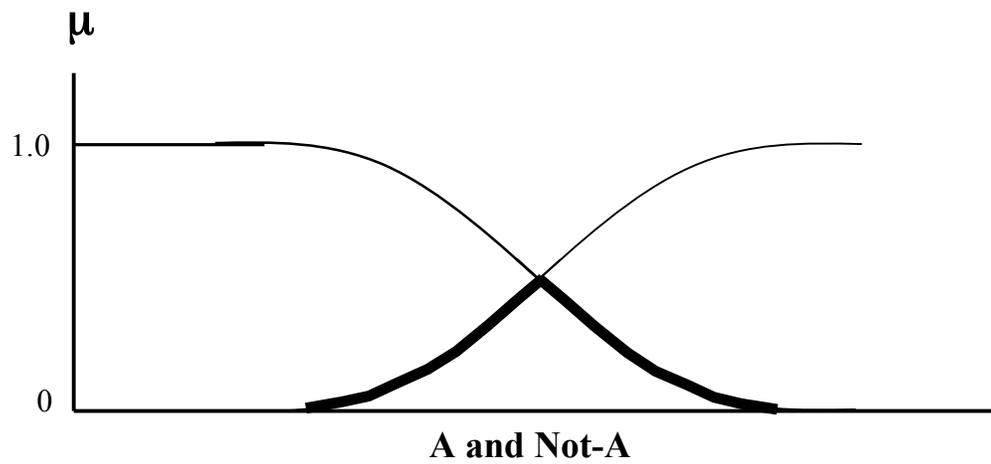
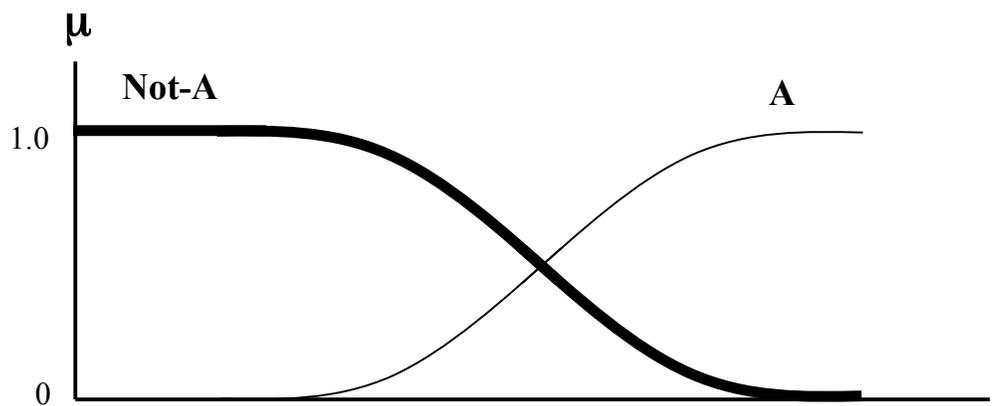


Figure 2.5. Fuzzy Set Violations of Classical Laws of Logic. *Top:* Law of Identity. *Middle:* Law of Non-Contradiction. *Bottom:* Law of the Excluded Middle.

where a certain degree of ambiguity or fuzziness is tolerated, in part because there are contextual clues to meaning in addition to the precise, formal definitions of words. At the root of the law of identity there is a sense of “self” and “other,” the fundamental dichotomy by which each of us—even biological complements, identical twins—divides our shared world in a different place. Two other fundamental laws of classical set theory, corollaries of the law of identity, are relaxed in the operations of fuzzy intersection and fuzzy union. Fuzzy intersection violates the law of non-contradiction, which says that contradictory statements cannot both be true at the same time (Figure 2.5, *Middle*). The fuzzy operation of union violates the principle of the excluded middle, which says that for any proposition, either it is true or its negation is (Figure 2.5, *Bottom*). There’s no third alternative or middle ground between two contradictory propositions. In the remaining chapters, I’ll try to spell out some of the psychological, ethical, and legal implications of the top figure and its two corollaries. They represent a world in which to be and not to be overlap, in which the self and its environment, particularly its social environment, interact in ways that don’t seem always to obey the laws of binary logic.

We live in a fuzzy world, and one method of making at least approximate sense of it is the linguistic approach. This method, which Zadeh first outlined in 1973, uses *linguistic variables*, whose values are words rather than numbers. For any linguistic variable X , such as *height* in the earlier example, we may partition its possible values into overlapping fuzzy subsets to which we give appropriate names—*e.g.*, *short*, *medium*, and *tall*—symbolized here by the letters a , b , and c (Figure 2.6, *Top*). In a simple fuzzy system, we could represent the input variable X on one axis and the output variable Y , similarly partitioned into fuzzy subsets, on another axis (Figure 2.6, *Bottom*). Suppose the behavior of the system is nonlinear, as represented by the curved line, but you don’t know its precise mathematical formula, and it would be too costly in both time and other resources to try to discover it. Being a humble systems theorist, you’re content to cover your ignorance with “patches” or rules, conditional propositions in natural language that anyone can understand—*e.g.*, If the distance to the train station is *near*, then the speed of the train is *slow*. The linguistic approach may not be as sophisticated or as

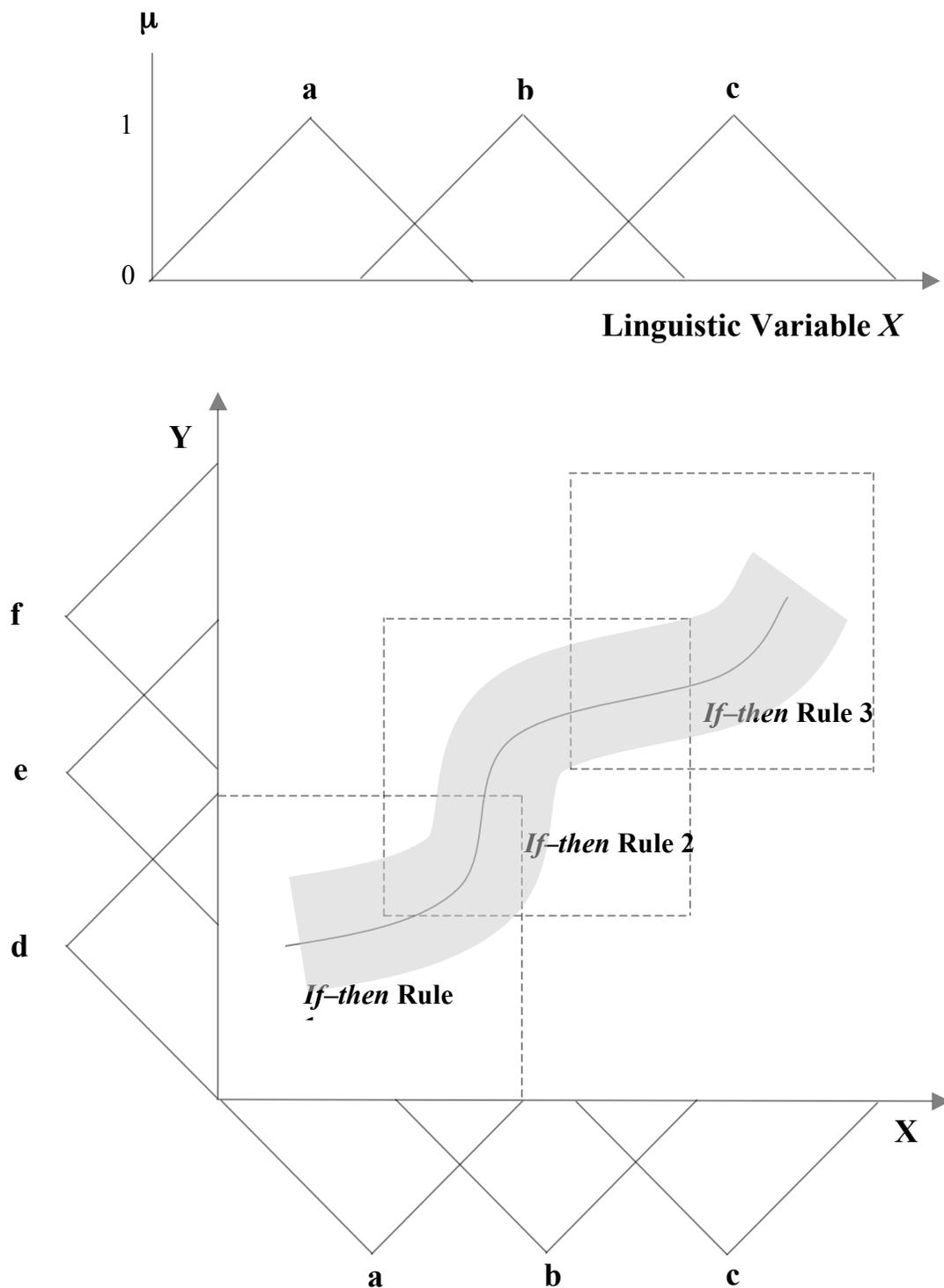


Figure 2.6. Linguistic Approach to Fuzzy Systems. *Top:* General Form of a Linguistic Variable X . Letters a , b , and c , represent the names of fuzzy subsets. *Bottom:* Use of fuzzy rules to approximate a complex relation between input variable X and output variable Y .

mathematically elegant as more precise methods, but being pragmatic, you're primarily interested in how well the fuzzy system performs in the world we live in.

One year after Zadeh introduced the notion of a linguistic variable, Ebrahim Mamdani, an electrical engineer at Queen Mary College in London, figured out a way to apply fuzzy rules to control a simple model steam engine.⁷² Mamdani's method artfully blended the old with the new. Computer programmers trying to apply artificial intelligence techniques to solve complex problems had developed a heuristic approach based on "rules of thumb," which had demonstrated its effectiveness in chess playing and theorem solving. However, heuristic programs were complex and difficult to construct because they needed many precise *If-then* rules. Mamdani saw that Zadeh's linguistic approach offered a general method of expressing linguistic rules that could be quickly processed by a computer. It was possible to develop a fuzzy control algorithm that didn't depend upon the exhaustive expression of every rule so that the performance of each fuzzy rule could be evaluated and the rule could be modified to improve it. In pilot studies on a simple steam engine constructed in the lab, the fuzzy controller outperformed more precise controllers. The results showed that it was possible to take an entirely unstructured set of heuristics expressed in natural language and translate them into a fuzzy algorithm. The only operations needed to implement the algorithm were the basic ones of fuzzy set theory, union (or), intersection (and), and complementation (not). Although the method of fuzzy reasoning is generally referred to as "Mamdani implication," there is no fuzzy implication operation involved.

Fuzzy inference is a process of approximate reasoning using fuzzy rules and factual data to draw precise conclusions (Figure 2.7). Suppose we have two fuzzy rules relating the distance of a subway train from the station and its speed: (1) *If the distance to the station is very near, then the speed of the train is very slow*; and (2) *If the distance to the station is near, then the speed of the train is slow*. A sensor on the front of the

⁷² See E.H. Mamdani, *Application of Fuzzy Algorithms for Control of Simple Dynamic Plant*, 121 Proceedings of the Institution of Electrical Engineers: Control & Science, 1585-1588 (1974); see also E.H. Mamdani & S. Assilian, *An Experiment in Linguistic Synthesis with a Fuzzy Logic Controller*, 7 International Journal of Man-Machine Studies, 1-13 (1975).

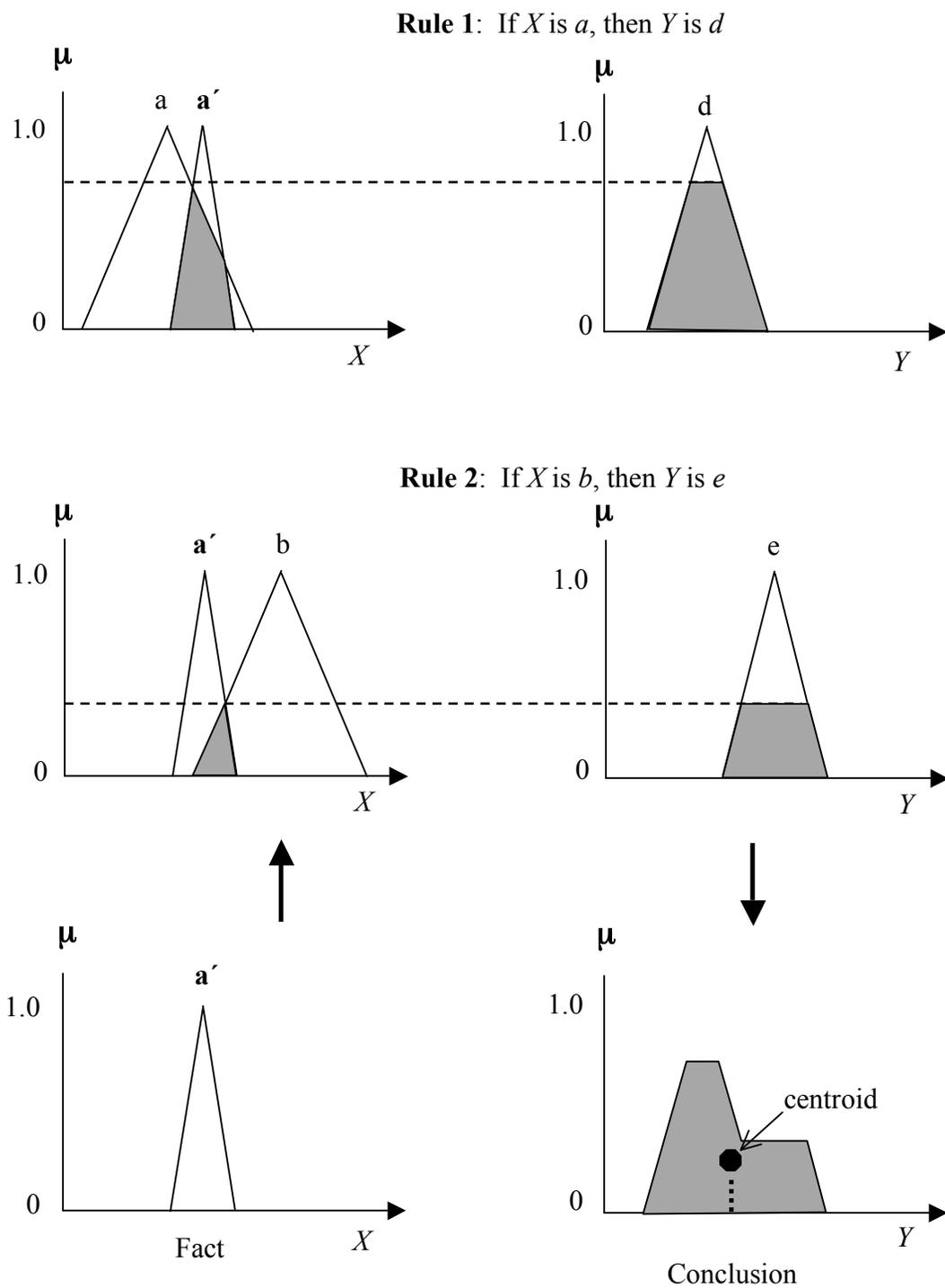


Figure 2.7. Fuzzy Reasoning.

train is continually monitoring the distance to the platform and expressing the distance as the fuzzy set *fact*. For each rule, this fuzzy fact is superimposed upon the fuzzy set in the antecedent to get a measure of their compatibility, indicated by the shaded fuzzy set. The fuzzy set in the consequent of the rule is then truncated at this level to produce the shaded fuzzy sets representing the degree of truth of the conclusion. These truncated fuzzy sets are then combined using the union operator to produce the composite fuzzy set representing the overall conclusion of the approximate reasoning process. For practical applications, a precise value of the output variable Y can be found by “defuzzifying” this composite fuzzy set, using various methods. A common method is to use the output value directly under the centroid or geometric center of the composite fuzzy set.

Zadeh saw the potential field of application of approximate reasoning as almost unlimited. The concluding section of his 1973 paper introducing the linguistic approach reads like the description of a new day dawning. He acknowledged that what he had done was merely a tentative first step. Nevertheless, he predicted that the method could be applied to a wide variety of practical problems, particularly in fields such as economics, management science, psychology, linguistics, taxonomy, artificial intelligence, information retrieval, medicine, and biology. Its usefulness in these fields would be particularly great in problem areas where fuzzy algorithms could provide a means of describing ill-defined concepts, relations, and decision rules. The first computer chips programmed with fuzzy rules appeared around 1985 and were primarily used in electronic control devices. In Sendai, Japan, the world’s first public trains to use fuzzy logic to control their speed appeared on the Nanboku line in the late 1980s. They’re said to start and stop more smoothly than trains operated by even the most skilled humans or by conventional controllers, and are 10% more energy efficient. The decade of the 1990s witnessed a breakthrough of fuzzy logic into popular culture. So-called “smart” technologies controlled by fuzzy logic chips were a hit with the public.

You may find a fuzzy logic controller in your washing machine or microwave. Best-selling books on fuzzy thinking captivated the public imagination.⁷³ Fuzzy sold.

Scholarly reaction to fuzzy set theory was less enthusiastic. Zadeh remembers that while the reaction to his original paper on fuzzy sets as well as later ones was mixed, “[f]or the most part, however, what I encountered was skepticism and, on occasion, downright hostility.”⁷⁴ He attributed the hostility to a deep-seated Cartesian respect for what is quantitative and precise and disdain for what is qualitative and imprecise. The debate over fuzzy sets and fuzzy logic largely centered on the question whether or not they could handle aspects of the concept of uncertainty not adequately dealt with by the classical theory of probability and Bayesian statistics. One mathematician involved in the debate, J.N. Kapur, described it as “a struggle between probability theory and fuzzy set theory to capture the soul of uncertainty.”⁷⁵ It’s hardly a life-or-death struggle—Kapur and Zadeh believed that both theories have their proper place in dealing with uncertainty.⁷⁶

Perhaps a simple example can illustrate the basic difference between the kind of uncertainty amenable to treatment by probability theory and the type of uncertainty for which fuzzy set theory is useful. Imagine you have a bag of apples and you reach in and begin to count them 1, 2, 3, ... when you pull out an apple that’s half-eaten. Immediately, the sight of this unexpected object causes you to stop counting and think. Before you can begin counting again, you have to decide whether that half-eaten apple is an apple or not. It’s definitely not an orange or some other completely un-apple-like fruit, because it has some unmistakable apple-like features. However, you probably wouldn’t put it out for sale in the supermarket apple bin, so you don’t recognize it as fully an apple. What do you do? If all you have is a binary scheme of classification consisting of 1s (apples) and

⁷³ See Bart Kosko, *Fuzzy Thinking: The New Science of Fuzzy Logic* (Hyperion Books, 1993); see also Daniel McNeill & Paul Freiberger, *Fuzzy Logic* (Simon & Schuster, 1993).

⁷⁴ Zadeh, *supra* note 70, at 95.

⁷⁵ George J. Klir, *Foundations of Fuzzy Set Theory and Fuzzy Logic: A Historical Overview*, 30 *International Journal of General Systems*, 91-132 (2001) at 125 (citing an interview published in 1990 by A.K. Seth with the well-known contributor to classical (probabilistic) information theory Jagat Narain Kapur).

⁷⁶ See Lotfi A. Zadeh, *Probability Theory and Fuzzy Logic Are Complementary Rather Than Competitive*, 37 *Technometrics*, 271-276 (1995).

0s (not apples) you must make an arbitrary decision whether to count it or not count it. However, with fuzzy sets, the “borderline” apple presents no problem--you might say it has a 0.7 degree of compatibility with the term "apple." There's no probability in that number despite the fact that it uses the same scale from 0 to 1 as that used by probability theory. Probability calculus and statistics are basically just sophisticated forms of counting.⁷⁷ The point is that you can only count and calculate p-values in a world that's already interpreted. In the “blooming, buzzing confusion” in which the world presents itself to our senses, our mind has to bring some kind of initial order out of the chaos before we can count things. That's the kind of uncertainty that fuzzy set theory is useful in dealing with—the kind of uncertainty that goes with classifying or interpreting the world. It's not a type of uncertainty that one sees easily through the conceptual "window" of classical probability theory. However, there are other "windows" on the world—if you choose to look through them.

There has been some progress since 1973 in implementing the linguistic approach to decision-making regarding the environment. Keith M. Reynolds of the U.S. Forest Service has led an effort he calls “digital forestry” to develop computer-based decision support tools for managing forest ecosystems.⁷⁸ Although he's a strong supporter of the use of fuzzy models, he takes a balanced view of the merits of fuzzy logic as opposed to Bayesian methods.⁷⁹ He thinks that Bayesian networks are preferable when the problem can be represented strictly in terms of the likelihood of events and data are available to estimate the likelihood. For more general types of problems involving both prediction and interpretation, or strictly interpretation or classification, he recommends fuzzy models. Reynolds and his colleagues have developed the Ecosystem

⁷⁷ Bertrand Russell and Alfred North Whitehead showed in *Principia Mathematica* (1910-13), their foundational study of the philosophical foundations of mathematics, that all of mathematics, including probability theory and statistics, is reducible to classical set theory.

⁷⁸ See Guofan Shao & Keith M. Reynolds (eds.), *Computer Applications in Sustainable Forest Management: Including Perspectives on Collaboration and Integration* (Springer, 2006); see also Keith M. Reynolds, *Fuzzy Logic Knowledge Bases in Integrated Landscape Assessment: Examples and Possibilities* (U.S. Dept. of Agriculture, Forest Service, Pacific Northwest Research Station, General PNW-GTR-521, September 2001), available at www.fs.fed.us/pnw/pubs/gtr521.pdf; Keith M. Reynolds, *EMDS: Using a Fuzzy Logic Framework to Assess Forest Ecosystem Sustainability*, 99 *Journal of Forestry*, 26-30 (2001).

⁷⁹ Shao & Reynolds, *id.* at 151-152.

Management Decision Support system to assess ecosystem sustainability. The system integrates the knowledge-based inference engine NetWeaver with ArcView to perform landscape analyses useful for adaptive management. NetWeaver uses fuzzy logic, but its method of representing problem-solving knowledge is based on network theory, which allows the user to model a problem by constructing fuzzy logic networks.⁸⁰ It has become a useful tool among ecological modelers faced with the need to clarify fuzzy terms such as *biodiversity* and *sustainability*.

Does the linguistic approach to complexity have anything to offer the field of law? A small but enthusiastic cadre of legal scholars has promoted the virtues of fuzzy thinking, especially in the 1990s as books and articles on the subject appeared in the popular press.⁸¹ Perhaps most lawyers would agree with Supreme Court Justice William O. Douglas when he said, “[t]here are few areas of the law in black and white. The greys

⁸⁰ See Michael C. Saunders, Bruce J. Miller, J. Kathy Parker, & Max W. McFadden, A Tutorial for Using the NetWeaver and GeoNetWeaver Knowledge Engineering Tools: A Practical User’s Guide and Tutorial for Developing Knowledge-Based Models for Ecological Analyses and Environmental Management, (The Heron Group LLC, 1999, rev. September 27, 2002), available at <http://rules-of-thumb.com/downloads>.

⁸¹ To my knowledge, there exists no bibliography of the application of fuzzy set theory in law. The following is a partial list, in no particular order, of journal and law review articles applying fuzzy set theory and fuzzy systems to various areas of law: Jacky Legrand, *Some Guidelines for Fuzzy Sets Application in Legal Reasoning*, 7 *Artificial Intelligence and Law*, 235-257 (1999); L. Reisinger, *Legal Reasoning by Analogy: A Model Applying Fuzzy Set Theory*, in Edited Versions of Selected Papers from the International Conference on “Logic, Informatics, Law,” Florence, Italy, April 1981 (Amsterdam, 1982), 151-163; Walter A. Effross, *Bright Lines or Blurry Labels? Interpreting the “Fuzzy Logic” of Bankruptcy Law*, 6 *American Bankruptcy Institute Law Review*, 141-176 (1998); Arvind Verma, *Construction of Offender Profiles Using Fuzzy Logic*, 20 *Policing: An International Journal of Police Strategies and Management*, 408-418 (1997); Jack F. Williams, *The Fallacies of Contemporary Fraudulent Transfer Models As Applied to Intercorporate Guaranties: Fraudulent Transfer Law as a Fuzzy System*, 15 *Cardozo Law Review*, 1403-1473 (1994); Jack F. Williams, *Process and Prediction: A Return to a Fuzzy Model of Pretrial Detention*, 79 *Minnesota Law Review*, 325-390 (1994); Charles M. Yablon, *On the Allocation of Burdens of Proof in Corporate Law: An Essay on Fairness and Fuzzy Sets*, 13 *Cardozo Law Review*, 497-518 (1991); Edward S. Adams & Torben Spaak, *Fuzzifying the Natural Law-Legal Positivist Debate*, 43 *Buffalo Law Review*, 85-119 (1995); Derek Osborn, *From Pollution Control to Sustainable Development: Lucid Law for Fuzzy Objectives* 1 *Environmental Law Review*, 79-81 (1999); Edward S. Adams & Daniel A. Farber, *Beyond the Formalism Debate: Expert Reasoning, Fuzzy Logic, and Complex Statutes*, 52 *Vanderbilt Law Review*, 1243-1340 (1999); David F. Chavkin, *Fuzzy Thinking: A Borrowed Paradigm for Crisper Lawyering*, 4 *Clinical Law Review*, 163-194 (1995); Beverly Blair Cook, *Fuzzy Logic and Judicial Decision Making*, 85 *Judicature*, 70-77, 99 (2001); Deborah Jones Merritt, *Commerce!*, 94 *Michigan Law Review*, 674-751 (1995); Deborah Jones Merritt, *The Fuzzy Logic of Federalism*, 46 *Case Western Reserve Law Review*, 685-694 (1996); Frederick L. Kirgis, *Fuzzy Logic and the Sliding Scale Theorem*, 53 *Alabama Law Review*, 421-461 (2002).

are dominant and even among them, the shades are innumerable.”⁸² Douglas called the need to accommodate conflicting interests “the eternal problem of the law,” which is why most legal problems end as questions of degree. If that’s true, it would seem that fuzzy set theory is well suited for some areas of law because the function of fuzzy sets is to help us think more precisely about matters of degree.

Yet there are objections to the use of such methods, which may ultimately stem from something Justice Oliver Wendell Holmes said in the beginning of his book *The Common Law* published in 1881:

The life of the law has not been logic; it has been experience. The felt necessities of the time, the prevalent moral and political theories, intuitions of public policy, avowed or unconscious, even the prejudices which judges share with their fellow-men, have had a good deal more to do than the syllogism in determining the rules by which men should be governed.⁸³

At least for lawyers trained in the common law tradition, and perhaps for other lawyers as well, there seems to be a professionally inculcated distrust of logical syllogisms and any other mechanical means of inference as an instrument for deriving rules that determine how people should live their lives. The antipathy seems to extend to the idea that computer programs could be useful decision support tools to aid in legal decision-making. There are advocates for the importance of expert systems and information technology in law,⁸⁴ but the skeptics seem to be a rather large majority. Still, there may be a future for the information technology movement, but only, I think, if lawyers view computerized legal tools as technologies of humility.

IV. International Liability as a Fuzzy System

In 1980, well before fuzzy thinking became popular, John Farley Thorne III, a law student at Northwestern University School of Law, published a comment titled

⁸² *Estin v. Estin*, 334 U.S. 541, 545 (1948).

⁸³ Oliver Wendell Holmes, *The Common Law* (Mark DeWolfe Howe, ed., Little, Brown and Company, 1963), at 5.

⁸⁴ Most notably Richard Susskind. For a list of his numerous books and articles on the use of information technology by lawyers and other professionals see his website at <http://www.susskind.com/index.html>.

Mathematics, Fuzzy Negligence, and the Logic of Res Ipsa Loquitur.⁸⁵ He presented the legal doctrine of *res ipsa loquitur* (the thing speaks for itself) as a paradigm case of the conflict between legal experience and mathematical-logical modeling that Justice Holmes was talking about. He noted that the tension was even greater around 1980 as mathematical analyses were becoming more common in law and logic was seen as the *sine qua non* of legal reasoning. Thorne argued that despite the tension between them, mathematics and formal logic can be reconciled with law and experience. Even though mathematical and logical systems are independent of the reality they represent, they are rooted in human experience.⁸⁶ If traditional mathematical models fail to mirror the realities of experience, the remedy is to improve the models. If the legal doctrine of *res ipsa loquitur* is poorly modeled by classical bivalent logic, lawyers ought to build a new model based on the mathematics of fuzzy sets and fuzzy logic. Such a model would bridge the gap between the clear thinking of mathematics and logic and the fuzzy reality of legal experience.

In a traditional action for negligence, the plaintiff must prove, by a preponderance of the evidence: (1) that he suffered loss or injury; (2) of which the defendant was the physical cause; (3) that the defendant had a duty to exercise reasonable care to prevent injury or loss, but (4) failed to do so. Theoretically, a plaintiff must prove all four elements to recover damages, or he gets nothing. However, in practice, a typical damage award is rarely “all or nothing.” Courts usually award an intermediate amount depending upon the circumstances of the case and a lawyer’s ability to assert the interests of their client. Thorne attributed the variance in awards to the fuzziness in each of the elements in the negligence action. These elements interact in a way difficult if not impossible to untangle. He focused on the ambiguity inherent in the concept of negligence and showed how it may be modeled mathematically using fuzzy set theory. The key is to view negligence as a matter of degree.

⁸⁵ John Farley Thorne III, *Mathematics, Fuzzy Negligence, and the Logic of Res Ipsa Loquitur*, *Northwestern University Law Review*, Vol. 75: 147-174 (1980); *reprinted in* *Jurimetrics Journal*, Vol. 22: 92-120 (1981). Citations are to the first.

⁸⁶ Thorne, *id.*, at 148 (citing the pragmatist philosopher C.S. Peirce to support the claim that the premises of mathematical modeling derive from human experience).

In order to model the concept of negligence using fuzzy set theory, Thorne turned to Judge Learned Hand's definition of negligence as a function of three variables: (1) the probability that the accident will occur; (2) the gravity of the resulting injury should the accident occur; and (3) the burden of adequate precautions.⁸⁷ Liability is incurred whenever the burden of precautions (B) is less than the magnitude of the loss (L) multiplied by the probability of the accident (P), or, expressed algebraically, whenever $B < PL$. Thorne noted that although this formulation contains ambiguities, it may be generalized to a fuzzy measure of negligence.

Theoretically, there's a bright line between negligence and non-negligence at the point where $B = PL$. However, courts are generally reluctant to draw such lines, particularly in hard cases, where the practical consequence is the difference between a defendant paying all or none of the plaintiff's damages. In these borderline cases, courts often impose some kind of compromise, such as awarding the plaintiff half the damages sought. Still, one has to draw lines, which introduce step-wise discontinuities rather than a smooth gradation in the levels of negligence. Thorne proposed a continuous measure of fuzzy negligence resulting from implicit and explicit adjustments to liability (Figure 2.8). The fuzziness of the curve depends upon the value of a constant in the general equation determining its shape. Thorne argued that measures of fuzzy negligence of the type such as those shown in the Figure 2.8 fit more closely to judicial experience than do doctrinal interpretations of negligence.

Under the doctrine of contributory negligence, the Learned Hand test for liability also regulates liability by taking into account the defendant's as well as the plaintiff's culpability in the accident. In this case, the plaintiff's and the defendant's culpabilities can be represented on a pair of orthogonal axes, with fuzzy liability represented as a smooth surface whose height is measured on the vertical axis (Figure 2.9). Thorne suggested that this fuzzy model of negligence is useful in and of itself as a descriptive framework for studying the observed and theoretical variance in plaintiff's damage

⁸⁷ *Id.* at 157 (citing Judge Learned Hand, *United States v. Carroll Towing Co.*, 159 F.2d 169 (2d Cir. 1947)).

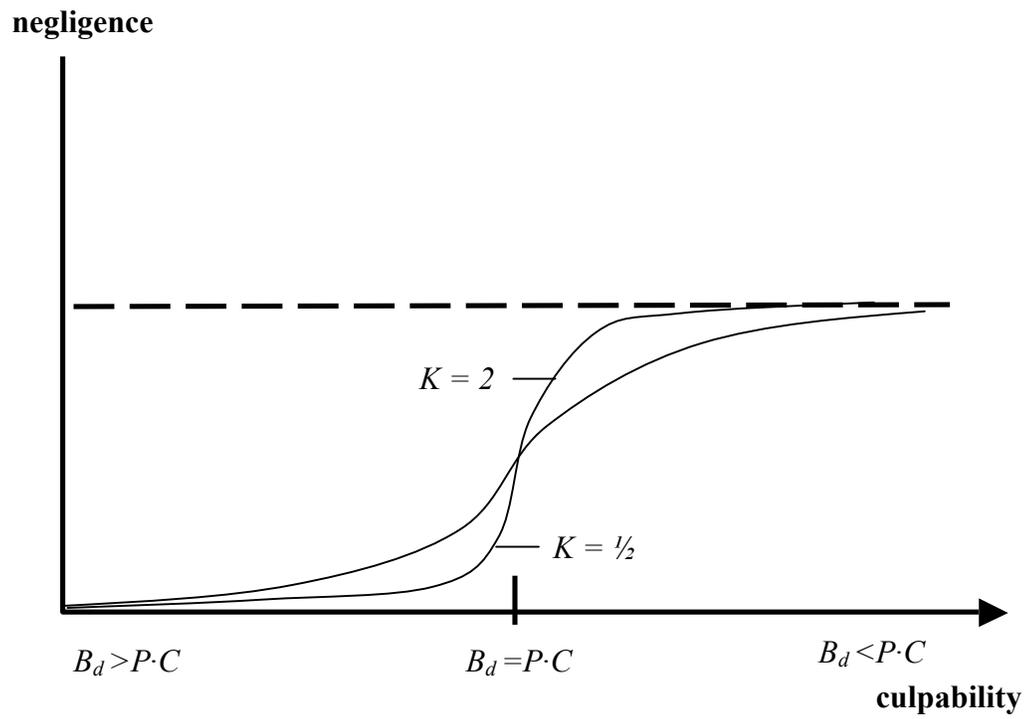


Figure 2.8. Fuzzy Negligence. After Thorne, 1980

awards. It could also be used as a component in a larger fuzzy model of the logic underlying the legal doctrine of *res ipsa loquitur*.

Res ipsa loquitur depends on the near equivalence of two conditional propositions:

- (1) If negligence is absent, then a particular type of accident does not usually occur;
- (2) If the particular type of accident occurs, then negligence is probably present.

These two propositions seem to be logically equivalent (the technical term is *contrapositive*) to each other. However, there are instances in which one may be true and the other not true. An accident may not ordinarily occur in either the presence or the absence of negligence simply because the accident occurs very infrequently under any circumstances. Thus proposition (1) is true. However, there are no grounds for the implication of proposition (2) that when the accident occurs, it is likely due to negligence. Courts have applied the doctrine of *res ipsa loquitur* despite its lack of logical coherence, and sometimes they have been criticized for it.⁸⁸ The common use of *res ipsa loquitur* in the face of such criticism has led some to look for non-logical justifications for the doctrine. Some see it as evidence of a general trend toward strict liability and social insurance, others as a kind of “legal fiction” used to mask an underlying shift in legal doctrine. However, Thorne noted that *res ipsa loquitur* is firmly ensconced in American jurisprudence and “will not easily be dislodged by the normative cries of wounded logic.”⁸⁹ He cited the warning of the pragmatist philosopher Charles Sanders Peirce not to confuse normative science with practical science. One wonders what Peirce, with his keen interest in logic, would have thought of Zadeh’s fuzzy set theory. Fuzzy logic is a kind of pragmatic logic.

In Thorne’s fuzzy model of *res ipsa loquitur*, the doctrine is not simply applicable or not applicable to a given case, but applicable according to some fuzzy degree of certainty. Also, the presence or absence of negligence is fuzzy. The fuzzy model requires (1) a function measuring the fuzzy *applicability* of *res ipsa loquitur* to a given case; (2) a function measuring the fuzzy *negligence* of the defendant in the situation.

⁸⁸ See *id.* at 166 (citing the dissent of Justice Traynor of the California Supreme Court in *Cavero v. Franklin General Benevolent Society*, 36 Cal 2d 301, 223 P.2d 471 (1950)).

⁸⁹ *Id.* at 168.

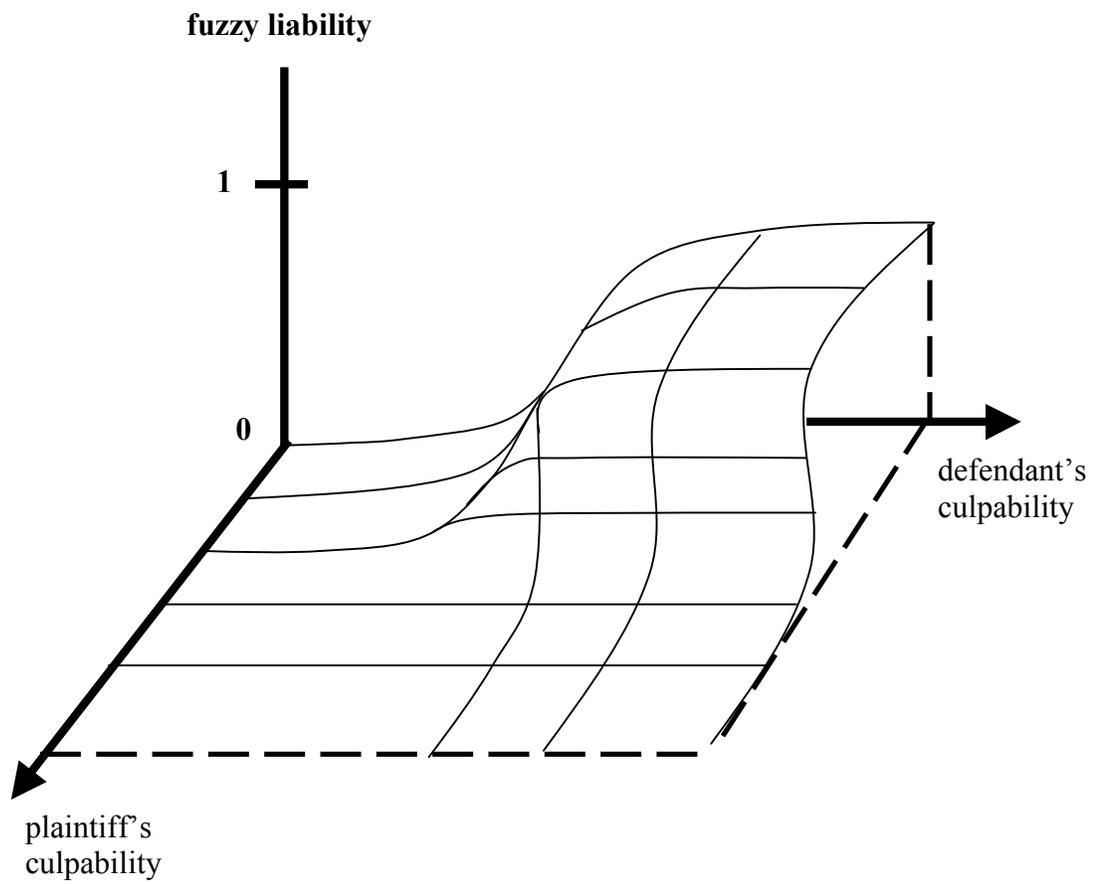


Figure 2.9. Fuzzy Contributory Negligence. After Thorne, 1980.

Thorne noted that it's important not to interpret these fuzzy measures as probability measures in disguise. For example, the probability of an event occurring in the absence of negligence might be quite small, say only $\frac{1}{4}$. However, a court might judge this probability too great for the doctrine of *res ipsa loquitur* to be applicable, and so the fuzzy measure of *applicability* would be 0. The fuzzy measure involves subjective elements of interpretation, and while it may be influenced by estimates of probability, they don't define it.

Thorne came up with a mathematical equation between the two functions above and the strength of the equivalence upon which the doctrine of *res ipsa loquitur* hinges. He called this equation the *fundamental relation* of *res ipsa loquitur*. Given fuzzy measures of applicability and of negligence in a particular case, one could use the equation to determine a fuzzy measure for the appropriateness of the doctrine's application. In those cases in which the doctrine is judged to be more applicable than not applicable (*i.e.*, the fuzzy measure of applicability > 0.5), the degree of appropriateness of the result (*i.e.*, its desirability) can never exceed the degree of applicability. The desirability may be less due to the fuzzy nature of negligence.

Would Thorne's argument have persuaded Justice Holmes that the syllogism—or at least some kinds of fuzzy reasoning—could have an appropriate role in determining the rules by which people are governed? When Holmes said that the life of the law is not logic but experience, he seems to imply that, at least in the eyes of lawyers, there's a bright line between logic and experience. Thorne argued that fuzzy set theory and fuzzy logic blur the line. He summed up his case by saying, “Logic and mathematics are not wisely estranged from the law. Now more than ever the law is called upon to solve the most difficult problems. Lawyers, judges, and legal scholars must look to all disciplines—including mathematics and logic—to find creative insights leading toward the solution of these problems.”⁹⁰ I find Thorne's argument persuasive. I believe that fuzzy modeling can help to deal with some of the conceptual problems associated with liability for transboundary harm to biological diversity. In the remainder of the chapter,

⁹⁰ *Id.* at 174.

I'll outline a simple approach to making complex decisions about such fuzzy matters that I hope lawyers might develop further.

It's a commonplace that one should tailor a decision-making method to the nature of the problem. While I subscribe to that general point, I also think it's also important to consider the decision maker's needs. Computer technology can be useful for handling complex problems. However, if one understands nothing about what the computer is doing, the decision-making process becomes a kind of black box that only technical experts understand. In turning the problem over to experts, one loses part of the sense of responsibility for the outcome. Those trained in the law may be only too glad to rely entirely on experts when it comes to computers. Most lawyers and legal scholars tend to look upon computers as useful only for number crunching rather than as aids to legal reasoning. The law is about language, which is fuzzy, and legal experts have their own ways of reasoning carefully with imprecise terms. To those who don't speak the legal jargon, judicial reasoning may appear as another kind of black box. Somewhere between the black boxes accessible only to computer programmers and those accessible only to legal experts there's a place where one can try to construct simple computer models as tools for making better judgments about difficult legal problems such as assessing appropriate degrees of liability in a particular context.

The model I present here is based on a concept of fuzzy liability analogous to the one Thorne used to model the Learned Hand test under the doctrine of contributory negligence. In Thorne's model, fuzzy liability is a function of both the defendant's and the plaintiff's fuzzy negligence. In my model, the basic issue is one of nuisance rather than negligence. In the *Trail Smelter* case, smelter smoke created a nuisance for the settlers in Washington. However, from the point of view of the smelter's owners, regulatory restrictions on its operation also constituted a kind of nuisance. The legal problem for the *Trail Smelter* Tribunal was how to balance the environmental interference and the regulatory burden in an equitable way. I model the problem by representing the environmental and the regulatory burden on a pair of axes in the horizontal plane (Figure 2.10). Fuzzy liability or responsibility is a function of this pair of variables, and is represented by the height above the plane as measured on the vertical

axis with a scale from 0 (no responsibility) to 1 (full responsibility). The model thus allows for degrees of responsibility. The surface of the graph is smooth, with no sudden jumps or gaps. As Thorne points out with respect to fuzzy negligence, this feature of continuity has a powerful non-empirical justification based on the principle of equality before the law.⁹¹ Small differences in the level of nuisance, whether environmental or regulatory, should not result in large changes in the level of responsibility. Arbitrary economic line drawing undermines faith in the integrity of the legal decision-making process. Equitable balancing is generally a matter of making small adjustments based on slight differences in the factual circumstances.

The method of determining the degree of responsibility using the model is based on the linguistic approach Zadeh outlined in his 1973 paper on analyzing complex systems and decision processes. The first attempt to develop the linguistic approach in decision making came in 1979,⁹² shortly after the introduction of precise mathematical methods based on multi-attribute utility theory.⁹³ In this class of decision-making techniques, the goal is to find the alternative course of action that maximizes overall utility, which is interpreted as the aggregate of many partial utilities. However, precise calculation of overall utility is complicated by interdependencies among the partial utilities. These interactions result in trade-offs or situations in which we're willing to sacrifice some amount of good as measured on one dimension of utility to gain a greater amount of good as measured on another. One solution is to treat the relation between the partial utilities and the overall aggregate utility as a fuzzy relation. We thus "fuzzify" the traditional Bayesian probabilistic method of decision-making based on multi-attribute utility theory. Because the aggregate utility function is, in general, too complex to be

⁹¹ *Id.* at 161-162.

⁹² See Janet Efstathiou & Vladislav Rakovič, *Multiattribute Decisionmaking Using a Fuzzy Heuristic Approach*, 9 IEEE Transactions on Systems, Man, and Cybernetics, 326-333 (1979).

⁹³ Multi-attribute utility theory has its origins in a paper by Howard Raiffa, *Preferences for Multi-Attributed Alternatives*, Memorandum RM-5868-DOT/RC (Prepared for U.S. Dept. of Transportation, Federal Railroad Administration, Office of High Speed Ground Transportation. The RAND Corp., Santa Monica, CA, 1969); *reprinted in* 14 *Journal of Multi-Criteria Decision Analysis*, 115-157 (2006). The first textbook on the subject was Ralph L. Keeney & Howard Raiffa, *Decisions with Multiple Objectives* (John Wiley & Sons, 1976). For a brief historical account of the theory see Howard Raiffa, *Decision Analysis: A Personal Account of How It Got Started and Evolved*, 50 *Operations Research*, 179-185 (2002).

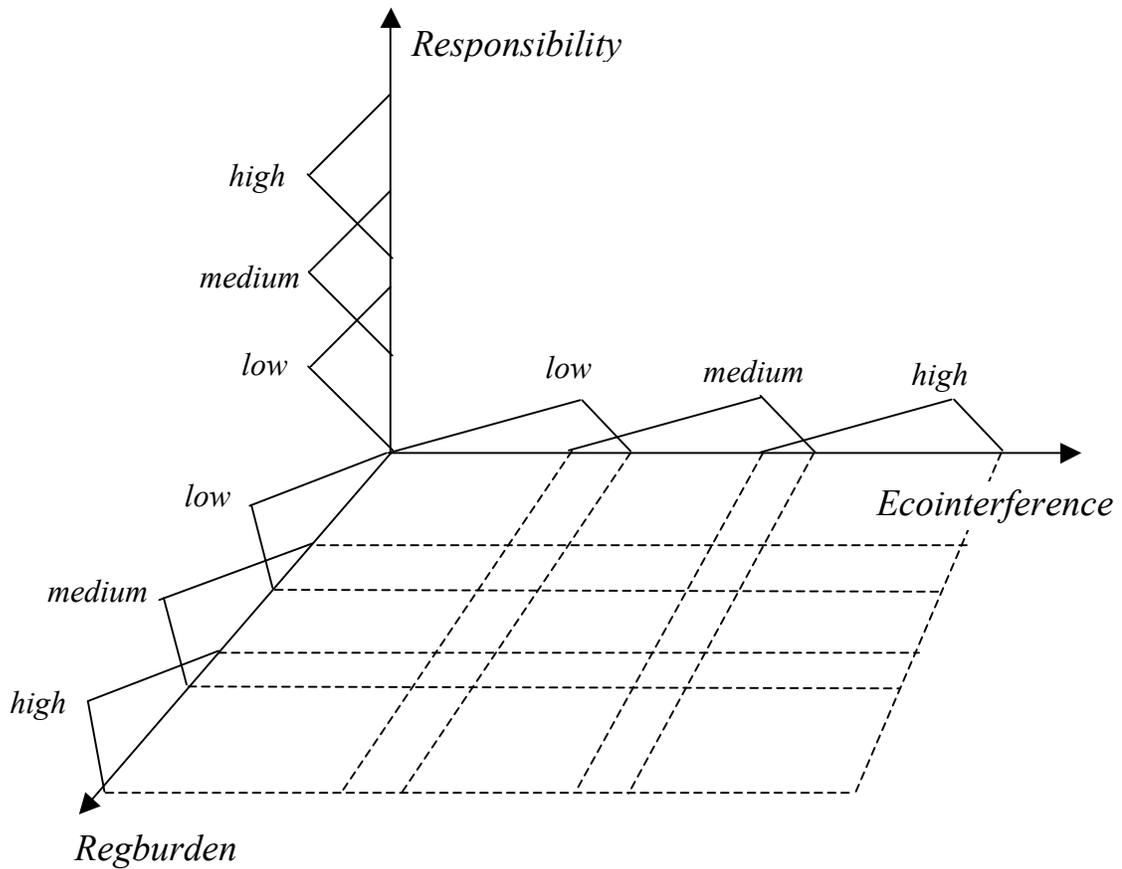


Figure 2.10. Responsibility as a Fuzzy System. The input space is represented on the horizontal plane by the Cartesian product of the two fuzzy input variables *Ecointerference* and *Regburden*. The level of the fuzzy output variable *Responsibility* is represented by the surface (not shown) whose height is measured on the vertical axis from 0 to 1.

derived by considering all the possible combinations of partial utilities, a heuristic approach is used to define it. We evaluate the overall utility for certain combinations of partial utilities and use a method of interpolation to obtain the utility of all other possible combinations. Finally, the method is intended primarily for lawyers, who are more used to dealing with words than numbers in making decisions. Linguistic variables offer a way to describe the various attributes contributing to utility in natural language with all its inherent fuzziness. My goal is to enhance legal decision-making by means of a simple computer technology that allows one to manipulate the relevant fuzzy variables in order to reason more precisely with them.

The Fuzzy Logic Toolbox™ software,⁹⁴ which operates within the MATLAB® computing environment, offers user-friendly tools for constructing simple fuzzy inference systems. The key feature of the software is the graphical user interface, which permits one to build the system graphically without having to master the underlying computer language. There are five tools—three for editing the values of the linguistic variables and the *If-then* rules, and two for viewing, as opposed to editing, the fuzzy inference system. Of the three editors, the Fuzzy Inference System Editor handles high-level tasks such as adding or removing input and output variables, naming them, and selecting methods to implement the various logical operations involved in fuzzy inference (Figure 2.11). The Membership Function Editor (Figure 2.12) is used to define the shape of the *membership function* for each of the fuzzy subsets of a variable. For example, the user may wish to define the shape of the fuzzy subsets as triangular, or as trapezoidal, or perhaps bell-shaped (Gaussian). User-defined parameters control the precise shape of the membership function. For example, in a triangular membership function, the parameters *a* and *c* set the right “feet” or base points of the triangle, and the parameter *b* determines the location of the triangle’s “peak.” Finally, the Rule Editor (Figure 2.13) is used to formulate and edit the list of *If-then* rules that govern the operation of the fuzzy inference system.

The two viewers—the Rule Viewer and the Surface Viewer—are especially useful for diagnostic purposes. The Rule Viewer (Figure 2.14) allows one to see which

⁹⁴ See Fuzzy Logic Toolbox™ User’s Guide (Version 2), available at www.mathworks.com.

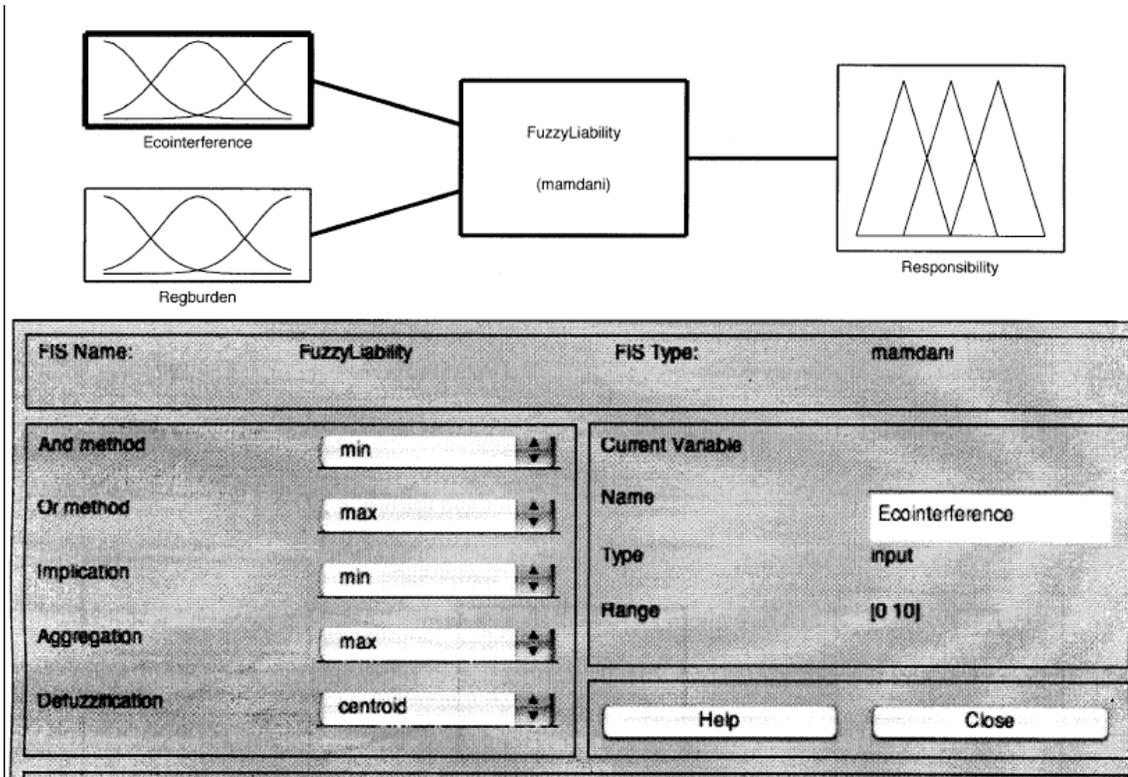


Figure 2.11. Fuzzy Inference System Editor.

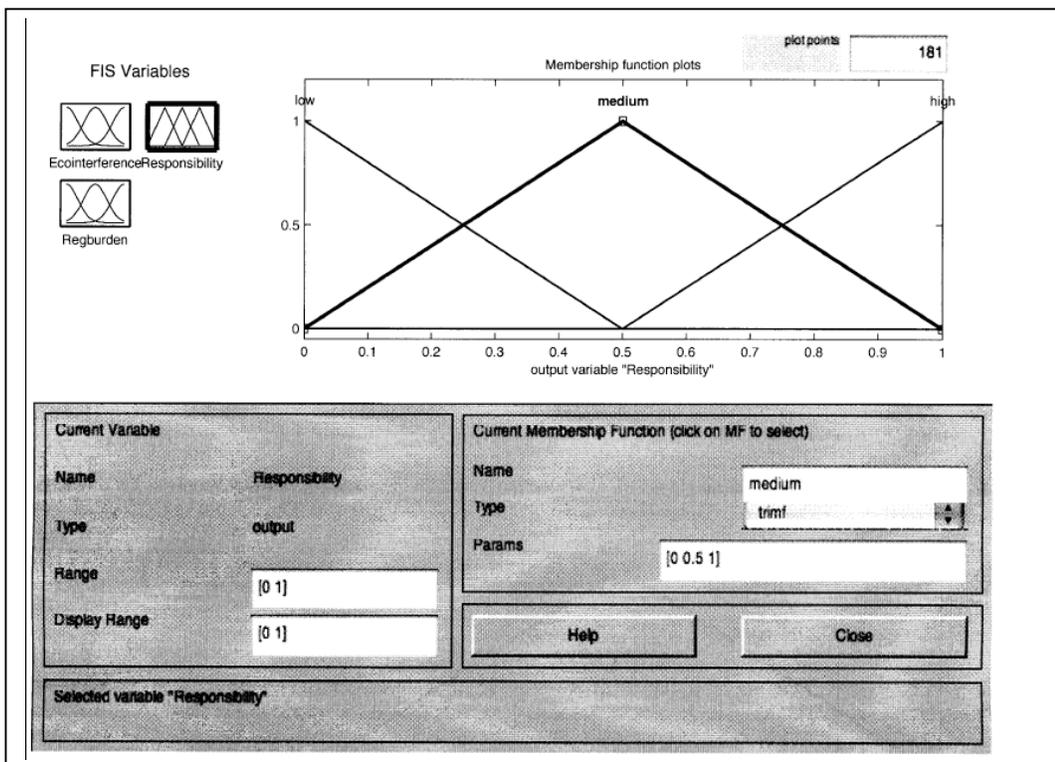
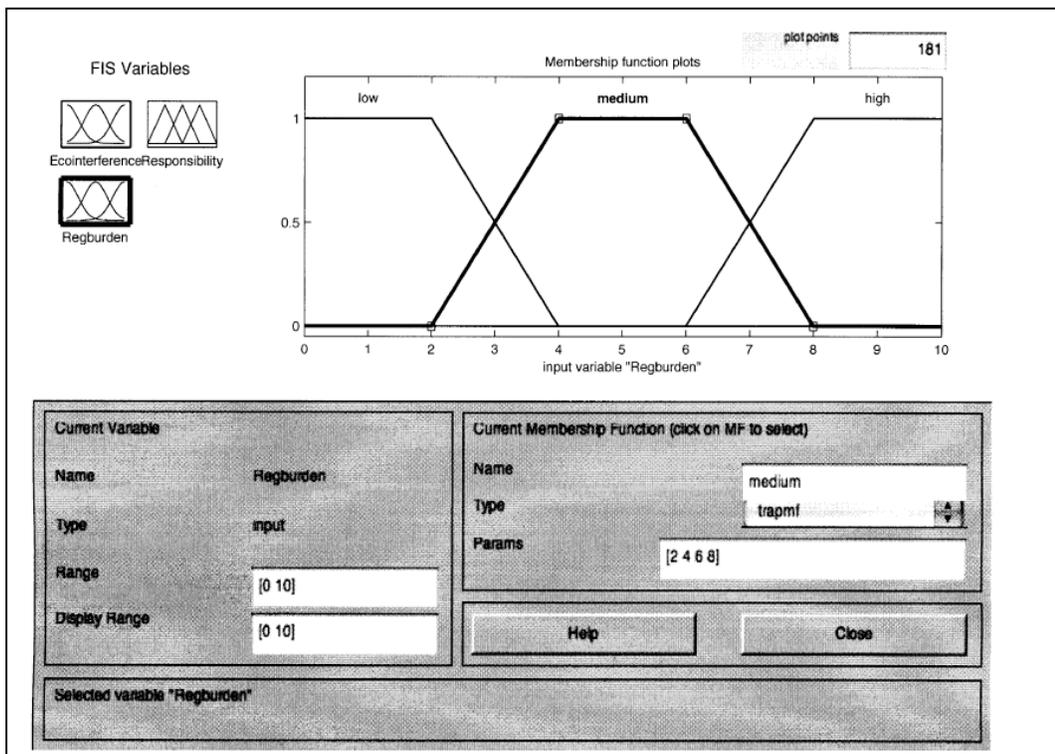


Figure 2.12. Membership Function Editor

rules contributed to a particular inference. It also shows how the shapes of the membership functions affect the final outcome. Such information can be useful in “fine-tuning” the performance of the fuzzy system. The Surface Viewer (Figure 2.15) allows one to see the entire range of the output set as a function of the entire range of the input set. Because the viewer can only display a three-dimensional space, only two input variables at a time can be allowed to vary. If there are more than two input variables, all but two must be held constant, so that the output variable can be displayed as a surface whose height is a function of the values of the two selected input variables.

Here, the two input variables are fuzzy sets represented by the two axes in the horizontal plane labeled *Ecointerference* and *Regburden*, and the output variable is the constructing a fuzzy system is to determine the universe of discourse for each variable by partitioning it into fuzzy subsets. To keep things simple, I’ll use the same three fuzzy subsets for each: *low*, *medium*, and *high*. At this point, we’re ready to write the fuzzy rules governing the system. Again, to keep things simple, I’ll write just a couple of them. It’s common sense that if the Trail Smelter could avoid creating a large-scale environmental nuisance by taking a few inexpensive preventive measures, it should have an obligation to do so. At the same time, one might argue that if the regulatory costs and the level of environmental nuisance are both moderate, the operator has a reasonable degree of responsibility to prevent or mitigate the adverse consequences. We might express these common-sense judgments by the following *If-then* rules:

- (1) If *Regburden* is *low* and *Ecointerference* is *high* then *Responsibility* is *high*.
- (2) If *Regburden* is *medium* and *Ecointerference* is *medium*, then *Responsibility* is *medium*.

In the example, there are only nine combinations of values for the input variables, so it wouldn’t be difficult to write an exhaustive list of rules. However, at lower hierarchical levels in the model—for example, when *Regburden* and *Ecosystem* are treated not as

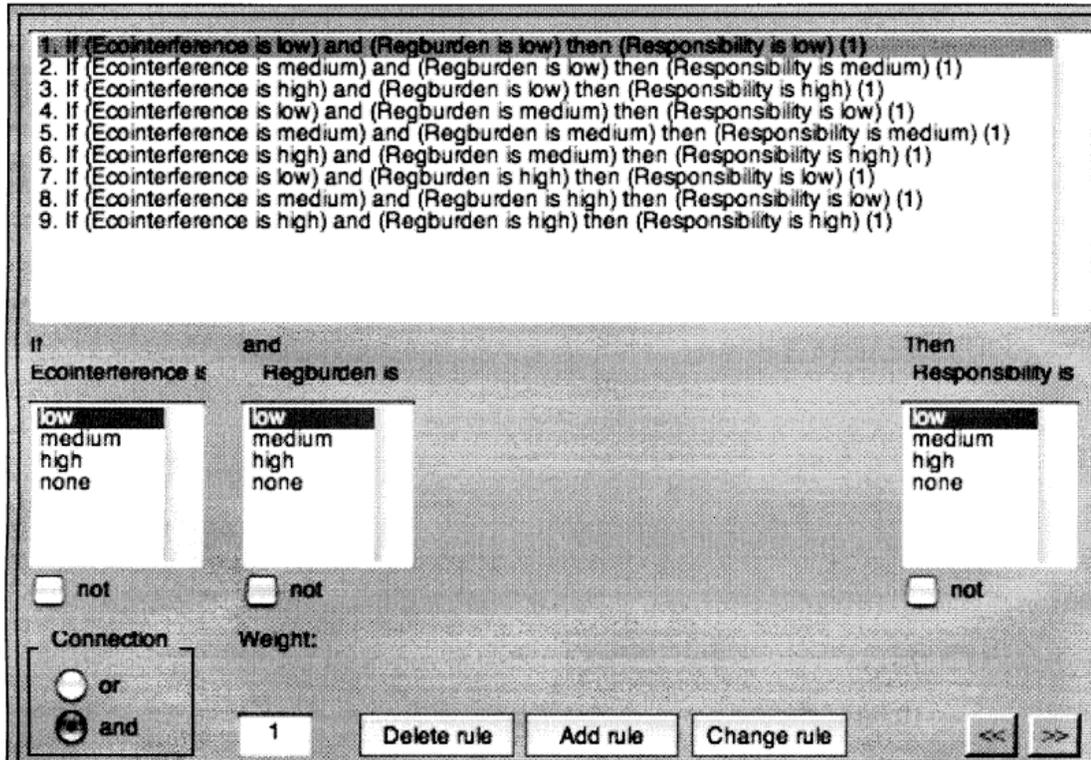
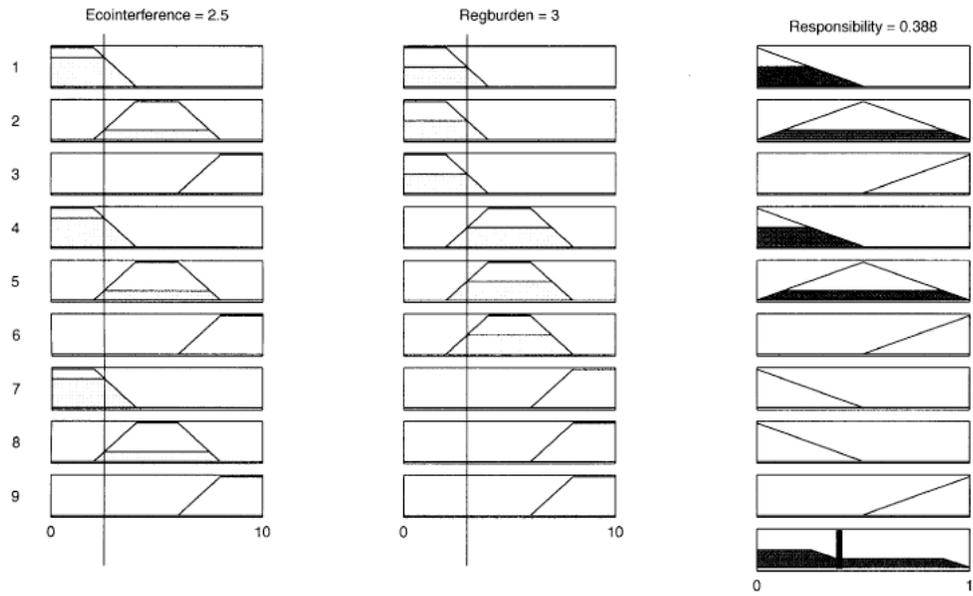


Figure 2.13. Rule Editor



Input: [2.5 3]	Plot points: 101	Move: left right down up
Opened system FuzzyLiability, 9 rules		Help Close

Figure 2.14. Rule Viewer

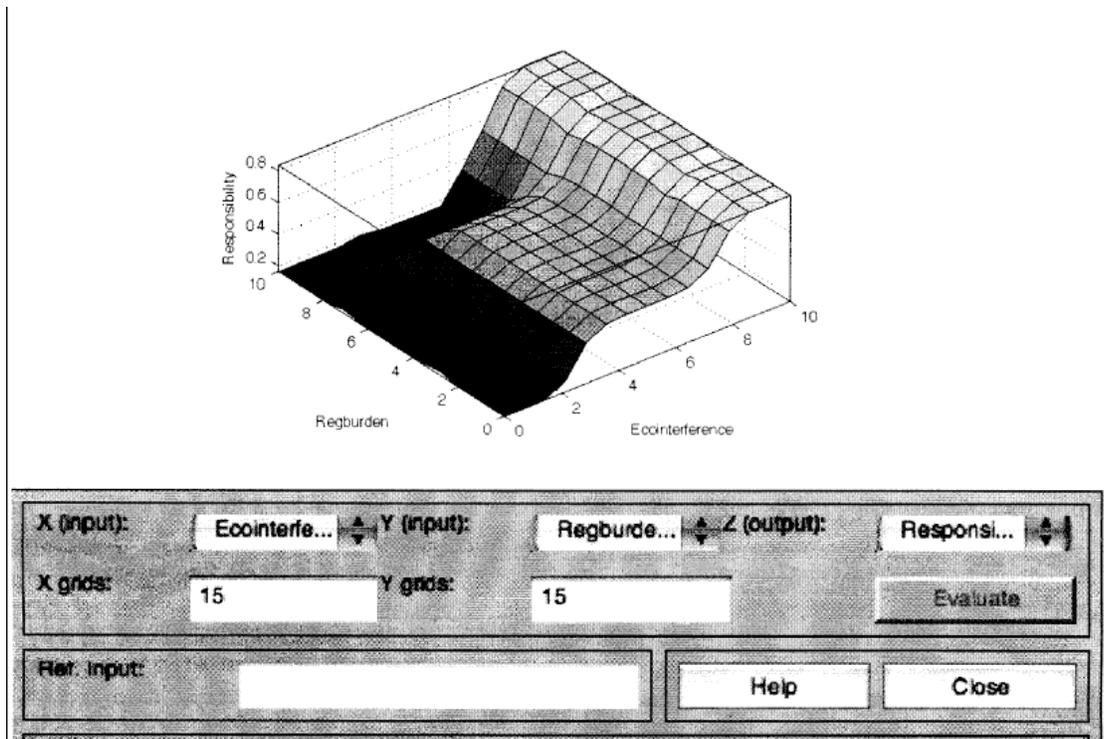


Figure 2.15. Surface Viewer

input variables but as outputs, each determined by a number of factors, the number of rules could grow quite large. In that case, we would have to resort to simple heuristics or “rules of thumb” to determine the rules for certain points, and use a method of interpolation to determine the output at intermediate points. This process could be carried out interactively with the computer. The real value of the exercise lies precisely in this need to reflect carefully about the parameters of the decision algorithm.⁹⁵ It should be emphasized that the use of such a decision support tool such as the Fuzzy Logic Toolbox™ doesn’t circumvent the need to negotiate.⁹⁶ If the American and Canadian teams had used such a technology in the *Trail Smelter* case, their universes of discourse probably would have differed, perhaps significantly. Modeling the problem with fuzzy set theory would be part of the process of arriving at an equitable balance of interests.

Once the rule base of the fuzzy inference system is tentatively settled, the computer takes over. The reasoning process is carried out by something called an *inference engine*, a set of programs that use the knowledge base and data for a particular case to infer a conclusion. A fuzzy inference engine is capable of interpreting and operating on fuzzy *If-then* rules such as the two above. Although the one E.H. Mamdani invented in 1974 was designed to control the operation of a steam engine, the same process of reasoning can be used in a decision support system. I’ll outline briefly here how the Mamdani inference engine might work in this context.

Suppose that the level of regulatory burden associated with an activity that has potentially harmful transboundary consequences to biological diversity were described as around 3 on a scale from 0 to 10. And suppose that the degree of damage to biological diversity from the activity were described as around 2.5, also on a scale from 0 to 10.

⁹⁵ See Efstathiou & Rakovič, *Multiattribute Decisionmaking Using a Fuzzy Heuristic Approach*, *supra* note 92, at 329 (“This heuristic decisionmaking process should be obtainable under a question and answer system involving dialogue between the decisionmaker and the analyst, whose role could be taken by a computer. This process will require the decisionmaker to think very carefully about his decision algorithm and to remove inconsistency and explain arbitrariness within it.”).

⁹⁶ See *id.* at 327 (arguing that in general, different groups have a different aggregate utility functions, from which a social aggregate utility function must be constructed, either through logical operations or through negotiation).

The inference engine begins by truncating the fuzzy subsets of the antecedent variables of each rule at a height corresponding to these values (Figure 2.14). The next step is to truncate the fuzzy subsets of the consequent variable *Responsibility*. For each rule, the computer calculates the degree of membership in the *Responsibility* subset using the operation of fuzzy conjunction (AND). The degree of membership of an element in a conjunction of fuzzy sets is the minimum of its degree of membership in the individual sets. The intuitive justification for using the minimum operator is that degree of membership of an element in the fuzzy intersection of sets should not be any higher than the least degree of membership in the individual sets.

Once the inference engine has gone through all the rules and truncated the subsets of *Responsibility* at the appropriate level, it aggregates the truncated subsets into one composite subset (Figure 2.14). In traditional multiple-attribute decision-making, the most common procedure for aggregation is the simple additive weight method, also known as the weighted sum method.⁹⁷ For each alternative, the values of the various attributes are first scaled to make them comparable and then added to obtain the total score for that particular alternative. The method assumes that there is no interdependence among the various attributes, even though in reality we commonly find that our level of satisfaction with regard to one attribute affects how we evaluate our level of satisfaction with regard to others. In the fuzzy aggregation method used in the Mamdani inference engine, the truncated subsets of the *Responsibility* variable are added using the operation of fuzzy conjunction (OR). The degree of membership of an element in a union of fuzzy sets is the maximum of its degree of membership in the individual sets. The intuitive justification for using the maximum operator is that the degree of membership of an element in a fuzzy union of sets cannot be any lower than the degree of membership in the individual sets.

The aggregation procedure results in a composite fuzzy subset of the linguistic variable *Responsibility*. This subset represents the fuzzy responsibility of the acting party in a situation involving an activity having potentially harmful transboundary

⁹⁷ See C.L. Hwang & Kwangsun Yoon, *Multiple Attribute Decision Making: Methods and Applications: A State-of-the-Art Survey* (Springer-Verlag, 1981).

consequences for biological diversity. However, from a practical standpoint, a court would need to be a bit more precise about the level of responsibility. In the terminology of fuzzy logic, it would need to “defuzzify” matters. One way to do this, shown in Figure 2.14, would be to use the point directly under the centroid to represent the precise level of responsibility in the case.

The computer does not get the last word in any balance-of-interest test. Allowing it to be the decision maker in a case would be an abdication of responsibility by the human decision makers. What the computer may do is play a supporting role in the decision-making process. It does so by making the activity of balancing the scales of justice more concrete. One has to think about the meaning of terms like *significant injury* or *onerous regulation* within the context of the case and try to give them at least a partly quantitative meaning. A virtue of the fuzzy linguistic approach is that it avoids getting bogged down in the numbers and the quest for a spurious precision. Instead, lawyers may try to give more precision to the fuzziness of legal concepts, to adjust the boundaries of the fuzzy subsets in the model to reflect their intuitions about what the words mean in the case before them. And their adjustments will be captured in code for others to see and perhaps to use as parameters in future cases involving similar circumstances.

Chapter Three

I. Pragmatic Compass

On August 26, 1898, William James addressed the Philosophical Union at Berkeley in a lecture titled *Philosophical Conceptions and Practical Results*.¹ The audience consisted of educated listeners, some with a technical knowledge of philosophy. James noted that the occasion required him to say something simple enough to catch and inspire non-philosophers but with just enough ingenuity and oddity to keep philosophers from yawning and letting their attention wander.

James began playfully by saying that he had in mind the perfectly ideal discourse for the occasion. If he were to set it down on paper, everyone would regard it as the final word of philosophy, the truth. As it was, he had humbly to apologize; he had tried to articulate it, but it would not come. After all, philosophers are like poets—they are pathfinders. The words and thoughts of both have the same function—they serve as so many spots or blazes made by the axe of the human intellect on the otherwise trackless forest of human experience. They give you somewhere to go from, and they give you a direction, a place to reach. But they do not give you “the integral forest with all its sunlit glories and its moonlit witcheries and wonders. Ferny dells, and mossy waterfalls, and secret magic nooks escape you, owned only by the wild things to whom the region is home.”² It would be better, James said, not to need the blazes, but at least they allow us to use and enjoy the forest.

James confided that he felt that there is a center in truth’s forest where he had never been. To track it out was the secret spring of all his philosophic efforts. At times, he had almost reached the final valley, where there was a gleam at the end and a sense of certainty . . . but always there came another ridge, and his blazes merely circled toward the true direction. He could not take us to the wondrous hidden spot on this day. “To-morrow it must be, or to-morrow, or to-morrow, and pretty surely death will overtake me

¹ William James, *Philosophical Conceptions and Practical Results*, reprinted in *Pragmatism* (The Works of William James, ed. by Frederick H. Burkhardt, Fredson Bowers & Ignas Skrupskelis, Harvard University Press, 1975), 255-270.

² *Id.* at 258.

ere the promise is fulfilled.”³ The lives of philosophers consist of such postponed achievements. “Truth’s fulness is elusive; ever not quite, not quite.” And so we have to fall back on the preliminary blazes, a few formulas, technical conceptions, and verbal pointers, which at least defined the initial direction of the trail. That, to his sorrow, was all he had to offer us. As I sat in the audience I wondered what to make of all this. In particular, I wondered if anyone else realized how much that James had just revealed about the new philosophy he called *pragmatism*.

As I listened to James speak, I recalled what Sheila Jasanoff said about the great mystery of modernity—our faith that we can reach the center in truth’s forest, that we just need to find a few more scientific facts. She spoke of the need for technologies of humility, which compel us to reflect on the sources of ambiguity, indeterminacy, and complexity. We learn from humility to think harder about reframing problems so that their ethical dimensions are brought to light. I thought about one of those technologies of humility, Lotfi Zadeh’s theory of fuzzy sets, which allows us to reframe the way we think about complex systems. His theory of linguistic variables struck me as a humanistic approach to dealing with the vagueness inherent in our perceptions of reality. But the literature on fuzzy logic didn’t have much to say about the ethical dimensions of problems, including the problem that concerned me—how to deal with transboundary damage to biological diversity in a pragmatic way. The word *pragmatic* is tossed around so much at the turn of the twenty-first century. But what does it mean? To find out, I thought I should go back to the previous turn of the century when the philosophy of pragmatism was new. I began by attending a lecture at Berkeley by Professor James of Harvard in which he introduced pragmatism to the world. If anyone could tell me what pragmatism means, he could.

James gave credit to Charles Sanders Peirce not only for the principle but also the name of *pragmatism*, which James sometimes called *practicalism*. However, he thought that the principle of practicalism should be expressed more broadly than Peirce had formulated it. In James’s words, “[T]he effective meaning of any philosophic proposition

³ *Id.*

can always be brought down to some particular consequence in our future practical experience.”⁴ The important point was that the experience must be particular or concrete. To take in the importance of this principle, James said, one must get used to applying it to concrete cases. Suppose there are two different philosophical propositions or maxims that seem to contradict each other. If, by assuming that one is true, you can foresee no conceivable practical consequence to anyone, at any time or place, that is different from what you would foresee if you supposed the other proposition were true, the difference between the two propositions is not important. It’s only a specious or verbal difference not worth arguing about. Both formulas mean essentially the same thing, although they express it in different words. It’s astonishing, James remarked, how many philosophical disputes collapse into insignificance the moment you subject them to this simple test. “There can *be* no difference which doesn’t *make* a difference—no difference in abstract truth which does not express itself in concrete fact, and of conduct consequent upon the fact, imposed on somebody, somehow, somewhere, and somewhen.”⁵

To illustrate how the principle of pragmatism works, James asked us to imagine that the present moment is the absolutely last moment of the world, with nothing beyond it, no hereafter for either experience or conduct. In this case, there would be no sense whatever in many of our most urgent and venomous philosophical and religious debates. The dispute whether matter alone could produce the world around us, or whether God is also necessary, would be perfectly insignificant if there were nothing more to come. Many, indeed most, of us, James said, would feel as if a terrible coldness and deadness had come over the world if forced to believe that no informing spirit or purpose was behind it. The actually experienced facts might be the same under either the materialistic or the theistic hypothesis, but without a God behind those facts, they would seem somehow ghastly, with no genuine story to tell. With a God, however, they grow solid, warm, and full of real significance. Such a difference in feelings is reasonable in a consciousness like ours that lives so much in the future, whose world is partly yet to come. It would be absolutely senseless and irrational in a purely retrospective

⁴ *Id.* at 259.

⁵ *Id.* at 260.

consciousness. Such a consciousness would have no emotional interest in either side of the debate; the problem would be purely intellectual. Most men, including many so-called positivists or scientists, deliberately turn their backs on philosophical arguments from which nothing in the line of definite future consequences can be seen to follow. In every genuine metaphysical dispute, some practical issue, however remote, is involved. An student who had escaped from Berkeley had remarked to James at Harvard recently: “Words, words, words, that’s all you philosophers care for.” James thought that it was a perfectly sound reproach—unless the metaphysical alternatives could be shown to have different practical outcomes, however delicate and distant. The common man and the positivist could discover no such outcomes. If the metaphysician couldn’t either, they are right to disparage philosophy. Metaphysics would be but a pompous trifling, and the endowment of professorships for such subjects would be absurd. I got the impression from listening to him speak that Professor James didn’t think all metaphysics is absurd.

James next asked us to put ourselves back in the real world we live in, the world that has a future, that is yet uncompleted. In this unfinished world, the choice between materialism and theism is intensely practical. James dismissed the arguments of Herbert Spencer and other proponents of cosmic evolution that the dislike of the ordinary person for materialism comes from a purely esthetic disdain for matter as something gross in itself, vile and despicable. Perhaps that was true in earlier times, but esthetic reasons were not the grounds of an intelligent modern man’s dislikes of materialism. We really object to materialism because it is not a permanent warrant for our more ideal interests, not a fulfiller of our remotest hopes.

James was well read concerning the mathematical notions of late nineteenth-century mechanical philosophy and the implications of the second law of thermodynamics for the future of the universe. He described the end of the world as portrayed by the mechanical philosophy “an utter final wreck and tragedy” in which nothing, absolutely *nothing* remains. However, in a world with a God, the tragedy is only provisional and partial; shipwreck and dissolution are not the absolutely final things. The world may burn up or freeze, yet God will remain mindful of the old ideals and be sure to bring them to fruition elsewhere. This need of an eternal moral order, James said, is one

of our deepest human needs. Surely here was an issue genuine enough to sustain serious philosophical debate for as long as we are human. On this question, positivists and other pooh-pooh-ers of metaphysics are simply wrong.

When I thought about the individuals I'd describe as pragmatic, they didn't seem to fit the type that James was describing. In my experience, pragmatic persons aren't too concerned with how the universe is destined to end billions of years from now. They tend to take a shorter view of things; they're muddle-through-ers. James seemed to be talking about some kind of religious melancholy, which seemed to me to border on a kind of insanity. I wouldn't call individuals with that condition "pragmatic." However, James believed that to think that way does injustice to human nature. The absolute things, the last things, are the truly philosophic concern, and the mind with the shortest views is simply the mind of the more shallow man. Still, he was willing to bring the discourse down to my level and talk about the practical significance that the idea of God makes in our ordinary day-to-day experience.

According to James, the principle of practicalism says that the meaning of the concept of God lies in those differences in our concrete experience of the world that result from assuming the concept is true. Some of the definitions of God made by dogmatic theology stand and others fall when subjected to this test. James mentioned some of these abstract attributes of God's nature—necessary, simple, absolute, self-sufficing, and infinite in all respects—and asked: "Now in which of us practical Americans here assembled does this conglomeration of attributes awaken any sense of reality?"⁶ I didn't see any hands go up.

James described systematic theologians as "closet-naturalists" whose deduction of God's attributes is "nothing but a shuffling and matching of pedantic dictionary-adjectives, aloof from morals, aloof from human needs, something that might be worked out from the mere word 'God' by a logical machine of wood and brass as well as by a man of flesh and blood."⁷ Such attributes have nothing to do with religion because "religion is a living practical affair." Other traditional attributes of God such as his

⁶ *Id.* at 265.

⁷ *Id.*

omniscience, justice, and goodness do have some practical connection with life, which explains their historical importance. Yet even these more real and significant attributes as they have been described in books on theology “have the trail of the serpent over them.” In the hands of the theologians, these abstract general terms have become a set of dictionary-adjectives, mechanically deduced. Logic has taken the place of vision, professionalism the place of life.

In Professor James’s view, what keeps religion going is something other than abstract definitions and systems and professors of theology. It’s concrete religious experiences that connect with feeling and conduct in the lives of humble, private men. Such experiences are “conversations with the unseen, voices and visions, responses to prayer, changes of heart, deliverances from fear, inflowings of help, assurances of support, whenever certain persons set their own internal attitude in certain appropriate ways.”⁸ Such direct experiences of a wider spiritual life with which our superficial consciousness is continuous, and with which it keeps us an intense commerce constitute the foundation on which all religion rests, including the idea of God. Theology is just a translation of those direct religious experiences.

James’s words were a revelation to me. I hadn’t realized how closely pragmatism is associated with the kind of mystical experiences he was describing. I didn’t know that pragmatists believed in ghosts. Was Hamlet a pragmatist? He confronted the paradoxical nature of existence and didn’t try to explain away the contradictions with logical arguments. He grappled with the mystery through internal dialogue. That seems to me part of what is meant by being a pragmatist, and it has something in common with religious mysticism. James reassured us that it was immaterial to his purpose whether any of us personally enjoy or venerate such experiences, or whether we stand aloof and, observing them in others, suspect them of being illusory and vain. Like all human experiences, these too share in the general liability to illusion and mistake. They need not be infallible but they are certainly, James maintained, the source of the God-idea.

⁸ *Id.* at 266.

James was in the process of writing *On the Varieties of Religious Experience* when he gave his lecture on the pragmatic principle. Clearly, he was drawing upon some of the material from the book to illustrate the application of the principle. Still, the fact that a scientist of James's stature was interested in such phenomena and did not dismiss them, as so many scientists are quick to do, says something about the nature of the pragmatic attitude. It was becoming clearer to me as James spoke that pragmatism is above all a kind of attitude toward the surrounding world and not a philosophy in the traditional sense.

What James said next brought the debate over God and his relation to the world closer to home. It also revealed something about the nature of pragmatism. The debate between materialism and theism was an ancient one. At stake was the reality of miracles, which were supposedly a manifestation of God's providence over the world. Yet how many of us practical Americans here assembled in Berkeley at the turn of the twentieth century to hear Professor James speak were really concerned with that debate? We had other things on our mind, such as the idea, backed up by sophisticated mathematics, that the universe was heading toward some kind of "Big Freeze."⁹ There didn't seem to be anything God could do about it.

Still, the idea of God is not so easily banished from the world. James spoke of the revival of what in old times had been dismissed as the "pantheistic heresy," the idea that God is not an extraneous creator but the indwelling spirit and substance of the world. His colleague on the faculty at Harvard, Josiah Royce, had given a candid and clear account of the new theology in an address to the Philosophical Union just three years earlier. Royce's lecture had set off a debate among the philosophers present. The debate was not between materialists and believers in some kind of ideal reality. At the turn of the twentieth century, philosophy was growing more idealistic.¹⁰ The debate had shifted its

⁹ Cosmologists a century later are still debating the ultimate fate of the universe, whether it will end in "The Big Freeze" or "The Big Crunch." See NASA, Wilkinson Microwave Anisotropy Probe primer on cosmological concepts, *What is the Ultimate Fate of the Universe?*; available at http://map.gsfc.nasa.gov/universe/uni_fate.html (accessed 23 September 2011).

¹⁰ See James, *Philosophical Conceptions and Practical Results*, *supra* note 1, at 266 ("Religious philosophy, like all philosophy, is growing more idealistic.")

focus to the question whether a God dwelling within the universe left any room for morality and freedom.

James declined to go into the details of that discussion. Instead, he framed the debate in terms of the metaphysical question whether the world is at bottom One or Many. He found this question an exquisite example of the “*loggerheads* of metaphysics.” Parmenides and Spinoza say that the world is one great fact, whereas atomists and associationists in psychology see the world as many little facts. Hegelians say the world is both one and many, many in one. Is it not clear, James asked, when we take an adjective like “one” absolutely and abstractly that its meaning becomes so vague and empty that it doesn’t make any difference whether we affirm or deny it? What exactly do we mean in a practical sense when we describe the universe as one? In what way does the oneness come home to our own personal life? By what difference in our concrete experience does it express itself? How can you act differently towards a universe that is one? If we put the question in this way, James argued, we would see that its unity might be affirmed in some ways and denied in others. The question could be gradually cleared up, even though “a certain vague and worshipful portentousness might disappear from the notion of it in the process.”¹¹

James mentioned several possible practical meanings of oneness. Some thing is one if we can pass from one part of it to another without letting go of it. A collection is one even though the things that compose it are many. Oneness may mean generic similarity, so that you can treat all the parts of the collection by one rule and get the same result. Things may be one in origin, so that if we trace them backwards we arrive at one primal causal fact. All of these were ways that you could try to clear up the controversy between the monists and the pluralists by subjecting the notion of unity to practical tests. James said that he had little doubt that the old quarrel might be completely settled to everyone’s satisfaction if only the pragmatic principle were applied. The problem with the current monism is that it says that the world must be either pure disconnectedness—*i.e.*, no universe at all—or absolute unity. “It insists that there is no stopping-place half

¹¹ *Id.* at 267.

way.”¹² James re-affirmed his belief that if we attack the question in this way, searching out the possible connections, and conceiving them in a definite practical way, “the dispute is already in a fair way to be settled beyond the chance of misunderstanding by a compromise in which the Many and the One both get their lawful rights.” But at this point, he said he was afraid of becoming technical, and so he had to stop right there and let us go.

James concluded his lecture with a brief account of the philosophical origins of the pragmatic principle. Although Peirce was the first to formulate it explicitly, the basic idea could be traced back to the English-speaking philosophers beginning with Locke, Berkeley, and Hume in the seventeenth and eighteenth centuries, and continuing in the nineteenth century with James Mill, John Stuart Mill, and Alexander Bain. The great English way of investigating a conception was to ask what it could be known *as*, what facts does it result in, what is its “cash-value” in terms of particular experience. James acknowledged that some of the English empiricists had been too sweeping in their negations, but he maintained that it was they and not Kant who introduced the so-called “critical method” into philosophy. The problem with the English empiricists in his view came not so much from their eye to merely practical results but from their failure to track the practical results far enough to see where they would lead. James was alluding to his own philosophy he called “radical empiricism,” which he was just beginning to work out. James sympathized with Kant’s view that the mind plays an active role in the process of knowing. However, he criticized Kant as a symbol of a wrong-headed (*i.e.*, transcendental) idealism. He described Kant’s mind as “the rarest and intricate of all possible bric-a-brac museums,” and said that the true line of philosophic progress lay “not so much *through* Kant as *round* him to the point where now we stand.”¹³

As I left Professor James’s lecture that day, I thought about the meaning of pragmatism. If I understood his account of the principle of pragmatism, it was essentially a method of interpreting philosophical concepts. We should ask of any philosophical concept, what is its “cash-value”? The coin in which concepts are redeemed is some

¹² *Id.* at 268.

¹³ *Id.* at 269.

particular concrete experience. I wondered whether the pragmatic method wasn't a lot like Zadeh's linguistic approach to analyzing complex systems. They were both techniques for coping with vagueness based on non-binary ways of looking at the world. When James said that the world is partly one and partly many he is representing the universe as a kind of fuzzy set. Those who insist that the world must be either pure disconnectedness or absolute unity with no stopping-place half way are crisp thinkers. At the beginning of his lecture, James compared the principle of pragmatism to a clue or compass. By following it, we may keep our feet upon the trail of truth. In the final sentence of his lecture he said that he was placing the principle in our hands so that we may help the rest of us (himself included) in the struggle towards the light. So the principle of pragmatism was essentially an intellectual compass to point the way.

I'd heard a curious story about James' courtship of his wife Alice. Even after they had declared their attraction towards each other, James, in his usual manner, dithered over proposing. So Alice took matters into her own hands. She went north to Canada for the summer, but before leaving, she gave William a present—a small compass (as one of his biographers¹⁴ put it, “a large hint”). So Professor James had come west in 1898 to give us an intellectual compass—the principle of pragmatism—in the hope that it would guide us toward the truth in philosophical matters.

II. A First Class in Psychological Ethics

When he was seventy, John Dewey wrote an essay about his intellectual development titled *From Absolutism to Experimentalism*.¹⁵ Early in his career, Dewey was one of the absolute idealist philosophers James castigated in his lecture to the Philosophical Union at Berkeley, although Dewey was a Hegelian rather than a Kantian. In the early 1890s, when he was teaching philosophy at the University of Michigan, he

¹⁴ See Robert D. Richardson, *William James: In the Maelstrom of American Modernism* (Houghton Mifflin Company, 2006), at 174-175.

¹⁵ John Dewey, *From Absolutism to Experimentalism*, in *The Later Works of John Dewey*, Vol. 5: 1929-1930 (Ed. by Jo Ann Boydston, Southern Illinois University Press, 1984), 147-160. The Modern Language Association edition of Dewey's collected writings published by the Southern Illinois University Press consists of three series: The Early Works: 1882-1898; The Middle Works: 1899-1924; and The Later Works: 1925-1953. The standard three-part citation of Dewey's works, used throughout, consists of the series abbreviation, the volume number, and the page number(s). For example, the citation above would be: LW.5.147--160.

experienced an intellectual conversion from German idealism to the philosopher he remained for the rest of his life. Dewey said that reading William James's *Principles of Psychology* was responsible for giving his thought "a new direction and quality."

James's book contained one idea, Dewey said, that "worked its way more and more into all my ideas and acted as a ferment to transform old beliefs."¹⁶ This was James's return to the biological—*i.e.*, teleological or functional—conception of the *psyche* or human mind. Aristotle first proposed the teleological idea, but the return to it in modern times had new force and value due to Darwin's theory of evolution. According to Dewey, James didn't fully and consistently realize the significance of the biological conception of mind. Still, he praised James's vital sense of life and his profound sense—artistic and moral rather than "scientific" in origin—for the difference between the living and the mechanical. It was "reserved for James to think of life in terms of life in action."¹⁷ Dewey thought that this point, and the point about the biological factor in James's conception of thought, were fundamental to understanding the role of psychology in philosophy. It wasn't that psychology inherently had a closer connection than other branches of science did with philosophy. However, "historically and at the present juncture the revolution introduced by James had, and still has, a peculiar significance."¹⁸ The remoteness of his psychology from the abstractness of mathematics and physics, "its nearness to what is distinctively human, give it an emphatic claim for a sympathetic hearing at the present time."¹⁹

I think that Dewey's words are still true at the turn of the twenty-first century. In the topic of liability for transboundary harm to biological diversity we confront not just technical issues but also ethical questions. We cannot look to science to solve these distinctively human kinds of problems. As Sheila Jasanoff put it in calling for policies based on humility, "[w]e need to re-engage with the moral foundations for acting in the

¹⁶ LW.5.157.

¹⁷ LW.5.158.

¹⁸ LW.5.158.

¹⁹ LW.5.158-159.

face of inevitable scientific uncertainty.’²⁰ But where should we begin? For those engaged in trying to improve the Convention on Biological Diversity perhaps the most sensible place to start is with Darwinian biology. Our shared evolutionary history unites the peoples of all nations with each other and with all living things. Humans possess wondrous powers of mind. Perhaps, what Dewey found inspiring about James’s idea of the mind in *The Principles of Psychology* could, if the idea were more widely known, help us to find our way through what may seem like the trackless forest of our post-modern world.

We’ll come back to James’s psychology later in the chapter. For now, let’s go to Ann Arbor, Michigan in the early 1890s, where Dewey is teaching a class in ethics at the university. Inspired by his reading of James, he wrote the textbook himself in a hurry. He called it *Outlines of a Critical Theory of Ethics*.²¹ When that edition was exhausted, he prepared another titled *The Study of Ethics: A Syllabus*.²² He said in the preface that in no sense was it a second edition of the previous work. On the contrary, it undertook a complete psychological examination of the process of active experience and a derivation from that analysis of the chief ethical types and crises. To his knowledge, no one had ever attempted that task before. Liking to be on the cutting edge of ideas, even if they are more than a century old, I signed up for Dewey’s class.

On the first day, Professor Dewey dropped some hints about what was to come. The backbone of his ethical theory consisted of the conception of the will as the expression of ideas, particularly social ideas; the notion that an objective ethical world is realized in institutions that afford moral ideals, theatre and impulse to the individual; and the notion that the moral life consists in a growth in freedom as individuals find and conform to the laws of their social setting. Regarding the specific ideas that give flesh and blood to the backbone, he mentioned the idea of desire as an ideal activity in contrast with actual possession; the analysis of individuality into function, including capacity and environment; and the social bearings of science and art. He said that in presenting his

²⁰ Sheila Jasanoff, *Technologies of Humility*, 450 *Nature*, 33 (2007).

²¹ John Dewey, EW.3.239-388.

²² John Dewey, EW.4.221-362.

views he would adopt the method of comparing opposite one-sided views with the aim of discovering a more adequate, balanced theory. I thought that Professor Dewey's pedagogical method was similar to the pragmatic method described by Professor James: first set out the extreme positions and then look for the truth somewhere in the middle. It seemed to me like a sound strategy.

Of the flesh and blood ethical ideas, I was particularly interested in what Dewey meant by the analysis of individuality into function, including capacity and environment. He said that *function* is a term that signifies the union of the two sides of individuality—the power of doing on one side and something to be done on the other. To perform the function of a student, we don't just cultivate our tastes and possibilities internally; we also meet external demands of fact, of teachers, of others needing knowledge. (I took this to mean there would be exams.) The idea of meeting the external demands of the situation is fundamental to Dewey's notion of responsibility. A function, then, includes two sides—internal and external—that are reduced to elements in one comprehensive activity. Dewey compared the moral functions to an animal function such as digestion. The digestive function includes the food taken in just as much as it does the organs processing it. It's the work the digestive organs do in taking in the food. Similarly, moral function is capacity in action, the environment transformed into an element of personal service.

Dewey emphasized that it's a mistake to consider either the organ or the environment as fixed in itself. A function is not the exercise of a pre-determined organ upon an external environment or the adjustment of an organ to a pre-determined environment. "The nature of the *function* determines both the organ and the environment."²³ Like James, Dewey criticized the dualism in Spencer's notion that life and mind consist of an adjustment of inner to outer relations. A function is not a parallelism between organ and environment but includes and determines both. At first, I found this idea hard to grasp because of the apparent circular causal loop. I made sense of it by thinking in terms of the biological notion of co-evolution, a change in a biological

²³ EW.4.233 (emphasis in original).

structure or function caused by a change in a related structure or function. The “environment” Dewey speaks of is somewhat like the concept of a biological niche, in that two people can live in the same setting yet have different environments depending upon their interests. My environment consists of whatever corresponds to my desires and interests, which in turn modify my environment so that I feel more at home.

One of the fundamental distinctions in Dewey’s analysis is the distinction between action in general and the specific type of action he called *conduct*. Action is something that takes place and hence can be described like any objective fact. However, conduct implies more than something taking place; it implies a purpose or intention, an agent who is aiming at something, who has an end or goal consciously in view. All action has a cause; conduct has, in addition, a reason. Conduct is rational or purposeful activity. James had described the intentional element in conduct as “the idea of the yet unrealized end.” This end is not something in the future; it exists in the present but in the form of an idea, something to be realized through activity. Dewey used the expression “in view” to indicate the ideal nature of this type of end. The technical term he eventually developed for it was *end in view*.” He emphasized the importance of not confusing the two meanings of *end*—on the one hand, the termination or culmination of an action or process; and on the other, the ideal purpose that directs the activity from the beginning. By focusing on the purpose, we are considering the activity as a whole and thereby understand its meaning.

Dewey applied the notion of a function to the moral sphere by distinguishing between two factors in conduct—the agent and his sphere of action. From the point of view that considers the agent, no act can be part of conduct unless it is part of a system of plans (purposes) and interests. There are several necessary conditions for an act to be referred to the agent: (1) some end in view or foresight of the act’s consequences; (2) some interest in the act, the reason why it was preferred over some other alternative act; (3) some stability in the previous two elements so that the act proceeds from an established tendency or disposition to act in this way. Dewey emphasized that in analyzing conduct it was just as important to consider the situation as the agent. An agent always acts with reference to conditions that present themselves in the

environment. From the point of view that considers how environmental conditions, particularly social conditions, determine conduct, again, there are several ways in which the environment operates, or co-operates, in an act: (1) an agent is molded by education, conscious or unconscious, into certain habits of thinking and feeling as well as acting; (2) our acts are controlled by the demands made on us by the immediate circle of persons in our lives and the customs of society, as well as by the stimuli or surrounding objects such as books and tools, and opportunities available for exercising our capacities; (3) the situation does more than help to execute the agent's plans—it “reacts into consciousness” and thus alters the plans, strengthening or modifying them. All the existing ideals of practical agents result from a struggle for realization.

As I listened to Professor Dewey, I was struck by the number of technical terms such as *function* and *conduct*. His style was unlike that of Professor James, who tended to speak in ways that flowed over and around technical concepts and tried to evoke the direct experience of what he was talking about. With James you feel the idea, with Dewey you reflect on it. I wondered whether Dewey would have been possible without James. By that, I don't just mean that James acted as a ferment to transform Dewey from an absolutist to an experimentalist. There was something in James's unsystematic way of philosophizing that struck a deep chord in Dewey. I don't think it's any accident that Dewey's favorite philosopher was Plato. There were two Platos according to Dewey.²⁴ There was the artificial Plato constructed by unimaginative commentators who treated him as the original university professor expounding some philosophical system. Then there was the “dramatic, restless, cooperatively inquiring Plato of the *Dialogues*, trying one mode of attack after another to see what it might yield,” whose highest flight of metaphysics always ended in a social and practical turn.

It was time for Professor Dewey to give flesh and blood to his new theory of psychological ethics. I was especially eager to hear what he had to say about the underlying psychology of the ethical concepts of liability and responsibility. However, he began by talking about the nature of impulses. He said that all conduct is at first

²⁴ Dewey, *From Absolutism to Experimentalism*, LW.5.154-155.

impulsive, something that anyone who has ever observed a young infant would probably agree with. Although there's no end or purpose *consciously* in view, impulsive acts, like all conduct, are a type of purposive behavior. An infant follows light with its eyes. At a certain point in its development, it grasps objects placed in its hands. An infant has a talking impulse even though it doesn't know any words. And it doesn't repeat the same motions, so its actions are not habitual. Unlike habitual actions, which are always performed in the same way, impulses contain novel behavioral elements. Dewey noted that the term *impulse* is not synonymous with *instinct*. An instinct is a defined or limited kind of impulse with a fairly stable physical mechanism. Unlike other animals, humans have very few pure and simple instincts. Instead, we have "the loose beginnings and ends of very many instincts," which accounts for the greater variety of human as compared to animal actions. As a result, it's impossible to classify our native impulses, as traditional psychology texts do.

Impulses are acts that have proved themselves so important in the history of the species that they have become organized into the mental structure of the individual. The various kinds of impulses are not a loose bundle of tendencies; they are interconnected because they evolved together for the purpose of maintaining the life of the individual. One impulse tends to call up others. For example, an infant has a natural impulse to follow a brightly colored object such as an orange with its eyes. This activity of seeing tends to bring other experiences into consciousness. The pleasant visual experience may lead the infant to express the reaching impulse, which leads to a pleasant tactile experience. In turn, this experience may stimulate the eating impulse, and the infant puts a piece of the orange in its mouth and gets a pleasant taste experience. In other words, Dewey said,

*the expression of every impulse stimulates other experiences and these react into the original impulse and modify it. This reaction of the induced experience into the inducing impulse is the psychological basis of moral conduct.*²⁵

²⁵ Dewey, *The Study of Ethics: A Syllabus*, EW.4.236 (emphasis in original).

As far as Dewey could tell, humans are the only animals in which this reflection of later experiences into an impulse occurs. In other animals, stimulus and response have a purely serial order. Animal life is one of association, not of thought or reflection.

At this point, Dewey's Hegelian tendency showed itself. He called the back-reference of an experience to the impulse that induced it the *mediation* of the impulse. The term *mediation* comes from Hegel. Instead of using the term *relation*, denoting the linkage between two established things, Hegel used *mediation* to signify connections between things in the process of becoming or developing. When modern biologists describe the co-evolution of organs or organisms, they're essentially talking about "mediations." The term dropped out of Dewey's later works, replaced largely by *inquiry* or *reflection*. However, the idea of an interactive transformation of our ongoing active experience that results in the differentiation of a pre-reflective experience by means of a later reflective one remained fundamental to the whole of Dewey's thinking.

The process of mediation gives the original impulse a qualitative structure. For example, the next time an infant encounters an orange, the seeing impulse is modified by previous experiences. The idea or image of the pleasant tactile and taste experiences have become part of the impulse's internal structure. It's not simply that these later experiences follow the expression of the impulse; the infant becomes *conscious* that they follow. To the infant, these conscious back references or mediations constitute the meaning or significance of the impulse. In becoming an object of consciousness, the impulse is idealized, and we call this mediated impulse *will* or *volition*. Psychologically, mediation (a) idealizes the impulse, giving it a value or place in a whole system of actions and (b) controls or directs the impulse. The fundamental ethical categories result from this distinction.

At last, we were getting around to ethics. So far, Professor Dewey had been talking about things we'd discussed in his Advanced Psychology course, which used James's *Principles* as a text.²⁶ I was fascinated by the notion that memory and imagination play a decisive role in transforming us from the human-like creatures we

²⁶ See George Dykhuisen, *John Dewey and the University of Michigan*, 23 *Journal of the History of Ideas*, 513-544 (1962), at 531-532

were millions of years ago, dominated by impulses, to the social and moral beings we are today. However, what's the specific connection between these impulses and moral notions such as responsibility in a naturalistic ethics? We're still using the same traditional set of ethical terms and categories to describe moral human nature such as *will, habit, character, and conduct*. Yet the meaning of these words is different given their interpretation in terms of the new functional psychology and evolutionary biology. It seemed to me that Professor Dewey was right to say that he was doing something new in the field of ethics, but the words he was using were old. And the traditional ways of speaking presented problems for understanding the novelty of his views. We naturally read into those views old meanings, and sometimes the results seem paradoxical. I didn't see any way around the linguistic hurdles, other than to be on guard not to get tripped up by them.

According to Dewey, the fundamental ethical categories result from the distinction between (a) idealizing and (b) controlling or directing an impulse. Psychologically, the worth of an impulse is the whole range of experiences that presumably will result from acting upon it. This set of experiences constitutes the ethical *goodness* (or badness) of the impulse—the satisfaction (or dissatisfaction) it bears. The thought or imagination of these consequences reacts back into the impulse and modifies it in some way. The necessity of modifying the particular expression of an impulse by the whole system of which it is one part is the basis of the ethical concept of *obligation*. Any concrete act involves both phases. The act has a degree of goodness or value, described by how well it satisfies (or dissatisfies) the internal, subjective demands of the individual. The act also has a degree of rightness, described by how well it meets the external, objective demands or requirements of the situation. Well-adjusted conduct, which satisfies the demands of the individual and the environment, is free. Freedom is the third fundamental category of ethics, from which one can derive the concept of *responsibility*. Thus, in a functional ethical analysis, we have three sets of ethical ideas having to do with (a) the value, (b) the control, and (c) the freedom of conduct.

I wanted to hear more about the ideas of obligation and responsibility because they seemed fundamental to the paper I was writing on international liability for

transboundary harm to biological diversity. But, the hour was up. Professor Dewey said that he would talk more about them in the next class. Ever not quite, not quite. However, Dewey, like James, seemed to be blazing a trail that I might follow, if I only could, toward a pragmatic solution to the problem of international liability.

III. Getting the Mind in the Game

In December 1894, William James gave the President's Address to the meeting of the American Psychological Association at Princeton. In essence, the speech marked James's farewell to the science of psychology to which he had contributed in his books *The Principles of Psychology* and its shorter undergraduate version *Psychology: Briefer Course*. In the bigger picture, it represented James break with the dualistic point of view that constituted the orthodox philosophical position underlying the empirical science of psychology. He had long ago abandoned that dualism in his own thinking about psychological and philosophical questions. In effect, he was using the occasion both as a formal goodbye to the profession and as an embarkation on a philosophical journey that would take him, among other places, to the Pacific coast in 1898 to start the movement known as classical American pragmatism. He would do both things together, which seems to fit with the title of his address, *The Knowing of Things Together*.²⁷

Since I was a student in Professor Dewey's Advanced Psychology class, I thought I'd attend James's lecture in the hope that some of the things he said might act as a ferment for my own thinking. Dewey had described James's theory of mind as revolutionary. By going I might get a better sense of what made his view such a radical departure from traditional theories in psychology.

Professor James began by mentioning one of the great fundamental problems that divide the various schools of psychology. At the heart of the problem was a group of familiar experiences. For example, we know a lot of friends and can think of each of them individually. But we can also think of them as making up a "party" at our house. In a glass of lemonade, we can taste both the lemon and the sugar at the same time. If we

²⁷ William James, *The Knowing of Things Together*, 2 *The Psychological Review*, 105-124 (1895), reprinted in *Essays in Philosophy* (The Works of William James, ed. by Frederick Burkhardt, Fredson Bowers, & Ignas Skrupskelis, Harvard University Press, 1978), 171-189. Citations are to the latter.

hear a C major chord, our ear can pick out the individual notes once we has been become acquainted with them separately. The whole field of our experience, whether conceptual or sensible, is filled with such phenomena. Neither common sense nor commonplace psychology gives them a second thought. The most psychologists say is that the “ideas” of the various things “combine” in some way, which we might inquire into. But James refused to accept this account or the approach behind it. To describe the phenomenon of knowing things together as a combining of ideas was to foist a theory upon the phenomenon itself. That’s the wrong way to go about the inquiry. The phenomenon presents itself in the first instance as that of *knowing things together*. It’s in those terms that a solution to the problem must, in the first instance at least, be sought.

What do we *mean* by “things”? What do we *mean* by to “know” things? What do we *mean* by to know the “same” things “together” that elsewhere we knew singly? James believed that we mean something, and we mean something true. Whatever confusion is connoted by our questions, they at least denote a fundamental fact of our experience whose existence no one of those present would deny.

I certainly wouldn’t deny it, particularly after having spent so much effort thinking about what I meant by “biodiversity,” convinced that I did mean something and something true. And “biodiversity” was a lot more complicated than what Professor James was talking about, or so it seemed. So I should have phrased the question, how does “biodiversity,” in the first instance, present itself? And I should have sought an answer, in the first instance at least, in those terms. No theories about it, no measures for it, just the fundamental fact of how I experience it, at least to begin with.

So, what do we mean by “things”? James said that “things have no other nature than thoughts have, and we know of no things that are not given to somebody’s experience.”²⁸ When you look at the white paper in front of you, the nature of the thing and the nature of your sensations are one. The stuff of which it is made is “thought-stuff,” and whenever you speak of something that is out of your own mind, you either

²⁸ *Id.* at 72.

mean nothing, or you mean a thing that was or will be in your mind on another occasion or a thing that's in the mind of some other possible receiver of experiences like ours.

I wasn't quite sure what Professor James meant by "thought-stuff." It seemed to me that his way of speaking left him open to the criticism that he believed the world consisted of a single kind of mental substance that took on various forms. However, that idea sounded like a materialistic theory that everything is matter, and I didn't think James was proposing to substitute a mental monism for a material one. In the traditional philosophical battles between monists and pluralists, James sided with the pluralists. On this occasion, his colorful way of speaking may have betrayed him, but his point seems clear enough. Humans can only speak about things that present themselves in human experience. What could one possibly *mean* by a "thing" that can never be part of someone's experience? James listed a number of possibilities, but I tend to think the first one generally comes closest to the mark. One doesn't mean a thing.

So, what do we mean when we say we "know" a thing? After Kant, this question had become the mainstay of philosophy. Epistemology is the study of episteme (επιστημη), the Greek word for knowledge. The question is also a psychological one. Indeed, one could hardly separate psychology—the study of the soul (ψυχη)—from philosophy, but the audience of psychologists to which James was speaking regarded themselves primarily as scientists. Psychology was becoming a laboratory science, based on empirical methods of research and scientific (*i.e.*, statistical) standards of proof. James had come to Princeton to bid *adieu* to the positivist approach to psychology, but that only comes at the end of his address. In the meantime, he talked about his familiar theory of two ways of knowing things, either (a) intuitively or immediately (as Dewey might say) or (b) conceptually or representatively.²⁹

James first talked about conceptual knowledge, in which the traditional dualism between the knowing subject and the known object was the source of endless philosophical debates. The difficulty in theories about how we know the world is that the

²⁹ For James's earlier account of the two ways of knowing see *On the Function of Cognition*, 10 *Mind*, 27-44 (1885); *rev. and reprinted in* *The Meaning of Truth* (The Works of William James, ed. by Frederick Burkhardt, Fredson Bowers, & Ignas Skrupskelis, Harvard University Press, 1975), 13-32.

thing we know exists outside the mind, yet the knowledge of the thing is within the mind. Representational theories of knowledge attempted to get around the problem by claiming that the object in the mind is really a representation or idea of the thing outside. James tried to dispel the mystery surrounding conceptual knowledge by linking a concept and the object it means or intends through a chain of intermediate perceptual and conceptual experiences. “*To know an object is here to lead to it through a context which the world supplies.*”³⁰ In the case of immediate or intuitive modes of knowing, the mental content and its object are identical. There is no intervening chain of experiences. James said that even though his definitions of conceptual or representational knowledge and intuitive knowledge were very different, neither involved the mysterious notions of “self-transcendancy” or “presence-in-absence essential to the theories of knowledge both of common men and philosophers.

Yes, I thought, some of the mystery is gone because everything takes place *within* experience. The only difference between conceptual and immediate, perceptual knowledge is that the first involves a sequence of experiences whereas the second involves only one. There was nothing outside of experience that somehow enters into knowing a thing. However, Professor James’s idea of experience was becoming a bit more mysterious to me. He didn’t say anything about his notion of experience, but his theory seems to depend upon a kind of experience very different, indeed radically different, from that of traditional English empiricists. For them, conscious experience is just a kind of residue of our thinking processes. For James, experience is dynamic. As he said in his chapter on the stream of thought in the *Principles*, the first fact of psychology is that “thinking of some sort goes on.”³¹ In conceptual knowing, thinking goes on through a sequence of thoughts, whereas in immediate knowledge, there is just one instant field of consciousness. But to say that the activity of thinking is the primary fact of psychology leaves out an awful lot of what’s in the textbooks—things like the “I” that thinks. It’s a good think Descartes isn’t here.

³⁰ *Id.* at 74 (emphasis in original).

³¹ William James, *The Principles of Psychology*, *The Works of William James* (ed. by Frederick H. Burkhardt, Fredson Bowers & Ignas Skrupskelis, Harvard University Press, 1981), at 219.

James took up the next question, what does it mean to know the “same” things “together”? He proposed to look for an answer by looking at experience in its simplest possible form, what he called the “smallest effective pulse of consciousness.” He wasn’t talking about the underlying physiological events in the brain but the tiniest feelings that accompany these neurological events. To consciousness, the only thing that concretely was, is, or shall be is the *passing* moment. The idea of the present moment is an unreal postulate of abstract thought. Within each passing moment are two sub-feelings, one earlier, one later, as well as a sense of their continuous procession. James drew a diagram of a passing moment that showed it as a kind of bell curve, which he asked us to imagine as moving horizontally. “The rush of our thought forward through its fringes is the everlasting peculiarity of its life.”³² Our mental life is always off-balance, always in transition, “something that shoots out of a darkness through a dawn into a brightness that we know to be the dawn fulfilled.”³³ Inside this minimal pulse of consciousness, the elementary datum of which both our physical and mental worlds are built, we find the prototype of the mental operation of knowing of things together. The fact that past and present are already parts of the least experience that really can be is similar to what we find in other experiences whose parts are many, such as our field of view, the glass of lemonade, the musical chord. Can we explain the being-known-together of such complex facts? James thought that the general nature of the phenomenon would probably always be beyond our grasp. Because such a unity in manyness is the ultimate essence of all experience, we may never be able to account for the phenomenon. However, we could attempt to trace the particular *conditions* whereby we know particular things together.

James said that he had no pretensions of giving a positive solution; his sole ambition was to smooth the ground somewhat by a little classification so that some in the audience more able than he was could, perhaps before the next meeting, help him to advance to results he could not presently obtain. I thought about his path-finding speech to the Philosophical Union of Berkeley where he had similarly begged off from the task of providing definitive answers to questions he’d raised and instead put the matter in our

³² William James, *The Knowing of Things Together*, *supra* note 27, at 77.

³³ *Id.*

hands. But who besides Professor Dewey really understood where James was going? Another thing that struck me was that the diagram he'd drawn on the board looked like a fuzzy set. When he drew a series of these minimal pulses of consciousness overlapping with each other, I thought of the way that fuzzy systems theory partitions a linguistic variable by means of overlapping fuzzy subsets. So it seems Professor James was a fuzzy thinker a century before it became fashionable. We hear a lot about the philosophical affinities of fuzzy logic with Zen Buddhism and other eastern philosophies. Why hasn't anyone pointed out the connection with classical American pragmatism? Could it be because the philosophical gurus of fuzzy logic haven't read *The Principles of Psychology*? Before there was fuzzy thinking there were vague, complex phenomena in our mental life, of which James is one of the keenest scientific observers.

What are the conditions of our knowing many things together? James said that "the first thing that strikes us in these complex cases is that the condition by which one thing may come to be known with other things is an *event*."³⁴ Often the event is of a physical order, as when someone walks into our field of view and becomes part of it; or when you hold your nostrils and put a drop of cologne on your tongue, you experience the taste alone, but when you open your nostrils, you get the smell together with the taste. However, in many cases, the physical conditions are realized without the things being known together. When performing the experiment with the cologne, the clock may strike and you might not be aware of it. James pointed to the psychological experiments centering on the phenomenon of dissociation of consciousness as in studies of hypnosis, hysteria, and trance-states. He asserted that these curious phenomena revealed more about the nature of consciousness than the work of all the psycho-physical laboratories put together. The phenomena of dissociation indicated to James the need for an additional inner event, over and above the physical events, as a condition for knowing things together. He called this inner event *attention*.

The need for attention as a condition of knowing things together falsified, in James's view, the accounts based on the associationist theory in psychology. By

³⁴ *Id.* at 79 (emphasis in original).

associationist theory, he meant any theory that said, explicitly or implicitly, that for a lot of objects to be known together, it sufficed that a lot of conscious states, each with one of them as its content, should exist, as James Mill said, “synchronically.” Synchronicity did not suffice, as the dissociationist experiments had shown. Therefore, one could say (as Kant, among others, did say) that the “[u]nion in consciousness must be *made* by something, must be brought about.”³⁵ Recognizing this truth was the great merit of the anti-associationist psychologists. However, for James, that general recognition was pretty much all that the anti-associationist psychologists deserved credit for. Their chief attempts to fill the gap had all, in one way or another, failed. James catalogued the various kinds of anti-associationist theories and briefly described their faults. He described this portion of his talk as “gossip to while away this unlucky presidential hour to which the constellations doomed me at birth.”³⁶ But, he continued, since we’ve had to have gossip, he’d make the hour more gossipy still by saying a final word about the position he had taken on the question of knowing things together in his own *Principles of Psychology*. I sensed a general snapping-to-attention in many of the psychologists in the room.

James began by reminding his colleagues that his position had been vigorously attacked at the previous meeting. That position consisted in the proposal to eliminate from psychology, considered as a natural science, the whole business of explaining *how* we come to know things together. That task belonged to metaphysics. That we do know things together is an indisputable fact. That states of consciousness are the vehicles of knowledge and that these states depend on brain states were two other facts. James had proposed that the science of psychology confine itself to the task of tracing functional variations of these three sorts of fact and ascertaining what determinate body states are the conditions when the states of mind know things and groups of things. James had suggested treating states of mind that know compound things as unique kinds of mental entities different from any collection of simpler states. The result would be a psychology that, while it doesn’t ultimately explain the facts, at least avoids the traps into which the

³⁵ *Id.* at 80.

³⁶ *Id.* at 86.

associationist school and the anti-associationist school alike fall. It would be a psychology infinitely more complete than the psychologies we now possess, and it could be written without abandoning the terms of scientific psychology. James professed surprise that this child of his genius should not have been more admired by others, indeed that it should have been so misunderstood or even despised. However, the psychologists present should not fear that he was going either to defend or to re-explain the bantling. In the interests of harmony, he proposed simply to *give it up*. Since publishing the *Principles*, he had become more convinced than ever that no conventional restrictions could keep metaphysics and epistemology out of the psychology books. Moreover, his proposal to designate mental states simply by their cognitive functions led to a strained way of talking about things like dreams and reveries and an unnatural way of speaking about emotional states. So he was willing henceforth to call mental contents complex, just as their objects are. Complex mental states are complex not because their parts are separable like those of physical objects (as the associationists claimed), nor because they have an eternal or quasi-eternal existence (as the mental atomists claimed). James likened complex mental states existentially to integers—“their parts only live as long as *they* live. Still *in* them, we can call parts, parts.”³⁷ James said that, in coming over to the views of those in the audience, he insisted that the audience recognize the obligation that the agreement imposed on them. They should drop the absurd, empty old phrases about ideas “self-compounding” or being “united by a spiritual principle.” They should take up an inquiry, like the one he had just failed in, into the conditions of our knowing things together. Not until then would psychology derive the benefit from the conciliatory spirit of which he had tried to set an example.

As I walked back through the Princeton campus after James’s talk, I thought about his “retraction” of his position in the *Principles of Psychology* that metaphysics and epistemology should be eliminated from the natural science of psychology. It seemed to me that he was telling us that he no longer felt bound by the conventional restrictions or disciplinary boundaries of knowledge. He rejected the positivist philosophy underlying

³⁷ *Id.* at 88.

experimental psychology, which treated mental phenomena as if they were physical ones to be studied by so-called “objective” methods of precise measurement. He had little patience for the disciplinary squabbles among associationist and anti-associationist psychologists, although he praised the anti-associationists at least for recognizing that the need for an act of attention means that our complex ideas—like lemonade—must be *made* by something. But must there be a *conscious maker*?

I remembered something James wrote in his first philosophical essay criticizing Herbert Spencer’s evolutionary theory of mind.³⁸ Although James agreed with Spencer that our cognitive powers were produced by Darwinian evolution, he thought that Spencer—like every philosopher—went profoundly wrong in suggesting that our mind passively reflects or “mirrors” the external world. The metaphor of the mind as a “mirror of nature” that reflects objective reality underpins the traditional notion that knowledge is essentially accuracy of representation.³⁹ It’s the basis for the correspondence theory of truth. According to this Cartesian view of knowledge, achieving a more accurate conceptual model of reality is a matter of gradually eliminating distorted representations in our mental mirror and substituting more adequate ones. The metaphor of the mind as a mirror of nature still pervades our thinking in the twenty-first century.

James argued that the human mind is fundamentally active, constantly pursuing a plurality of vital interests. Love of consistency in thought and idealistic loyalty to truth (with a capital T) are particular forms of aesthetic interest, which evolved relatively late in human history along with many other similar aesthetic interests. There is no *a priori* reason why we should view scientific interests as more worthy than the others. If we may doubt one, we may doubt all. We should evaluate each interest by its practical consequences. James replaced the mirror metaphor with a metaphor of the mind as an active participant in the process of knowing reality:

³⁸ William James, *Remarks on Spencer’s Definition of Mind as Correspondence*, in *Essays in Philosophy* (The Works of William James, ed. by Frederick H. Burkhardt, Fredson T. Bowers, & Ignas K. Skrupskelis) (Harvard University Press, 1978), 7-22.

³⁹ For a critique of the mirror metaphor by a modern neo-pragmatist philosopher see Richard Rorty, *Philosophy and the Mirror of Nature* (Princeton University Press, 1979).

I, for my part, cannot escape the consideration, forced upon me at every turn, that the knower is not simply a mirror floating with no foot-hold anywhere, and passively reflecting an order that he comes upon and finds simply existing. The knower is an actor, and co-efficient of the truth on one side, whilst on the other he registers the truth which he helps to create. Mental interests, hypotheses, postulates, so far as they are bases for human action—action which to a great extent transforms the world—help to *make* the truth which they declare. In other words, there belongs to mind, from its birth upward, a spontaneity, a vote. It is in the game, and not a mere looker-on; and its judgments of the *should-be*, its ideals, cannot be peeled off from the body of the *cogitandum* as if they were excrescences, or meant, at most, survival.⁴⁰

We know so little about the ultimate nature of things, and about ourselves, it would be foolish to say that an ideal rational order extending beyond the surface of ordinary experience may not be real. The reality of a thought is proportionate to the way “it grasps us.” The only objective criterion of reality is coerciveness over thought. We measure an idea’s reality by its intensity and seriousness—in a word, its interest for us—taking these qualities not at any given moment but as shown by “the total upshot of experience.” If judgments of the *should-be* are fated to grasp us in this way, then they “correspond” to reality.

James concluded the essay with a reference to the “fate of thought.” The ancients, he said, had placed the concept of Fate at the bottom of things, deeper than the gods themselves. For James, the inscrutable nature of ultimate reality, including the depths of human nature, seems to play the role of fate in conscious mental life. He acknowledged that phrases such as the “fate of thought” are barren and indeterminate formulas for the deepest workings of the mind, but he believed that trying to be more precise is hopeless. In his *Principles of Psychology*, James tried to re-orient the empirical science of psychology toward a more subjective inquiry into concrete phenomena of mental life. In his address, he seemed to acknowledge that he had failed, that the dualistic point of view expressed in the metaphor of the mind as a mirror passively reflecting an extra-mental reality was too pervasive. It seemed to me that the idea of a radical new kind of

⁴⁰ William James, *Remarks on Spencer’s Definition of Mind as Correspondence.*, *supra* note 38, at 21.

empiricism, based on the concept of active experience, was calling Professor James, and he had come to the annual meeting of psychologists to say farewell.

IV. Freedom and Responsibility

Professor Dewey said that he wanted to talk about the ethics in psychological ethics. The discussion interested me because the moral categories of good, obligation, and responsibility are fundamental to the topic of international liability for transboundary environmental harm. In the *Trail Smelter* case, settlers around Northport, Washington described the damage from the smelter smoke not just to their crops and trees but also to their way of life, their livelihood. Of course, the citizens of Trail, British Columbia had their own way of life that depended upon the continuing operation of the smelter. In the convention establishing the Trail Smelter Tribunal, the governments of Canada and the United States asked the three-member panel to do justice in the case. By the word *justice*, they highlighted the moral aspects of the situation. How could the Tribunal balance the conflicting values and interests? What obligations did the smelter have to prevent damage? If damage should occur, what responsibility, if any, did the smelter owners have to make the settlers whole? These were not just, or even primarily, legal questions but moral ones.

Dewey began with the distinction between natural good and moral good. Natural good, or natural value, is the immediate satisfaction of an impulse, such as the satisfaction we get from fulfilling our appetite for food or drink. The process of reflection replaces natural good with moral good or moral value. Moral good is the natural impulse viewed as part of a whole system of impulses, each demanding satisfaction. Dewey used a metaphor from economics to clarify the distinction. Natural value is equivalent to what economists call “use value,” value that is directly enjoyed but not measured. Moral value is similar to what economists call “exchange value,” which is defined or measured through interaction in the market. The process of reflection sets up a standard or criterion for determining the value of our native impulse so that it no longer has worth in itself but only in relation to the whole set of desirable experiences it will lead to.

I was surprised by Professor Dewey's definition of the good as the satisfaction of an impulse. Usually, we think that we desire something because we find it good in some way. At least, that was the teaching of Plato and Aristotle—we have an innate impulse toward good things, and ultimately, toward the highest Good or Summum Bonum. Our natural impulses tend to drag us down and lead us astray from the pursuit of the good. What Dewey just said stands that doctrine on its head—we call something “good” precisely because it satisfies a natural impulse. The standard for evaluating the relative merits of these natural goods is not extrinsic but intrinsic to human activity. A special kind of activity, the process of reflection, is the source of the criterion by which we order the various kinds of goods in a system. So, it seems that Professor Dewey has broken the mirror of nature too. The human brain, like the lungs or the heart, is an organ continually active and interacting with the surroundings. Energy flows from the outside, through the nervous system, and back to the environment in a continual cycle. Our impulses are like channels in the mind through which the energy is directed toward certain things in the environment such as something suitable to eat. We view those things that satisfy our impulses as “good,” but most of the time we don't think about them as such. We just go about our normal business of eating, drinking, sleeping, and so forth. However, occasionally something forces us to think reflectively about our impulses. Then, natural goods become conscious or ideal goods as we think about how we can accommodate as many impulsive demands as possible. We systematize the various kinds of goods in a way that suits our interests. In controlling and idealizing our impulses we behave as humans.

Dewey said that we can look at the mediating process from two standpoints, just as in any commercial transaction there is one reality, but the process will be described differently depending upon whether one is the buyer or the seller. The same thing is true in measuring moral value. The whole process is one of adjustment, balancing, coordination, but we can identify ourselves in imagination either with the inducing impulse or with the impulses and experiences induced. If we look at the process from the standpoint of the inducing impulse, there is first the checking of its expression, the damming up of its natural energy, followed by its gradual transformation and

reinforcement. Blocking the expression of an impulse provides the conditions for our experience of *desire* and its struggle for fulfillment. The impulse is directly felt in consciousness as the present factor. However, as the other impulses stimulated by it begin to appear in consciousness we may identify with them and tell the story from their point of view. As induced and derivative, these impulses are not immediately present but exist as ideas. Yet their reflective character is not equivalent to unreality; they make themselves felt by checking the very impulse that aroused them. They are like the *law*, the controlling power of that impulse. They determine in what form, under what conditions of time, place, and quality it may be satisfied. They say to the original impulse, “You are what you are alone or in yourself, but your value is what is in relation to us.”⁴¹ Thus these induced experiences—Dewey calls them *reason*, for short—become the standard of measurement for the natural impulse. The experiences reflectively brought forth not only transform but also reinforce the original impulse. They have their own impulsive quality or urging for expression, which Dewey described as the *ideal*, the reflective good. The gradual self-assertion of desire up to choice or preference and the gradual formation of an ideal up to resolution or decision are one and the same process of mediation looked at from the two standpoints. Gradually, they merge into a complete unity, the overt act. Dewey describes the whole process as one of discovering and applying the criterion for estimating value—in short, a process of testing, of proving, until in the act there is a completed moral approbation.

Dewey talked about the central role of attention and interest in the reflective process by which an end becomes developed into an act. At first, the end is purely intellectual—it’s a *proposed* end, not an actualized one, just a plan, an intention, a purpose. However, the relation of this idea to the impulse that called it into being tends to unite the idea’s destiny with that of the impulse and thus to confer upon the idea a practical value. Dewey said that the psychological concept of attention reveals the principle of the connection of idea and impulse in its basic form. Attention is “an idea or

⁴¹ Dewey, *The Study of Ethics: A Syllabus*, EW.4.248.

set of ideas so completely bound up with an impulse that they demand realization.”⁴² The distinguishing feature of attention is that it arouses the whole set of ideas relevant to the impulse and *only* those. All other ideas die out as they arise because of their irrelevance to the realization of the impulse. Thus the full development of an ideal or end on the ethical side is the same thing as what psychologists call *reflective attention*, just as the direct satisfaction of an impulse is equivalent to non-voluntary or *direct attention*. Dewey cited James’s *Principles* as the basis of his theory of attention. By general consensus, interest is bound up with attention. Given the close relationship, it makes sense that the development of the idea on the intellectual side and the development of motive on the practical side occur together in the same process. Dewey called them two phases of reflective activity that could be considered separately but in fact are always found together.

In analyzing the rational content of a voluntary act, we have to consider what the agent *means* to do, what his intention is. The presence of meaning is the primary thing differentiating a voluntary from an impulsive act. It constitutes reflection or control of the impulse by reason. Dewey noted that so far he had simplified the discussion by ignoring the conflict of aims or the difficulty of making a decision in many cases. The natural satisfaction of an impulse, the course it would take if left to itself, and the rational or mediated satisfaction contend in the mind. Dewey called this the basis of the moral struggle, the conflict of desire and duty. The various suggested ends may not harmonize, so it’s necessary to bar some of them, or find some more comprehensive aim in which the conflicting intentions can be adjusted. We have to deliberate, consciously to weigh and balance our values. Dewey rejected the notion that deliberation was some kind of coldly intellectual process. In reality, it was a process of tentative action in which we “try on” one or another of the various ends, imagining ourselves doing them, going as far as we can in this make-believe action without actually doing them. Often, Dewey said, we get carried away. A given impulse gets a hold on us while we’re trying it out and we cross the line and, without consciously intending it, we pass into overt action. This temporary

⁴² *Id.* at 250.

relapse into a “compulsory idea” is especially common if our character is immature. Decision, resolution, a final plan is the outcome of the deliberative process. Out of the conflict of ends emerges a purpose that, whether through suppression or comprehension of other ends, expresses our self under the circumstances. There is no outside agency of power, will, or attention that enters into the process. The process of deliberation is the process of will or attention.

Dewey next considered the process from the side of motive, the identification of the aim with the impulse, the rational spring to action. Attention cannot be separated from interest, so the formation of a plan cannot be separated from the reaction of the plan into the self. Every end that occurs to our mind awakens a certain amount of interest, which has a certain value associated with it. That the end stays in mind is an indication of its continuing value. The extent to which the thought tends to stir the self measures the motive power of the thought. A conflict of emotions, the play of hope and fear, of doubt and expectation, of tension and ease, accompany the intellectual conflict over ends. Dewey singled out one of these emotions for special attention—the consciousness of *effort*. “Effort is the same process, stated in terms of emotion, that we call consideration or reflection when stated in terms of rational content.”⁴³ He criticized the common view that effort is the will asserting its own power against some external resistance. Dewey rejected the dualism implicit in this view. It was the same dualism implicit in any act of attention. On the one hand we have the self as attending, the group of impulses and habits trying to assert themselves. The content attended to seems to be outside the self, resisting its efforts to express itself. The fallacy in this view is that it takes the self as fixed. For Dewey, the moral struggle of the self is internal. The fact that we entertain certain ends that we end up rejecting as “bad” shows that these “bad” impulses are part of our self along with the others we call “good.” Which will carry the day is not determined until the decision is made and the will makes its choice in favor of one act or the other. One’s self may overcome temptation, but it is no longer the same self as it was before it was tempted. Dewey would say it’s a stronger self.

⁴³ *Id.* at 253.

I remembered Keats's term for a peculiar quality possessed by great writers like Shakespeare—*negative capability*. A person with negative capability is someone “capable of being in uncertainties, Mysteries, doubts without any irritable reaching after fact & reason.”⁴⁴ I asked Professor Dewey about negative capability, and he said that although he found Keats's statement somewhat elliptical, he shared with him the conviction “that ‘reasonings’ have an origin like that of the movements of a wild creature toward its goal, and they may become spontaneous, ‘instinctive,’ and when they become instinctive, are sensuous and immediate, poetic.”⁴⁵ The other side of this conviction is that “no ‘reasoning’ as reasoning, that is as excluding imagination and sense, can reach the truth.”⁴⁶ The mind's ability to sustain the intellectual and emotional effort of deliberation depends upon its “negative capacity” to entertain conflicting partial goals without prematurely diminishing the creative tension needed to devise imaginative solutions to practical problems.

Professor Dewey next turned to the psychology of obligation. He noted a curious split personality almost in our sense of duty. On the one hand, it seems that the thing we ought to do stands over and against our self and utters the categorical imperative “thou shall” or “thou ought” instead of drawing us to it by its intrinsic attractiveness. It would seem that we don't really want to realize the ideal. On the other hand, in spite of the apparent opposition between the agent and the ideal, consciousness of duty carries with it a sense of a fundamental underlying identity. There seems to be some awareness that in reality the ideal more adequately expresses the nature of the self than our current self does. Dewey explored the psychology of the two-fold relation in our sense of duty by using a concrete example of someone who marries or takes up a new profession. We say that they have “assumed the obligations” of a new condition or occupation. Their former habits cannot continue unchanged, or just slightly modified, but must be subordinated and readjusted to new aims. Here we have, Dewey said, the psychological conditions for the feeling of obligation. The old habits continue to assert themselves as if by their own

⁴⁴ Keats, Letter of Dec. 21, 1817, in *Romanticism: An Anthology* (ed. by Duncan Wu) (3rd ed., Blackwell, 2005) at 1351.

⁴⁵ See John Dewey, *Experience and Education*, LW.10.40

⁴⁶ *Id.*

inertia and momentum. From a moral and psychological standpoint, it's important that they do, for if the habits were entirely dissolved, there would be no means for forming new ones. The person would be "a moral pulp." What's needed is not the destruction but the re-direction of these old habits. Dewey thought that the expression of an old habit carried *within itself* its making over. The responsibilities of the new status or profession arise from the former interests and lines of attention.

Our sense of duty, then, is a phenomenon of moral *progress*. Dewey observed that the nature of progressive action required both conservative and radical factors. An ideal, without existing habits and impulses that represent the past—impulses, the history of the human race, habits of the individual—has no machinery or instrument for its realization. Reform must always be re-form, a readjustment of existing habits to give them new value. The past can be maintained only by being used. Left to itself, it decays and creates friction.

Dewey associated duty with critical periods, periods of greater or lesser readjustment, of adaptation of old habits to new needs. The connection of obligation with periods of reconstruction in moral progress implies the individuality of duty. Dewey maintained that no two persons have, or can have, the same duties in a concrete sense. "Truth-telling is a duty for all, but it is not the duty of all to tell the same truth because they have not the same truth to tell."⁴⁷ Dewey thought that theories of ethical relativity stopped half way. The idea of relativity implied that there is still some absolute standard and duty for everyone, but that due to circumstances, we aren't up to it yet and so have to make do with relative morality. However, if one assumes that conduct is an expression of the individual, "the whole relativity industry is outlawed, while all the facts brought out in its maintenance are amply preserved. The standard and process are absolute, but (and because) individual."⁴⁸

What Professor Dewey said about the individuality of duty reminded me of something that Robert Quentin-Baxter said about the *Trail Smelter* case. He used the *Trail Smelter* case as a working model for the international liability topic because "this

⁴⁷ Dewey, *The Study of Ethics: A Syllabus*, EW.4.317-318.

⁴⁸ *Id.* at 317, fn. 30.

arbitration between the United States of America and Canada is at once unique and prototypical. For forty years it has stood almost alone.”⁴⁹ It took the Arbitral Tribunal several years to render its final decision about the nature of the operating régime imposed on the smelter because they needed data from studies of the specific air current patterns in the Columbia River valley. The smelter’s obligations were individual, as they had to be for the Tribunal to do justice in the case. I think that may be why some legal scholars find the case dissatisfying, particularly if they’re looking for a sweeping generalization about the customary law principle of state responsibility for transboundary environmental harm. The Tribunal tailored their interpretation of the smelter’s duties to fit the circumstances in the case before them. Obligations arise out of the demands of the situation. What a state *ought* to do cannot be determined without looking carefully at the circumstances, the environment in which the state acts. Each situation is unique, and so the moral—and legal—demands it makes are unique. That conclusion seems to me the truly general principle of the *Trail Smelter* case. But what’s the relation between a state’s moral obligations and its legal ones?

Professor Dewey came to the third of the three basic ethical categories—freedom and responsibility. Freedom of the individual is really the third category, but responsibility is inextricably bound up with freedom. Whenever he gave an essay question about freedom, it was always phrased as “freedom and responsibility.” Before he discussed the ethics of freedom and responsibility, he talked about the psychology of freedom. Immediately, I shuddered, thinking he was going to get into the metaphysical issue of free will. However, as he spoke I realized that he was describing the active experience of freedom in a practical sense.

Dewey had described the immediate act of the will as impulsive and direct. The experiences induced by an impulse react back into the impulse and modify it, giving rise to another phase of moral experience. So far as the ideal end produced by the reaction reinforces the immediate tendencies of our habits and impulses, we experience desire and

⁴⁹ Robert Quentin-Baxter, *Second report on international liability for injurious consequences arising out of acts not prohibited by international law*, U.N. Doc. A/CN.4/346 and Add. 1 and 2, para. 22, in *Yearbook of the International Law Commission 1981*, vol. II (Part One), U.N. Doc A/CN.4/SER. A/1981, at 108.

consciousness of good. So far as the reaction checks and reconstructs them, we experience a sense of effort and consciousness of duty. We go through a process of reflective deliberation, pervaded by a sense of desire and of strain or effort, about what to do in a particular situation. The process reaches a completion in what we call a *deed*. Dewey argued that we cannot distinguish a deed as act from a mere getting ready to act. The whole process of working out ends, selecting means, estimating moral values, recognizing duty is one of activity at every point. It is dynamic and propulsive throughout. A deed is simply this activity focused, brought to a head. Dewey called it the “round up.”

On the one hand, the deed defines the self. Up to now, everything had been tentative, an experimenting in imagination. The self had been engaged in a voyage of discovery, which has at last resulted in a map that shows the limit, external and internal, of the activity. The culmination of the reflective activity is a complete co-ordination or unification. Dewey described the whole development as an increasing range of stimulation, bring this and that further habit or impulse into play. A moral struggle in the psychological sense means not the sacrifice or exclusion of one value by another, but its inclusion or comprehension. The process is not one of suppressing desire or habit but one of directing and using them as tributary factors. Physically, the deed itself may be either-or, as when one takes either the right- or the left-hand road. But morally, the meaning or value of this one-sided deed has the competing ends and values absorbed into it. The process of completion determines the significance of the deed in and to agent’s own consciousness. Dewey thought that the word *choice* best captured all of these various connotations.

The essential point of Dewey’s account of choice is the conception of it as the normal outcome of the process of will. It was opposed to all conceptions that interpret the process of deliberation not as involving the will but assuming that choice alone is the sole act of will. Such a view seemed to Dewey to make the will, or self, or personality into an entity that exists outside the operations of impulse, habit, desire, and reflection. The will enters in from outside to settle a process that is in itself endless and to give an ethical element to a process that is otherwise mechanical. Dewey rejected this dualistic

way of looking at the decision-making process. We don't have two separate faculties, one for gathering data, weighing, rejecting, and accepting evidence and the other an outside power, reason, to draw the inference. The whole process is rational in form. Drawing an inference is the conclusion arrived at when the data achieve coherence and completeness. Dewey believed that a lot of self-made problems, incapable of solution, arise from identifying the act of will with choice alone, problems that do not arise in the other point of view; such as: What causes the will to interfere? How does it know the proper time to do so? Does it make mistakes? Interminable discussions of these questions have haunted the problem of freedom of will since the time of the scholastics. However, one can give a psychological account of moral freedom and responsibility without discussing them.

The ethical concept of freedom involves the recognition of the meaning for conduct of the identity of self and act, will and deed. There is no factor in the act foreign to the agent's self; the act is the self through and through. This *selfness* of the deed constitutes freedom. Every conscious act is free in the sense that it expresses the self. However, only acts whose purposes square with the conditions of things are truly free. Reality must cooperate with the agent's intentions. The identity of self and deed is the basis of responsibility. Dewey distinguished between a formal and a substantial responsibility. One is held liable, accountable, or responsible for his acts because they are the agent himself. This is formal responsibility, and it can coincide with moral irresponsibility. If someone doesn't respond to their duties, to the demands made on them, they are not socially responsible, even though they may be formally responsible or liable. Only those influenced by the foreseen consequences of their acts are responsible in their acts, not merely liable for them. They don't try to escape the bad consequences that may result but stand up to the reckoning. In identifying themselves with the bad consequences, they get beyond them. In short, true responsibility is the *habit* of meeting the demands of the situation.

In his 1908 *Ethics*, Dewey expanded on the distinction between the formal and the substantial or positive aspects of freedom and responsibility.⁵⁰ He said that one could regard the positive forms as moral whereas liability and exemption from outside interference are political or legal. For example, an individual may be free from any interference with his powers to travel, to read, to listen to music, or pursue scientific research. However, if he lacks the material means or mental cultivation to enjoy these legal possibilities, the freedom means little or nothing. The situation creates a moral demand for the removal of the practical limitations that confine him. Similarly, the legal liabilities to which individuals are subject to fall far short of the accountability that the more conscientious members of society hold themselves to. The morale of the individual is in advance of the formulated morality, or legality, of the community.

Dewey cautioned against separating the legal and the moral spheres. “It is absurd,” he said, “to separate the legal and the ideal aspects of freedom from one another.” It is only as one is held liable that one becomes responsible. Even the most conscientious individuals in certain areas of life need to have their unconscious partiality and presumption in other areas checked by the requirements of others. They need to have their better judgment balanced against tendencies toward crankiness, narrowness, or fanaticism. Dewey thought that as individuals enlarged their sphere of legal freedom, they would become more apt to demand and work for the enlargement of their sphere of moral freedom. Possession of effective freedom by only a small group of more favored individuals in society would arouse a sense of unfairness that would lead to reforms of law, administration, and economic conditions so as to transform the empty freedoms of less favored individuals into more constructive realities.

As I reflected after class upon all the things Professor Dewey had said about the meaning of fundamental ethical concepts such as good, duty, and responsibility and their implications for the topic of international liability for transboundary environmental damage several thoughts came to mind. First, he had been talking about the foundations of ethics in individual psychology. There still remained the task of grounding the ethical

⁵⁰ See John Dewey, *Ethics*, MW.5.393.

concepts in social psychology. He suggested at the beginning of his book on psychological ethics the necessity of including social conditions and relations in the idea of conduct but for some reason didn't follow through.⁵¹ Maybe this consequence can be attributed to his decision in 1894 to accept a position as chairman of the philosophy department at the University of Chicago.

Second, the problem of balancing freedom and responsibility lies at the heart of the topic of international liability for transboundary environmental harm. It was essentially the problem that the *Trail Smelter* Tribunal wrestled with. The idea that obligations and duties arise out of the demands of the situation guided the Tribunal's experimental approach in resolving the dispute. By finding Canada legally responsible for the harmful transboundary consequences of the smelter's operations. The Tribunal allowed Canada to get beyond them, to develop the habit of acting responsibly which is the true meaning of responsibility.

Third, Dewey's ethics is based on a non-dualistic way of looking at the psychological process of making decisions and choices. We can talk about the intellectual and the emotional aspects of the process separately, but they cannot be separated in concrete activity. From this point of view, our contemporary search for some "value-neutral" mode of discourse seems fundamentally misguided. Dewey described the process as one of balancing, adjustment, co-ordination of partially conflicting impulses and habits. But he didn't recommend that we go out of our way to avoid talking about "controversial" issues. He seemed to recognize that conflict was an essential element in moral progress as well as legal progress—he didn't draw a bright line between the two kinds. Struggle is an inescapable part of the human condition. Dewey saw that it's the *way* we act at times of crisis that reveals who we really are. He didn't expect that finding practical solutions to complicated problems would be easy. He asked us to use our imagination, to hold our conflicting impulses and habits in suspense while

⁵¹ Dewey, *The Study of Ethics: A Syllabus*, EW.4.229. ("In analyzing conduct, it is just as important to consider the situation as the agent. While conduct proceeds from an agent, the agent himself acts with reference to conditions as they present themselves.")

we search for a way that will allow them to be expressed, not in their original form but in some new way that meets the demands of a new situation.

V. *Loss of Consciousness*

In September 1904, William James published an essay titled *Does Consciousness Exist?*. His short, informal answer was that “she doesn’t—what exists being another critter under the same name.”⁵² A complementary essay titled *A World of Pure Experience* published shortly afterwards tried to describe human experience in a world without consciousness. James was hoping to get the pieces out by October as a text for his students. The two essays were the first expression of James’s new philosophy he called *radical empiricism*. In a letter to François Pillon⁵³ that June, he spoke of his fears that the Angel of Death would overtake him before he could get his thoughts on paper. Life in the university consisted altogether of *interruptions*. He had resigned his professorship, but the administration wouldn’t accept his resignation, and due to the precarious financial situation of the university (Harvard!), James said that he felt obliged to remain. He described his philosophy as a radical empiricism, a pluralism, which “represents order as being gradually won and always in the making.”⁵⁴ It is theistic but not *essentially* so. It rejects all doctrines of the Absolute. James expressed the fear that Pillon would find his system too *bottomless* and romantic. However, he was sure that, whether it were judged true or false, it was essential to the evolution of clearness in philosophy that “*some* one should defend a pluralistic empiricism *radically*.”⁵⁵ The following day, James said, he’ be leaving Cambridge for his place in the county (Chocorua, New Hampshire) where he composed the first two essays.

Between July 1904 and February 1905, James wrote eight essays on various themes associated with radical empiricism. Jamesian scholar John McDermott called

⁵² Letter from William James to Frederich James Eugene Woodbridge (July 27, 1904) in *The Correspondence of William James*, vol. 10: 1902-March 1905 (Ed. by John J. McDermott, Ignas K. Skrupskelis, & Elizabeth M. Berkeley, University Press of Virginia, 2002), at 439.

⁵³ Letter from William James to François Pillon (June 6, 1904), in *The Correspondence of William James*, *id.*, at 409-410.

⁵⁴ *Id.* at 410.

⁵⁵ *Id.*

them “an explosion in James’s thought.”⁵⁶ The essential ideas had been simmering in James’s mind for more than twenty years. He first used the term *radical empiricism* in December 1896 in the preface to a book of essays, *The Will to Believe and Other Essays in Popular Philosophy*.⁵⁷ He described radical empiricism as an “attitude.” The essays were intended to “light up with a certain dramatic reality the attitude itself.” James acknowledged that they were not technical arguments; he hoped that he’d be spared to do some of that work later. However, this work was postponed by his research for the Gifford lectures, later published as *The Varieties of Religious Experience* in 1902.

When the stream of James’s thoughts about radical empiricism was finally flowing freely in the summer of 1904, the technical arguments ran from his mind through his pen in a torrent. The two pieces *Does Consciousness Exist?* and *A World of Pure Experience* contain the core of his new philosophy. Perhaps, he recognized that some the arguments in these essays are not as clear as they could be. The main problem was the traditional technical usages of certain key terms in philosophy. James’s ideas were radically new, but words such as *experience*, *truth*, and *reality* had philosophical connotations that tended to obscure his meaning. No one felt the frustration more keenly than James, yet he refused to talk in obscure technical jargon. He wanted to be understood, and at times he couldn’t understand why some of his philosophical colleagues had so much difficulty in grasping the general thrust of his ideas.

Perhaps, it was the generally puzzled reaction to his essays on radical empiricism⁵⁸ that led James in August 1909 to give probably the clearest statement of his philosophy. In the preface to *The Meaning of Truth*, James mentioned that he was interested in the doctrine of radical empiricism, and it seemed to him that the establishment of the pragmatist theory of truth was a key step in making radical empiricism prevail. Radical empiricism consists of a (1) postulate, (2) a statement of

⁵⁶ William James, *Essays in Radical Empiricism* (The Works of William James, ed. by Frederick H. Burkhardt, Fredson T. Bowers, & Ignas K. Skrupskelis, Harvard University Press, 1976), at xii.

⁵⁷ See William James, *The Will to Believe and Other Essays in Popular Philosophy* (The Works of William James, ed. by Frederick H. Burkhardt, Fredson T. Bowers, & Ignas K. Skrupskelis, Harvard University Press, 1979), at 5-7.

⁵⁸ For a discussion of the critical reception of radical empiricism see John J. McDermott, *Introduction*, in James, *Essays in Radical Empiricism*, *supra* note 55, at xxxviii-xxlvii.

fact, and (3) a generalized conclusion. The postulate is “that the only things that shall be debatable among philosophers shall be things definable in terms drawn from experience [Things of an unexperienceable nature may exist ad libitum but they form no part of the material for philosophic debate.]”⁵⁹ The part of the postulate within the brackets seems indistinguishable from the pragmatic principle. All philosophical debate should ultimately be about differences in concrete experience. However, the postulate of radical empiricism is broader than the pragmatic principle. Its full meaning is best captured in a sentence from *A World of Pure Experience*: “To be radical, an empiricism must neither admit into its constructions any element that is not directly experienced, nor exclude from them any element that is directly experienced.” Traditional empiricists, including many positivist philosophers, would agree on the methodological principle of excluding metaphysical ideas, which have no experienceable meaning. However, James also emphasized the necessity of including *all* the elements directly experienced. He thought that the positivists’ conception of a “fact” left out important elements.

In *The Varieties of Religious Experience*, James criticized scientists for repudiating the personal point of view. He thought that the impersonality of the scientific attitude was particularly inappropriate in the science of religions. Religious thought is carried on in terms of personality. James called this the fundamental fact in the world of religion. In spite of the appeal that the impersonality of the scientific attitude makes to magnanimity of temper, James believed it to be shallow. “The reason is that, so long as we deal with the cosmic and the general, we deal only with the symbols of reality, but *as soon as we deal with private and personal phenomena as such, we deal with realities in the completest sense of the term.*”⁶⁰ James’s interpretation of the term *reality* in this sentence is exactly the opposite of the interpretation held by virtually all philosophers, regardless of their particular school. To them, concrete sense experiences are generally illusions, to be corrected by the reasoning powers of the mind, which has the wonderful

⁵⁹ William James, *The Meaning of Truth*, *supra* note 29, at 6-7.

⁶⁰ William James, *The Varieties of Religious Experience* (The Works of William James, eds. by Frederick H. Burkhardt, Fredson Bowers & Ignas Skrupskelis, Harvard University Press, 1985) at 393.

ability to see the Truth. To James, the use of abstract symbols aids thinking, but it also introduces distortions into the direct experience of reality.

James said that every experience consists of an objective and a subjective part. Although the objective part might be much more extensive than the subjective part, the latter can never be omitted or suppressed. The two elements of an experience make up what James called a *full* fact, which consists of “[a] conscious field *plus* its object as felt or thought of *plus* an attitude towards the object *plus* the sense of a self to whom the attitude belongs.”⁶¹ Let’s consider the four components of a full fact. The presence of a conscious field means that every experience has a spatial and temporal context or horizon. Within this field exists some perceptual or conceptual object, the part of the experience that positivist scientists tend to focus on exclusively, ignoring the other two elements. However, we don’t just passively observe the object. Our mind is constantly probing its surroundings. When we bump into an object, we immediately have an attitude toward it, perhaps of curiosity and a desire to know more about it. That attitude is not a disembodied feeling; it belongs to a concrete individual. And, that self is unique, different from every other individual who may also be curious about the object. James expressed the idea in terms of living out an individual destiny:

That unshareable feeling which each one of us has of the pinch of his individual destiny as he privately feels it rolling out on fortune’s wheel may be disparaged for its egotism, may be sneered at as unscientific, but it is the one thing that fills up the measure of our concrete actuality, and any would-be existent that should lack such a feeling, or its analogue, would be a piece of reality only half made up.⁶²

James hoped that his audience could see why he had been so individualistic in his approach, so bent on rehabilitating the element of feeling in religion while subordinating its intellectual part. Individuality is founded in feeling, and “the recesses of feeling, the darker, blinder strata of character, are the only places in the world in which we catch fact in the making, and directly perceive how events happen, and how work is actually

⁶¹ *Id.*, at 393.

⁶² *Id.* at 393-394.

done.”⁶³ Although James didn’t say so, these depths are also the places where we make decisions affecting the pinch of our individual destinies.

The methodological postulate of radical empiricism insists that philosophical debates be about concepts ultimately derived from concrete experience. At the same time, the method insists that we give a full account of the experience, including our attitudes toward the facts and why they interest us. James thought that empirical psychologists systematically ignored one aspect of our concrete experience, which brings us to the second component of James’s radical empiricism. It consists of the factual statement “that the relations between things, conjunctive as well as disjunctive, are just as much matters of direct particular experience, neither more nor less so, than the things themselves.”⁶⁴ James’s doctrine of relations is the core of his radical empiricism.

In his 1885 article *On the Omissions of Introspective Psychology*,⁶⁵ James argued that much of our inner life is routinely overlooked and falsified even by respected psychologists. He said that what strikes us first about our wonderful stream of consciousness is the different *pace* of its various portions. “Our mental life, like a bird’s life, seems to be made of an alternation of flights and perchings.”⁶⁶ The resting places are usually occupied by images of some kind, which can be held before the mind and contemplated. The places of flight are filled with thoughts of relations, static or dynamic, between these images. James called the resting places the *substantive* parts and the places of flight the *transitive* parts of the stream of thought. The main purpose of our thinking is to arrive at some substantive part other than the one from which we’ve just been dislodged. The main use of the transitive parts is to lead us from one substantive conclusion to another. The primary omission of introspection is the failure to see the transitive parts for what they are. If they were just flights to a conclusion, stopping them to look at them before the conclusion is reached would annihilate them. However, if we

⁶³ *Id.* at 395.

⁶⁴ James, *The Meaning of Truth*, *supra* note 29, at 7.

⁶⁵ William James, *On Some Omissions of Introspective Psychology*, 33 *Mind*, 1-26 (1884); reprinted in William James, *Essays in Psychology* (The Works of William James, ed. by Frederick H. Burkhardt, Fredson Bowers & Ignas Skrupskelis, Harvard University Press, 1983), 142-167. Citations are to the latter.

⁶⁶ *Id.* at 143.

wait until the conclusion is reached before trying to look at the transitions, they are eclipsed and swallowed up by the vigor and stability of the substantive parts.

Introspective analysis is like turning up the gas quickly (or flipping the light switch on) to see how the darkness looks.

If arresting the transitive parts of thought's stream in order to observe them is the first great difficulty of introspection, its first great fallacy is to fail to register them and give them their due. We put too much emphasis on the substantive parts of the stream. Hume's empirical school of psychology tried to eliminate relations not only from the sphere of extra-mental reality but from the sphere of consciousness. It treated relations as mere words with no concrete empirical meaning. Platonist or Kantian schools of psychology took the opposite position. Since relations are definitely perceived to obtain between objects, even though the relations can't be sensed in the manner of other qualities, they must be perceived by some kind of transcendental power of Reason.

The second great fallacy of introspective psychology was to ignore the fact that a peculiar modification of our sensible feeling accompanies our awareness of each objective relation and is the condition of its being known. The evolutionary psychologist Herbert Spencer had exploded this fallacy in his psychology textbook when he showed that a relation, objectively considered, is itself a kind of feeling, the momentary feeling that accompanies the transition from one mental state to the next. James noted that the phrase "feeling of relation" would shock certain fastidious ears, but he saw no way around the difficulty. There was no other way to talk about the phenomenon. The idea that we can detect the relations embedded in concrete experience is the key to James's doctrine of radical empiricism.

Although James credited Spencer for being the first to talk about feeling relations, he faulted him for not seeing very deeply into the idea. Spencer reduced the number of felt relations among things to a minimum of four—likeness, unlikeness, co-existence in space, and sequence in time. James thought that psychological experiments had shown that it was certainly false to say that our feelings of relation consist of only these four kinds. On the contrary, he said, "there is not a conjunction or a preposition, and hardly an adverbial phrase, syntactic form, or inflection of voice, in human speech, that does not

express some shading or other of relation which we at some moment actually feel to exist between the larger objects of our thought.”⁶⁷ The relations are numberless, and no existing language can do justice to all their shades. As a result, all *dumb* psychic states have been coolly suppressed, or, if recognized, have been named after the substantive perception they lead to.

However, to James, the worst consequence of this “vicious mode of mangling thought’s stream” was to change it into a “manifold” of discrete bits. All psychological schools, rationalist and empiricist alike, made this mistake. As a result, a tedious and interminable quarrel arose between these schools over how separate bits can be combined into a single complex idea. By using the metaphor of a stream of consciousness, James underscored its lack of separate parts. In the first instance, and as an empirical fact, our thoughts present themselves as a continuum. James regarded the metaphor of “atoms” of thought as illegitimate. Experiments in brain physiology supported the notion that the brain always acts as a whole and that no part of it could be discharged without altering the tensions in the other parts. The structure of our brain is continually growing under the pressure of experience. James cited a number of examples from the literature to show that the “tendencies” of one thought to call up another are not just facts in the mind of the outside psychological observer. Feelings of tendency are among the *objects* of the stream, which is aware of them from within. They are often so vague that we’re unable to name them. In short, James said, it is “the re-instatement of the vague to its proper place in our mental life which I am so anxious to press on the reader’s attention.”⁶⁸

James located the vagueness in our mental life around the edges or boundaries of the field of consciousness. They are fuzzy boundaries. James’s technical term for the halo or penumbra that surrounds every definite image in the mind was *psychic fringe*. Relations between images can be seen, or more accurately, felt within their fringes. In *A World of Pure Experience*, James writes:

Our fields of experience have no more definite boundaries than have our fields of view. Both are fringed forever by a *more* that continuously

⁶⁷ *Id.* at 146.

⁶⁸ *Id.* at 165.

develops, and that continuously supersedes them as life proceeds. The relations, generally speaking, are as real here as the terms are, and the only complaint of the transcendentalist's with which I could sympathize would be his charge that, by first making knowledge to consist in external relations as I have done, and by then confessing that nine-tenths of the time these are not actually but only virtually there, I have knocked the solid bottom out of the whole business, and palmed off a substitute of knowledge for the real thing.⁶⁹

Nine-tenths of the time we are content not to follow the tendencies of our ideas out completely, to cash them in for concrete experience. Instead, we're satisfied if we think that we're "heading in the right direction." The tendency is something we feel at the fringes of consciousness, yet in making practical decisions we don't hesitate to stake our well-being on such intuitive judgments. As James points out, we live most of lives in a world of virtual reality.

In the last part of *On Some Omissions of Introspective Psychology*, James talked about another introspective difficulty and source of fallacy. The difficulty is "the confusion between the psychologist's standpoint and the standpoint of the feeling upon which he is supposed to be making his report."⁷⁰ Sometimes this confusion is referred to as the "psychologist's fallacy." It arises because the standpoint of the psychologist is external to the consciousness he's studying. The psychological observer alone can verify the cognitive character of any mental act through his own assumed *true* knowledge of its object. James points out that there are two ways the psychologist can err. He can foist his own knowledge of the object upon the feeling experienced by the subject by interpreting the latter as aware of the object just as he is. Or the psychologist may err by representing the feeling as if it felt *itself* to be what he knows it to be. The confusion of the two standpoints occurs especially around the question of perception, and the whole problem in which the object is present to the mind in cognition.

The main cause of the problem in James's view is that "our thought is a teleological organism of which large tracts exist only for the attainment of others."

⁶⁹ William James, *A World of Pure Experience*, in James, *Essays in Radical Empiricism*, *supra* note 56, at 35.

⁷⁰ William James, *On Some Omissions of Introspective Psychology*, *supra* note 65, at 161.

Those large tracts are the transitive parts of our thinking. Our perception of the substantive parts tends to spread itself everywhere in reflective memory and to obscure the perception of the more evanescent intervening parts. James acknowledged that there *seems* to be a paradox involved in understanding how the mind can know itself as in procession to or from a reality without knowing that reality itself immediately and face to face. However, the confusion arises from the confusion of the psychologist's standpoint with the subject's. In the course of developing our thoughts about a "topic," we designate the substantive reality toward which our incomplete thoughts look. As outside observers of the thoughts, knowing them in their function of being connected with it, we have a right to say that they are "thoughts concerning this topic." But we are absolutely wrong, James said, if we say that their *object* is the topic, or that the topic is present to them, or that they are in any direct way "of" or "about" it. In doing so, we not only thrust into them *our* object and the object of another thought with which they are only remotely connected, but we prevent ourselves from finding what their own immediate objects really are. Every thought has its *own* object, and the only question in any particular case is *what* that object is.

James maintained that in some cases the signal *is* the reality. In sense-perception, we normally believe that we see reality face to face. Of the other, incomplete kinds of thoughts, the reality is only "the topic." A whole procession of thoughts may occur without the reality's features being once directly present. Yet it is still a procession that's aware of itself *as* a procession leading to or from "the topic." James acknowledged that there is a semblance of paradox here. Given the awareness of the procession as a procession, how can we know it is a procession to or from *that* reality—or even in the direction of that reality—without knowing that reality immediately and face to face? However, the paradox arises from the confusion of the incomplete thought's standpoint with our own. We cannot *name* the topic without the reality becoming a direct present object to *us*. But the procession of our thoughts can and does feel its topic in an entirely different way. To substitute our way for this way is a complete falsification of the data that psychologists are supposed to be inquiring about. It's exceedingly difficult to make out what the actual way is because of the elusive character of the transitional and

relational elements of subjectivity of which the procession of our thoughts is mostly composed. What *sort* of a feeling does each thought in the procession have of the procession of which it's a part? James called it a mystery, one of the problems for the introspection of the future.

The third component of James's radical empiricism was the generalized conclusion that "the parts of experience hold together from next to next by relations that are themselves part of experience. The directly apprehended universe needs, in short, no extraneous trans-empirical connective support, but possesses in its own right a concatenated or continuous structure."⁷¹ James said that the great obstacle to radical empiricism is the popular belief that experience as immediately given is all disjunction and no conjunction. To make one world out of the separateness, a higher unifying agency was needed. In the most popular philosophy of the time, this role fell to the Absolute, which "related" things by throwing "categories" over them like a net. In the anti-associationist school of psychology, some kind of transcendental "consciousness" acting on the "manifold" generated by sense perceptions served as a unifying principle. James saw that as long as "consciousness" existed as an element of each experience, there would necessarily be another element, the "object of consciousness." Experience would have an essentially dualistic inner constitution. James rejected the dualism. "Experience, I believe, has no such inner duplicity; and the separation of it into consciousness and content comes, not by way of subtraction, but by way of addition—the addition, to a given concrete piece of it, of other sets of experiences."⁷² The distinction between consciousness and content comes later in our active experience. The distinction is not found pre-existing in the original experience; it arises from an interpretation or classification of that experience by a later one.

James called the original, uninterpreted, experience *pure experience*. It has an elusive nature, vanishing as the next experience comes alone—but not vanishing completely. Each experience shades into the next, in the way that fuzzy subsets overlap.

⁷¹ James, *The Meaning of Truth*, *supra* note 29, at 7.

⁷² William James, *Does Consciousness Exist?*, in James, *Essays in Radical Empiricism*, *supra* note 56, at 35.

The qualities of the experiences fuse in a particular way that colors all of them and that humans can detect as “tendencies.” In radical empiricism, “*the relations that connect experiences must themselves be experienced relations, and any kind of relation experienced must be accounted as “real” as anything else in the system.*”⁷³ James said that radical empiricism did full justice to conjunctive relations without treating them as being true in some “supernal” way as if the unity of things and their variety belong to completely different orders of truth and vitality. “The organization of the self as a system of memories, purposes, strivings, fulfilments or disappointments, is incidental to this most intimate of all relations [*i.e.*, the relation between terms that form states of mind], the terms of which seem in many cases actually to compenetrates and suffuse each other’s being.”⁷⁴ For James, the universe itself hangs together through the agency of various kinds of conjunctive relations. Taken as it appears, our universe is to a large extent chaotic. No one single type of connection runs through all the experiences composing it. Causes and purposes hold only among special series of facts. Radical empiricism tries to be fair to both the unity and the disconnection. It finds no reason for treating either as illusory. “It allots to each its definite sphere of description, and agrees that there appears to be actual forces at work which tend, as time goes on, to make the unity greater.”⁷⁵ In many cases, humans are responsible for making the unity greater.

In many ways, I see my work on transboundary harm to biological diversity as an attempt to make the unity in the world greater by taking advantage of our human ability to feel the conjunctive relations in a particular problematic situation. Balancing interests is mostly a matter of feeling the relations involved. We can specify the substantive interests involved in a problem in various ways, but the transitive parts of the system—the “flights” to use James’s metaphor—are more difficult to deal with. But I maintain, with James, that these relations are just as “real” as anything else in the system. They are fuzzy, but we have learned recently how to deal somewhat precisely with fuzzy kinds of things. What we may find harder to summon than technical knowledge is James’s faith

⁷³ William James, *A World of Pure Experience*, in James, *Essays in Radical Empiricism*, *supra* note 56, at 22.

⁷⁴ *Id.* at 23-24.

⁷⁵ *Id.* at 24.

that there are actual forces at work in the world that tend, as time goes on, to make the unity greater. We live in an age when the discontinuities are far more emphasized than the connections. Both are real, but one is not more real than the other. We have chosen to interpret reality in the way we do. Recognizing that, we may—I believe—choose to look at the some of the world's environmental problems in a different way. We may try a pragmatic key in the lock and see if it opens, at least here and there.

Chapter Four

I. Fermentation in a Law School Teapot

If we are inclined to scoff at the practitioner, let us remember the warning of William James that the worst enemies of a subject are the professors thereof.

Roscoe Pound, *My Philosophy of Law*

In the quotation above, Roscoe Pound—a professor of law for most of his adult life—warns us to be wary of law professors. Perhaps his experience as a dean of law schools, for seven years at the University of Nebraska and then for over two decades at Harvard, had something to do with his advice. The particular professors Pound probably had uppermost in mind were a group known as the “legal realists.” They were certainly his worst intellectual enemies, at least later in his career. It didn’t start out that way. Both Pound and the early realists shared a progressive view of the law. But the Great War changed things. In the years following the war, the realists wanted to shake up legal education, to move beyond the old case-book method of teaching, to bring in sociology and statistics, to look at the phenomena of law from above and outside. There was fermentation at some elite laws schools in the 1920s and 1930s, beginning at Columbia and spreading to Yale, and it made Pound dyspeptic. As the dean of Harvard Law School, where the case-book method was invented, he found himself defending a pragmatic philosophy of law rooted in practical realities. He continued to look at the law, as he had all his life, from the point of view of a practitioner, from inside. In defending that position against the realists he drew upon the pragmatic philosophy of William James.

At some point in his life, Pound must have had to decide whether to pursue a career as a lawyer or as a botanist. In a way, he did both. As an undergraduate at the University of Nebraska, Lincoln, he specialized in botany and classics.¹ He graduated in

¹ See Richard Warner, *Roscoe Pound*, American National Biography Online Feb. 2000; available at <http://www.anb.org>. (accessed August, 29, 2009). For a full biography see David Wigdor, *Roscoe Pound: Philosopher of Law* (Greenwood Press, 1974). See also Roger J. Cusick, *Roscoe Pound: A Reconsideration of His Life and Ideas* (Paper presented at the annual meeting of the Western Political Science Association, Albuquerque, NM, Mar. 17, 2006; available at http://www.allacademic.com/meta/p97414_index.html); Roger J. Cusick, *The Ideas of Roscoe Pound*:

1888, and the following year earned an M.A. in botany. In September 1889 he began his legal education at Harvard Law School, where the dean, Christopher Columbus Langdell, had recently introduced the case-book method of study. In this method, students learn the law not by reading treatises or textbooks but by reading and analyzing judicial opinions, usually appellate court or Supreme Court decisions. After a year at Harvard, Pound returned to Nebraska and began to practice law, and by the end of the century he established himself as a partner in one of the leading corporate law firms in the state. While practicing law, he continued to study botany, and in 1897 he received the first Ph.D. in this subject awarded by the University of Nebraska. In 1898, he published his dissertation, *The Phytogeography of Nebraska*, co-authored with Frederic E. Clements, who later became a leading plant ecologist and pioneer in the study of plant succession. Pound's passion for botany deeply influenced his philosophy of law. Botany at the turn of the century emphasized the evolutionary view of living things as functional organisms adaptively responding to environmental changes. Pound was particularly interested in taxonomy, the science of classification, and it was just a short step intellectually from classifying plants to classifying legal interests and values.

Although Pound initially had been skeptical of Langdell's case-study method, he quickly came to embrace it, in part because it rooted the study of legal principles in empirical facts. However, he completely rejected the legal philosophy underlying Langdell's pedagogical method. Langdell is remembered for the fervor with which he preached the doctrine "that law is a science and that all the available materials of that science are contained in printed books."² He described the law library as "the proper workshop for professors and students alike; . . . it is to us all that the laboratories of the university are to the chemists and physicists, the museum of natural history to the zoologists, the botanical garden to the botanists."³ At least one legal botanist dissented from Dean Langdell's metaphor. Langdell thought that the goal of legal research is to

Pragmatism, Pluralism, and Polylegalism (2006) (unpublished Ph.D. dissertation, State University of New York at Albany). For

² Christopher Langdell, *Harvard Celebration Speeches*, 3 *Law Quarterly Review* pp. 123-125, at 124 (1887); see also Marcia Speziale, *Langdell's Concept of Law as Science: The Beginning of Anti-Formalism in the United States*, 5 *Vermont Law Review*, pp. 1-37 (1980).

³ Langdell, *id.*

construct a conceptually ordered and universally formal legal system analogous to Euclidean geometry. By finding the right principles and arguing through close, deductive reasoning, a lawyer could resolve even the most difficult cases just as Euclidean theorems could be used to solve practical problems involving measurement. Langdell's theory of legal science became the orthodox view in American laws schools of the late nineteenth and early twentieth centuries.⁴ It was an appealing point of view for many reasons, not the least of which was that it promised legal predictability and suggested that there was a legal "right answer" to almost every case.

Pound became dean of the Nebraska College of Law in 1903 and immediately began reforming it. As dean, he also called for reforms of the judicial system to make it more responsive to social needs. There was a philosophic vision behind the push for reform. Pound argued that states were justified in maintaining laws schools only because of the close connection of the lawyer with the vital machinery of society.⁵ A philosophy of law based on knowledge of the elements of social and political science therefore formed a necessary part of every trained lawyers toolkit. Among the legal scholars Pound looked to for guidance was the Austrian jurist Rudolf von Jhering who argued for the need to replace a jurisprudence of concepts (*Begriffsjurisprudenz*) with a jurisprudence of results (*Wirklichkeitsjurisprudenz*). The immediate question for legal decision makers should be "how will a rule or decision operate in practice?"⁶ In 1908, Pound presented a paper⁷ before the Bar Association of North Dakota attacking "mechanical jurisprudence," the tendency of scientific law to become a jurisprudence of rules that operate mechanically. He argued that the profession should rid itself of this sort of legality and strive toward becoming a pragmatic, sociological legal science. The movement toward a sociological jurisprudence is "a movement for pragmatism as a philosophy of law; for the adjustment of principles and doctrines to the human condition they are to govern rather than to assumed first principles; to putting the human factor in

⁴ For a good account of Langdell's importance in establishing classical legal orthodoxy see Thomas C. Grey, *Langdell's Orthodoxy*, 45 *University of Pittsburgh Law Review*, 1-53 (1983).

⁵ See Pound, *Do We Need a Philosophy of Law?*, 5 *Columbia Law Review*, 339-353 (1905).

⁶ Roscoe Pound, *A New School of Jurists*, 4 *University Studies of Nebraska*, 10-39 (1904), at

⁷ Roscoe Pound, *Mechanical Jurisprudence*, 8 *Columbia Law Review*, 605-623 (1908).

the central place and relegating logic to its true position as an instrument.”⁸ Pound cited William James’s recently published popular book *Pragmatism* several times in calling for the development of a pragmatic philosophy of law.

In 1910, Pound accepted a position at Harvard Law School. The following decade was the most fruitful intellectual period of his life. In a stream of articles, he developed the two themes for which he is most remembered. He intended to write a book, entitled *Sociological Jurisprudence*, combining them, but it was never finished. He became dean in 1916, which cut into his time for scholarly work. Upon arriving at Harvard, he’d lost no time in producing a series of three articles outlining the scope and purpose of sociological jurisprudence.⁹ At the conclusion, he summarized several characteristics of sociological jurists: (1) they look more to the working of the law than to its abstract content; (2) they view law as a social institution, capable of being improved by human effort and think they have a duty to further this effort; (3) they stress the social purposes of law rather than its sanctions; (4) they urge that legal precepts are not so much inflexible molds as they are guides to socially just results; and (5) although they have diverse philosophical views, recently they have adhered to one or another of the social philosophical schools such as utilitarianism. Pound concluded with a statement by Professor Addison Webster Moore, John Dewey’s student and successor at Chicago: “the time had come in the development of the pragmatic movement for systematic and detailed applications of pragmatic methods and conceptions to specific problems rather than more discussion of general principles.”¹⁰ Unhappily, Pound noted, the discussion of general principles goes on, and a pragmatist philosophy of law is yet to come. When it appeared, it could expect many adherents from sociological jurists. That was another book that failed to get written.

⁸ *Id.* at 609-610.

⁹ See Roscoe Pound, *The Scope and Purpose of Sociological Jurisprudence I*, 24 *Harvard Law Review*, 591-619 (1911); *The Scope and Purpose of Sociological Jurisprudence II*, 25 *Harvard Law Review*, 140-168 (1911); *The Scope and Purpose of Sociological Jurisprudence III*, 25 *Harvard Law Review*, 489-516 (1912).

¹⁰ See Addison Webster Moore, *Pragmatism and Its Critics* (University of Chicago Press, 1910), at vii.

The other theme that Pound developed was a theory of interests. It began with an article in a sociological journal,¹¹ and continued with another series of three articles in the pages of the *Harvard Law Review*.¹² Pound put the concept of interests in the context of a theory about the several stages of legal development. In the beginning of law, the idea was simply to keep the peace. In the second stage, the stage of strict law, law had definitely prevailed as the regulative agency of society and the state has prevailed as the organ of social control. The third stage, the stage of equity or natural law, is one of liberalization, which relies on moral ideas and reason. In the fourth stage, the watchwords are equality and security. Toward the end of the nineteenth century, the signs of a new stage began to appear. Juristically, it was the beginning of the recognition of interests as the ultimate idea behind rights, duties, and remedies. The watchword is the satisfaction of human wants, and the goal of law is to satisfy as many human demands as possible with the least sacrifice of other demands. This stage is called the socialization of law. One can recognize in Pound's legal stages an analogue to the progressive vegetative stages in the theory of plant succession developed by his former botanical colleague Frederic E. Clements. In the legal field, the law-maker has to consider what interests the law must recognize and secure, the principles upon which these interests can be defined and limited, the legal means available for securing those interests, and the limits on effective legal action that may preclude a complete recognition to the extent that ethical considerations might demand. The fundamental questions facing the law-maker are: How are the interests to be balanced? What principle is to be used to determine their relative weights? Which shall give way in case of conflict? Pound disavowed any belief that there's some absolute formula for balancing interests. Although he suggested a couple of principles that might be generally useful, he thought that the legal system must

¹¹ See Roscoe Pound, *Legislation as a Social Function*, 18 *The American Journal of Sociology*, 755-768, (1913).

¹² See Roscoe Pound, *The End of Law as Developed in Legal Rules and Doctrines*, 27 *Harvard Law Review*, 195-234 (1914); *The End of Law as Developed in Juristic Thought I*, 27 *Harvard Law Review*, 605-628 (1914); *The End of Law as Developed in Juristic Thought II*, 30 *Harvard Law Review*, 201-225 (1917). For an early mature version of Pound's theory of social interests see Roscoe Pound, *A Theory of Social Interests*, 15 *Publication of the American Sociological Society*, 16-45 (1921). Pound revised this paper in *A Survey of Social Interests*, 57 *Harvard Law Review*, 1-39 (1943).

be kept flexible and that law-making must accommodate itself perennially to the shifting in the quantity and quality of the interests it had to balance.

Pound concluded with the recognition that making and applying law requires social facts. Compared to legislatures, courts are ill prepared to obtain the necessary facts. He suggested that adjunct laboratories and staffs of experts in social sciences could be developed, as they were in some European tribunals. But first, judicial organization would have to become more flexible. We would have to abandon the hard and fast line between the judicial and the administrative in our legal tradition. Each court must become a bureau of justice rather than a kind of slot machine into which the facts of the case are fed and out of which a decision is taken. In the immediate past, the social facts required for the exercise of the judicial function have been arrived at by mechanical means. Sociological jurists must come up with a rational way of advising a court of facts of which it is supposed to take judicial notice.

At the same time that Pound was trying to ignite a sociological jurisprudence movement, the first paper by a legal realist appeared. In 1912, Walter Bingham of the Stanford Law School published an article titled *What is the Law?*¹³, although it was not about defining the meaning of law but about its “field.” Bingham identified the field of law as belonging to the science of government. By this he meant the empirical study of the concrete operations and effects of governmental institutions and the causes responsible for the effects. Knowledge about the phenomena of government obtained by observation, inductive and deductive reasoning, and other means of scientific investigation may be generalized into rules and principles. This organized body of knowledge is the science of law. Bingham’s vision of law as a predictive, empirical science became an article of faith for many legal realists.¹⁴

Bingham specified the attitude with which we are to view the field of law. A judge presiding over a case is engaged in the art of government—he is making law. The lawyer arguing a case before a jury is assisting in the law-making process. Even the

¹³ Joseph W. Bingham, *What is the Law?*, 11 Michigan Law Review, 1-25, 109-121 (1912).

¹⁴ The prediction theory of law is usually credited to Oliver Wendell Holmes. See, *The Path of the Law*, 10 Harvard Law Review, pp. 457-478 (1897), at 461 (“The prophecies of what the courts will do in fact, and nothing more pretentious, are what I mean by the law.”).

legislator indirectly influences similar processes by determining the existence and form of the legislative expression that indicates what shall or shall not be done in concrete instances. All of these processes lie in the field of legal study and constitute some of its objective phenomena. To view the field from the attitude of the judge, or the lawyers, or the legislator is, metaphorically, “to try to see the field from a small spot inside it instead of from above and outside of it.”¹⁵ This external attitude toward the law was a characteristic trait of legal realists.

Bingham concluded on a prophetic note. He saw a movement portending a change in the administration of justice gathering momentum all over the country. If those who realized the importance of the science of law were to lead, they should direct their lawmaking efforts by an understanding of the purposes of good government, the needs of the people, and the experience of the past. Bingham cited a passage from one of Roscoe Pound’s articles on sociological jurisprudence in support of his plea for a greater emphasis on empirical study of the concrete facts of government, their causes and their concrete effects. There is no sense of tension between Bingham’s realist vision of the law and Pound’s sociological jurisprudence, despite the fact that Bingham looked at the law from above and outside whereas Pound viewed it as a practitioner from a small spot inside.

In the summer of 1922, Columbia University Law School presented a seminar series “Special Conferences in Jurisprudence” designed to introduce new ideas about the theory of law to members of the bar and law school professors. Two of the invited speakers were well known: Roscoe Pound, Dean of the Harvard Law School, was to lecture on “Sociological Jurisprudence,” and John Dewey, professor of philosophy at Columbia, was to present “Some Problems in the Logic and Ethics of Law.” The third speaker, Professor Walter Wheeler Cook of Columbia, discussed selected problems of legal analysis from the standpoint of analytical jurisprudence. Cook was one of a group of professors in the law school at Columbia who had pushed for the conference as a way

¹⁵ Bingham, *What is the Law?*, *supra* note 13, at 10.

of promoting what they thought were more sophisticated new ways of thinking about the law.

After the war, some legal scholars who wanted to view the field of law from above and outside decided that the Columbia University Law School offered a good vantage point. They planned to enlarge and develop the school into a national centre of legal learning.¹⁶ Underhill Moore had been teaching there since 1916; Walter Wheeler Cook joined the faculty in 1919, and Herman Oliphant came in 1922. One of the more poetic realists, Karl Llewellyn, who came in 1925, proclaimed that “[f]erment is abroad in the law.”¹⁷ These realist fermenters of the law were intellectually restless individuals—some would call them malcontents. They wanted to stir things up. In some cases, they wanted to shock, and they did. Above all, they wanted to beat Harvard. When realists spoke of the need to reform legal research and education, they had in mind Langdell’s vision of the science of law and his case study method of instruction. Llewellyn described the realists’ ideals as modest: they wanted to deal with “people, with tangibles, with *definite* tangibles, and *observable* relations between definite tangibles—not with words alone.”¹⁸ On one point, Llewellyn was wrong—the realists’ ideals were definitely not modest. Realizing them would mean radically changing the way scholars conducted legal research and the way students learned law. Law would take its place as one of the social sciences, and legal scholars would become empirical scientists and expert advisers to political leaders.

I came to Columbia University Law School in 1922 as a student in search of a pragmatic philosophy of law. It had been difficult choosing between Columbia and Harvard. I recalled what Robert Quentin Baxter said about the importance of balancing interests for the topic of international liability for transboundary environmental damage. Among lawyers, Roscoe Pound is remembered for inventing, or at least popularizing, the

¹⁶ *Columbia to Expand its School of Law*, N.Y. Times, May 16, 1919, at 28.

¹⁷ Karl N. Llewellyn, *Some Realism About Realism—Responding to Dean Pound*, 44 Harvard Law Review, pp. 1222-1264 (1931), at 1222.

¹⁸ *Id.* at 1223 (emphasis in original).

balancing test.¹⁹ Pound's sociological jurisprudence seemed to be a good starting point upon which to construct a progressive-pragmatic philosophy of law. However, in the end, I chose Columbia for at least a couple of reasons. Professor Dewey was teaching in the philosophy department, which would give me a chance to deepen my understanding of pragmatism, or "instrumentalism," as he called it. Also, he was co-teaching a seminar in the law school with a new faculty member Edwin W. Patterson, who had been Pound's student and who was also sympathetic to some of the new ideas about the law. Patterson was not a legal realist—at least I didn't think so, although Karl Llewellyn classified him as one.²⁰ Unlike many of his realist colleagues, Patterson did not look at law from above and outside but from within.²¹ He described his philosophy of law as made up of generalizations formed by arriving at particular judgments concerning legal problems when he had tried his best to think them through.²² The result was a fragmentary, pluralistic, and eclectic approach to the law that's difficult to classify. On the one hand, he described himself as "genuinely loyal to the realist movement for fact finding research as an aid to change in, or understanding, of law."²³ On the other hand, he acknowledged his debt to Pound for the inspiration of his ideas and to his colleague and co-teacher John Dewey for "the sane guidance of his philosophy."²⁴ With the aid of Dewey and Patterson, I thought it might be possible to develop a common-sense, progressive-pragmatic philosophy of law as a basis for my work on international liability for transboundary environmental harm. Neither of them knew much about international law, but one can't have everything.

¹⁹ See Patrick M. McFadden, *The Balancing Test*, 29 Boston College Law Review, pp. 585-656, at 618 ("It distorts history only a little to say that Roscoe Pound is responsible for the balancing test.").

²⁰ Llewellyn included Patterson on his list of realists. See *id.* at 1258. However, this classification has been questioned by others who knew Patterson well. See *A History of the School of Law*, Columbia University (Columbia University Press, 1955), at 272 ("He [Patterson] has been rather uncritically grouped among the leading exponents of what is called 'legal realism.'").

²¹ *Id.* ("His is preeminently a practical, common-sense approach, what may be described as a lawyerly approach. It is much more workable than the 'realism' of W.W. Cook and Underhill Moore.").

²² See Edwin W. Patterson, *My Philosophy of Law*, in *My Philosophy of Law: Credos of Sixteen American Scholars* (Boston Law Book Co., 1941), pp. 229-243.

²³ See John Henry Schlegel, *American Legal Realism and Empirical Social Science* (University of North Carolina Press, 1995) at 324, fn. 220 (citing a letter from Patterson to Underhill Moore, October 15, 1931).

²⁴ Edwin W. Patterson, *Jurisprudence: Men and Ideas of the Law* (The Foundation Press, Inc., 1953) at viii.

One topic we discussed in our seminar was the theory of rationalization.²⁵ It was a relatively new idea, which originated from the study of abnormal psychology. Rationalization is characterized as a defense mechanism observable in the behavior of some insane persons who, after they had done something to upset the order of the asylum, invented “good reasons” for their behavior. Such behavior suggests a deep-seated need to appear rational in the eyes of others. Social psychologists applied the theory of rationalization to the realm of political behavior. Some of the more extreme legal realists even applied it to judicial decision-making. Joseph Hutcheson, District Judge for the Southern District of Texas, confessed that in difficult cases he “hunched out” his decision.²⁶ Hutcheson cited Rabelais’s Judge Bridlegoose²⁷ as his model for judicial decision-making—except for one thing. Judge Bridlegoose had the habit of deciding tough cases by the aleatory method—throwing a pair of dice. Hutcheson preferred to brood, waiting for the feeling or hunch, “that intuitive flash of understanding which makes the jump-spark connection between question and decision.”²⁸ To which he added: “ ‘lest I be stoned in the street’ for this admission, let me hasten to say to my Brothers of the Bench and of the Bar, ‘my practice is therein the same with that of your other worships.’ ”²⁹ Hutcheson noted that he was speaking only of the decision-making process as opposed to the judge’s rationalization of the decision in his written opinion. Furthermore, he defended the practice of intuitive decision-making not only as something that judges actually do but as something they *should* do. He closed by recommending that law schools attempt to discover and develop the processes of mind by which such

²⁵ See Edwin W. Patterson, *John Dewey and the Law: Theories of Legal Reasoning and Valuation*, 36 American Bar Association Journal, 619-622, 699-701 ((1950), at 622, fn. 30 (“Dewey inserted in our seminar readings, as explaining rationalization, excerpts from Hart, *The Psychology of Insanity* (1916) 66 and Tansley, *The New Psychology* (1920) 159, 160 168. [James Harvey] Robinson referred to ‘modern psychologists’ (page 44, [*The Mind in the Making*, 1921] but based his arguments chiefly on social psychologists.”).

²⁶ See Joseph C. Hutcheson, Jr., *The Judgment Intuitive: The Function of the “Hunch” in Judicial Decision*, 14 Cornell Law Review, 274-288 (1929).

²⁷ The story of Judge Bridlegoose can be found in Rabelais, *Gargantua and Pantagruel*, Book Three, Chapters 39-44.

²⁸ Hutcheson, *The Judgment Intuitive*, *supra* note 26, at 278.

²⁹ *Id.* at 278 (quoting Judge Bridlegoose).

decisions are reached. Perhaps, he'd suggest that as part of that effort law students read Rabelais's story of Judge Bridlegoose, which wouldn't be a bad idea in my opinion.³⁰

In our seminar, we read Professor Dewey's paper titled *Logical Method and Law*.³¹ Dewey begins by dividing human conduct into two general kinds, those in which we act with a minimum of foresight, as when we follow a "hunch" or impulse, and those in which action follows upon careful deliberation and inquiry. Dewey didn't reject intuitive decision making, which may produce reasonable and good results. He told the story about a layman appointed to a position in India where he would have to make judgments in matters of controversy among natives. He asked advice from a legal friend about how to approach the job. His friend told him to use common sense and announce his decisions firmly—most of the time, his natural decision about what is fair and reasonable would suffice. But, his friend added: "Never try to give reasons for they will usually be wrong."

Dewey's main focus was on decisions of the second type, which are reasoned or rational to the degree that we deliberate carefully and thoroughly. He began by outlining an admittedly unorthodox conception of logic. He claimed that logic is really an account of the procedures followed in reaching decisions of the second type, procedures of inquiry about some practical matter. The obvious objection to this conception of logic is that it does not consider the cases in which logical method is best exemplified, such as scientific and mathematical subjects. However, Dewey responded that if one considers the actual procedure of the mathematician or the scientist, we find that he is constantly engaged in making decisions, as is an intelligent farmer, businessman, or physician. To make decisions wisely, he takes into account various considerations and accepts or rejects them with a view toward making his decision as rational as possible. Although

³⁰ Since making this suggestion, it has come to my attention that Prof. Donald Vish, lecturer in law at the Louis D. Brandeis School of Law, University of Louisville, has stolen my idea. The syllabus for his Law & Literature class in Spring 2010 includes the story "On Judge Bridlegoose and Lord John the Loony" from Gargantua and Pantagruel. See <http://danzigusa.blogspot.com/2009/12/syllabus-law-literature-brandeis-school.html> (accessed 25 September 2011).

³¹ John Dewey, *Logical Method and Law*, 10 *Cornell Law Quarterly*, 17-27 (1924). Dewey published only one other article in a law review, *The Historic Background of Corporate Legal Personality*, 35 *The Yale Law Journal*, 655-673 (1926).

mathematicians or scientists deal with different subjects from those of the farmer, merchant, or lawyer, the form of the procedure is the same. One might object that this is an arbitrary notion of logic, that in reality logic is an affair of the relations and orders of relations between propositions that constitute the particular subject matter. Such relations are independent of the operations of deliberation and inquiry. Dewey used this objection to point out the essential difference between the traditional view and his own. He viewed logical systematization as necessary but not ultimate. It is an instrumentality, not an end. It is a means of improving, facilitating, clarifying the inquiry leading up to concrete decisions. With regard to the law, logical systematizations in any area such as contracts or torts, which reduce a multitude of decisions to a few logically consistent general principles, may be an end in itself for some. However, in the last resort, systematization is subservient to economical and effective decision-making in particular cases.

Dewey argued that the notion that there are two kinds of logic—a logic of discovery and a logic of justification—has an important bearing on legal thinking and decision making. He reminded us of a quote from Justice Holmes that “the whole outline of the law is the resultant of a conflict at every point between logic and good sense—the one striving to work fiction out to consistent results, the other restraining and at last overcoming that effort when the results become too manifestly unjust.”³² Holmes seems to contradict Dewey’s view by implying that logic is not the method of good sense, that it has a life of its own, which conflicts with the need to make good decisions regarding concrete subject matters. However, Dewey said that the undoubted facts that Justice Holmes had in mind do not concern logic but rather tendencies or habits of the humans using logic, which a sound logic would guard against.

However, that was only part of the story. The rest of the story is brought to light by another passage from Justice Holmes, which I vaguely recalled from an earlier chapter in my life:

The life of the law has not been logic but experience. The felt necessities of the times, the prevalent moral and political theories, intuitions of public policy, avowed or unconscious, even the prejudices which judges share

³² Oliver Wendell Holmes, *Collected Legal Papers* (The Lawbook Exchange, Ltd., 2006), at 50.

with their fellow men, have had a good deal more to do than the syllogism in determining the rules by which men should be governed.³³

Justice Holmes was clearly thinking of logic in terms of the syllogism, as most people do. However, Dewey said that the tendency to think that for every case that may arise there's a fixed antecedent principle or rule ready at hand tends to produce what Professor Pound calls "mechanical jurisprudence." It flatters our longing for certainty and reinforces the inert factor in human nature which make us hold on as long as possible to any idea that has gained acceptance in the human mind. In experimental logic, general principles emerge as statements of generic ways that have been found helpful in treating concrete cases.

In practice, lawyers don't analyze the case for their clients in terms of a syllogism. They begin with a conclusion, favorable to their clients, that they intend to reach, and analyze the facts of the case to find material from which to construct a favorable statement of facts, to form a minor premise. At the same time, they research records of cases to find rules of law used in those with similar circumstances that will support a certain way of looking at the facts. As their acquaintance with possible applicable rules widens, lawyers may alter their perspective and emphasis upon the facts that constitute evidence. Changing the facts may entail modifying the principles. Dewey didn't recommend this procedure, pre-committed to a particular and partisan conclusion, as a model of scientific method. However, it illustrated his point that thinking begins with a confused situation, and that both the major and minor premise arise tentatively and correlatively in the course of analyzing the situation and the prior rules. In strict logic, the conclusion does not follow from the premises; conclusions and premises are two ways of stating the same thing.

Courts don't just reach conclusions; they explain them, and the explanation must state reasons. Dewey argued that the logic of exposition is different from the logic of search and discovery. Exposition presupposes that the situation is determinate with respect to its legal implications. The purpose is to set forth grounds for the decision so

³³ Oliver Wendell Holmes, *The Common Law* (Ed. by Mark DeWolfe Howe, Little, Brown, & Co., 1963), at 5.

that it will not appear arbitrary and will suggest a rule for dealing with similar cases in the future. Dewey suggested formal logic developed out of the need for justifying to others the decisions reached in legal cases. If no one had ever been required to account to others for their decisions, we would still use methods of inarticulate intuition and impression or feeling. In any case, it is certain that in judicial decisions the only alternative to arbitrary dicta, accepted because of the authority or prestige of the judge, is a rational statement formulating the principles and indicating the logical steps leading to the conclusion.

Dewey argued that the chief temptation to the abstract use of formal concepts and mechanical logic comes in the process of justifying decisions. The temptation is to surrender the vital logic responsible for the conclusion and substitute for it forms of expression that are rigorous in appearance and create the illusion of certitude. This tendency is reinforced by the need for maximum stability and certitude. Individuals need to know what legal consequences society, acting through the courts, will attach to their actions, the liabilities they are assuming, and the fruits they may count on in entering upon any given course of action. Dewey found this to be a legitimate requirement from the standpoint of the community and of particular individuals. However, confusion results from the failure to distinguish theoretical certainty from practical certainty. It's reasonable to expect that judicial decisions should have the greatest possible regularity in order that people may foresee the legal consequences of their acts, but it's absurd to expect that every decision should flow with formal logical necessity from premises known beforehand. One needs general principles for interpreting cases—rules of law—and established procedures for pleading and trying cases. However, principles of interpretation do not mean rules so rigid that they can be stated once and for all and mechanically adhered to. The situations to which the rules are applied differ in their details, and questions of degree regarding this or that factor have the chief weight in determining which general rule to apply. The amount and kind of certainty actually attainable is a matter of fact, not form. One can expect a high degree of certainty when social conditions are uniform and when industry, commerce, transportation and so forth move in accustomed channels. There's much less certainty when invention is active and

when new devices in business and communication bring about new forms of human relationship. Statutes can never keep up with the variety and subtlety of social change. Even the best statutes are ambiguous due to the impossibility of foreseeing all circumstances, and without such foresight, definitions must be vague and classifications indeterminate.

Dewey said that the facts he'd mentioned are not new. However, their implications for the logic of judicial decision are more revolutionary than they may seem. They suggest either that logic must be abandoned, or that it must be a logic relative to consequents rather than to antecedents, a logic of prediction of probabilities rather than a deduction of certainties. General principles are tools of intellectual analysis justified by the work they do. They need to be modified when new conditions arise and new results have to be achieved. The doctrine of fixed and necessary principles sanctifies the old. Adherence to it widens the gap between social conditions and the principles used by courts and breeds irritation and contempt for the law. Failure to recognize that general legal rules and principles are working hypotheses needing constantly to be tested by their results in concrete situations explains the otherwise paradoxical fact that the slogans of liberalism in one period become the bulwarks of reaction in the later time. Currently, society is witnessing a reaction against the individualistic formulae of an earlier liberalism. The last thirty years had seen a tendency in the direction of "social justice" and formulae of a collective nature. It's possible that new rules may be necessary and useful, but they may become harmful and socially obstructive if they are hardened into absolute and fixed principles. However, conceiving rules as tools to be adapted to the conditions of social life will draw attention to these facts. Rules will not become absolute truths to be maintained at all costs. Infiltration into the law of a more experimental and flexible logic is a social as well as an intellectual need.

I thought that Professor Dewey's distinction between a logic of search and discovery and a logic of exposition could be useful to some of my classmates uneasy about Judge Bridlegoose's "realistic" interpretation of judicial decision making. The distinction suggested that there's a logical middle ground between formalistic reasoning and blind intuition. The legal realists seemed to me a bit conventional in their thinking. I

didn't think that they really understood the non-dualistic nature of Dewey's theory of logic, even though they praised him and used his name to support their push for reforms in legal education.³⁴ For his part, Professor Dewey never joined the legal realist movement at Columbia Law School,³⁵ at least not as that movement was understood by some of the more radical members of the faculty, "fermenters" as Professor Llewellyn called them. I wasn't sure about the merits of Dewey's analogy between the way a judge makes decisions and the way that farmer or a businessman does.³⁶ Were the judges weighing the facts and the rules of law in the *Trail Smelter* case really going through the same intellectual process as a farmer deciding which crops to plant this season or an businessman deciding whether or not to open a new store next year? Still, the kind of intelligent and even creative legal problem-solving evident in the *Trail Smelter* case did seem to me "logical" in some unorthodox way.

When I came to Columbia Law School in 1922, there was a storm brewing among the faculty members (which didn't have anything to do with my admission). Some of the more urgent realists led by Herman Oliphant had presented the President of the university with a plan to reorganize the entire law school curriculum and to foster research into the interrelation of law and other social sciences. Oliphant wrote to the President because he suspected that the dean of the law school, Harlan Fiske Stone, didn't share his point of view. He was probably correct. Dean Stone was a progressive pragmatist when it came

³⁴ See Edwin W. Patterson, *Pragmatism as a Philosophy of Law*, in *The Philosopher of the Common Man: Essays in Honor of John Dewey to Celebrate His Eightieth Birthday* (G.P. Putnam's Sons, 1940), 172-204, at 177 ("Many of the men who took part in the various movements known as legal realism were devoted admirers of Dewey; and through their teaching and writing pragmatism has become an important influence in law.")

³⁵ See Martin P. Golding, *Jurisprudence and Legal Philosophy in Twentieth-Century America—Major Themes and Developments*, 36 *Journal of Legal Education*, 441-480 (1986), at 467 ("Dewey was influenced by Holmes and Pound, and he never associated himself with the realists. Attention to Dewey's approach would have saved the last from extreme and untenable statements that denigrate the role of logic in the law.")

³⁶ See *id.* at 469 ("It is not clear to me that there is a perfect analogy between a question of law as a "problematic situation" and other sorts of problematic situation, or that "solutions" to the former are like solutions to the latter, or that "testing" can mean the same thing in both. . . . Despite my reservations about it, I think that Dewey's logic of search and discovery still has great importance, because it shows that intelligence can be applied in reaching judicial decisions as much as in expounding and justifying them.")

to legal education,³⁷ whereas Oliphant thought that the only way to approach the curriculum problem, indeed any social problem, was with an objective, scientific method. In this case, the pragmatic dean and the realistic professor didn't see eye to eye.

Oliphant's proposals for reforming the curriculum at Columbia Law School were hardly pragmatic. His letter to the president of the university is lost, but we can get some idea of the changes he was proposing from an outline of the plan Oliphant drew up about the same time.³⁸ He set forth the objective of integrating the study of the law with the study of social institutions. To achieve this goal, he proposed reorganizing the curriculum along "more practical lines" with a focus on three social institutions—business, the family, and political relations—with a variety of courses in each category to explore the role law plays in them. A second objective was to develop a program of legal research in which objective, statistical methods like those in other social sciences would be used to determine what rules of law to apply in particular cases.

The president of the university was receptive to the ideas, and he suggested that Oliphant should bide his time, hinting that the day would soon come when Oliphant would be the dean of the law school and could implement his proposals. Dean Stone did soon retire, but Oliphant didn't get his position. Others on the faculty were not so keen on his radical reform proposals. A compromise candidate, Huger W. Jervey, was appointed as dean, and he did what deans tend to do when faced with demands for change now—he organized a committee to study the problem.

The faculty wanted some kind of change. They were not content with Columbia Law School being a mere prep school to prepare students for the bar exam. However, what kind of change was appropriate? And how fast should it occur? The faculty focused on two goals: (1) making the Law School a great center for legal research; and (2) making it a superior institution to prepare students for public service careers in law. During his tenure, Dean Stone had argued, and most of the faculty had agreed, that the Law School should pursue both objectives simultaneously.

³⁷ See Young B. Smith, *Harlan Fiske Stone: Teacher, Scholar, and Dean*, 46 *Columbia Law Review*, pp. 700-709 (1946).

³⁸ See Herman Oliphant, *The Future of Legal Education*, 6 *The American Law School Review*, pp. 329-336 (1928).

The fermenters had different ideas. They wanted to abandon the traditional goal of preparing students to practice law and to focus entirely on creating a community of scholars devoted exclusively to legal research. It's probably significant that the leaders of the realists, including Oliphant and Walter Wheeler Cook, were trained in law but had never practiced it.³⁹ In the mid 1920s, the dean, who had skillfully moderated the debate between factions of the faculty, became ill (perhaps as a result) and resigned. The question of his successor turned into a showdown over the future direction of the law school. Oliphant was again a candidate, but this time when he failed to get the position, it prompted many of the realists to leave. In 1928, the academic center of legal realism shifted to the up-and-coming law school of Yale University and, to a lesser extent, to a new institute for legal research at Johns Hopkins University.

The Institute for the Study of Law at Johns Hopkins may sound to some law school professors like a dream job—a good salary, no teaching responsibilities, colleagues devoted to research about legal problems and their economic and social implications.⁴⁰ One of the Institutes's goals was “to show that the methods which have proved so fruitful in the physical sciences can be applied to the social sciences as well,” particularly to law.⁴¹ An empirical methodology for solving legal problems was central to the realists' quest to develop a science of law.

In this positivist program, two things had to be avoided: subjectivity and metaphysics. Physicists had largely eliminated personal, subjective elements from their investigations, and social scientists were developing similar objective methods. Legal researchers should follow suit. The materialist metaphysics that usually accompanied a rigid scientific method could be avoided by sharply distinguishing between metaphysical and methodological questions. An objective method should be compatible with any belief in ultimate reality.

³⁹ A History of the School of Law, Columbia University, *supra* note 20, p. 302.

⁴⁰ See *The Johns Hopkins Institute for the Study of Law*, 6 *The American Law School Review*, pp. 336-338 (1928). There were plans for teaching “to the extent that this may be necessary for the training of students in the science of legal research.” *Id.* at 338.

⁴¹ See Herman Oliphant & Abram Hewitt, *Introduction*, in Jacques Rueff, *From the Physical to the Social Sciences* (The Johns Hopkins Press 1929), pp. ix-xxxii, at ix.

The initial faculty at the Institute included three fermenters: Herman Oliphant and Hessel Yntema from Columbia, and Walter Wheeler Cook who was primarily responsible for getting things started. There were high hopes for the future of the Institute, which was billed as the first of its kind in the country. However, it closed in 1933 after only five years in existence, partly because the scholarly results were disappointing and partly because funding dried up during the Great Depression.

In the early 1930s, things looked promising for the legal realism movement at Yale Law School. The dean, Robert Maynard Hutchins, strongly supported the idea of integrating the study of law with the social sciences. The centerpiece of the project to encourage empirical legal research was the Institute of Human Relations, which would provide funds to scholars in the medical school, the law school, and the social science departments. Underhill Moore and William O. Douglas were recruited from Columbia Law School, along with two social scientists to assist in conducting empirical legal studies. However, by the end of the thirties, the legal realist movement at Yale had died out. There were a number of reasons, some having to do with lack of money, some with factions among the faculty, others with recalcitrant students, and still others with the lure of administrative positions in the New Deal. However, in accounting for the failure, one should not overlook the intellectual flaws in the realist movement itself. Laura Kalman, an authority on the legal realist movement at Yale, said that “[i]f realism had had stronger intellectual legs, it might have run more sturdily at Yale.”⁴² To which I would add that realism might have stayed the course better at Yale had it displayed more common-sense pragmatism. If things didn’t work out, it was largely because realist ideas for legal education and research were not very workable. The realist perspective failed to express what lawyers saw when they viewed their activities not from above and outside the field of law but “from a small spot inside.”

One prominent realist who remained at Columbia was Karl N. Llewellyn. I first learned about his legal philosophy from reading his book *The Bramble Bush*,⁴³ a set of

⁴² Laura Kalman, *Legal Realism at Yale, 1927-1960* (The University of North Carolina Press, 1986) at 143-144.

⁴³ K. N. Llewellyn, *The Bramble Bush* (Columbia University School of Law, 1930).

general lectures he published in 1930 to introduce first year law students at Columbia, such as myself, to “this law business.” Llewellyn didn’t beat about the bush. In the first few pages he said, “this doing of something about disputes, the doing of it reasonably, is the business of the law.”⁴⁴ The people in charge of doing it—sheriffs, clerks, jailers, lawyers—are officials of the law. “*What these officials do about disputes is, to my mind, the law itself.*”⁴⁵ I could imagine Professor Dewey saying something like that, though perhaps not so directly.

I vividly recall a controversy between Professor Llewellyn and Professor Pound in 1930-31 that had lasting implications for the development of a pragmatic philosophy of law. It started with an article by Professor Llewellyn in the *Columbia Law Review* titled *A Realistic Jurisprudence—A Next Step*.⁴⁶ In it, Llewellyn said so rather harsh things about Professor Pound’s sociological jurisprudence. Pound responded in the pages of the *Harvard Law Review*, in an article titled *The Call for a Realistic Jurisprudence*.⁴⁷ Then, Llewellyn rebutted Pound’s response in the same volume in an article titled *Some Realism About Realism—Responding to Dean Pound*.⁴⁸ Everyone was talking about this “debate.”

Years later, a diligent historian discovered correspondence between Pound and Llewellyn in the Pound papers at the Harvard Law School library that shines light on the controversy.⁴⁹ In 1925, Llewellyn set out to write a book on “Realistic Jurisprudence” and its intellectual origins. He found those origins in Pound’s sociological jurisprudence,

⁴⁴ *Id.* at 3.

⁴⁵ *Id.* (emphasis in original).

⁴⁶ Karl N. Llewellyn, *A Realistic Jurisprudence—The Next Step*, 30 *Columbia Law Review*, 431-465 (1930).

⁴⁷ Roscoe Pound, *The Call for a Realist Jurisprudence*, 44 *Harvard Law Review*, 697-711 (1931).

⁴⁸ Karl N. Llewellyn, *Some Realism About Realism—Responding to Dean Pound*, 44 *Harvard Law Review*, 1222-1264 (1931).

⁴⁹ See N. E. H. Hull, *Some Realism About the Llewellyn-Pound Exchange Over Realism: The Newly Uncovered Private Correspondence, 1927-1931*, 1987 *Wisconsin Law Review*, pp. 921-969; N. E. H. Hull, *Reconstructing the Origins of Realistic Jurisprudence: A Prequel to the Llewellyn-Pound Exchange Over Realism*, 1989 *Duke Law Journal*, pp. 1302-1334; N. E. H. Hull, *Roscoe Pound and Karl Llewellyn: Searching for an American Jurisprudence* (The University of Chicago Press, 1997).

which he described as “vital, growing, expanding to meet new needs.”⁵⁰ Llewellyn saw the difference between sociological jurisprudence and his own realistic jurisprudence as mainly a matter of emphasis. Pound had attempted to incorporate ethics, morality, and prescriptive ideals into juristic science. However, Llewellyn thought that it was “hard to see how a movement for anything but objectively verifiable facts and relations between facts can be characteristic of any science.”⁵¹ He believed that it was an error to study what “is” and what “ought to be” as parts of the same inquiry. Despite his reservations about Pound’s confusion of legal science with morals, Llewellyn acknowledged that his realistic jurisprudence was a plant-like “shoot” emerging from the vital “stock” of sociological jurisprudence.⁵²

By 1930, when Llewellyn published his initial article, his attitude had changed. It seems that two incidents were responsible. Llewellyn was disappointed with Pound’s cautious response to the Sacco and Vanzetti appeals in 1927; and he harbored bad feelings from a failed collaborative effort with Pound on an article for the *Encyclopedia of Social Sciences*.⁵³ In his article, Llewellyn sharply criticized Pound and downplayed (although he did not deny) the connections between realistic jurisprudence and the sociological school. Considering the harsh tone of Llewellyn’s remarks, Pound’s response seems rather mild. Without mentioning any names or citing any specific works, he praised the realist movement generally while criticizing some of their more extreme views.

Llewellyn combined with Jerome Frank, another realist who felt himself implicated in Pound’s piece, to write a detailed rebuttal based on a survey of the writings of twenty realists. The article, published under Llewellyn’s name alone, is generally regarded as the founding document of the Legal Realist movement. Llewellyn emphatically denied that there existed a realist “school” with an official or accepted creed, and he said that he hoped that there never would be. Realists were related to each

⁵⁰ Hull, *Reconstructing the Origins of Realistic Jurisprudence*, *id.* at 1312 (citing Llewellyn, A Realistic Jurisprudence, Llewellyn Papers, B. I, 6, a-c) [hereinafter Llewellyn manuscript].

⁵¹ *Id.* at 1314 (citing Llewellyn manuscript, at 2).

⁵² *Id.* at 1315 (citing Llewellyn manuscript, at 1).

⁵³ For an account of the two incidents see *id.* at 1318-1333.

other only in their negations and in their skepticisms, as well as their curiosity. However, there was a realist *movement* in legal thinking and practice. There were several (Llewellyn lists nine) common points of departure that together constituted the characteristic marks of the movement. An important one was recognition of the need for a temporary divorce of Is and Ought. Value judgments should not intrude into the investigation of facts; judgments about what ought to be done should be grounded in knowledge and not armchair speculations. Descriptive sociology of law was already offering knowledge-based guidance about how courts should change existing rules.

When I learned the story behind the Pound-Llewellyn “debate” over legal realism years later, I couldn’t help thinking that James was right about chance playing an important part in human events. In addition to Holmes, Pound was the primary jurist speaking out against Langdell’s formalistic science of law. His sociological jurisprudence was the first coherent philosophy of law in the twentieth century, even though Pound traced its roots to the ideas of Jhering in the preceding century. Pound had read the pragmatists, particularly James, and called for the development of a pragmatic philosophy of law, which he saw as a further development of sociological jurisprudence. By the 1920s, everyone more or less accepted Pound’s view that law is a social phenomenon and that its practitioners need to take into account social facts. Initially, there was no tension between sociological jurisprudence and realism. Pound regarded himself as a realist, and even Llewellyn initially saw legal realism as a branch off the main stock of sociological jurisprudence.

However, several law professors on the make who got together at Columbia Law School after the war insisted on taking things further and treating law as an offshoot of empirical sociology. Llewellyn was the one member of the realist group with the gift for legal theorizing and the imagination to develop the progressive-pragmatic jurisprudential movement started by Pound. Instead, partly because of accidental circumstances, in a fit of pique he essentially chopped off the realist branch of sociological jurisprudence and turned it into the Legal Realist movement to which scholars have devoted countless pages in law review articles and books. As the official story goes, the Legal Realists in the 1920s and 30s are responsible for liberating the study of law from the shackles of

nineteenth-century formalism. We rarely hear of more moderate realists such as Edwin Patterson, Nathan Isaacs,⁵⁴ or Clarence Morris,⁵⁵ whose views don't fit neatly into the binary legal narrative. I strongly suspect that if Professor Dewey had turned his attention solely to legal philosophy, he would have been at the center of this moderate group of progressive legal pragmatists. However, he retired from regular teaching in 1930, at the age of seventy, and I stopped going to the law school seminar, my search for a pragmatic philosophy of law unfulfilled.

II. What is Truth?

I'm no idealist to believe firmly in the integrity of our courts and the jury system—that is no ideal to me, it is a living, working reality.

Atticus Finch in To Kill a Mockingbird

In Harper Lee's novel, the lawyer Atticus Finch spoke those words in his closing argument to the jury in a case in which he defended a negro man wrongfully accused of raping a white woman. The story is set in a small town in Alabama in 1935. Finch reminded the jury that Thomas Jefferson once said that all men are created equal. He pointed out that some people use this phrase out of context to justify all kinds of ridiculous practices. We know that men are not created equal in many ways. However, there is one way in which they are, and one human institution that views all men as equals, and that institution is a court. It could be the Supreme Court of the United States or the humblest justice-of-the-peace court in the land, or the court in which the jury was serving in this particular case. Finch acknowledged that courts have their faults, as does any human institution, but in this country courts are the great levelers, and in our courts all men are created equal. We know that he must have believed those words, because before he said them his children noticed that he was sweating. They had never seen him sweat before—he was one of those men whose faces never perspired—but now his face was shining tan.

⁵⁴ See Nathan Isaacs, *How Lawyers Think*, 23 *Columbia Law Review*, pp. 555-563 (1923). For an interpretation of Isaacs as a conservative legal realist see Larry A. DiMatteo & Samuel Flaks, *Beyond Rules*, 47 *Houston Law Review*, 297-365 (2010).

⁵⁵ Clarence Morris, *How Lawyers Think* (Alan Swallow, 1962) (1937).

Anyone who has ever practiced law, and even many of us who only went to law school occasionally, recognize something profoundly true about the nature of law in this passage. It is a human institution grounded in a bedrock faith in certain principles—Jefferson called them self-evident truths—that guide the activities, the living, working realities that make up the practice of law. There are times in the course of every lawyer's career when those realities become palpable, so much so that they may induce sweating or other signs indicating that one is face to face with something hard to define but whose reality cannot be doubted. It is possible to glimpse that greater truth even from a small spot within the practice of the law. I would go further and say that it's not possible to perceive it from any other perspective, certainly not from any vantage point above and outside the law.

I suspect that what I have said so far about the need for a pragmatic philosophy of law has caused some disquiet among those, professors of law and practitioners alike, who think as lawyers think. To some, my ideas may even appear threatening. There's a reason why before witnesses in a jury trial may speak, they must first take an oath to tell the truth, the whole truth, and nothing but the truth. Lawyers must take the concept of truth seriously, for without it our legal institutions—imperfect though they are—become empty forms and the rule of law soon disappears. There may be skepticism, perhaps justified, whether philosophers in the twenty-first century take the concept of truth seriously enough, at least for the practical purposes of the law. There may be less fear that, in our non-dogmatic, pluralistic age, they will take it too seriously, although it seems to me that either extreme tends to undermine respect for the rule of law. What characterizes the professional attitude of lawyers—though not just them—is an inability to imagine that there may be a respectable middle ground on the question of truth.

Finding that middle ground is made more difficult by our fascination with the present, with the noisy debates that go on around us that in a fundamental sense are not really disagreements at all. The opponents in such debates share a certain way of looking at reality that underlies their opposing claims about particular truths. What's unspoken is generally more significant than what's said. But everything in the way that lawyers are trained to think seems to lead away from an examination of those underlying

assumptions. Again, this is not a criticism just of legal education, but it applies to the way things are done in law schools, which is what I'm focusing on here. It's not just a call for legal training to be more reflective but for it to come to grips with ways of looking at the world that are radically different from traditional ideas. A good place to start would be to ask the old question, what is truth? I'm not asking about the abstract, ideal notion of truth but the practical kind of truth that to lawyers is a living, working reality.

In the winter of 1906-07, William James gave a series of public lectures at the Lowell Institute in Boston, repeated at Columbia University, on the pragmatic movement in philosophy, which were later published in book form as *Pragmatism*.⁵⁶ The pivotal lecture, which sparked a battle between pragmatists and anti-pragmatists, was titled *Pragmatism's Conception of Truth*. James re-entered the fray with a sequel to *Pragmatism*, published in 1909, titled *The Meaning of Truth*.⁵⁷ Then as now, *truth* is a fighting word in philosophy, and in law as well. Roscoe Pound complained about the pragmatists being slow to apply their ideas in the field of law. The main reason is that they were busy defending their ideas about truth.

James was busying himself during this time trying to develop his philosophy of radical empiricism, which was the center of his own philosophical vision. That he spent a good portion of his intellectual energy defending the pragmatic conception of truth is not only due to the fact that he was the one who had launched pragmatism as a philosophical movement in 1897. He also saw a connection between the pragmatic theory of truth and the doctrine of radical empiricism. In the preface to *Pragmatism*, he remarked that there is no logical connection between pragmatism, as he understands it, and his recent doctrine of radical empiricism. The latter stands of its own feet, and one could entirely reject it and still be a pragmatist.

In the preface to *The Meaning of Truth*, he said that most of the pragmatist and anti-pragmatist warfare is over the meaning of the word *truth*. The dispute did not

⁵⁶ William James, *Pragmatism* (The Works of William James, ed. by Frederick Burkhardt, Fredson Bowers, Ignas Skrupskelis, Harvard University Press, 1975).

⁵⁷ William James, *The Meaning of Truth* (The Works of William James, ed. by Frederick Burkhardt, Fredson Bowers, Ignas Skrupskelis, Harvard University Press, 1975).

concern any of the facts in the truth-situation because both sides believe in existing objects just as they believe in ideas of them. The difference is that when pragmatists speak of truth, they mean exclusively something about the ideas, namely their workableness, whereas when anti-pragmatists speak of truth they generally seem to mean something about the objects. Paraphrasing James, the dispute is over the question whether an idea is true because it is workable or whether it is workable because it is true. In either case, the practical result is the same. Thus according to the pragmatic principle that we should only dispute about things that make a practical difference, there would seem to be little left to fight about. James said that he might well be asked why, instead of contributing to the verbal wrangling, he didn't show his sense of "values" by burning all of his previous articles on the pragmatic meaning of truth. James said that he understood the question and would answer it. He was interested in another philosophical doctrine called *radical empiricism*, "and it seems to me that the establishment of the pragmatist theory of truth is a step of first-rate importance in making radical empiricism prevail."⁵⁸

The great obstacle to radical empiricism in James's view was the belief that experience as immediately given consists of lots of separate mental facts, such as sensations, that are unrelated to each other. Some unifying agency was needed to combine them. This transcendental agent relates things by throwing "categories" over them like a net. The most peculiar of all the categories is the truth-relation which connects parts of reality in pairs, making one a knower and another a thing known. However, this truth-relation between an idea and its object is purely formal. It cannot be described or explained in experiential terms. Pragmatists hold that everything in the truth-relation is capable of being experienced. The "workableness" that characterizes true ideas means can be described psychologically. If this pragmatic conception of truth were admitted, James said, it would be an important step toward acceptance of radical empiricism. The anti-pragmatist arguments about truth could be used as weapons not only against pragmatism but also against radical empiricism, because if the truth-relation

⁵⁸ *Id.* p. 6.

is transcendent, other relations might be as well. However, radical empiricism hinges on the factual claim that all relations between things are matters of direct particular experience. So for strategic reasons, James said, it's important to counter the opponents' argument that although workableness goes with truth, it does not constitute truth.

Anti-pragmatists argued that the object of an idea must pre-exist in reality in order for an idea to assert it "truly." They accused pragmatists of denying the reality of objects. James called the charge "slanderous." He didn't confront it head-on because to do so would have involved him in metaphysical issues about the nature of reality. He believed that if we establish the proper verbal custom and let the word *truth* represent a property of the idea rather than something mysteriously connected with the object known, the path would be open to a discussion of radical empiricism on its merits. Resolving the epistemological dispute over the truth-relation would clear the ground for a discussion of ontological matters. The idea that truth is a verbal custom rather than an abstract, metaphysical property of objects shocked many of James's contemporaries. It wasn't a new idea. Nietzsche had said something similar, but in a much more threatening way compared to James's and Dewey's pragmatic formulation of the idea. Nietzsche rejoiced in proclaiming the death of God and delighted in depicting human morality as a sham. Both James and Dewey were moral philosophers who realized the implications of Darwinian biology for philosophy, particularly for ethics and the study of human affairs, including law. One should not make the mistake of thinking that by calling truth a verbal custom, James intended to diminish respect either for the concept of truth or its efficacy in human affairs. To him, as to Dewey, the idea of truth was a living, working reality.

James described his account of truth as "an account of truths in the plural" rather than an account of truth with a capital T. All of the individual truths shared only one quality in common—"they *pay*." They pay by guiding us toward some part of the system of theoretical or scientific truths—James called this system our *funded experience*—that make up our beliefs about reality at any time. "So far as reality means experienceable reality, both it and the truths men gain about it are everlastingly in process of mutation—

mutation toward a definite goal, it may be, but still mutation.”⁵⁹ James suggests that the growth of knowledge *may* be tending toward a definite goal, Truth with a big T and in the singular. He had not yet rejected the traditional rationalistic idea that there is a foundation to the process by which scientific knowledge grows. One was free to interpret our scientific models as approximating closer and closer to an underlying Reality. The point James is arguing is this: “Truth is *made*, just as health, wealth, and strength are made, in the course of experience.”⁶⁰ Truth with a capital T is merely a collective name for the verification processes, just as health, wealth, and strength are names for other processes connected with life and pursued because it pays to pursue them.

Of course, to prevail over the anti-pragmatists, James had ultimately to confront the metaphysical issues surrounding the nature of reality. If all of our scientific model-building activities are pursued out of a disinterested desire to know the Truth, and we see the growth of science as leading us closer and closer to the ultimate goal, one can hardly say that truth is *made*. We’re simply discovering a part of Truth that pre-exists. James was aware that his audience must have been asking the question: so what’s the practical difference between being a rationalist and being a pragmatist if they both end up at the same place, Truth? Like a skillful lecturer, he teased them with a hint. Pragmatists face forward to the future, while rationalists face backward to a past eternity. Rationalists have recourse to “principles” and think that once they have named an abstraction, we now own an oracular solution. The “tremendous pregnancy in the way of consequences for life of this radical difference of outlook,” James said, would only become apparent in his later lectures. James was well read enough in literature to know how to use the fictional plot device known as a “cliffhanger.”

The lecture following *Pragmatism’s Conception of Truth* was titled *Pragmatism and Humanism*. *Humanism* was the name Professor Ferdinand Canning Scott Schiller of Oxford University gave to his own philosophy, which was similar to James’s pragmatism. James probably wished that he had chosen that name also, but it was too late. James reminded the audience of the crucial part from his previous lecture:

⁵⁹ James, *Pragmatism*, *supra* note 56, at 107.

⁶⁰ *Id.* at 104.

“ ‘Reality’ is in general what truths have to take account of.” Specifically, there are three parts of reality that we need to take account of in making truth. The first consists of the flux of our sensations, which simply come upon us from somewhere. The second part that our beliefs must take account of is the relations between our sensations—or, if one was a rationalist, between our mental copies of these relations. The third part of reality, in addition to these perceptions and largely based on them, consists of the *previous truths*—our funded experience—which every new inquiry must take account of. However fixed these three elements of reality may be, James said, “we still have a certain freedom in our dealings with them.”⁶¹ Here was the practical nub of the difference between the pragmatists and the rationalists in James’s view. It was no longer a question in the theory of knowledge but concerned the structure of the universe itself. According to the pragmatists, “we have only one edition of the universe, unfinished, growing in all sorts of places, especially in the places where thinking beings are at work.” On the rationalist side, there was a universe in many editions, “one real one, the infinite folio, or *édition de luxe*, eternally complete; and then the various finite editions, full of false readings, distorted and mutilated each in its own way.”⁶²

James detected a temperamental difference between the members in the two camps. The rationalist mind has a doctrinaire and authoritative complexion—“the phrase ‘must be’ is ever on its lips.”⁶³ In contrast, a radical pragmatist is “a happy-go-lucky anarchistic sort of creature.”⁶⁴ James was aware that many rationalists found his idea of a loose universe irrational. It is a “tramp and vagrant world, adrift in space, with neither elephant nor tortoise to plant the sole of its foot upon.”⁶⁵ Although we are used to living in a state of relative insecurity in many spheres of life, the idea that we may create part of the truth in the world is not considered respectable in philosophy classrooms. James allowed that rationalist philosophers’ notion of the “absolute edition” of the world is a legitimate hypothesis. He refused to reject the idea of a world beyond our finite

⁶¹ *Id.* at 118.

⁶² *Id.* at 124.

⁶³ *Id.*

⁶⁴ *Id.*

⁶⁵ *Id.* at 125.

experience as some materialistic philosophers did. It's a misunderstanding of pragmatism to identify it with positivistic "tough-mindedness," which scorns every metaphysical notion. In his last lecture in the series, *Pragmatism and Religion*, he tried to show that pragmatism could be called religious, if one allows that religion could be pluralistic and melioristic. Pragmatism didn't have any dogmatic opinion about the best type of religion because it didn't know which would work best in the long run. In the middle ground between the extremes of crude naturalism and transcendental absolutism, James hoped that some in the audience would find his melioristic theism exactly the kind of religious belief they needed.

So, do we create truth or do we discover it? Or do we do both? In a letter to Dickinson Miller in the summer following his lectures on pragmatism, James expressed his frustration with critics who accused him of denying the existence of realities outside the thinker. He used an analogy to explain his position:

The world *per se* may be likened to a cast of beans on a table. By themselves they spell nothing. An onlooker may group them as he likes. He may simply count them all and map them. He may select groups and name them capriciously, or name them to suit certain extrinsic purposes of his. Whatever he does, so long as he *takes account* of them, his account is neither false nor irrelevant. If neither, why not call it true? It *fits* the beans-*minus*-him and expresses the *total* fact, of beans-*plus*-him. Truth in this total sense is partially ambiguous then. If he simply counts or maps, he obeys a subjective interest as much as if he traces figures. Let that stand for pure "intellectual" treatment of the beans, while grouping them variously stands for non-intellectual interests. All that Schiller and I content for is that there is *no* "truth" without *some* interest, and that non-intellectual interests play a part as well as intellectual ones. Whereupon we are accused of denying the beans, or denying being in any way constrained by them! It's too silly!⁶⁶

Truth in the total sense is always ambiguous because it involves *some* subjective interest as well as objective constraints imposed by the environment in which we act. We can create truth only because the world supplies us with some truths, primarily in the form of stored or funded knowledge but also in empirical facts—things and their relations—that

⁶⁶ Letter from William James to Dickinson Sergeant Miller (Aug. 5, 1907) in *The Correspondence of William James*, vol. 11 (University of Virginia Press, at 411.

we perceive immediately in any particular situation. We live in a fuzzy world in which truth is irreducibly ambiguous and as vital to the human organism as health, and wealth, and strength. James didn't find the ambiguity cause for despair; if anything, he seemed to be rejuvenated by it.

In the preface to *Pragmatism*, James provided a few suggestions for further reading. He mentioned some articles by Dewey, but recommended that the reader begin with several essays in Schiller's *Essays in Humanism*. It was a tactful way of letting the general reader get his feet wet before plunging into Dewey's more technical arguments. In 1903, while Dewey was chairman of the philosophy department at the University of Chicago, he and several colleagues and students published a collection of essays titled *Studies in Logical Theory*. In reviewing the work,⁶⁷ James could barely contain his enthusiasm for this "new system of philosophy" as he called it, and he predicted that it was bound to be a bone of contention among philosophers. He noted that Dewey had certain favorite words. *Life* or *experience* is the fundamental conception, and whether you take it mentally or physically, it involves a certain adjustment between terms. Dewey's favorite word was *situation*, which implies at least two factors—the environment and the organism—each of which is both an independent variable and a function of the other variable. The situation gets perpetually "reconstructed," to use another of Dewey's favorite words, and this reconstruction is the process of which all reality consists, although James was unsure whether Dewey interpreted this reality monistically or pluralistically.

Most of James's review concerned the psychological and epistemological doctrines of the school. Consciousness is functionally active in readjusting to changes in the environment. In perfectly "adapted" situations where adjustments are fluent and stereotyped, consciousness exists only minimally. Only where there's hesitation, where "past habit will not run," does the situation awaken explicit thought. Thus thought is incidental to change in experience, to conflict between the old and the new. The situation has to be reconstructed before activity can resume, and the first stage in reconstruction is

⁶⁷ See William James, *The Chicago School*, 1 *The Psychological Bulletin*, 1-5 (1904).

re-judging it. In psychological terms, some stimulus to action has failed to function properly as a stimulus, and the activity is interrupted. It can be resumed only when a new habit is set up to which the stimulus is adequate. During the period of reconstruction, the stimulus becomes intellectually irritating, and we become conscious of it *as* a stimulus. Our response becomes “problematical,” and instead of manifesting itself in overt action it becomes a hypothetical response carried out in our mind. The process of “knowing,” the conscious relation of an object to the self, occurs only during these episodes of adjustment or reconstruction, which also includes unconscious adjustments.

James talked about the peculiar meaning that Dewey and his disciples gave to the terms *fact* and *truth*. Contrary to what most people think, a fact and a theory do not have different natures, one being objective and the other subjective. The fact-theory distinction relates solely to their different functions. What is a fact for one inquirer or in one epoch becomes a theory for another inquirer or another epoch. It's a “fact” when it functions steadily; it's a “theory” when we hesitate. “Truth” is thus in the process of formation like all other things. It doesn't consist in the correspondence between an idea and an externally fixed archetype or model. Such truth would be irrelevant, even if we knew it to exist. Truth consists in a character enclosed within a “situation.” Whenever a situation has maximum stability and seems most satisfactory to the subject-factor in the situation, it's true for him. Experience is constantly enlarging and the object-factors in a situation are always becoming problematic, making old truths unsatisfactory and obliging us to find new ones. Because these object-factors are common to everyone our individual truths have to be harmonized. The safeguard against caprice is the “grain” in things against which we cannot practically go. As the grain creates itself from situation to situation, truth creates itself *pari passu*. There's no eternally standing system of extra-subjective truth to which our judgments must conform ideally and in advance of the facts.

James noted two gaps in the system proposed by the Chicago School. There was no cosmology or account of the system of physical facts as contrasted with mental facts. And there was no explanation of the fact that different subjects share a common object-world. In closing, he said that what struck him overall about the work was “the great

sense of concrete reality with which it is filled.”⁶⁸ It offered a promising middle ground between the empiricist and the transcendental tendencies in philosophy. Like empiricism, it was individualistic and phenomenistic, placing truth in the world of things and not before it. It resembled transcendentalism in making fact and value inseparable and in standing for continuities and purposes in things. James saw the Chicago School as coinciding with the “pragmatic” or “humanist” movement at Oxford University under Schiller. He predicted a great future for the Chicago School and called it something of which Americans may be proud.

Dewey never made any significant attempt to fill the cosmological void in his philosophy pointed out by James. He was less interested in the cosmos than James was, more interested in the logic underlying the process by which truth is made or “re-constructed” to use one of his favorite words. In his article *Logical Method and Law*, he applied his general theory of truth to judicial decision-making. Let’s step back from the legal context and look at Dewey’s treatment of the question of truth more generally. Dewey thought that we only ask what truth is when something is the matter. Prior to a period of crisis, truth is essentially a living, working reality that we’re barely conscious of as we go about our business. Habit rules, and we each have our own truth. As long as we don’t bump into each other, we don’t bother to inquire about the standard by which to measure truth—unless we happen to be philosophers like James or Dewey. When they proposed that truth is something we make, it precipitated a crisis in philosophical circles. Dewey noted that “[t]he claim of ‘making truth’ is treated as a blasphemy against the very notion of truth: such are the consequences of venturing to translate the Latin ‘verification’ into the English ‘making true.’”⁶⁹

Dewey said that “[i]f we “face the bogie thus called it will be found that the horror is largely sentimental.”⁷⁰ We might name this bogie “Boo” after the bogieman in

⁶⁸ *Id.* at 5.

⁶⁹ John Dewey, *Reality and the Criterion for the Truth of Ideas*, 15 *Mind*, 317-342 (1907); rev. and reprinted as *The Intellectualist Criterion for Truth*, in John Dewey, *The Influence of Darwin on Philosophy and Other Essays in Contemporary Thought* (Larry Hickman, Ed., Southern Illinois University Press, 2007), 50-66, at 62.

⁷⁰ *Id.* 60.

To Kill a Mockingbird. Why did Dewey think that our reasons for fearing Boo are largely sentimental? Suppose, he argues, that we stick to the notion that truth is a character belonging to a meaning so far as it has been tested through action that carries it to a successful conclusion. To make an idea true is to modify and transform it until it reaches the successful outcome, until the idea initiates a response that realizes its claim to be the method of harmonizing the discrepancies in a situation. The meaning is remade by constantly acting upon it and by modifying it in ways suggested by any failures to secure harmony. From this point of view, verification and truth are two names for the same thing. We call it “verification” when we regard it as a process and we call it “truth” when we take it as a product, a process telescoped and condensed.

Dewey considered the question of the truth of practical ideas. Suppose the idea is the invention of the telephone. He argued that the verification of the idea and construction of the device are one and the same. The truth of the idea means that the idea can be carried into effect. Dewey noted that there are some intellectualists not of the absolutist type who do not believe that all practical projects, whether industrial, social or moral in scope, have been from all eternity registered as something already accomplished in reality. They believe that the truth of practical ideas is an affair of *making* them true by constructing, through appropriate behavior, a condition that satisfies the requirements of the case. There’s nothing in the logic of the case to forbid us from applying analogous considerations to any idea. Even actions that we undertake to satisfy our intellectual curiosity have a practical motivation. We hear a noise in the street. It suggests the meaning of a streetcar. To test the idea, we go to a window and listen and look intently. Dewey argued that there is no intellectual necessity, no physical or metaphysical necessity, that compels the event to arouse the judgment that the noise means a streetcar. There’s only a need to characterize the noise for some purpose of our own. Why, he asked, should we be mealy-mouthed about calling this need practical? If the necessity that led to the formation and development of an intellectual judgment was purely objective—whether physical or metaphysical—there are countless millions of other ways of characterizing the event. We might characterize the event by its distance from some crater on the moon, or its effect upon the circulation of our blood, or upon my irascible

neighbor's temper, or its bearing on the Monroe Doctrine. However, we don't characterize it in these ways because intellectual positions and statements "mean new and significant events in the treatment of things."⁷¹ As James would say, there is no truth without *some* interest.

Dewey said that it is perhaps dangerous to speculate on the inner workings of the processes by which truth is first identified with some superior type of Reality and then this Truth is used as the standard to judge the truth of ideas. However, he believed that there is some evidence to suggest that the identification is due to a two-fold confusion, one having to do with ideas and the other with things. Regarding the first, after an idea is made true we naturally say, "it *was* true all the time." However, to say, after the event, that a given idea was true all the time, is to lose sight of what makes an idea an idea, namely its hypothetical character. It transforms the idea into a brute dogma, a claim to which no canon of verification can ever be applied. Intellectualists treat the pragmatic account of the truth as if it were a denial of the existence of truth, whereas in fact it is nothing but a statement of its nature.

From the standpoint of things, *reality* is identified with truth, and therefore truth as idea and truth as reality are taken to be one and the same thing. Whenever there is an improved or tested idea that has made good, there's a concrete existence in the way of a completed or harmonized situation. The same activity that proves the idea constructs an inherently satisfied situation out of an inherently dissentient one. It is precisely the capacity of the idea as an aim or method of action to determine such a transformation that is the criterion of its truth. Dewey argued that unless we keep all the elements in the situation firmly in view, there's a tendency to view the final state of affairs, apart from its functional or practical character, as the Truth. However, when reality is separated from the process by which it is achieved, it is neither truth nor a criterion of truth. It's a state of facts like any other.

Dewey thought that the confusion of truth with ideas on the one hand and "reality" on the other is due to the fact that after ideas have been tested in action, they're

⁷¹ *Id.* at 61.

used in developing and grounding further beliefs. There are cases in which an idea ceases to exist as an idea as soon as it is made true. For example, in the situation involving the verification of the idea about the noise in the street, Dewey couldn't imagine a situation in which the truth—the verification that the noise is a streetcar—would ever function as truth again, except in the context of writing a paper on the idea of truth. Such ideas mostly cease, giving way to matter-of-fact status such as the perception of the noisy streetcar.

However, such is conspicuously *not* the case with our scientific ideas. Newton's idea or hypothesis of gravitation stands at first on the same level as the hypothesis regarding the noise in the street. But because the idea operates in many other inquiries and operates no longer as mere idea but as *proved* idea, such truths get "eternal" status, regardless of their application here and now, because there are so many heres-and-nows in which they are useful. Just as to say an idea was true all the time is a way of saying in *retrospect* that it has come out in a certain way, so to say that an idea is "eternally true" is to indicate indefinite *prospective* modes of application. Its meaning is strictly pragmatic. It doesn't indicate a property inherent in the idea as an intellectual thing but a property of use and employment. "Always at hand when needed is good enough eternal for reasonably minded persons."⁷² In *To Kill a Mockingbird*, Boo was on hand when needed at a critical moment in the life of Atticus Finch's young son. Such "ghosts" have an eternal quality about them.

Dewey continued to develop his pragmatic theory of logic throughout his career. In addition to the 1903 *Studies in Logical Theory*, to which he contributed four essays, two other important works were his 1910 book *How We Think*,⁷³ in which he applied his theory of logic to education, and the 1916 *Essays in Experimental Logic*.⁷⁴ His lifelong inquiry into the nature of inquiry culminated in 1938 with the publication of *Logic: The*

⁷² *Id.* at 63

⁷³ John Dewey, *How We Think*, *The Middle Works of John Dewey*, Vol. 6: 1910-1911 (Ed. by Jo Ann Boydston, Southern Illinois University Press, 1978).

⁷⁴ John Dewey, *Essays in Experimental Logic* (Ed. by D. Micah Hester and Robert B. Talisse, Southern Illinois University Press, 2007).

Theory of Inquiry,⁷⁵ which he finally found time to complete after his retirement from teaching. Here Dewey provided his mature formulation of the nature and structure of inquiry. As James noted, Dewey has a lot of “favorite words” that (unlike James) he’s careful to define. Dewey began his discussion of scientific inquiry with an account of the word *situation*, which he approached by saying what it was not:

What is designated by the word “situation” is *not* a single object or event or set of objects and events. For we can never experience nor form judgments about objects and events in isolation, but only in connection with a contextual whole. This latter is what is called a “situation.”⁷⁶

Dewey emphasized that in actual experience, there’s no such thing as an isolated singular object or event; an object or event is always a special part of an enviroing, experienced world or situation. A particular object stands out conspicuously because of its crucial focal position at a given time in the process of determining some problem of use and enjoyment presented by the *total* complex environment. There’s always a field in which observation of this or that particular object or event occurs.

Dewey described a situation as a whole in virtue of its immediately pervasive quality. Psychologically, a situation as a qualitative whole is sensed or *felt*. Dewey is careful to point out that saying that a situation is felt does not imply that the situation *is* a feeling or emotion. On the contrary, feelings, sensations, and emotions have to be identified and described in terms of the immediate presence of the total qualitative situation. The pervasive quality that binds all the constituents into a whole is unique—it makes each situation an *individual* situation, indivisible and induplicable. However, the distinctions and relations instituted within a situation may recur and repeat themselves in different situations. Finally, by the word *quality* of a situation, Dewey did not mean something specific as we do when we describe something as red or sweet. The sense in which a quality pervades a situation is akin to the sense that a painting is said to have a particular quality, such as a Titian or Rembrandt quality. In saying that, we don’t refer to any particular line, color, or part of the painting; rather, it’s something that affects all the

⁷⁵ John Dewey, *Logic: The Theory of Inquiry*, *The Later Works of John Dewey*, Vol. 12: 1938 (Ed. by Jo Ann Boydston, Southern Illinois University Press, 1986).

⁷⁶ John Dewey, *Logic*, LW.12.72.

constituents of the picture and all their relations. It's not something that can be expressed in words, although discourse may point out the effects of certain lines, colors, and parts on the quality of the whole. In the end, the pervasive quality of a situation is something that must be *had*.

Dewey's fundamental thesis is that logical forms accrue to a subject matter when the latter is subject to controlled inquiry. Forms emerge to control the inquiry. He illustrates this thesis with an example from the law. The materials of legal regulations are transactions occurring in the ordinary activities of individuals and groups. Such transactions occur apart from the law. As they're legally formalized, conceptions arise such as misdemeanor, crime, torts, contracts, liability and so forth. These conceptions are not imposed from any external or *a priori* source, but when they are formed they are also *formative*; they regulate the proper conduct of the activities from which they developed. All these formal legal conceptions are operational in nature. They formulate and define *ways of acting* by parties engaged in the transactions and also *ways of acting* by those who have jurisdiction to decide whether the forms have been complied with and the consequences for failure to comply. Legal forms change with changes in the habitual transactions, although as a rule forms lag behind. Dewey regarded the development of forms in consequence of operations as an established fact in law, and he maintained that the same general pattern holds for logic as well. He did not see the divorce between logic and the law that Justice Holmes did.

Inquiry occurs in every area of life and in every aspect of every area. We examine things, turn them over intellectually, infer and make judgments about them as surely as we walk or talk. Because inquiry is a mode of conduct, it's accessible to objective study as much as any other mode of behavior. We can look for common patterns of inquiry in all areas of life. By comparing and contrasting what methods have worked in the past with those that haven't, we can figure out how and why certain means and agencies have yielded "warrantably assertible"⁷⁷ conclusions. We can also figure

⁷⁷ Dewey, when speaking carefully, tended to use the term *warranted assertibility* instead of *truth*.

out which methods have not and cannot do so, taking *cannot* to mean that there's some intrinsic incompatibility between the means used and the consequences attained.

What do we mean by *inquiry* in its most general form? Dewey's defined it as "*the controlled or directed transformation of an indeterminate situation into one that is so determinate in its constituent distinctions and relations as to convert the elements of the original situation into a unified whole.*"⁷⁸ The original indeterminate situation is not only "open" to inquiry but also open in the sense that the various elements don't hang together. The determinate situation, achieved as the result of inquiry, is a closed and finished situation. The phrase "controlled or directed" refers to the fact that the inquiry is competent to the degree that it ends by establishing an objectively unified situation. In the course of inquiry, we carry on discourse through the use of symbols—propositions, or terms and the relations between them—as a means.

Although the process of inquiry is a continuum, Dewey identified several general stages or phases. The first consisted of the antecedent conditions of inquiry—the indeterminate situation. The essence of this phase is the presence of something *questionable*. This quality is not just uncertainty at large but a unique doubtfulness that applies to the particular situation. It's this unique quality pervading the situation that exercises control over the inquiry and its special procedures. Without a situation uniquely qualified in its very indeterminateness, there's only a condition of complete panic, and our response to it takes the form of blind and wild activities. In short, "we've lost our heads." Dewey emphasized that it's the situation that has the traits we call "troubled" or "ambiguous" or "confused." Our personal states of doubt are induced because the situation is inherently doubtful.

Dewey described the next stage of inquiry as "the problematic situation." An indeterminate situation is precognitive—Dewey compared it to the organic imbalance of hunger. A problematic situation is characterized by the fact that we've made a judgment that the situation requires inquiry—in Dewey's analogy, we need to search for something to get rid of the hunger. Characterizing a situation as problematic doesn't carry inquiry

⁷⁸ *Id.*, LW.11.108.

very far. We have to determine *what* the problem is. To define a problem is to be relatively far along in the process of inquiry. Until we can do that, we're only groping in the dark. The way the problem is conceived determines which specific suggestions are entertained and which are dismissed, which data are selected and which are rejected. The description of the problem determines the criterion of relevancy and irrelevancy of hypotheses and conceptual structures.

The next step in inquiry is making the problem definite and clear so that it has, in the very terms of its statement, reference to a possible solution. How then can we control the formation of the problem so that further inquiries will move toward a solution? The first step is to recognize that no situation that's *completely* indeterminate can possibly be converted into a problem having definite components. We need to search out those elements of the given situation that, as elements, are settled. Dewey gives the example of a fire alarm sounding in a crowded lecture room. The fire has some settled traits—for example it is located *somewhere*. The aisles and exits are also located at fixed places. We also need to observe other factors that, while they are not spatially or temporally fixed, are observable parts of the problem such as the behavior and movement of other members of the audience. All these conditions constitute the “facts of the case.” because they are what we must reckon with to find a solution to the problem of getting out safely.

Finally, we must reason. We need to develop the meaning of the ideas in their relations to each other. Dewey distinguished the type of reasoning needed as a kind of rational discourse, which he distinguished from reasoning syllogistically. There's a tendency in logic to identify inference with the logical relation of implication, which in his view seriously confuses logical theory. We need to talk about matters reasonably, using symbols, rather than construct a sequence of logical implications that will take us step by inexorable step from conditions to conclusion. If a suggested meaning is immediately accepted, inquiry is cut short. Hence the conclusion is not grounded, even though it may be correct. The check upon immediate acceptance is the investigation of meaning as a meaning. That inquiry entails examining the meaning in relation to other meanings in the system of which it is a member. If such and such a relation of meanings is accepted, we're committed to certain other relations of meaning. Through this process

we finally arrive at a meaning that is more clearly *relevant* to the problem at hand than the originally suggested idea. This developed meaning suggests operations that can be performed to test its applicability whereas the original idea was too vague to specify crucial operations. Dewey thought that this point could most readily be appreciated in connection with scientific reasoning. Development of a hypothesis may suggest certain important experiments to perform, whose results may in turn suggest modifications of the original theory. However, he noted that there can be no adequate inquiry into the meaning used to settle the given situation. Inquiry terminates when we stop talking and act. The conclusion of an inquiry is in this sense logically ungrounded. We might regard it as a leap *from* faith, like the leap James's alpine climber made across a chasm in the Alps. In the end we've no choice but to believe something. What we believe makes all the difference, and most of the truth, in the world.

At least I was no longer groping in the dark. I could now formulate the problem. I was looking for a philosophy of international environmental law based on the pragmatic conception of truth as something we make. In the process, we must take account of reality as it presents itself partly in the form of funded experience, contained in books and other kinds of documents and records; and partly in the form of concrete experience, particularly the fuzzy relations that give structure to a problematic situation. If the world is loosely structured, as some evidence suggests, we have a certain degree of freedom in searching for workable solutions. But the exhilaration in that sense of freedom is tempered by humility based on the recognition that any solution we find will not last forever. The most we can aim for is stability over a period of time, which we hope will be long.

The greatest obstacle in the path of creating a pragmatic philosophy of law is getting past the old debate over whether law is essentially something we make or essentially something we find. Though they disagree about the nature of law, both camps—legal positivists and natural law theorists—share the same dualistic way of looking at legal phenomena. Legal realism failed to bridge the gap because it couldn't find a point of view from above and outside the law that made sense to those engaged in the business of teaching and practicing law. Its descriptive, social scientific approach,

armed with statistics, could not express the felt meanings—the living working realities—embodied in legal forms of social order. The most important step toward eliminating the dualism underlying current philosophies of law is to view the law as an expression of a human nature that has evolved through interactions with its environment, especially the social environment. The legal realist movement had as its most enduring progeny the study of law and economics. We need to develop the study of law and psychology. I don't mean *psychology* in the narrow sense any more than William James did when he titled his great book *The Principles of Psychology*. I mean the kind of psychology in which our ideas about how we know the world and how the world presents itself to us are relevant to the discussion of human think and behave, and ought to think and behave, in particular situations. Although we may shy away from such discussions for fear that we may encounter “ghosts,” there may be less to fear from some ghosts than we think.

III. Ever Not Quite

In 1943, when the nation's future lawyers were fighting battles overseas, two professors at Yale University, Myres S. McDougal and Harold D. Lasswell, were planning for a different kind of battle within one of the country's most prestigious law schools. They wanted to change the way lawyers were educated. As they stated their goal, “if legal education in the contemporary world is adequately to serve the needs of a free and productive commonwealth, it must be conscious, efficient, and systematic *training for policy-making*.”⁷⁹ At most law schools, this proposition would have seemed outlandish, perhaps even a little bit dangerous. Policy-making is a messy political process very different from what judges do—or ought to do—namely apply established legal principles and precedents to the given facts of a case. Law students should spend their time mastering the technical forms of the law in order to serve the legal needs of their clients.

McDougal and Lasswell were an intellectual odd couple. Myres McDougal was a lawyer by training and temperament. Born in Mississippi in 1906, he attended the University of Mississippi where he received his undergraduate and LL.B degrees,

⁷⁹ Harold D. Lasswell & Myres S. McDougal, *Legal Education and Public Policy: Professional Training in the Public Interest*, 52 *Yale Law Journal*, 203-295 (1943), at 206.

specializing in legal history, before going to Oxford University on a Rhodes Scholarship.⁸⁰ He later received his J.S.D. from Yale Law School, where he became a member of the faculty in 1934 and taught for fifty years. He was not a legal realist when he came to Yale; in fact, he found realism appalling. With his background in classics and Oxonian views of legal history, it took some time to re-orient his perspective on the law.⁸¹ Once he had seen the realist light, McDougal's only question was "where do we go from here?" The Legal Realism movement had died out at Yale, so the question was really about how the next generation of realists could adapt their program for reforming legal education to the changed post-war environment.

One of McDougal's first steps was to team up with Harold Lasswell. Born in Illinois in 1902, Lasswell was a child prodigy who grew into something of a professorial prodigy.⁸² When he was in high school, one of his teachers arranged for him to talk with John Dewey whom Lasswell recalled as the thinker who most deeply influenced him. The conversation may have led Lasswell to the University of Chicago where he studied political science with Charles Merriam, founder of the behavioralist school. When Lasswell completed his doctorate in 1928, he accepted an appointment to the political science faculty at Chicago. His found his career path thwarted by the president of the university, Robert Maynard Hutchins, former dean of Yale Law School who'd become disenchanted with legal realism and skeptical about the value of empirical research in the social sciences. Lasswell left Chicago in 1938 and, after nearly a decade as an

⁸⁰ *Renowned international legal scholar Myres S. McDougal dies*, Yale Bulletin & Calendar, Vol. 32, no. 26 (May 18-June 1, 1998); available at <http://www.yale.edu/opa/arc-ybc/ybc/v26.n32.news.11.html>. For an appreciation of McDougal's contributions to international law see 1 Denver Journal of International Law & Policy (1971).

⁸¹ See, Laura Kalman, *supra* note 42 at 176. ("Yale's Wesley Sturges 'beat the legal realism into my head,' he [McDougal] later recalled. 'I thought this was so damn illiterate when I first came here. It was probably May before I woke up one morning—it was almost like a conversion—and said "why the son of a bitch is right." He had the surprise of his life when he called on me that morning.'").

⁸² For information on Lasswell's life see Dwaine Marvick, *Introduction: Context, Problems, and Methods*, in Harold D. Lasswell on Political Sociology (University of Chicago Press, 1977), pp. 1-72; Rodney Muth, *Harold Dwight Lasswell: A Biographical Profile*, in Harold D. Lasswell: An Annotated Bibliography (Rodney Muth, Mary M. Finley, Marcia F. Muth eds., New Haven Press, 1990), pp. 1-48; Bruce Lannes Smith, *The Mystifying History of Harold D. Lasswell*, in *Politics, Personality, and Social Science in the Twentieth Century: Essays in Honor of Harold D. Lasswell* (Arnold A. Rogow ed., Univ. of Chicago Press, 1969), pp. 41-105.

intellectual gypsy, in 1947 accepted a senior position at the Yale Law School where he taught until retiring in 1972.

In the summer of 1947, McDougal gave an address to the Yale Law School Association titled *The Law School of the Future: From Legal Realism to Policy Science in the World Community*.⁸³ He argued that the world had completely changed since the legal realist movement in the interwar years and that Yale Law School had an opportunity and obligation to create the institutions, doctrines and practices of the future. It was time for legal realism to yield the stage to “policy science.” McDougal didn’t define what he meant by the phrase, probably because he didn’t have a very clear idea what it meant. Lasswell invented the term *policy science*. In a private memorandum outlining his career goals in 1943, Lasswell said that “[t]he policy sciences include the social and psychological sciences; in general, all the sciences that provide facts and principles of direct importance for the making of important decisions in government, business, and cultural life.”⁸⁴ He devoted the rest of his career to developing the methodology of policy science so that by 1970 many social scientists were familiar with the phrase.⁸⁵ Policy sciences had become an academic discipline with professional policy scientists who published papers in a journal devoted to the policy sciences.⁸⁶ In the end, Lasswell had some success in accomplishing his personal policy objectives—only not at Yale Law School.

From 1947, McDougal and Lasswell regularly co-taught two seminars at Yale Law School, “The World Community and the Law” dealing with McDougal’s specialty, international law; and “Law, Science and Policy” in which law and science are treated as instruments of policy-makers. Among those taking these seminars were some law

⁸³ Myres S. McDougal, *The Law School of the Future: From Legal Realism to Policy Science in the World Community*, 56 *Yale Law Journal*, 1345-1355 (1947).

⁸⁴ See Rodney Muth, *supra* note 82 at 17 (citing Harold D. Lasswell, “Memorandum: Personal Policy Objectives,” Harold D. Lasswell Papers, Yale University Library, New Haven, CT).

⁸⁵ See Frederick Sampson Tipson, *The Lasswell-McDougal Enterprise: Towards a World Public Order of Human Dignity*, 14 *Virginia Journal of International Law*, 535-585 (1974), at 555-556 (“Though it failed to gain widespread usage at the time [*i.e.* the early postwar period], the phrase ‘policy sciences’ is currently gaining broad acceptance as a general term for describing the entire set of modern decision-making techniques and systems analysis.”).

⁸⁶ See E.S. Quade, *Why Policy Sciences*, 1 *Policy Sciences*, 1-2 (1970); see also Harold D. Lasswell, *The Emerging Conception of the Policy Sciences*, 1 *Policy Sciences*, 3-14 (1970).

students who would later become advocates of what was called the “New Haven School of International Law.” I’d decided to go back to law school, and the New Haven School interested me. I applied to the joint degree program at the Yale Law School and the Yale School of Forestry and the Environment. Professor Tim Clark of the forestry school had written an article⁸⁷ in *Conservation Biology* about the need to develop policy-oriented curricula for conservation biologists. He endorsed the set of social-process categories in Lasswell’s policy-sciences approach as a comprehensive method for exploring the human context of any conservation problem. As is customary, my first year in the joint degree program was spent in the law school. I decided to take the McDougal-Lasswell seminar on Law, Science, and Policy.⁸⁸ Professor Jerome Frank, a former legal realist in the law school, reportedly had heard some students describe the course as “drifting and dreaming.”⁸⁹ However, everyone knew there was bad blood between Frank and the policy-science professors because they were competing for students. So I discounted the statements about “drifting and dreaming” and signed up.

On the first day of class, before passing out the syllabus, McDougal and Lasswell said that there were certain points they wanted to emphasize, beginning with a definition of law.⁹⁰ The most viable conception of law is that of a process of authoritative decision by which members of a community clarify and secure their common interests. It’s important to locate the particular process of authoritative decision within its larger context of social processes in the community, in particular the effective power processes. Humanity today lives in a hierarchy of interpenetrating communities from the local to the global. Making authoritative decisions in the common interest requires a focus upon the totality of a community’s values and institutional practices. In addition, a number of

⁸⁷ See Tim W. Clark, *Developing Policy-Oriented Curricula for Conservation Biology: Professional and Leadership Education in the Public Interest*, 15 *Conservation Biology*, 31-39 (2001).

⁸⁸ This course was the basis for the masterwork of the New Haven School of Law, Harold D. Lasswell & Myres S. McDougal, *Jurisprudence for a Free Society: Studies in Law, Science and Policy*, 2 vols, (New Haven Press, 1992).

⁸⁹ See Kalman, *supra* note 42 at 183. The reference to the students’ comments was made by Frank in a communication with his colleague Lon Fuller.

⁹⁰ The points in this paragraph are all taken from Harold D. Lasswell & Myres S. McDougal, *Legal Education and Public Policy: Professional Training in the Public Interest*, 52 *Yale Law Journal*, 203-295 (1943)

distinguishable, though interrelated, intellectual tasks need to be performed. Inquiry and education about the law should adopt a comprehensive focus of attention upon community values and institutions, sharpen the employment of all relevant intellectual tasks, and deliberately direct itself toward improvement in making and applying community policy.

With the introductory remarks over, the professors passed out the syllabus. There seemed to be a coherent structure to the course.⁹¹ The first part set out the goal criteria for an adequate theory about law and looked at trends in previous theories to see how well they have done in achieving them. The remainder of the course, considerably longer than the first part, was concerned with methodology and the social-process categories. These constituted Lasswell's conceptual framework for analyzing the social process context, the intellectual tasks involved in policy thinking, and the stages in the decision process. There seemed to be a lot of categories.

McDougal began by saying that in many areas of inquiry about social process today scholars are creating comprehensive and well-articulated frames of reference—"general orientations" or "conceptual maps" he called them—to assist in conducting studies. Unfortunately, legal scholars haven't done so. He mentioned several legal frames of reference or "schools of jurisprudence." The oldest was the natural law frame, followed by the historical frame, the analytical or positivist frame, sociological jurisprudence and sociology of law, and last the recent frame known as American Legal Realism, which went far beyond sociological jurisprudence in its criticism of earlier legal theories and procedures. However, Legal Realism was just a preliminary to the main task of creating a more relevant policy-oriented jurisprudence.

In keeping with the methodology of policy science, McDougal first set out objectives or goal criteria for a policy-oriented theory about law: (1) establishment of observational standpoint, (2) delimitation of the focus of inquiry, (3) formulation of particular problems of inquiry, (4) explicit postulation of public order goals, and (5)

⁹¹ In the absence of a real syllabus from the course (if there was one), I have used the structure of McDougal's & Lasswell's *Jurisprudence for a Free Society* as the organizational framework.

performance of intellectual tasks. My fellow law students loved lists and McDougal was certainly obliging. I had to admit, everything was very systematic and comprehensive.

Since there was no “neutral” point of view, it was important to be clear about one’s own perspectives. McDougal distinguished the observational standpoint of a scholar from that of a decision-maker. A scholar is primarily concerned with enlightenment whereas a decision-maker is concerned with power. A scholar’s vantage point is different from the perspective of community participants, who present claims for authoritative decision, and from the perspective of authoritative decision-makers, who respond to these claims. A scholar’s role is to clarify for the various participants their common interests, which they may not be able to perceive.

Establishing and maintaining the scholarly standpoint required a system of expressions both sufficiently comprehensive and sufficiently precise to be able to refer to all the significant features of the total context of legal and social process. Such words will be used in a functional rather than a conventional sense. McDougal emphasized that policy-oriented jurisprudence is a theory *about* law rather than a theory *of* law. He thus adopted the realist perspective of the law from above and outside the ordinary realm of discourse. It seemed that one was going to have to learn something like a foreign language in this course, but law students at Yale were good with language, especially meta-language.⁹²

Comprehensiveness and selectivity are the most important criteria for delimiting the focus of inquiry. The broadest reach of any configurative, contextual jurisprudence must extend to the whole of the social process in which authoritative decision is an interacting component. At the same time, a viable theory of law must be able to focus in whatever precision is necessary upon particular decisions and flows of decisions. The central focus is upon decision as including both *perspectives* (subjectivities attending choice) and *operations* (choices actually made and enforced by threats and promises).

⁹² See John Norton Moore, *Prolegomena to the Jurisprudence of Myres McDougal and Harold Lasswell*, 54 *Virginia Law Review*, 662-688 (1968) at 665 (“An overriding characteristic of the system is the use of a meta-linguistic terminology for assistance in carrying out the sophisticated tasks performed by the system. This use of a precise meta-language for analysis is both one of the greatest strengths of the system and one of the greatest causes of popular misunderstanding of the system.”).

Moreover, the theory characterizes law not merely as decision but as *authoritative* decision in which elements of both authority and control are combined. *Authority* means participation in decision in accordance with community perspectives about who is to make particular decisions, by what criteria, and by what procedures. *Control* means effective participation in the making and enforcing of decisions. When decisions are authoritative but not controlling, they're not law but pretense; when they're controlling but not authoritative, they're not law but naked power. Both authority and control are empirical terms and can be subjected to systematic, disciplined inquiry using all the techniques of modern science.

Furthermore, as McDougal and Lasswell presented it, the policy-oriented approach extends beyond occasional or isolated authoritative decisions to the whole continuous *process* of authoritative and controlling decision by which a community shapes and shares its values. This process consists of two different kinds of decisions, *constitutive* and *public order*. Constitutive decisions are those whereby a community identifies various authoritative decision-makers, basic community policies, appropriate structures of authority and bases of their power to make decisions. Public order decisions are those that flow from the constitutive process, such as decisions about how resources are allocated and developed, how wealth is produced and distributed, and how human rights are promoted and protected.

For the comprehensive and economic description of a process of decision it is necessary to employ a conceptual framework. In McDougal's and Lasswell's schema, there are three basic sets of categories, one used to classify all values, another to describe the social process, and a third to analyze the phases of decision. *Value* should not be understood in its common-sense meaning. *Value* is an empirical term used to designate a preferred or goal event. There are eight value categories derived from contemporary social science: power, respect, rectitude, affection, well-being, wealth, skill, and enlightenment. Decision-making is concerned with the power process in society, whereas the scholar-advisor to decision makers is basically concerned with scientific knowledge, which fits into the enlightenment category.

According to McDougal and Lasswell, when we speak of the social process of a community, we're technically referring to "people seeking values through institutions using resources." The categories for describing this process are derived from cultural anthropology. To describe any social process we need to consider seven questions: (1) who are the *participants* or *stakeholders*? (2) what do they think, feel, believe about the problem or policy (*perspectives*)? (3) where are the participants and what are their occasions for interaction with other stakeholders (*situations*)? (4) what assets (capabilities, perspectives, values) do participants hold (*base values*)? (5) how do they use or are likely to manage their assets (*strategies*)? (6) what outcomes do participants seek in terms of distribution of values (*outcomes*)? (7) what overall redistribution of values is likely to be achieved by the stakeholders as a result of their participation (*effects*)?

Finally, the conventional way of describing the parts of authoritative decision uses such terms as *legislative*, *executive*, *judicial*, and *administrative*. However, these terms refer to structures. It's more precise to use a set of seven functional terms to describe the phases of the decision-making process: (1) *intelligence*, the gathering of information relevant to decision; (2) *promotion*, the advocacy of policy alternatives; (3) *prescription*, the enacting of a community policy which is authoritative and controlling; (4) *invoking*, the provisional characterization of an action as contrary to policy (4) *application*, the determination whether or not the action is contrary to policy with the application of sanctions for violation ; (5) *termination*, the revoking of prescription, and (7) *appraisal*, the evaluation of past decision processes.

McDougal noticed that some students were looking slightly glassy-eyed from all the meta-linguistic terminology, and he reassured them that they would become familiar with the policy-science language as they got deeper into the methodological part of the course. Some students looked at each other as if to ask if they should go there. Perhaps they were thinking that the policy-oriented approach is a bit far removed their ideas about law as a collection of principles and rules gleaned from studying cases and they couldn't see how policy sciences could ever be useful in their careers. But some students thought otherwise. They saw the sets of categories (twenty-seven of them by my count) as

general rubrics or templates that could be applied to any type of problem-solving situation.⁹³ In the following chapter, we will look at the application of the policy science framework in the field of conservation biology. Within the field of law, the conceptual schema could be used to organize articles and books on such topics as the law of the oceans,⁹⁴ the law of space,⁹⁵ international law,⁹⁶ international human rights law,⁹⁷ and the interpretation of international agreements.⁹⁸ The authors all had one thing in common: they spoke the language of policy science. Facility with the language identified one as a member of the New Haven School of Law. But learning a language requires effort, and the question some were asking, including myself, was whether or not it is worth the effort. That's a meta-question the methods of policy sciences can't answer.

Professor McDougal turned to the third topic on the agenda, formulation of particular problems for inquiry. In any community, including the global community, there's a continuous flow of deprivations and non-fulfillments in the shaping and sharing of values. As a result, participants in the social process make demands on established decision-makers for some kind of authoritative decision. The task for the policy scientist and the authoritative decision maker is to formulate the problem adequately. The version of events, the alleged deprivations and non-fulfillments, put forth by the various claimants may be biased or distorted. It's important to characterize these opposing claims appropriately because the description will affect the comprehensiveness, realism,

⁹³ On the generality of the methodology, see W. Michael Reisman, Siegfried Wiessner, & Andrew R. Willard, *The New Haven School: A Brief Introduction*, 32 *Yale Journal of International Law*, 575-582 (2007) at 576 ("It should be evident that the intellectual tools of the New Haven School can assist anyone in any context who is grappling with and trying to solve a problem."). For an example of the application of Lasswell's policy science framework in the field of educational administration see Lavern L. Cunningham, *Applying Lasswell's Concepts in Field Situations: Diagnostic and Prescriptive Values*, 17 *Education Administration Quarterly*, 21-43 (1981).

⁹⁴ See Myres S. McDougal & William T. Burke, *The Public Order of the Oceans: A Contemporary International Law of the Sea* (Yale University Press, 1962).

⁹⁵ See Myres S. McDougal, Harold D. Lasswell, & Ivan A. Vlasic, *Law and Public Order in Space* (Yale University Press, 1963).

⁹⁶ See Lung-chu Chen, *An Introduction to Contemporary International Law: A Policy-Oriented Perspective* (Yale University Press, 1989).

⁹⁷ See Myres S. McDougal, Harold D. Lasswell, & Lung-chu Chen, *Human Rights and World Public Order: The Basic Policies of an International Law of Human Dignity* (Yale University Press, 1980).

⁹⁸ See Myres S. McDougal, Harold D. Lasswell, & James C. Miller, *The Interpretation of Agreements and World Public Order* (Yale University Press, 1967).

and economy with which the scholarly observer and the decision-maker can carry out the various intellectual tasks of inquiry. Unfortunately, traditional analytical frames of jurisprudence continue to formulate problems in terms of definitional and derivational exercises. Despite the effort to focus on aspects of human activity in terms of their effect on values, Dean Pound's sociological theory of balancing interests leaves the conceptions of "interest" largely over-lapping and non-homogenous. Legal realists point out the need to observe and study the actual structure and functioning of social processes, insisting that facts be compared with facts, not words with words. However, their voices were largely unheard. Policy-oriented jurisprudence seeks to formulate problems in factual terms, that is, in terms of values or preferred events. By using a comprehensive cognitive map showing the demanded values and the institutional practices by which values are shaped and shared, policy scientists try to minimize the gap between a community's desired goals and their achievement. The process of decision is directed as much toward change as towards protection of existing interests.

The fourth item on Professor McDougal's list of criteria for an adequate theory about law was the explicit postulation of basic public order goals. Since there are no neutral or pure theories of law in the sense of rules devoid of policy content, it's important to be as explicit as possible about policy commitments. Basic goal values should be postulated rather than derived from higher norms. Logical derivation of policy goals from some trans-empirical or highly ambiguous system of values only leads to an infinite regress. Peoples with diverse styles of derivation have shown that they can cooperate in promoting the same values regardless of the faiths or creeds used to justify them. Basic goal values for a preferred public order can be implemented by a variety of functionally equivalent institutional practices. Everywhere peoples and cultures demand values associated with human dignity. These values have been recently transformed into authoritative prescription in the United Nations Charter, the Universal Declaration of Human Rights, and elsewhere. The eight value categories mentioned earlier provide a way of thinking about the global social processes promoting the fundamental goal of human dignity.

The final thing McDougal talked about was how to make decisions. He spoke of five intellectual tasks in the decision-making process: (1) clarification of community policies, (2) description of past trends in decision, (3) analysis of factors affecting decision, (4) projection of future trends, and (5) invention and evaluation of policy alternatives. The first task is to clarify abstract postulated goals, such as human dignity, by formulating them in empirical terms that refer to preferred events in social process. Global community policies on ownership of these resources needed to be clarified to reflect this preference. In a contextual approach, clarifying community policies requires the concurrent and systematic performance of all the other relevant intellectual tasks. Inquiry into trends, conditioning factors, and future probabilities provides information about the past and a preview of the future if no policy changes are made. In order to compare decisions and their social consequences both through time and across community boundaries, it's important to use a set of factual value-institution categories. Comprehensive maps of value-institutional terms will reveal the particular configuration of relevant factors in a given problem, which in turn will permit more efficient design of policy responses to problems. A policy-relevant jurisprudence will encourage creativity by demanding deliberate invention and assessment of new alternatives in policy, institutional structures, and procedures. All the preceding intellectual tasks will be synthesized and brought to bear upon the ultimate task of finding integrative solutions characterized by maximum gains and minimum losses.

Professor McDougal says that he had finished with his remarks and that if there were no questions he would turn the floor over to Professor Lasswell to introduce the methodology of policy sciences. Lasswell began by saying that the policy sciences are an adaptation of the approach to public policy taken by John Dewey and the American pragmatists.⁹⁹ The world around us is a “big, blooming, buzzing confusion” and to cope with it we need a set of comprehensive, systematic, scientific tools. Above all, we need a meta-language.

⁹⁹ See Harold D. Lasswell, *A Preview of Policy Sciences* (American Elsevier Pub. Co., 1970) at xiii-xiv (“The policy sciences are a contemporary adaptation of the general approach to public policy that was recommended by John Dewey and his colleagues in the development of American pragmatism.”).

When Professor Lasswell mentioned Dewey's name, I recalled what Dewey and James said about how we go about ordering our thoughts about the world around us. We certainly don't do it by shoe-horning reality into twenty-some pre-fabricated boxes. I wanted to say to Professor Lasswell, "Wait a minute, I knew Professor Dewey, Professor Dewey was a friend of mine, and" But I decided that it would be better not to say anything. I could see that things weren't going to work out at Yale. I wondered if they work out anywhere. With that, my mind began drifting and dreaming, recalling the words of the Yale fight song:

Well, here we are, well, here we are!
Just watch us rolling up a score.
We'll leave poor Harvard behind so far,
They won't want to play us anymore.
We'll roll the score so very high,
That you will hear them sigh:
Well, a Boola, Boo, Boola, Boola, Boo,
Boola, Boo, Boola, Boola, Boola Boo!

Chapter Five

I. The Information Processing System Called Man

In 2002, the Royal Swedish Academy of Sciences awarded the Nobel Prize in Economics jointly to Daniel Kahneman and Vernon Smith for their work in the field of economic psychology and experimental economics. The Academy cited Kahneman's contribution in integrating economic analysis with insights from cognitive psychology regarding the heuristics and biases of decision-making under uncertainty.¹ They cited Smith for his development of experimental methods shedding light on microeconomic behavior. The awards signify recognition that human behavior is more complicated than conventional models of economic decision-making have described. When making complicated decisions of an economic type, our minds seem to deviate to some degree from ideal models of rationality. Our thought processes have evolved their own "logic" during the long history of human transactions. The Academy's award sent a message that economists and political scientists—and I would add lawyers—should try to learn more from psychologists about how the mind makes decisions under uncertainty and apply the knowledge in their practical work.

At least two well-known economists in the early twentieth century—Frank H. Knight and Friedrich von Hayek—had studied the psychology of William James. Knight was professor of economics at the University of Chicago from the late 1920s to the early 1960s.² Among economists, he is remembered primarily for his distinction between risk and uncertainty.³ Risk is the quantitative form of uncertainty, capable of being measured

¹ See http://nobelprize.org/nobel_prizes/economics/. Kahneman's collaborator in much of the work, Amos N. Tversky, would undoubtedly have shared the prize, but he died in 1996.

² No biography of Knight exists. For an account of his early life see Donald Dewey, *Frank Knight Before Cornell: Some Light on the Dark Years*, *Research in the History of Economic Thought and Methodology*, Vol. 8: 1-38 (1990); for additional biographical information and an account of Knight as an historian of economics see Richard S. Howey, *Frank Hyneman Knight and the History of Economic Thought*, *Research in the History of Economic Thought and Methodology*, Vol. 1: 163-186 (1983).

³ See Frank H. Knight, *Risk, Uncertainty and Profit* (Houghton Mifflin Company, 1921). Knight's theory of knowledge discussed in this section is found in Chapter 7: *The Meaning of Risk and Uncertainty*; and Chapter 8: *Structures and Methods for Meeting Uncertainty*. In addition, Knight expanded on these methodological chapters in an essay *The Limitations of Scientific Method in Economics*, in *The Trend of Economics*, (edited by R.G. Tugwell, Alfred A. Knopf, 1924), 229-267; reprinted in *Selected Essays by Frank H. Knight*, Vol. 1: *"What is Truth" in Economics* (edited by Ross B. Emmett, The University of Chicago Press, 1999), 1-39. Citations are to this edition.

using techniques based on probability theory and statistics. True uncertainty, or simply uncertainty, cannot be measured. In making decisions under conditions of uncertainty, we rely on cognitive mechanisms of “judgment,” “common sense,” or “intuition.” Knight described himself as a “radical empiricist in logic,”⁴ which meant being agnostic on all questions beyond the fairly immediate facts of experience. For a radical empiricist, most of these immediately experienced facts consist of relations between things. Ordinary decisions of life are made on the basis of crude, superficial estimates about how the future will be different if we act in a particular way. The future situation depends upon so many objects and is influenced by so many factors that we don’t make any real effort to take them all into account, much less estimate each one of them precisely and sum their individual significances. The mental operations by which ordinary real-life decisions are made are very obscure. Knight lamented that most logicians and psychologists had shown little interest in them, perhaps because there was little that could be said about unconscious processes of “judgment” or “intuition.” For Knight, such judgments are the most important ones because almost all of economic behavior comes from decisions made under conditions not of quantifiable risks but of unknown uncertainty.⁵

Although many are familiar with the economic and political writings of Friedrich von Hayek, fewer know of his life-long interest in how the mind works. As a student, Hayek was torn between psychology and economics as a career, and it seems that he chose the latter primarily because it offered better job prospects.⁶ During an interlude

⁴ Knight, *Risk, Uncertainty and Profit*, *id.*, fn. 1 at 199-201. For a discussion of Knight’s radical empiricism see Roger Frantz, *Two Minds: Intuition and Analysis in the History of Economic Thought* (Springer, 2005), Chapter 6: Intuition, Risk and Uncertainty, 95-111.

⁵ Nassim Taleb criticizes Knight’s distinction between computable risks and uncomputable uncertainty on the grounds that all uncertainty is essentially unknown. See Nassim Taleb, *The Black Swan: The Impact of the Highly Improbable* (Random House, 2007), at 127-128 (“Economists, who do not consider what was discovered by noneconomists worthwhile, draw an artificial distinction between Knightian risks (which you can compute) and Knightian uncertainty (which you cannot compute), after one Frank Knight, who rediscovered the notion of unknown uncertainty and did a lot of thinking but perhaps never took risks, or perhaps lived in the vicinity of a casino. Had he taken economic or financial risks he would have realized that these ‘computable’ risks are largely absent from real life! They are laboratory contraptions!”).

⁶ See Bruce Caldwell, *Hayek’s Challenge: An Intellectual Biography of F.A. Hayek* (University of Chicago Press, 2004), at 139 (“Although, over the years, Hayek mentioned several reasons [for pursuing

from his studies at the University of Vienna in the winter of 1919-20, he attended the Institute of Brain Anatomy in Zurich where he spent his time staining brain cells and looking at their connections. His experience studying the anatomy and physiology of the brain led him to write a paper on the theory of consciousness.⁷ However, his pursuit of economics led him in other directions, and the paper lay in a drawer for a quarter of a century until 1945 when he took it up again and developed his ideas into a book on theoretical psychology titled *The Sensory Order*.⁸

Hayek wanted to eliminate Cartesian dualism from psychology and philosophy. He believed that Descartes' separation of the mind from the physical world led to a misguided theory of knowledge called *constructivist rationalism* or simply *constructivism*.⁹ Applied to social problems, constructivism envisions that human intelligence can design rational institutions based on a synoptic view of objective, scientific truth. In opposition to the constructivist idea of a "made" social order, Hayek proposed the model of a "grown" or *spontaneous order*.¹⁰ Instead of being imposed from the top down, spontaneous order emerges gradually from the bottom up. Spontaneous orders occur in a variety of social phenomena such as economic and legal systems. In *The Wealth of Nations*, Adam Smith showed how, in certain circumstances, markets arise spontaneously based on the principle of exchange. In his legal writings, Lon Fuller systematically explored the principles underlying various kinds of spontaneously emergent legal orders.

Hayek viewed the mind as a spontaneous order. What we call "mind," he says, is "a particular order of a set of events taking place in some organism and in some manner

economics rather than psychology as a career] it seems likely that, in the end, such mundane concerns as credentials and job prospects may have been the key factors determining his choice.”)

⁷ F.A. Hayek, *Contributions to a Theory of How Consciousness Develops*, (1920, 1991 trans. by Grete Heinz), Hoover Institution, Hayek Archives, box 92, folder 1.

⁸ F.A. Hayek, *The Sensory Order* (The University of Chicago Press, 1952). For a good account of Hayek's theory of mind and its relationship to economic theory, past and present, see Brian J. Loasby, *Hayek's Theory of the Mind*, in *Advances in Austrian Economics*, Vol. 7: *Evolutionary Psychology and Economic Theory* (Elsevier Ltd., 2004), 101-134.

⁹ See F.A. Hayek, *Law, Legislation and Liberty*, Volume 1: *Rules and Order*, (The University of Chicago Press, 1973) at 5.

¹⁰ For Hayek's distinction between the two types of order see *id.*, Chapter Two, *Cosmos and Taxis*, 35-54.

related to but not identical with, the physical order of events in the environment.”¹¹ The goal of theoretical psychology was to explain the relationship between the mental and the physical order. To simplify the problem, Hayek focused on just one part of the mind, the sensory order, which consists of the order in our sensory experience of the world, which includes such phenomena as our ability to discriminate between various shades of color or pitches of sound. The corresponding physical order consists of the neural impulses in the brain that accompany the various sensations. Hayek maintained that the experienced sensory order has essentially the same structure¹² as the physical order in the brain, the synaptic connections between brain cells or neurons and the physiological impulses that traverse various areas of the brain through these connections. In describing how the brain performs its functions, he used the metaphor of the nervous system as a classification or sorting machine. Different events at the neural level that produce the same sensory effect are described as events of the same class, say the color blue. The *sole* criterion that makes them members of this class is the identity of their effects. To illustrate the idea, Hayek imagined machines constructed for the purpose of sorting things, such as statistical machines for sorting cards with punched holes (computers were still in the future).

One may ask how do the various sensory classes originate? In traditional empirical psychology, they result from experience—for example, from repeated sensations of blue things, we learn to discriminate between the color blue and other colors in the system. However, in Hayek’s theory, the brain must classify particular neural events as the same before it can make this discrimination. To explain how the brain does this, Hayek used the concept of *pre-sensory experience* or “linkages.” In our initial encounters with a color that is not part of the existing color system, the resulting visual nerve impulses have not yet been classified. Such impulses are not yet mental events but purely physiological ones. Over time, they acquire “linkages” with the other elements in the system. Not only are we not conscious of the events producing such

¹¹ Hayek, *The Sensory Order*, *supra* note 8, at 16 (emphasis in original).

¹² Hayek used the term *isomorphism* to denote the structural similarity between the physical and the sensory order.

linkages, linkages do not even qualify as mental events in the ordinary sense. They are *pre-sensory experience*. Eventually, a new system that includes the new color emerges spontaneously out of this pre-sensory experience. His account of the spontaneous emergence of a sensory order is similar to his later explanations of the emergence of economic markets.

Was Hayek a radical empiricist? He preferred to describe his theories as a “pure empiricism.” Like James, Hayek rejected the traditional tenets of empiricism “not from an opposite [*i.e.*, rationalistic] point of view, but on the contrary, by a more consistent and radical application of its basic idea.”¹³ Hayek had an ambivalent attitude toward James. On the one hand, he criticized James’s “school of thought” in psychology, which he described as widespread though not formally organized. Followers of James believed that even if one were to succeed in describing all the physiological events in the brain accompanying mental phenomena, this account of brain processes would not exhaust the human significance of these phenomena. To Hayek, James’s phenomenological approach to psychology is not fully scientific because the questions it asks cannot be clearly stated, and, indeed, it is impossible to say what kind of statement would provide an answer. Which is to say, Hayek was more at home in a laboratory than James was.

Hayek did not believe that it would ever be possible for the mind completely to explain its own mental operations in terms of the underlying order of neural events. The complexity of the brain presented a daunting challenge to neurophysiologists, but they could hope to continuously to extend our knowledge. However, Hayek believed that there exists an *absolute* limit to our capacity to obtain precise, predictive causal explanations of particular mental processes. The limit is determined by the nature of the brain itself. Any classification apparatus has to have a structure with a higher degree of complexity than that of the objects it classifies. Thus not only the mind as a whole but also all individual mental processes must always remain “phenomena of a special kind.”¹⁴ Although mental processes are produced by the same principles that operate in the physical world, we shall never be able fully to explain our mental life in purely physical

¹³ Hayek, *The Sensory Order*, *supra* note 8, at 8.26, p. 172.

¹⁴ *Id.* at 8.87, p. 191.

terms. The most theoretical psychology can do is to demonstrate the *principle* by which the order of mental events is determined. In studying human phenomena, we must always start with our direct knowledge of the different kinds of mental events, which to us must remain irreducible. Human decisions will always appear as the result of the whole human personality, the whole of a person's mind. Hayek's skepticism about ultimate explanations in psychology has its correlate in his skepticism about the effectiveness of central planning in economies. We can understand how some small portion of the system works here and there, and on the basis of that knowledge we may be able to intervene effectively, but we can never see the big picture. At least with regard to the mind, James said much the same thing, albeit from a very different point of view.

The Nobel Prize in Economics was established only in 1969. Hayek won the prize in 1974 for his work on the theory of money and economic fluctuations and his analysis of the interdependence of economic, social, and political processes. In his banquet speech at the ceremony,¹⁵ Hayek said that had he been consulted about whether or not to establish the prize, he would have advised against it. He believed that the prize confers on an individual an authority that no one in economics should possess. There was no reason why someone who had made a distinctive contribution to economic science, perhaps in the distant past, should be regarded as omni-competent on all problems of society. He said that was almost inclined to suggest that the Nobel committee require winners of the economics prize to take an oath of humility, like the Hippocratic oath, not to exceed the limits of their competence in their public pronouncements.

One Nobel economics laureate who might have had difficulty taking a humility oath was the 1978 winner, Herbert A. Simon. The Nobel committee cited Simon for his pioneering research into the decision-making process within economic organizations. In his banquet speech, Simon remarks that to deal with problems such as world population and hunger, peace, energy and mineral resources, environmental pollution, and poverty, we must broaden and deepen our knowledge of nature's laws as well as our

¹⁵ Friedrich August von Hayek, *Banquet Speech*, available at http://nobelprize.org/nobel_prizes/economics/laureates/1974/hayek-speech.html.

understanding of the laws of human behavior. The Nobel ceremony was an occasion to “renew our resolution to use all the powers of the human mind, finite though they be, to search forward to a more humane world.”¹⁶ When Simon referred to the powers of the human mind, he had a particular image in view, which has come to be the primary metaphor for the cognitive powers of the mind today—the image of the mind as a computer. In his Nobel Prize lecture, Simon acknowledged that our knowledge of human behavior falls short of our need for such knowledge. However, he was not inclined to discount what we do know. In his view,

we do understand today many of the mechanisms of rational choice. We do know how the information processing system called Man, faced with complexity beyond his ken, uses his information processing capacities to seek out alternatives, to calculate consequences, to resolve uncertainties, and thereby—sometimes, not always—to find ways of action that are sufficient unto the day, that satisfy.¹⁷

Simon invented the terms *satisfice* and *bounded rationality* to describe the mind’s mechanisms of rational choice. Before we look at what they mean, however, we should pause briefly to consider the nature of the metaphor itself.

With the discovery in 1953 by Watson and Crick of DNA as the genetic material and the working out of the genetic “code” in the 1960s, it became natural to think of the brain as “hard-wired.” The biological basis of the metaphor of the mind as a kind of “computer” is rooted rather narrowly in the discipline of molecular biology. The earlier idea of the mind as a spontaneous mental order has a broader root system in Darwin’s evolutionary biology. As Hayek’s work on the sensory order showed, thinking of the mind as a spontaneous order did not preclude the conception of it as a kind of machine. However, the fundamental purpose of the machine was to classify or group events, which is a peculiar kind of “information processing.” To classifying is to interpret the world. The kind of uncertainty that attends the act of classification is radically different from the

¹⁶ Herbert A. Simon, *Banquet Speech*, available at http://nobelprize.org/nobel_prizes/economics/laureates/1978/simon-speech.html.

¹⁷ Herbert A. Simon, *Rational Decision-Making in Business Organizations* (Nobel Memorial Lecture, 8 Dec. 1978), at 368; available at http://nobelprize.org/nobel_prizes/economics/laureates/1978/simon-lecture.html.

type of uncertainty that arises in processing information already interpreted. The metaphor of man as an information processor may be an adequate description when one looks at the brain's activities from the vantage point of a psychologist above and outside the subject. However, subjects might use a different metaphor to describe their experience of what they're doing. Neither point of view is more "objective" than the other unless one thinks that the subject's experience is reducible to physiological events in the brain, which Simon doesn't claim.

In the early 1950s, Simon was primarily concerned with the descriptive study of organizational decision-making, the subject of his Ph.D. dissertation. He and others believed that there was a need for a more adequate theory of human problem-solving in order to understand decisions. Simon and Allen Newell, a research in computer science and cognitive psychology at the RAND Corporation, conceived the idea that the right way to study problem-solving was to simulate it using computer programs. Gradually computer simulation of human cognition became Simon's primary research interest, and it continued to occupy him even after the Nobel Prize in economics.

In his autobiography, Simon said that two ideas make up the core of his intellectual work: (1) humans are capable of achieving only a very bounded rationality, and (2) as a consequence of our cognitive limitations, we are prone to identify with sub-goals.¹⁸ By the term *bounded rationality* Simon meant that behavior is determined by irrational and non-rational elements bounding the area of rationality.¹⁹ Cognitive limitations on rationality arise from two sources: lack of knowledge about the decision-making environment²⁰ and the decision-maker's limited computational capacity.²¹ In a metaphor that became known as "Simon's scissors," Simon compared the interaction

¹⁸ See Herbert A. Simon, *Models of My Life* (Basic Books, 1991), at 88.

¹⁹ See Herbert A. Simon, *Administrative Behavior* (McMillan, 1947),

²⁰ See Herbert A. Simon, *Rational Choice and the Structure of the Environment*, 63 *Psychological Review*, 129-138 (1956).

²¹ See Herbert A. Simon, *A Behavioral Model of Rational Choice*, 69 *The Quarterly Journal of Economics*, 99-118 (1955).

between these two limitations to the blades of a scissors that act together to shape human rational behavior.²²

In developing the concept of bounded rationality, Simon made a distinction between substantive and procedural types of rationality. He defined behavior as substantively rational when “it is appropriate to the achievement of given goals within the limits imposed by given conditions and constraints.”²³ In contrast, behavior is procedurally rational when “it is the outcome of appropriate deliberation.”²⁴ Substantive rationality depends upon the actor in only one respect—his postulated goals. Given these goals, rational behavior is determined solely by the characteristics of the environment in which he acts. To illustrate the idea, Simon used the example of someone who wants to obtain a nutritionally adequate diet at minimum cost.²⁵ Given the number of calories one must consume, and the required proportions of carbohydrates, proteins, fats, vitamins, and minerals, along with their costs, one can come up with a formula for calculating the least expensive way of achieving a nutritionally adequate diet. There is only one substantively rational solution to the problem. To predict how someone with this goal will behave, you don’t need to know anything about the psychology of an actor other than that they are rational.

Procedural rationality, in contrast, depends upon the deliberative process that leads to the behavior. For example, in the optimal diet problem, cognitive psychologists are interested not in the prescribed diet, but in the method subjects use to discover it. They ask whether or not the procedures for solving the problem are computationally efficient. Simon pointed out that today when we speak of computational efficiency we’re

²² Herbert A. Simon, *Invariants of Human Behavior*, 41 *Annual Review of Psychology*, 1-19 (1990), at 7.

²³ Herbert A. Simon, *From Substantive to Procedural Rationality*, in *Method and Appraisal in Economics* (Ed. by Spiro J. Latsis) (Cambridge University Press, 1976), 129-148, at 130. *See also* Herbert A. Simon, *Models of Bounded Rationality*, Vol. 3 (MIT Press, 1997), Ch. IV.9: *Rationality in Psychology and Economics*, 367-385.

²⁴ Simon, *From Substantive to Procedural Rationality*, at 131. *See also* Herbert A. Simon, *Rationality as Process and as Product of Thought*, *The American Economic Review*, Vol. 68: 1-16 (1978), at 9 (“procedural rationality—the effectiveness, in light of human cognitive powers and limitations, of the procedures used to choose actions.”).

²⁵ Simon, *From Substantive to Procedural Rationality*, *id.* at 131.

referring to the computing time or effort required to solve a problem.²⁶ Our brain is essentially a neural system for processing information. Although our mind is much slower than computers at carrying out elementary computational operations, the basic repertoire of processes in the two systems is very similar. The search for computational efficiency is therefore a search for procedural rationality, and computational mathematics provides the normative theory of such rationality.

Psychologists investigating procedural rationality generally study decision-making behavior in simple, well-structured laboratory situations in which theory makes specific predictions about how rational subjects will act. Simon was interested in the psychology of chess-playing and what we can learn about the thought processes of expert players confronted with enormously complex computational problems, too complex even for the fastest computers to discover optimal solutions. Players compensate for deficiencies in their computational capacity by *selectively* searching through the immense tree of possible moves, seldom considering more than 100 branches before making a move. They store significant relational patterns in their long-term memory along with procedures for exploiting the possibilities in those patterns. So called “rules-of-thumb” or heuristics for selective search along with an encyclopedic knowledge of significant patterns lie at the heart of an expert player’s procedural rationality. In addition, players constantly modify their aspirations in deciding whether a particular move is good enough so that the search can end. Simon described sub-optimal moves as “satisficing,”²⁷ satisfactory and sufficient for the purpose at hand. He noted that procedural forms of rational behavior have been found in other problem situations of comparable complexity to those in chess, and to some extent in even more complex real-life situations.²⁸ In all cases, individuals rely on heuristics and means-ends analysis to search for a small set of promising alternatives, they use their experience to detect important features in the

²⁶ *Id.*, at 133.

²⁷ Simon notes that the term *satisfice* appears in the Oxford English Dictionary as a Northumbrian synonym for “satisfy.” For a discussion of the meaning of *satisficing* and its consequences for behavioral economics see Herbert A. Simon, *Models of Bounded Rationality*, Vol. 3 (MIT Press, 1997), Ch. IV.4, 295-298.

²⁸ *Id.*, at 136.

situation, and they employ some kind of aspiration mechanism to terminate the search when an adequate solution is found.

Simon criticized the dominant model of rationality in neo-classical economics, the theory of subjective expected utility. Mathematical statisticians and decision theorists developed the theory in the first half of the twentieth century.²⁹ Its main components consist of: (1) a well-defined personal *utility function* which assigns a number as a measure of the decision-maker's overall preference for a particular outcome or set of events; (2) an exhaustive, well-defined set of alternatives to choose from; (3) a joint subjective probability distribution, based on Bayesian probability theory, which associates a probability with each outcome; and (4) a policy of choosing the alternative that maximizes expected utility. Simon called the subjective expected utility model "an elegant machine for applying reason to problems of choice."³⁰ It allows one to "finesse" the question of how different values are to be compared. In effect, the comparison has already been made when one assigns a personal utility to each outcome.

The basic problem with the subjective expected utility model in Simon's view is that it ignores the computational limitations of the human mind. The theory assumes that the decision-maker can contemplate, in one synoptic view, everything that could affect the outcome. With this omniscient perspective, one knows the full range of alternative choices and can see into the future well enough to assign precise probabilities to possible outcomes. However, in complex, decision-making, there is always uncertainty due to missing or incomplete information. Just as important, there are cognitive limitations on the mind's capacity to process available information. Not even the most powerful computer could apply the subjective expected utility model of decision-making to complex decision-making problems in the real world.

²⁹ Frank Plumpton Ramsey and Bruno de Finetti were two of the pioneers who independently formulated the theory of choice-based subjective probabilities in the late 1920s and 1930s. See F. P. Ramsey, *Truth and Probability* (1926), in F.P. Ramsey, *The Foundations of Mathematics and Other Logical Essays* (ed. by R.B. Braithwaite) (Kegan, Paul, Trench, Trubner & Co., 1931), 156-198; and Bruno de Finetti, *La Prévvision: Ses Lois Logiques, Ses Sources Subjectives*, *Annales de l'Institut Henri Poincaré*, Vol. 7: 1-68 (1937). Leonard Jimmie Savage synthesized their work and the game-theory contributions of John von Neumann and Oscar Morgenstern in his seminal work *The Foundations of Statistics* (Wiley, 1954).

³⁰ Simon, *Reason in Human Affairs* (Stanford University Press, 1983), at 12.

If we ask ourselves how we actually make ordinary decisions of real life, Simon argued, certain features of the process stand out.³¹ Generally, our decisions are concerned with specific choices that we consider to be independent of other important choices. For example, when deciding which job offer to take, we're probably not also making up our mind about which marriage proposal to accept. Second, we generally don't imagine the full range of possible future scenarios and assign a probability distribution to them. Third, because the choice problem is relatively specific, we focus on only certain aspects of our lives and only some of our values and neglect others. Finally, in making decisions, we spend most of our time gathering information and considering the relevant values and very little time actually deciding.

Several cognitive mechanisms are required³² in order to exercise a sensible kind of bounded rationality. First, we have to have some way of focusing attention, of avoiding too many distractions and concentrating only on the important things in the situation. Physiological psychologists had shown that one of the main functions of the emotions is to help focus attention. Emotions distract us from our current focus of thought and call attention to something in the environment demanding immediate attention. Autonomic physiological mechanisms can generally take care of an organism's vital processes like breathing, but for intermittent needs, Simon argues, "we operate very much as serial, one-at-a-time animals."³² Emotional mechanisms help to assure that urgent tasks get priority. Second, we need mechanisms for generating alternatives. Much practical problem solving consists in searching for better ways of doing what we've done before. Third, we must be capable of acquiring facts about our environment and possess a modest capability of making inferences from those facts. By reasoning in a commonsense way, organisms can get by with only a very simple model of the particular part of the world relevant to their current decisions.

Simon's behavioral model of rationality included the mental processes known as "intuition." He viewed the "aha!" experience characteristic of intuition basically as a process of recognition. A number of studies had shown that recognition processes play a

³¹ *See id.*, at 17-19.

³² *Id.*, at 21.

major role, perhaps the most important role, in cognitive tasks such as playing chess, making a medical diagnosis, and reading.³³ A grandmaster in chess can play many games simultaneously and make good, even optimal, moves after studying the board for only a few seconds. Without conscious analysis, his mind can rapidly retrieve from memory the appropriate information needed for dealing with a particular problem situation characterized by recognizable cues. Moreover, such expertise based on search and evaluation algorithms can be programmed into a computer, allowing the current generation of chess-playing machines to compete with, and sometimes beat, the best human players.³⁴ Simon believed that the same kind of recognition mechanisms could explain most phenomena of human creativity. He saw no contradiction between the intuitive model of thinking and the behavioral model, nor did he regard the mechanisms as residing in different parts of the brain and competing for control of the mind. Serious thinking requires both search-like process and sudden recognition of familiar patterns. Without such recognition, search through complex spaces would proceed at a snail's pace. In most problem situations having aspects of novelty, intuition and efficient search cooperate in reaching solutions.

Simon stressed the frequent association of intuitive processes with emotion. The searching, plodding parts of problem solving are a kind of “cold cognition” relatively free from intense emotion, whereas the sudden discovery—the “aha” experience—is “hot cognition” which comes when we're excited about something. Such considerations point to the importance of understanding the role of the emotions in human rationality. Simon saw several cognitive functions for them. Certain kinds of emotion, such as pleasure, enter into the personal utility function in the subjective expected utility theory, and are among the goals people strive for in behavioral models of rationality. Moreover, emotions help us to select particular things in the environment to focus attention on. In Simon's words, “[a] behavioral theory of rationality, with its concern for the focus of attention as a major determinant of choice, does not dissociate emotion from human

³³ See Herbert A. Simon, *The Sciences of the Artificial* (MIT Press, 1981).

³⁴ “Deep Fritz,” a German chess program, has recently drawn or defeated several former world champion opponents. See Dylan Loeb McClain, *Once Again, Machine Beats Human Champion at Chess*, N.Y. Times Online, (Pub. Dec. 5, 2006) (retrieved July 5, 2010).

thought, nor does it in any respect underestimate the powerful effects of emotion in setting the agenda for human problem solving.”³⁵

Simon’s work on bounded rationality provided the theoretical foundation for the research program of cognitive psychologists Amos Tversky and Daniel Kahneman known as “heuristics and biases.” Other cognitive psychologists, led by Gerd Gigerenzer, claimed that many of the so-called cognitive “biases” are really adaptive mechanisms if one considers the decision-making environment, and they developed a competing research program called “ecological rationality.” In the field of economics, Tversky and Kahneman used the notion of cognitive biases to undermine subjective expected utility theory, the basis of orthodox microeconomic models of decision-making. Economists incorporated results from the heuristics and biases program into a new field of economics called *behavioral economics*.

At the same time, Vernon L. Smith used the concept of ecological rationality as the basis of a competing research program called *experimental economics*, which supports classical microeconomic theories about the spontaneous formation of markets. In addition, neurophysiologists and economists created a research program called *neuroeconomics*, which uses brain scans to detect areas of the brain active when we make various kinds of economic decisions. Finally, some legal scholars jumped into the fray by incorporating behavioral economics into traditional law and economics. A warning: we are entering a war zone, and the “rationality wars,” as they have been called,³⁶ show no signs of abating.

Tversky and Kahneman introduced their heuristics and biases program to the scientific world in a 1974 article titled *Judgment Under Uncertainty: Heuristics and Biases*.³⁷ They were interested in the question what determines our beliefs concerning the likelihood of uncertain events such as the outcome of an election, the future value of

³⁵ Simon, Reason in Human Affairs, *supra* note 30, at 30.

³⁶ See, e.g., Richard Samuels, Stephen Stich, and Michael Bishop, *Ending the Rationality Wars: How to Make Disputes About Human Rationality Disappear*, in Common Sense, Reasoning, & Rationality (ed. by Renée Elio, Oxford Univ. Press, 2002), 236-268.

³⁷ Amos Tversky & Daniel Kahneman, *Judgment Under Uncertainty: Heuristics and Biases*, 185 Science, 1124-1131 (1974).

the dollar, or the guilt of a defendant. To find out, they conducted experiments, generally on undergraduates, in which subjects are presented with various types of probabilistic questions. They compared the pattern in the responses with the pattern predicted by probability theory, including Bayes's rule. They found that subjects relied on a limited number of heuristic principles, which reduced the complex task of assessing probabilities to simpler kinds of judgments. In general, these heuristics were useful, but sometimes they led to severe and systematic errors or "biases." Tversky and Kahneman described three heuristics used in making judgments under uncertainty—representativeness, availability, and anchoring³⁸—and discussed the theoretical implications of the cognitive biases to which they lead. They concluded that internal consistency—the rationality criterion of subjective expected utility theory—is not enough for judgments to be considered adequate or rational. Judgments "must be compatible with the entire web of beliefs held by the individual."³⁹ Unfortunately, there's no simple, formal procedure for assessing this compatibility. In striving for compatibility, subjects attempt to make their probability judgments compatible with their knowledge of the subject, the laws of probability, and their own judgmental heuristics and biases.

In their 1986 paper, *Rational Choice and the Framing of Decisions*,⁴⁰ Tversky and Kahneman attacked the foundations of subjective expected utility theory, the basis of orthodox theories of microeconomic decision-making. They focused on two of the theory's basic assumptions: dominance and invariance. The principle of dominance says that if one option is better than another in one state and at least as good in all other states, the dominant option should be chosen. Invariance states that the preference between options should be independent of how they are described. Tversky and Kahneman tested these normative rules by presenting undergraduates with decision problems in which

³⁸ The three heuristics use in making judgments under uncertainty are" "(i) representativeness, which is usually employed when people are asked to judge the probability that an object or event A belongs to class or process B; (ii) availability of instances or scenarios, which is often employed when people are asked to assess the frequency of a class or the plausibility of a particular development; and (iii) adjustment from an anchor, which is usually employed in numerical prediction when a relevant value is available." *Id.*, at 1131.

³⁹ *Id.* at 1130.

⁴⁰ Amos Tversky and Daniel Kahneman, *Rational Choice and the Framing of Decisions*, *The Journal of Business*, Vol. 59, Part 2: S251-S278 (1986).

individuals were asked to choose between alternative possible outcomes. They found that the axioms of rational choice are generally satisfied in transparent situations and often violated in non-transparent ones. Variations in how a particular problem is presented produced systematic violations of invariance and dominance that could not be explained on normative grounds. Tversky and Kahneman labeled this phenomenon the “framing effect.” To account for framing effects, they proposed a descriptive theory of risky choice called *prospect theory*, which earned Kahneman a share of the 2002 Nobel Prize in economics. Prospect theory essentially attempts to describe some of the principles of perception and judgment limiting the rationality of choice. To Tversky and Kahneman, introducing psychological considerations such as framing “both enriches and complicates the analysis of choice.”⁴¹ An adequate account of choice could not afford to ignore effects of framing and context, “even if they are normatively distasteful and mathematically intractable.”⁴²

Tversky’s and Kahneman’s interpretation of deviations from the rational-choice model as cognitive “biases” drew a sharp response from the German cognitive psychologist Gerd Gigerenzer. He emphasized the Darwinian evolutionary origins of heuristic mechanisms and their ecological soundness as rational modes of inference.⁴³ The concept of ecological rationality focuses attention on the importance of the decision-making environment for evaluating the rationality of choice. Gigerenzer cited Herbert Simon as the inventor of the ecological rationality concept. Gigerenzer criticized the heuristics-and-biases research program for ignoring the environmental blade in Simon’s scissors metaphor of bounded rationality and focusing solely on apparent irrationalities or “cognitive “biases.” To Gigerenzer, this way of viewing bounded rationality interprets it as an imperfect form of rationality. He argued that so-called “cognitive biases” disappear

⁴¹ *Id.* at S273.

⁴² *Id.*

⁴³ See Gerd Gigerenzer & Daniel G. Goldstein, *Reasoning the Fast and Frugal Way: Models of Bounded Rationality*, 103 *Psychological Review*, 650-669 (1996).

when one considers the environmental context and sees the ecological rationality of heuristics-guided behavior.⁴⁴

Gigerenzer described the mind as an “adaptive toolbox,” which is a Darwinian metaphor for decision-making in two respects.⁴⁵ First, the course of evolution does not follow some grand plan but rather results in a patchwork of solutions for specific problems. Thus the heuristics in the toolbox are cognitive mechanisms evolved for solving domain-specific problems. Second, just as evolutionary adaptations are favorable or unfavorable only with respect to the environment, heuristics can be judged good or bad—rational or irrational—only by virtue of how well they perform in a specific context. The problem structure includes both the statistical structure of the environment and the decision-maker’s goals. Unlike general decision-making algorithms, domain-specific heuristics allow an organism to react more quickly with less information and computation. Such “fast and frugal heuristics” consist of three functions: (1) a search rule to guide the search for environmental cues to evaluate alternatives; (2) a stopping rule or criterion for deciding when to end the search; and (3) a decision rule to determine which alternative to select. Gigerenzer emphasized that none of these rules excels in all environments. The ecological rationality research program studied the adaptation of particular heuristic rules to specific environmental structures. Gigerenzer described the adaptive toolbox as a set of cognitive, emotional, and social strategies for handling a multitude of goals by making decisions quickly, frugally, accurately—or sometimes by not making a decision at all.⁴⁶

⁴⁴ See Gerd Gigerenzer, *How to Make Cognitive Illusions Disappear: Beyond “Heuristics and Biases,”* European Review of Social Psychology, Vol. 2 (Ed. by W. Stroebe & M. Hewstone): 83-115 (1991). Kahneman and Tversky rebutted Gigerenzer’s critique in Daniel Kahneman and Amos Tversky, *On the Reality of Cognitive Illusions*, 103 Psychological Review, 582-591 (1996). Gigerenzer replied to the rebuttal in *On Narrow Norms and Vague Heuristics: A Reply to Kahneman and Tversky (1996)*, 103 Psychological Review, 592-596 (1996). After a further exchange in the postscripts to the two articles, the “rationality debate” came to a close.

⁴⁵ See Gerd Gigerenzer, *The Adaptive Toolbox*, in *Bounded Rationality: The Adaptive Toolbox* (ed. by Gerd Gigerenzer & Reinhard Selten) (MIT Press, 2001), Ch. 3: 37-50. See also Gerd Gigerenzer, *Is the Mind Irrational or Ecologically Rational?*, in *The Law and Economics of Irrational Behavior* (ed. by Francesco Parisi & Vernon Smith) (Stanford University Press, 2005), 37-67, at 41.

⁴⁶ Gigerenzer, *The Adaptive Toolbox*, *id.*, at 43.

Within the discipline of economics, behavioral economists and proponents of the experimental economics research program eye each other warily. In his speech at the Nobel banquet in 2002,⁴⁷ experimental economist Vernon L. Smith read a list of people, mostly, that he wished to celebrate. He mentioned his co-winner of the prize, Daniel Kahneman, for his work demonstrating that the logic of choice and the ecology of choice can be divergent. He cited David Hume who declared the three laws of human nature—the right of possession, its transference by consent, and the performance of promises—and who also taught that the rules of morality are not the conclusions of reason. He included F.A. Hayek for teaching us that an economist who is only an economist cannot be a good economist; that social science should largely be a study of what is not; that reason should recognize its own limitations; and that civilization rests on the fact that we all benefit from knowledge that we as individuals do not possess. Smith also celebrated humanity’s most significant emergent creation: markets.

Smith explored the ecology of choice experimentally in the laboratory using mostly undergraduates as subjects. He rejected the problem choice survey methods used by cognitive psychologists and instead developed interactive protocols in which subjects engaged in impersonal exchange through simulated markets as well as in personal, although anonymous, forms of social economic exchange using computers. In his Nobel Prize lecture,⁴⁸ Smith criticized behavioral economists for making a “cottage industry” of showing that the assumptions of the subjective expected utility model don’t apply to real decisions. He recalled that it was not always so. Beginning in the 1970s, research began to focus on contradictions between reports of behavior and caricatures of mainstream microeconomic theory to the exclusion of the predictive successes of the theory. Smith said that the image of psychologists and economists as antagonists obscures their underlying agreement on foundations. Psychologists such as Kahneman don’t believe that people are irrational except in the very narrow context of economic modeling based

⁴⁷ Vernon L. Smith, *Banquet Speech*, available at http://nobelprize.org/nobel_prizes/economics/laureates/2002/smith-speech.html.

⁴⁸ See Vernon L. Smith, *Constructivist and Ecological Rationality in Economics*, 93 *The American Economic Review*, 465-508 (2003). (This article is a revised version of the lecture Smith delivered in Stockholm on Dec. 8, 2002.)

on axioms of subjective expected utility theory.⁴⁹ But no one is arguing that the model is an adequate description of how people really behave in making decisions. A fuller account of rationality in economics must include the concept of ecological rationality.

Ecological rationality is the concept of a rational order as “an undesigned ecological system that emerges out of cultural and biological evolutionary processes: homegrown principles of action, norms, traditions, and ‘morality.’”⁵⁰ Ecological rationality uses reason in the form of rational reconstruction to understand the behavior of individuals based on their experience and folk knowledge; to understand the emergent order in human cultures; and to discover the intelligence embodied in rules, norms, and institutions created from human interactions but not by deliberate design. Smith traced the concept of ecological rationality back to philosophers of the eighteenth-century Scottish Enlightenment such as David Hume and Adam Smith. Modern proponents of the idea included F.A. Hayek and Herbert Simon. Experimental economic offers a methodology for objectively testing the “Scottish-Hayekian” hypotheses under scientific controls. Smith noted that Hayek saw the possibility of testing his theories experimentally through simulated situations but didn’t think that such experiments would be worth the expense because the results would have no practical value.⁵¹

Finally, Smith said that understanding decision requires knowledge that goes beyond the traditional bounds of economics. This was a challenge to which Hume and Adam Smith were no strangers, nor was Hayek. Vernon Smith said that he urged his students to read narrowly within economics but widely in science.⁵² The economics literature was not the best place to find inspiration beyond the traditional technical methods of modeling. One area of science that promised to shed new light on the subject of economic decision-making was the study of the neural correlates of strategic interactions using functional magnetic resonance imaging and other brain-imaging technologies. Those engaged in this emerging field of research called it

⁴⁹ *See id.* at 481, fn. 43 (“Kahneman clearly does not see people as irrational except in the narrow context of economic modeling based on dominant choice.”).

⁵⁰ *Id.* at 469.

⁵¹ *See id.* at 470, fn. 21.

⁵² *See id.*, at 471, fn. 22.

“neuroeconomics.”⁵³ It’s too soon to say what effect, if any, neuro-imaging studies will have in economics and psychology. Some economists believe that they should have none.⁵⁴ Others, such as Smith, believe that neuroeconomics may help to disentangle some confounding interpretations of behavior observed in the laboratory.⁵⁵ Hayek, too, probably would have viewed neuroeconomics favorably even though he didn’t think that models of neural mechanisms could provide ultimate explanations of biological and cultural forms of order.

Experimental economics and neuroeconomics have not found many applications in the field of law.⁵⁶ However, scholars in the field of law and economics have explored how introducing ideas from the heuristics-and-biases program into various areas of law might lead to reforms.⁵⁷ For example, in nuisance cases, it is commonly assumed that parties bargain after judgment.⁵⁸ However, empirical evidence suggests that they frequently find bargaining distasteful. If so, it’s more difficult to defend using legal measures such as assigning property rights or establishing liability rules to reduce the transaction costs of bargaining. Daniel Farber reviewed the behavioral economics and

⁵³ For a good introduction to the history of neuroeconomics see Paul W. Glimcher, Colin F. Camerer, Ernst Fehr, & Russel A. Poldrack, *Introduction: A Brief History of Neuroeconomics*, in *Neuroeconomics: Decision Making and the Brain* (ed. by Paul W. Glimcher, Colin Camerer, Ernst Fehr, & Alan Poldrack, Elsevier Academic Press, 2009), Ch. 1: 1-12. This book updates Paul W. Glimcher, *Decisions, Uncertainty, and the Brain: The Science of Neuroeconomics* (MIT Press, 2003). For a good review article from the perspective of economists see Colin Camerer, George Loewenstein & Drazen Prelec, *Neuroeconomics: How Neuroscience Can Inform Economics*, 43 *Journal of Economic Literature*, 9-64 (2005).

⁵⁴ See Faruk Gul & Wolfgang Pesendorfer, *The Case for Mindless Economics*, in *The Foundations of Positive and Normative Economics: A Handbook* (Oxford University Press, 2008), Ch. 1: 3-39.

⁵⁵ See Vernon L. Smith, *Introduction: Experimental Economics and Neuroeconomics*, in *Neuroeconomics: Decision Making and the Brain*, *supra* note 53, 15-19.

⁵⁶ For some attempts to link experimental economics and law see Francesco Parisi & Vernon L. Smith (eds.), *The Law and Economics of Irrational Behavior* (Stanford University Press, 2005); for the relevance of neuroeconomics to law see Kevin McCabe, Vernon Smith, & Terrence Chorvat, *Lessons from Neuroeconomics for the Law*, in *id.* Ch. 3: 68-94.

⁵⁷ For an anthology of articles published largely in the 1990s see Cass R. Sunstein (ed.) *Behavioral Economics and Law* (Cambridge University Press, 2000); for a good introduction to the behavioral approach to law and economics see Christine Jolls, Cass R. Sunstein, & Richard H. Thaler, *A Behavioral Approach to Law and Economics*, in *id.* Ch. 1: 13-58 (orig. pub. *Stanford Law Review*, Vol 50: 1471-1550 (1998); see also Thomas S. Ulen, *Behavioral Law and Economics: An Introduction*, in Morris Altman (ed.) *Handbook of Contemporary Behavioral Economics: Foundations and Developments* (M.E. Sharpe, Inc., 2006), Ch. 34: 671-688.

⁵⁸ See Ward Farnsworth, *Do Parties to Nuisance Cases Bargain After Judgment? A Glimpse Inside the Cathedral*, in Sunstein, *id.*, Ch. 12: 302-321 (orig. pub. 66 *University of Chicago Law Review*, 373-436).

law movement in an article titled *Toward a New Legal Realism*.⁵⁹ Farber noted a kinship between the previous legal realists and current behavioralists whose goal is “a new and improved understanding of the real-world effects of law” and “the better use of law as an instrument of social ordering.” However, Farber argues that even if the rational choice model is adjusted for cognitive biases, it still has limitations that suggest a need to rethink the behavioral economics and law agenda. Behavioral research focuses on whether choices comply with the rational choice model or whether they fit some pattern of cognitive bias. Farber believes that this may miss the most interesting and significant aspect of the problem: the interpretive dimension.

The importance of considering how experimental subjects may interpret a given problem can be seen in a behavioral study of the “compromise effect” in jury verdicts.⁶⁰ This effect refers to the observation that the same verdict is evaluated more favorably when presented as an intermediate in a set of options than when presented as an extreme. The existence of this bias in legal decision-making contradicts the normative assumption of context-independence. But Farber contends that the authors of the study failed to ask the most interesting question. Instead of asking whether the data illustrate the compromise effect, the authors should have asked how *did* the jurors reach their decision? If they were not following instructions, what *were* they doing? Farber says, “by focusing so intently on the choices, without considering the prior act of interpretation necessary to structure the choices, the behavioralist account misses what is in many aspects the most noteworthy aspect of the experiment.”⁶¹ Of course, there’s no way of knowing what was going on in the minds of the jurors without asking them how *they* viewed the situation. Farber concludes that “if the purpose was merely to collect work in a particular mode, no harm is done—but if the idea is that behavioral law and economics is an emerging paradigm, the narrowness of its horizons is worrisome.”⁶²

⁵⁹ Daniel A. Farber, *Toward a New Legal Realism*, 68 *University of Chicago Law Review*, 279-303 (2001).

⁶⁰ See Mark Kelman, Yuval Rottenstreich, & Amos Tversky, *Context-Dependence in Legal Decision Making*, in Sunstein, *id.*, Ch. 2: 61-94 (orig. pub. 25 *Journal of Legal Studies*, 287-318 (1996)).

⁶¹ Farber, *supra* note 59, at 298.

⁶² *Id.* at 299.

In the conclusion of his review, Farber argues that while behavioral law and economics has gone beyond the rational choice model in significant ways, it needs to go further. Specifically, it needs to broaden its scope by looking to a broader range of social sciences; to take a fuller account of the institutional context; and to think more deeply about the normative implications of its findings. If we need a name for this “no-holds-barred” use of the social sciences in solving legal problem, Farber suggests that we might call it the “Law and Reality” movement or the “Realistic Legal Studies” movement. The social sciences today are more sophisticated than they were in the past, in part because of the rigorous development of rational choice theory. We may look back and come to regard the behavioral economics and law movement as a harbinger of a revitalized legal realism.

There’s a futuristic quality to Farber’s recommendations. I believe that if we want to move beyond the rationality wars between the psychologists and the economists, the best thing to do is to try to look at rationality from a new point of view. The metaphor of the mind as an information processor does not express the full capacity of humans to imagine the future and to act in the present upon the basis of those images. To use Farber’s terms, the metaphor does not express the interpretive dimension of reality, which is the most significant and interesting part. How can we use scientific knowledge of how the brain works, mathematical techniques of modeling vague ideas, philosophical ideas about the nature of truth and rationality in an effort to solve concrete legal problems? Perhaps it would be best not to give a name to this “no-holds-barred” attitude that doesn’t recognize disciplinary boundaries as having any basis in the human mind. However, if one insists on a name, maybe we could use the term that William James seemed to favor—*humanism*—to describe this new legal movement. Historians will write about the birth of legal humanism in the twenty-first century. Legal humanists shed the image of themselves as technicians and information processors and began to think of themselves as architects, artists even, who used computers to accomplish the human purposes of the law. They were good lawyers because they were not only lawyers.

II. Workshops of Being

In the silence of our theories we then seem to listen
and to hear something like the pulse of Being beat.

William James, *Reflex Action and Theism*

In the fall of 1880, the Unitarian Ministers Institute at Princeton, Massachusetts invited William James, a young teacher of physiology at Harvard, to speak. It seems that the theologians wanted to know what scientists like James thought about philosophical or universal matters. In his talk, James said that he found such curiosity to be a healthy symptom characteristic of the times. One had a better chance of being listened to if one could quote Darwin or Helmholtz than if one could quote only Schleiermacher or Coleridge. James said that he almost felt that if he were to produce a frog and put him through his physiological performances, he would gain more reverential ears for what he had to say during the remainder of his talk. He declined to ask whether the prestige that the words of physiologists enjoyed was simply a passing fashion, particularly since he was profiting from it on the current occasion.

Instead of giving the ministers the latest breeze from the physiological horizon, James fell back on a fundamental and well-established doctrine—the theory of reflex action, especially as it included the brain.⁶³ The doctrine of the reflex arc held that all the acts we perform result from discharges of nervous centers in the brain, and that these discharges in turn result from impressions from the external world transmitted by the sensory nerves to the brain. In its earliest form, the theory applied only to a small portion of our acts, “automatic” actions such as retracting our hand quickly from a flame. However, James notes that most physiologists generalized the doctrine to include *every* action, even the most deliberately weighed and calculated ones. All the neural events in the brain to which our trains of thought correspond are “middle terms” between incoming sensations that arouse them and a motor discharge of some sort to which brain events gives rise. James summarized the physiologists’ tri-partite model of the nervous system:

⁶³ For the contributions of James and Dewey to the theory of the reflex arc see D.C. Phillips, *James, Dewey, and the Reflex Arc*, 32 *Journal of the History of Ideas*, 555-568 (1971).

The structural unit of the nervous system is in fact a triad, neither of whose elements has any independent existence. The sensory impression exists only for the sake of awakening the central processes of reflection, and the central process of reflection exists only for the sake of calling forth the final act. All action is thus *re*-action upon the outer world, and the middle stage of consideration or contemplation or thinking is only a place of transit, the bottom of a loop, both whose ends have their point of application in the outer world. If it should ever have no roots in the outer world, if it should ever happen that it led to no active measures, it would fail of its essential function, and have to be considered either pathological or abortive. The current of life which runs in at our eyes or ears is meant to run out at our hands, feet, or lips. The only use of the thoughts it occasions while inside is to determine its direction to whichever of these organs shall, on the whole, under the circumstances actually present, act in the way most propitious to our welfare.⁶⁴

Of the three parts of the nervous system, today we're most interested in the central processing unit, the "computer" in which we take so much pride, which we occasionally have to swallow when sophisticated computing machines beat us at games of chess or on quiz shows. Like it or not, they're simply better at statistics. James would have found our chagrin over this fact misplaced. For him, "[t]he willing department of our nature, in short, dominates both the conceiving department and the feeling department, or, in plainer English, perception and thinking are only there for behavior's sake."⁶⁵ Perhaps we should challenge the computer Watson⁶⁶ to a contest of wills, although it wouldn't be a contest, of course, because Watson doesn't have a will.

James asked his audience to linger a moment over the reflex theory of mind because he wasn't quite sure that even its most zealous advocates fully grasp its scope. Not all physiologists saw that the theory commits them to regarding the mind as essentially a teleological mechanism. The conceiving or theorizing faculty—the mind's middle department—functions exclusively for the sake of ends set by our emotional and practical subjectivity together. The theoretical department transforms the world of sense

⁶⁴ William James, *Reflex Action and Theism*, in *The Will To Believe and Other Philosophical Essays* (The Works of William James, ed. by Frederick H. Burkhardt, Fredson Bowers, Ignas K. Skrupskelis, Harvard University Press, 1979), at 92 (emphasis in original).

⁶⁵ *Id.*

⁶⁶ Watson is the name of the computer that defeated two former champions on the quiz show "Jeopardy." See John Markoff, *Computer Wins on 'Jeopardy!': Trivial, It's Not*, N.Y. Times, Feb. 16, 2011, at A1.

impressions into a totally different world of conceptions, and it performs the transformation solely in the interests of our volitional nature, the willing department. The world's contents are given to each of us in an order so foreign to our subjective interests that it's hard for us to imagine what it is like. We have to break that order altogether by picking out from it items that concern us and connecting them with others far away that we say "belong" with them. In this way, we can make out certain threads of sequence and tendency, we can foresee certain events and get ready for them, and we can "enjoy simplicity and harmony in place of what was chaos." Our mind is constantly active reconstructing the world as we find it so that we may begin to feel at home. If we fail, we have no choice but to try again. In the endeavor itself, we are obeying, in form at least, what James called the mind's most necessary law.

The mind is the umpire who decides whether our conceptual models of the universe are fit to be called a rational universe or not. The question of rationality is different from the question of truth. Not any theory about the nature of things will seem to be *ipso facto* rational. Einstein never could accept the ultimate rationality of the quantum theory even though he was one of its inventors. James said that if a theory does not seem rational, it "will afflict the mind with a ceaseless uneasiness, till it be formulated or interpreted in some other and more congenial way."⁶⁷ All three departments of the mind have a vote in the matter, and no conception will pass muster that violates any of their essential modes of activity or leaves them with no chance to work. James didn't have time to discuss the mind's criteria of rationality in his talk to the Unitarian ministers, though he noted that it formed an intensely interesting subject.⁶⁸

The subject of rationality had intensely interested James for more than a decade. Perhaps only someone who has struggled to overcome the darker forces of his own nature can experience the full intensity of the feeling of rationality. In a diary entry from

⁶⁷ James, *Reflex Action and Theism*, *supra* note 64, at 100.

⁶⁸ James seemed to regard his address to the Unitarian ministers as "in matter, though not exactly in form, a fragment of a larger essay on the 'Sentiment of Rationality.' of which a first fragment was published in *Mind* in July, 1879." *Id.* at 333.

February 1, 1870, James wrote: “Today, I about touched bottom.”⁶⁹ He was not describing the state of his physical health, which had gone through a series of ups and downs. He was referring to a disturbance in his moral condition caused by habitual brooding on what kind of life to lead. Any thoughtful scientist in the decade following the publication of Darwin’s *On the Origin of Species* must have gone through some degree of brooding about the book’s implications for human nature. Thankfully, the deepest torment seems to be reserved for the few with James’s vital and resilient genius. Many of James’s fellow physiologists seemed to rejoice at the prospect of shutting down department number three of the mind permanently. Talk about “freedom of the will” was just talk, with no scientific basis in the new evolutionary psychology.

James knew that he could not live in such a world, but he needed some basis upon which to believe. Fortunately, he was an omnivorous reader and perhaps for that reason he found what he was looking for. In his diary for April 30, 1870, he writes:

I think that yesterday was a crisis in my life. I finished the first part of Renouvier’s second *Essais* and see no reason why his definition of free will—‘the sustaining of a thought *because I choose to* when I might have other thoughts’—need be the definition of an illusion. At any rate, I will assume for the present—until next year—that it is no illusion. My first act of free will shall be to believe in free will.⁷⁰

The phrase *because I choose to* contains the insight that James found in Renouvier’s definition of free will. In the reflex arc theory as James interpreted it, the stream of ideas in our mind is part of the “current of life” that runs in at our eyes, ears, and other senses. The willing department of the mind may, through an act of attention, intervene in the current of ideas to prevent one that interests it from slipping away. The thinking department can then develop some of the consequences of this belief or hypothesis as a kind of probation to test its worth for the life of the individual. James sets a reasonable length of time—until next year—to conduct the experiment, a rather remarkable attention span by today’s standards. No one other than James can be privy to his first free act,

⁶⁹ See Ralph Barton Perry, *The Thought and Character of William James: As Revealed in Unpublished Correspondence and Notes, Together With His Published Writings*, (2 vols., Little, Brown, and Co.1935), Vol. I: *Inheritance and Vocation*, at 322.

⁷⁰ *Id.* at 323.

intervening in the stream of thought to choose a belief like a shorebird spearing a fish. However, behavior and the consequences resulting from behavior can be observed. In evaluating the consequences of James's decision to believe in free will, we must ask what is *different* about the world as a result of his choice. Answering the question requires using the mysterious division of our thinking department called *imagination*.

In his address to the Unitarian ministers, James alluded to the criteria of rationality by which the philosophical products of the thinking department are assessed. He had recently written a couple of papers on the topic of rationality,⁷¹ which he later combined in an essay titled *The Sentiment of Rationality*. Perhaps James thought that a better title would have been *The Sentiment of Irrationality* because his basic thesis is that the general mark of rationality is the absence of any feeling of irrationality. There were psychological grounds for this view. Recent experiments had shown that the physical condition underlying all mental states is not simply the discharge of nerve-currents but their discharge under impediment or resistance. In a similar way, we feel no particular pleasure when we breathe, but intense distress when respiratory motions are prevented. The absence of all need to explain, or to justify, the feeling of the present moment, the feeling of its absoluteness, James called the sentiment of rationality. Whenever we can, from any cause whatever, think with perfect fluency about some thing, it seems rational. Whatever way of thinking about the world that facilitates this fluency produces the sentiment of rationality.

The kind of philosopher you are is determined, James says, by the balance of two cravings. The passion for parsimony, for economy in the means of thought, is the philosophic passion *par excellence*. Its sister passion is a passion for simplification, for distinguishing, an impulse to be acquainted with the parts rather than to comprehend the whole. Clearness and simplicity—or diversity and unity—set up rival claims and pose a

⁷¹ The first article, also titled *The Sentiment of Rationality*, appeared in 4 *Mind*, 317-346 (1879). The second article, *Rationality, Activity, and Faith*, was an address to the Harvard Philosophical Club delivered in 1880 and published in 2 *Princeton Review*, 58-86 (1882). James combined part of the first, and almost all of the second in *The Sentiment of Rationality*, in *The Will to Believe* (Longmans, Green and Co. 1896), 63-110; *reprinted in* William James, *The Will to Believe and Other Essays in Philosophy* (The Works of William James, ed. by Frederick H. Burkhardt, Fredson Bowers, Ignas K. Skrupskelis, Harvard University Press, 1979), 57-89. Citations are to this edition.

dilemma for any thinker. No system of philosophy that grossly violates either need, or entirely subordinates one to the other, can hope to win universal acceptance.

Most of James's essay deals with the feeling of rationality in its *practical* aspect. James maintained that there is one particular relation of greater practical importance than all the rest—the relation of a thing to its future consequences. The first practical criterion of rationality a philosophy must possess is that it must—in a general way at least—banish uncertainty from the future. James thought that most writers had ignored the permanent presence in our minds of a sense of futurity. Our consciousness at any given moment is never free from the ingredient of expectancy. If this “haunting sense of futurity” is left without an object, we immediately experience uneasiness. In every novel or unclassified experience, this is just what happens—we don't know what will come next, and novelty itself becomes a mental irritant. Custom, in contrast, acts as a mental sedative because it settles our expectations.

Knowing the future as determined is not sufficient for our satisfaction, for we may find that future to be either agreeable or disagreeable. For a philosophy to succeed, it must define the future congruously with our spontaneous powers, the powers in the willing department of the mind. James observed that most of us find incompatibility of the future with our desires and active tendencies a greater source of discomfort than uncertainty itself. However, an even worse defect in a philosophy than contradicting our active propensities is to give them no object to press against. “Better face the enemy than the eternal Void!”⁷² James thought that too few psychologists recognized how entirely the intellect is built up of practical interests. Evolutionary psychologists were helping to change that situation by reducing all mentality to the type of reflex action. Unlike other animals, humans, with our hypertrophied cerebrum, engage in a lot of theoretical activity over and above what is immediately necessary to practice. Still, our fundamentally active nature asserts its rights. These active impulses are variously mixed in each individual, so that a philosophy fit for a Bismarck would likely be unfit for a valetudinarian poet. James saw no way around disputes in philosophy that arise primarily from differences in

⁷² *Id.* at 71.

personal temperaments. As he put it, “[a]lthough all men will insist on being spoken to by the universe in some way, few will insist on being spoken to in just the same way.”⁷³

One element of our active nature that James thought most philosophers tended to ignore was the element of faith. He described faith as a “belief in something concerning which doubt is still theoretically possible.”⁷⁴ The test of a belief is the willingness to act on it. In a practical sense, then, faith is “the readiness to act in a cause the prosperous issue of which is not certified to us in advance.”⁷⁵ James wanted to point out something that to his knowledge had never been clearly pointed out, namely that there is a certain class of truths whose reality depends upon belief as a necessary factor. Such truths cannot become true until faith has made them so. Suppose, he said, I am climbing in the Alps and I have the bad luck to find myself in a position from which the only escape is by a terrible leap. I have no evidence of my ability to perform it successfully, but I have hope and confidence in myself. These subjective emotions may allow me to execute what without them would perhaps have been impossible. If I let my fear and mistrust predominate, I may miss my footing and fall into the abyss. “Believe and you shall be right, for you shall save yourself; doubt, and you shall again be right, for you shall perish. The only difference is that to believe is greatly in your advantage.”⁷⁶ Obviously, faith cannot change the future movements of the stars or the facts of past history. However, in every fact in which there enters an element of personal contribution, the fact is conditioned by my faith in it.

The great question for James, the one that led him to the brink of the abyss several years earlier, was “the radical question of life—the question whether this be at bottom a moral or an unmoral universe—and whether the method of faith may legitimately have a place there.”⁷⁷ James compared the world to a lock, whose inward nature, moral or unmoral, will never reveal itself to our simply expectant gaze. Positivists, who forbid us to make any assumptions regarding it, condemn us to ignorance for the “evidence” they

⁷³ *Id.*

⁷⁴ *Id.* at 76.

⁷⁵ *Id.*

⁷⁶ *Id.* at 80.

⁷⁷ *Id.* at 84.

demand can never come as long as we are passive. However, nature has put into our hands two keys by which we may test the lock. If we try the moral key and it fits, the world is a moral lock. If we try the unmoral key and it fits, it is an unmoral lock. James could not conceive of any other sort of “evidence” or “proof” than this. Our active preference is a legitimate part of the game, and it’s our business as humans to try the key in which we most confide. On such questions, the world has no neutrals.

Shortly after the publication of *Pragmatism*, James found himself facing a terrible leap intellectually. Pulling it off would require finding the courage to take away the intellectual department’s veto on questions concerning the ultimate rationality of the universe. In November 1907, he received an invitation to give the Hibbert Lectures at Oxford University the following May. The invitation from Manchester College, primarily a theological college, suggested that the religious aspects of James’s philosophy would provide the most suitable range of topics. After hesitating a week, James finally, as he put it, “cast the die.”⁷⁸ In a letter to Ferdinand Canning Scott Schiller,⁷⁹ the chief advocate of pragmatism at Oxford, James wrote that he’d accepted because he was ashamed to refuse a professional challenge of this importance. He lamented having to publish another book in the picturesque and popular style when he was really looking forward to writing something concise, dry, and impersonal. The free and easy style of *Pragmatism* had made him so many enemies in academic circles that he hated to go on increasing their number and wanted to become tighter instead of looser. Lectures had to be prepared for audiences, and once prepared James said that he had neither the strength to re-write them nor the self-abnegation to suppress them.

Over the next several months, James and Schiller exchanged letters, almost as if they were plotting a military campaign, which in some sense they were. Oxford was the English-speaking home of absolute idealism, the primary philosophical rival to the nascent pragmatic movement. In a letter to Schiller, James remarks that his pragmatic

⁷⁸ Letter from William James to Henry James (Nov. 30, 1907), in *The Correspondence of William James*, vol. 3 (ed. by Ignas K. Skrupskelis and Elizabeth M. Berkeley, University of Virginia Press, 2003).

⁷⁹ Letter from William James to Ferdinand Canning Scott Schiller (Jan. 4, 1908), in *The Correspondence of William James*, vol. 11 (ed. by Ignas K. Skrupskelis and Elizabeth M. Berkeley, University of Virginia Press, 1994), at 354.

conception of truth assumes the notion of “reality” uncritically. A more thorough treatment would be a necessary step toward establishing Schiller’s more inclusive doctrine of humanism, which is in part an account of reality as well as of truth. James adds,

I naturally fight with zest for my own doctrine. It is the easiest first step to make. Once made, the way to humanism lies open. But I think that one great trouble so far has been that everyone was fighting all over the lot at once. If ‘pragmatism’ gets settled, ‘humanism’ follows in due course.⁸⁰

The following day, James again wrote to Schiller with a plan. The title of the lectures would be “The Present Situation in Philosophy.” James outlined a series of eight lectures with a brief indication of their content. At the end of the outline, he remarked that the stuff was bound to be either unintelligible or unwelcome to an Oxford audience, but the object was to get the book written. The *punctum saliens*, as he called it, would be “the definite and uncompromising break with the intellectualist method in treating of metaphysical questions with the frank adoption . . . of scientific habits of hypothesis making and testing by the way they work.”⁸¹ The book did get written. James’s Hibbert lectures were published in 1909 as *A Pluralistic Universe*,⁸² the last book published in his lifetime.

James hoped to persuade at least some of the younger philosophers in the audience to look at the world from a different point of view from the prevailing one at Oxford. The name for the philosophical school of thought at Oxford was *absolute idealism*. In contrast to philosophies that viewed the world as the product of a divine Creator who remained external to the creation, absolute idealism saw the Creator as an immanent, active power in the world process. Humans had at least partial access to the absolute Truth in the divine mind through their powers of discursive or conceptual

⁸⁰ Letter from William James to Ferdinand Canning Scott Schiller (Jan. 26, 1908), in *The Correspondence of William James*, vol. 11 (ed. by Ignas K. Skrupskelis and Elizabeth M. Berkeley, University of Virginia Press, 2003), at 527.

⁸¹ Letter from William James to Ferdinand Canning Scott Schiller (Jan. 27, 1908), in *The Correspondence of William James*, vol. 11 (ed. by Ignas K. Skrupskelis and Elizabeth M. Berkeley, University of Virginia Press, 2003), at 530.

⁸² William James, *The Pluralistic Universe* (Works of William James, ed. by Fredson Bowers and Ignas K. Skrupskelis, Harvard University Press, 1977).

reasoning. By building more and more elaborate conceptual systems, philosophers could, as it were, construct a “map” of the same reality that God viewed in a timeless, eternal manner. James disparaged this systematizing trend in modern philosophy as “vicious intellectualism.” He defined the term as the “*treating of a name as excluding from the fact named what the name’s definition fails positively to include.*”⁸³ Whatever is not explicitly included in the definition of some thing, or in a conceptual system of several things, lacks reality and can be ignored. James traced the origins of vicious intellectualism to the belief, which he attributes to Plato and Aristotle, that what a thing is can be found by looking to its definition. There was no harm in using concepts in this way; the misuse of concepts began with the habit of using them to deny the very properties with which things present themselves to our senses. “It is but the old story of a useful practice first becoming a method, then a habit, and finally a tyranny that defeats the end it was used for. Concepts, first employed to make things intelligible, are clung to even they make them unintelligible.”⁸⁴

The point of view whose seeds James hoped to plant at Oxford was that of a philosopher looking at the world process from the inside, not from some timeless, impersonal perspective. He left the audience with a glimpse of his point of view at the end of the first lecture:

We humans are incurably rooted in the temporal point of view. The eternal’s ways are utterly unlike our ways. ‘Let us imitate the All’ said the original prospectus of that admirable Chicago quarterly called the *Monist*. As if we could, either in thought or conduct! We are invincibly parts, let us talk as we will, and must always apprehend the absolute as if it were a foreign being.⁸⁵

Philosophers are necessarily actors in the world process they describe. Despite their deepest desires, they can never be spectators viewing things from above and outside. In his second lecture, James described the underlying psychology of the absolutist philosophy as revealed in their style of argument. He observed a tendency to fly to

⁸³ *Id.* at 32 (emphasis in original).

⁸⁴ *Id.* at 99.

⁸⁵ *Id.* at 23.

extremes. The tendency toward either-or thinking appeared in their common use of the logical technique of proof by *reductio ad absurdum*. The world must be either completely unified, one total fact, or it must be a complete plurality of things. There was no middle way. In the philosophical battles, absolutists tended to stake out the monist position, and they called their pluralist opponents irrational. Pluralists picked up the charge of irrationality and hurled it back at their monist opponents, pointing out that the world did have undeniably evil aspects. Rationality wars were going on even a century ago. Although James was a pluralist in his philosophical temperament, he sought to broker a truce by looking at the old controversy from a radically new point of view.

The *punctum saliens* or leaping-point in the lectures series occurs at roughly the mid-point, in the fifth lecture on *The Compounding of Consciousness*. James says that he had been struggling for years to try to solve a particular metaphysical problem. The problem arose from a conflict between the logical kind of rationality and every other kind. To call a thing and its other the same is to commit the crime of self-contradiction. *My* conscious and your consciousness of some thing, say the room we're sitting in, are different. Yet we seem to behave for the most part as if our consciousnesses are the same, as if we are living in the same world, even though from a strictly logical point of view this makes no sense. James found this claim of irrationality intolerable.

Sincerely and patiently as I could, I struggled with the problem for years, covering hundreds of sheets of paper with notes and memoranda and discussions with myself over the difficulty. How can many consciousnesses be at the same time one consciousness? How can one and the same identical fact experience itself so diversely? The struggle was vain; I found myself in an *impasse*.⁸⁶

In the end, James “finally found himself compelled to *give up the logic*, fairly, squarely, and irrevocably. It has an imperishable use in human life, but that use is not to make us theoretically acquainted with the essential nature of reality.”⁸⁷

The meaning of James's act becomes clear only in a later lecture. James says that for many years he had refused to think in non-conceptualized terms even though he knew

⁸⁶ *Id.* at 94-95 (emphasis in original).

⁸⁷ *Id.* at 96 (emphasis in original).

that the denial of manyness-in-oneness by intellectualism must be false, for it's clear that the same reality does perform the most diverse functions at once. He said that he kept hoping to find a revised intellectualist way around the difficulty. However, in a flash of supreme insight James saw that to continue using the intellectualist method based on the binary logic of identity was itself the problem. An *intellectual* answer to the intellectualists' difficulties will never come, and the real way out of them consists in simply closing one's ears to the question. "When conceptualism summons life to justify itself in conceptual terms, it is like a challenge addressed in a foreign language to someone who is absorbed in his own business; it is irrelevant to him altogether—he may leave it lie unnoticed."⁸⁸ By not listening to the intellect's logical demand to fit reality neatly into *a priori* systems of conceptual categories, James found a way to go beyond the *impasse* over rationality in modern philosophy.

In his lecture outline in the letter to Schiller,⁸⁹ James remarked that the sixth lecture—which turned out to be the seventh lecture titled *The Continuity of Experience*—would be the climax of the lectures. He would attempt to show how the *same* experience could figure in many contexts. He said that he was doubtful of pulling it off, even though for many years it had been the center of his own philosophizing, a reference to his philosophy of radical empiricism. James's middle ground between the monist and the pluralist views of the world process was the idea of an unfinished universe, a plurality of real things eternally in the process of becoming unified. He proposed the idea as a metaphysical hypothesis that could be tested empirically. Humans have the cognitive ability to feel relations, particularly connective relations, between things. By formulating the felt connective relations conceptually, we're able to glide efficiently over the surface of things to discover new facts far removed from the starting point. To James, this is the proper use of our intellect. Our conceptualizing powers are good for moving about on the surface of reality. We go wrong when we try to use them to reveal the deeper levels of being. James described much of contemporary philosophy as "thin." Philosophy to him

⁸⁸ *Id.* at 132.

⁸⁹ See Letter from William James to Ferdinand Canning Scott Schiller (Jan. 27, 1908), *supra* note 81, at 529.

was more a matter of passionate vision than of logic, with logic only finding reasons for the vision afterwards. It was high time, in his view, for philosophy to become thickened up by bringing in concrete peculiarities of life. He thought that it would be a shame if the word *rationality* were allowed to get in the way. It's one of those eulogistic words both sides in contemporary philosophical debates claim for themselves. It carries too many meanings to be useful. James suggested that it would be better to give up the word *rational* altogether than to get into a verbal fight about who has the best right to keep it.

Humans are the places where connections get forged in James's unfinished, pluralistic universe. In *Pragmatism*, he wrote:

Our acts, our turning-places where we seem to ourselves to make ourselves and grow, are the parts of the world to which we are closest, the parts of which our knowledge is the most intimate and complete. Why should we not take them at their face-value? Why may they not be the actual turning-places and growing-places which they seem to be, of the world—why not the workshop of being, where we catch fact in the making, so that nowhere may the world grow in any other kind of way than this?⁹⁰

Some of James's contemporaries found this vision of reality irrational. How, they asked, could new being come randomly in local spots and patches? There must be a reason for our acts, and that reason must ultimately come from some physical force or logical compulsion. To which James replied:

Talk of logic and necessity and categories and the absolute and the contents of the whole philosophical machine-shop as you will, the only real reason I can think of why anything should ever come is that *someone wishes it to be here*. It is *demande*d, demanded, it may be, to give relief to no matter how small a fraction of the world's mass. This is *living reason*, and compared with it the material causes and logical necessities are spectral things.⁹¹

In our world, the wishes of an individual are only one condition for the appearance of new being. There are other individuals with other wishes, and they must be accommodated. "So Being grows under all sorts of resistances in this world of the many,

⁹⁰ William James, *Pragmatism* (The Works of William James, ed. by Fredson Bowers and Ignas K. Skrupskelis, Harvard University Press, 1975), at 138.

⁹¹ *Id* (emphasis in original).

and, from compromise to compromise, only gets organized gradually into what may be called secondarily rational shape.”⁹² There are times when secondarily rational forms of order, including forms of legal order, may satisfy.

III. Theaters of Deliberation

John Dewey described rationality as “an affair of the relation of means and consequences.”⁹³ When we think about something we’d like to do, it’s unreasonable to imagine a goal without taking into account how we might accomplish it or what might stand in the way. It’s reasonable to look for and choose those means most likely to be successful. It would be very unreasonable to choose those we could see would have a consequence different from the one we intended, perhaps so different that it would prevent us from ever achieving our goal. The abstract idea of rationality is just this generalized idea of the means-end relation as such. Deliberating reasonably about means *and* ends is the concrete activity. We cannot separate the evaluation or appraisal of ends from the calculation of means in the activity of deliberating. Neither is fixed until both are fixed in the form of a decision, and we pass into overt activity. The curtain rises and the world will prove how reasonably we deliberated. Dewey described deliberation as a “dramatic rehearsal” that takes place in the imagination. We try to see the future, and we re-act to what we see, which changes the meaning of the future we see, which in turn changes the way we re-act, and so on until we become one with our acts in imagination. We become the character in the play, and the play becomes a reality on the world stage.

Let’s begin with Dewey’s account of the simplest acts of deliberation in his 1896 paper on the reflex arc concept.⁹⁴ Like James and other psychologists influenced by evolutionary biology, Dewey regarded the reflex arc as the basic type of all mental acts. However, Dewey criticized the traditional interpretation of the stimulus-response as a mechanistic sequence of events—sensory perception of the stimulus, followed by processing of the information in the brain, followed by a muscular movement in response. He insisted that the sensory stimulus, the central connections, and the motor

⁹² *Id.* 139.

⁹³ John Dewey, *Logic: The Theory of Inquiry*, LW.12.17.

⁹⁴ John Dewey, *The Reflex Arc Concept in Psychology*, 3 *Psychological Review*, 357-70 (1896); reprinted in EW.5.96 -109.

responses are not separate entities complete in themselves but rather divisions of labor, functioning factors, within a single, concrete whole called the reflex arc. This whole could be described in both psychological and physiological terms. In psychological terms, it is a “psychical organism” in which sensation, ideas, and movement are the chief organs. In physiological terms, Dewey referred to it as a *co-ordination*.

To illustrate the idea of a co-ordination, Dewey used the familiar example of a reflex action from psychology textbooks of a child seeing a candle flame, reaching to touch it and getting burned, and quickly withdrawing its hand. The ordinary interpretation is that the sensation of light is the stimulus that induces grasping as a response, and the burning sensation is the stimulus for withdrawing the hand as a response. Dewey thought that this is a “rough practical way” of describing the phenomenon, but that it’s not an adequate psychological account. The primary psychological reality is the activity of seeing, which in physiological terms is an optical-ocular co-ordination. The eye-muscles control the movement of the eye; which in turn affects the quality of the sensory image; which in turn serves as a stimulus and control to re-adjust the eye muscles, and so on until the activity of seeing becomes unified. At that point, we simply look. In other words, Dewey said, “the real beginning is with the act of seeing; it is looking and not a sensation of light. The sensory quale gives the value of the act, just as the movement furnishes its mechanism and control, but both sensation and movement lie inside and not outside the act.”⁹⁵

If the act of seeing stimulates the act of reaching, it is because both of these acts fall within a larger co-ordination. They have been so often linked together that they reinforce each other. The ability of the hand to do its work depends, directly or indirectly, upon its stimulation and control by the act of vision, which can inhibit and as well as excite the act of reaching. The act of reaching would be indeterminate, a mere reaching for anything or nothing, were it not for the particular object seen. In turn, reaching stimulates and controls the act of seeing. The eye has to be kept on the candle for the arm to do its work. If the eye wanders, the arm will find something else to do. In

⁹⁵ EW. 5.97-98.

other words, Dewey said, “we now have an enlarged and transformed co-ordination; the act is seeing no less than before, but it is now seeing-for-reaching purposes.”⁹⁶ This activity has more content or value than either of the elementary activities, seeing or reaching, by themselves.

If we now consider the situation when the child gets burned, Dewey regarded this also as a sensori-motor co-ordination and not a mere sensation. Because the heat-pain quality of experience enters into the same circuit of experience with the optical-ocular and muscular qualities, the child learns from the experience of touching the flame and can avoid it in the future. Dewey said that the ordinary interpretation of the phenomenon seems to tacitly assume that the outcome is a totally new experience—the substitution of a burn sensation for a light sensation through the intervention of motion. Dewey denied that one experience replaces another. We have the development or—to use one of his favorite words from his *Syllabus of Ethics*—the mediation of an experience. The seeing remains to control the reaching and is, in turn, interpreted by the burning. The child is not merely seeing a light but seeing a light that means pain when touched.

Having described what is going on psychologically in the child-candle example, Dewey then provided an explanation of the phenomenon. Activities such as seeing, reaching, seeing-for-reaching purposes are teleological or functional activities. The terms *stimulus* and *response* are used to analyze such functional activities. They do not denote things that exist in themselves apart from the referential whole provided by the concrete activity. In any teleological process, Dewey said that there are two stages that should be discriminated because their confusion is one of the sources of confusion in the theory of the reflex arc. In one case, the stimulus-response relation represents an accomplished adaptation, an organization of means with respect to a comprehensive end. This is the case with all well-developed instincts. Contact with an egg serves as the stimulus for the hen to set; sight of corn serves as the stimulus to peck. This is also the case with all thoroughly formed human habits, as when contact with the floor stimulates walking. In all these cases, there is no question of the consciousness of stimulus *as* stimulus, or of

⁹⁶ EW.5.98.

response *as* response. There is simply a continuously ordered sequence of events, all adapted in themselves and in the order of their sequence to bring about a certain end. To use Dewey's phrase, "the end has got thoroughly organized into the means." It's only the assumed common reference to an inclusive end that marks each member of the series off as stimulus and response. Apart from such reference, we have only antecedent and consequent. In short, the stimulus-response distinction is one of interpretation.

It's not legitimate—Dewey calls it the psychological or historical fallacy—to apply the same method of interpretation that serves in the case of well-established, habitual actions to cases in which habits are in the process of becoming formed. In these cases, we're conscious of the stimulus *as* stimulus and response *as* response. Neither mere sensation nor mere movement can ever be either stimulus or response; only an act can be that. Consciousness of sensation *as* stimulus means the lack of and the search for an objective stimulus or orderly placing of an act. Consciousness of movement *as* response means the lack of and the search for the right act to complete a given co-ordination. In the case of a child who, upon reaching for bright light, has sometimes found something good to eat and sometimes been burned, not only is the response uncertain but the stimulus is uncertain as well and to the same degree. The real problem is to discover, or constitute, the right stimulus and the right response. The question of whether to reach or abstain from reaching is really the question of what sort of stimulus is present—the one that means playing with one's hands, eating milk or the one that means burning one's fingers? Precisely at this point the distinction between sensation *as* stimulus and response *as* response arises. The conscious stimulus is that phase of the co-ordination requiring attention because of some conflict within it. It furnishes the motivation to attend to what has just taken place, to classify it more carefully. Just as discovery of the sensation serves to define the problem, so the constitution of the proper response is that phase of the co-ordination that marks the solution of the problem. Because we determine both the adequate stimulus and the adequate response at the same time, stimulus and response are strictly correlative and contemporaneous.

At the conclusion of his essay on the reflex arc theory, Dewey said that the point of the story lies in its application. The point of the story with regard to deliberation is the

analogy between the stimulus-response relation in reflex actions and the mean-end relation at the heart of all practical reasoning. Dewey applied the story to his analysis of the nature of deliberation in his 1922 book *Human Nature and Conduct*⁹⁷ in which he tried to make good on his earlier pledge⁹⁸ to develop the social aspects of his psychological theory of morals. He subtitled the book *An Introduction to Social Psychology*, and while he acknowledged in the preface that the book was not a treatment of social psychology, it seriously set forth his belief that an understanding of habit and of different types of habit is the key to social psychology.

In the preface to the 1930 Modern Library edition of *Human Nature and Conduct*, Dewey noted that in the eighteenth century English philosophical tradition the term *morals* had a broad sweep. It included “all the subjects of distinctively humane import, all of the social disciplines as far as they are intimately connected with the life of man and as they bear upon the interests of humanity.”⁹⁹ The book was intended to be a contribution to morals in this broad sense. The particular point of view is the structure and function of human nature—*psychology* in its wider sense. Dewey aligned the work with the positive, as opposed to the skeptical, side of the work by David Hume. Hume’s positive idea is that knowledge of human nature provides a map or chart that can be used to navigate through the complexities of all humane and social subjects. However, in using the key, Hume had neglected to give sufficient attention to the reaction of social institutions and conditions upon the ways that human nature expresses itself. He emphasized the part played by our common human nature in shaping social life, but failed to see the reflex influence of the latter upon the shape that a plastic human nature takes because of its social environment. Although he rightly emphasized the importance of custom, he failed to see that custom is essentially a fact of associated living, which is the dominant force in forming the habits of individuals.

⁹⁷ John Dewey, *Human Nature and Conduct*, The Middle Works of John Dewey, Vol. 14: 1922 (Ed. by Jo Ann Boydston, Southern Illinois University Press, 1983)

⁹⁸ See John Dewey, *The Study of Ethics: A Syllabus*, EW.4.234 (“The discussion of conduct in relation to the agent constitutes *psychological* ethics; in relation to the conditions of action *social* ethics.”) (emphasis in original).

⁹⁹ MW.14.228.

Dewey noted that it's not always easy to keep a balance between the two sides of the situation. There are always two schools of thought, one emphasizing original and native human nature and the other looking to the influence of the social environment. Dewey noted that when the book was first published in 1922, there was a tendency among psychologists to insist upon native human nature untouched by social influences, and to explain social phenomena by reference to traits of our original nature called "instincts." By the end of the decade, thanks in part to the rise of anthropology and other social sciences, the pendulum had swung the other way, and the importance of culture as a formative influence was more generally recognized. Dewey suggested that perhaps the present tendency was to overlook the basic identity of human nature amid its diverse manifestations. In any event, *morality* in its broad sense is a function of the interaction of the forces of cultural habitude and the biological aptitudes of human nature. Among the biological aptitudes central to Dewey's account was a propensity toward social living, toward interacting with our fellow humans not only in economic but in many other ways that express our innate sense of common humanity.

Dewey's discussion of ordinary judgments about what's best or wise to do—*deliberation* in ordinary language—has both a positive and a negative side. On the negative side, he criticized the theory of utilitarianism for its account of deliberation as a kind of calculation. Dewey said that underlying this theory is a false psychology, characterized by two traits. The first is the claim that knowledge originates from sensations rather than habits and biological impulses; and the second is view that judgment about good and evil in action consists in calculation of agreeable consequences, of profit and loss. He thought that, apart from being false, such a view tends to degrade morals, which provokes a tendency on the part of some moralists to fly to the other extreme and claim that morals has to do with ideal, transcendental principles. Neither view is true according to Dewey, although his own theory was closer to the utilitarian theory that morals is an empirical science, and hence he had to show why true deliberation involves more than calculating the likelihood of pleasures and pains, or profits and losses.

Dewey raised two objections against the theory of deliberation as calculation. The first is that the subject matter of deliberation is future feelings and sensations, and that actions and thought are just means to get and avoid these sensations. This is essentially the instrumentalist theory that practical reason is a faculty of devising means to obtain particular ends preferred on non-rational grounds. Such a theory encourages people to focus upon their most subjective and private feelings, which are conducive to morbidity, sophistication, and isolation from others. Dewey's second argument focused on the practical impossibility of the calculation:

Future pleasures and pains, even of one's own, are among the things most elusive of calculation. Of all things they lend themselves least readily to anything approaching a mathematical calculus. And the further into the future we extend our view, and the more the pleasures of others into the account, the more hopeless does the problem of estimating future consequences become. All of the elements become more and more indeterminate.¹⁰⁰

Despite its elaborate and impossible calculus, Dewey looked favorably upon utilitarianism as a nineteenth century philanthropic and social reform movement whose goal was to develop a type of character with a wide social outlook and sympathy for the experiences of all sentient creatures. The movement took a wrong turn in part because of the domination of intellectual interests by economic considerations. In assimilating other activities to the model of economic activity, utilitarianism took a narrow view of reason because in business the end—maximizing profits—is taken for granted and does not enter into the deliberations. Dewey thought this assumption did violence to the facts. “To reduce all cases of judgment of action to this simplified and comparatively unimportant case of calculation of quantities, is to miss the whole point of deliberation.”¹⁰¹ The poignancy of situations that evoke reflection lies in the fact that we really don't know the meaning of the various tendencies pressing for action. We have to search and experiment. Deliberation is a work of discovery, in part about the kind of person one is to be. Significant choices always involve a deliberation about ends as well as means.

¹⁰⁰ MW.14.141-142.

¹⁰¹ MW.14.151.

Dewey's positive description of the nature of deliberation is based on the reflex arc theory. Even the most complex decision-making involves essentially the same thought-processes as those in the example of the child and the candle. Imagination is the principal intellectual capacity required, and the driving force comes from biological aptitudes, our habits and impulses. Dewey described the decision-making process metaphorically as a "dramatic rehearsal (in imagination) of various competing possible lines of action."¹⁰² Deliberation begins when overt action is blocked due to a conflict in a prior habit. Each conflicting habit and impulse then takes its turn in "projecting itself upon the screen of imagination. It unrolls a picture of its future history, of the career it would have if it were given head."¹⁰³ The decision-making process continues until the imagination discovers some object that furnishes an adequate stimulus to action. The decisive direction of action constitutes choice. Choice is not the emergence of a preference out of indifference but the emergence of a unified preference out of competing preferences. Reasonableness or rationality is not something opposed to desire. Reasonable choice requires discovering some comprehensive object capable of coordinating and organizing competing habits and impulses in a new—or rather a re-constituted—habit that meets the demands of the situation. Deliberation is irrational to the extent that an end is so fixed, or a passion so absorbing, that it warps our ability to foresee the consequences of a proposed action.

Dewey traced the doctrine that there are fixed ends in nature—the theory of "final causes"—back to Aristotle. According to this theory, the changes in something like an oak tree as it grows from acorn to mature tree are regulated by the end-form. When natural philosophers overthrew this doctrine in the seventeenth century scientific revolution, it should also have disappeared from the theory of human action. However, humans are not perfectly logical creatures; we have a tendency to hang on to old beliefs even when their scientific basis has been eroded. Not only did the idea of fixed ends-in-themselves survive, it became the cornerstone of orthodox moral theory. The result "was to dislocate moral from natural science, to divide man's world as it had never been

¹⁰² MW.14.132.

¹⁰³ MW.14.133.

divided in prior culture.”¹⁰⁴ Dewey saw his primary mission in philosophy as healing this rift between natural science and morals in the broad sense. A crucial part of the task involved re-constructing the traditional view of the ends-means relation to eliminate the notion of fixed ends.

In connection with his theory of values and valuation,¹⁰⁵ Dewey introduced the conception of a *continuum of ends-means*. Dewey accepted the utilitarian idea that the good is what satisfies desire. Values can be determined empirically by observing the kinds of activities people engage in and the ends or goals they strive to attain. A businessperson prizes money, a poet prizes a beautiful poem, a mother prizes her child. Such forms of valuation necessarily involve desire and effort, for we don’t just *wish* for certain things, we actively attempt to bring them about. In thinking about how to realize our ends or desires, we appraise the value of certain things as useful means or instruments. The distinction between certain things intrinsically valuable and other kinds of things instrumentally valuable, between ends and means, seems to be a matter of common sense.

However, Dewey challenged sharp distinction between end and means on the grounds that it failed to taken into account the empirical circumstances in which desires and interests arise and function and in which our goals are determined. Desires only arise when we sense that “something is the matter” in the situation. When we look further, we discover that this sense of foreboding arises from the fact that there is something lacking or wanting in the situation. When everything is going well, desires and purposes don’t arise. There is no need for effort; we just let things “take their natural course.” Our vital impulses and acquired habits simply operate on their own. Dewey thought that this was the case with much of human behavior. However, in certain situations, as with the example of the child and the candle, we find ourselves at a loss regarding what to do. Valuation occurs only in these problematic situations. There is necessarily an intellectual factor involved in valuation as we form certain purposes or *ends-in-view* and project them

¹⁰⁴ MW.14.155.

¹⁰⁵ John Dewey, *Theory of Valuation*, *The Later Works of John Dewey*, Vol. 13: 1938-1939 (Ed. by Jo Ann Boydston, Southern Illinois University Press, 1988).

in imagination. We also feel the tension of desire and effort. The difference between different desires and their correlative objects depends upon two things: (1) the adequacy of our inquiry into the requirements of the situation, and (2) the adequacy of our inquiry into the probability that a particular end, if acted upon, will resolve the situation. Dewey concluded that “[p]ropositions in which things (acts and materials) are appraised as means necessarily enters into desires and interests that determine end-values.”¹⁰⁶ Because the end-values have factual elements, they can be compared with each other scientifically.

Developing a science of values depended upon modeling the ends-means relation on the cause-effect relation of modern science. In the physical—i.e. non-human—sciences all “effects” are also “causes.” Everything that happens is part of an ongoing stream of events. Dewey thought that if this principle were extended to the moral or social sciences, it necessarily follows that the ends-means distinction is temporal and relational. There exists an ends-means continuum in the social sciences analogous to the cause-effect continuum in the physical sciences. Each attained end is a condition for further existential occurrences, and as such it must be appraised as a potential obstacle or resource. Dewey made a bold claim about the potential significance of conceiving social phenomenon in terms of an ends-means continuum:

If the notion of some objects as ends-in-themselves were abandoned, not merely in words but in all practical implications, human beings would for the first time in history be in a position to frame ends-in-view and form desires on the basis of empirically grounded propositions of the temporal relations of events to one another.¹⁰⁷

Values are final in the sense that they represent the conclusion of a process of analytic appraisals of the conditions in a concrete case, which include the impulses and desires on the one hand and external conditions on the other. Conclusions reached by inquiry are “final” only for that case. The value correlated with the last desire formed in the process of valuation is not an end *per se* but the ultimate value for that particular situation.

¹⁰⁶ LW.13.222 (emphasis in original).

¹⁰⁷ LW.13.229.

Dewey noted that the objection usually brought against such a view is that it involves valuation in a *regressus ad infinitum*. Because there's no natural stopping point to the process, any value chosen as final will be arbitrary. Dewey met the objection by going back to the conditions under which valuation takes place. The value of proposed actions is measured by their capacity to remedy existing defects in a problematic situation. The ability to satisfy is the factor that cuts short the infinite regression. "Sufficient unto the day is the evil thereof, and sufficient also is the *good* of that which does away with the existing evil."¹⁰⁸ It's sufficient because it serves as the means of restoring a complete situation or functional co-ordination. Although no one likes the evils of the day, Dewey saw the positive role that conflicts can play when treated as problems whose conditions and consequences are explored with a view toward finding solutions. By calling upon us to pay more attention to the demands of a situation, periods of crisis can provide opportunities for learning, as in the example of the child and the candle. In that example, the consequences of deliberation affected only the child. However, in most cases, the consequences affect other human beings in the social environment, which highlights the importance of developing the habit of responsibility, the tendency to act responsibly in a particular situation.

There is always an audience that judges our acts in the real world to whose reactions we can never be entirely indifferent, whether on the local stage or the world stage. Why that should be the case has to do with the make-up of human nature. Dewey's social psychology put habits or social functions at center stage and the individualistic components—our biological impulses and our intelligence—at the periphery. The theme of the play is the development of character through human interaction. As social animals, we have a propensity to go to the theater to see plays about our selves, the ones we are but more importantly the ones we may become. As actors in the play, we're extraordinarily conscious of our audience, of how they will judge us, favorably or unfavorably. Liability plays an important role in the story. Dewey called liability "the beginning of responsibility." Others hold us accountable for the

¹⁰⁸ LW.13.232.

consequences of our acts, whether or not we blame ourselves. The social purpose of liability is to influence the formation of habits and purposes, and so to influence future acts. “Gradually persons learn by dramatic imitation to hold themselves accountable and liability becomes a voluntary deliberate acknowledgment that deeds are our own, that their consequences come from us.”¹⁰⁹

Yet Dewey gave the last word neither to obligation nor to the future. In the midst of conflict, struggle, and defeat, he believed that a consciousness is possible of “the enduring and comprehending whole.” To be grasped, this consciousness needs, as does every consciousness, objects and symbols. “With responsibility for the intelligent determination of particular acts may go a joyful emancipation from the burden of responsibility for the whole which sustains them, giving them their final outcome and quality.”¹¹⁰ Dewey perceived within the “flickering inconsequential acts of separate selves” a sense of the whole that claims and dignifies them. Through such acts, we put off mortality and live in the universal. The appropriate symbol for this relationship is the life of the community in which we live and have our being. Acts that express our sense of the ties that bind us to others are its only rites and ceremonies.

IV. Houses of Law

By the necessities of his profession, the lawyer is frequently called upon to become the architect of social structure.

Lon Fuller, *The Lawyer as an Architect of Social Structures*

In 1949, an article appeared in the Harvard Law Review titled *The Case of the Speluncean Explorers*.¹¹¹ It was about a Supreme Court case in the mythical commonwealth of Newgarth in the year 4300. The defendants in the case had gone spelunking in a limestone cave when a landslide trapped them. Rescue operations began,

¹⁰⁹ Dewey, *Human Nature and Conduct*, MW.14.217.

¹¹⁰ MW.14.227.

¹¹¹ Lon L. Fuller, *The Case of the Speluncean Explorers*, 62 Harvard Law Review, 616-645 (1949). Kenneth I. Winston calls the article “a classic of the legal literature, indeed probably the single most frequently reprinted portrayal of judicial reasoning in the English language.” See *The Principles of Social Order: Selected Essays of Lon L. Fuller* (ed. with an introduction by Kenneth I Winston, Duke University Press, 1981), at 11.

but encountered difficulties. Twenty days into their ordeal, the leader of the group established communication with the rescuers through a portable wireless device. When it became clear that the entire group was likely to perish from malnutrition before they could be rescued, the leader asked if they would be able to survive if they consumed the flesh of one of their members. They were told that it would be possible, but no one in the rescue party offered any advice about how to proceed. When they were finally rescued ten days later, it was learned that on the twenty-third day, the leader of the spelunkers had been killed and eaten by his companions. Although he had been the one to propose the plan, he had decided not to act upon it. However, his companions proceeded anyway, and by a throw of the dice, he was selected as the victim. After the rescue, the other spelunkers were indicted for murder. At the trial, after the testimony had been heard, the foreman of the jury asked permission to let the judge decide the question of the defendants' guilt. Basing his ruling on the clearly worded murder statute, the judge found the defendants guilty and sentenced them to be hanged. After the trial, the judge and the members of the jury petitioned the Chief Executive asking that the sentence be commuted to six months imprisonment. The Chief Executive delayed, waiting for a ruling from the Supreme Court. In the remainder of the article, members of the Supreme Court debate the case from different legal and moral perspectives. In the end, the court was evenly divided, the decision of the trial court was *affirmed*, and the defendants sentenced to be hanged at 6:00 A.M. on Friday, April 2, 4300.

Lon L. Fuller, author of the article, was Roscoe Pound's successor as Carter Professor of General Jurisprudence at Harvard. In a postscript, Fuller noted that the period separating us from 4300 is roughly the period from the Age of Pericles to the present. The article was not intended to be a work of satire or prediction in any ordinary sense of the term. He had devised the case solely for the purpose of bringing into focus certain divergent philosophies of law and government. These philosophies presented live questions of choice in the times of Plato and Aristotle, and Fuller believed that they are still vital today for such questions are among the permanent problems of the human race.

I'd read many law review articles in my on-and-off career as a student of law. Before reading Fuller's piece, I wasn't aware that it's permissible to make things up. *The*

Case of the Speluncean Explorers seemed like an imaginative way to teach the subject of jurisprudence. In his course in jurisprudence for the second-year studentsm Fuller assembled a collection of pieces,¹¹² including the spelunking case and several other fictional cases along with readings from classical authors such as Aristotle. Fuller said that after some experimentation, he'd decided to organize and conduct the jurisprudence course around the reading and discussion of a few (ten to fifteen) authors.¹¹³ Some might call it a Great Books course like the one at the University of Chicago. Fuller was aware that Professor Mortimer Adler was attempting to reduce the world's wisdom to a hundred index headings that included "angel" but none that suggested anything like contract, exchange, bargain, deal or compact. As a teacher of contracts, he found it incredible that the world's wisdom would relegate such notions to the status of a sub-heading in order to make room for a concept like "angel."

Fuller also said that he was aware that there was said to be a certain pervasive animosity around Chicago toward American pragmatism. If that were true, he was definitely out of the Chicago camp on this issue. In his view, we need the insights of James and Dewey more badly today than ever. Only with those insights could one see a fallacy shared by most of the American realists—the idea that there exists a "pure fact of law," consisting in certain behavior patterns of judges, that are supposed to exist and be objects of study by legal scholars. There is no better way of revealing the error in these assumptions than by going back to the principle of pragmatism called "contextualism"—the notion that when you're dealing with purposive human acts, a single part of the act cannot be given meaning apart from the whole act itself and the purpose it seeks to achieve. The idea of a "pure fact of law" has about as much substance as the word *however* standing in the middle of a blank page. He believed that there existed at Chicago a great variety of points of view and a climate of controversy and discussion that most universities might envy. In any case, as a method of teaching, the Great Books approach is a great contribution to education and should not be rejected because it has

¹¹² See Lon L. Fuller, *The Problems of Jurisprudence* (Temporary Edition, Foundation Press, 1949).

¹¹³ See Lon L. Fuller, *The Place and Uses of Jurisprudence in the Law School Curriculum*, 1 *Journal of Legal Education*, 495-507 (1949), at 503-504, fn. 6.

acquired, in some minds, objectionable ideological connotations. In selecting readings, he intended not that they be “authoritative” but that they open up for discussion the most basic and recurring problems.

I remember listening to Mortimer Adler when he occasionally lectured at the St. Johns College, whose curriculum is based on the Great Books. There was indeed a climate of controversy and discussion at St. Johns that not only most universities might envy but even most laws schools—disputatious places that they are—might find uplifting. There was no question that I could learn a lot about the law from Professor Fuller, but what concrete practical difference would it make with regard to the specific legal problem I was working on—implementing Article 14.2 of the Convention on Biological Diversity? There was only one way to find out—go back to law school, this time to Langdell’s Harvard about which the legal realists had said so many bad things.

During the Second World War, Fuller practiced law for the Boston law firm of Ropes, Gray, Best, Coolidge and Rugg in the general field of labor relations.¹¹⁴ After the war, he frequently served as an arbitrator and mediator in contract disputes at the request of both labor and management. His experience as a practitioner profoundly influenced his thinking about the law. One of the essays by Professor Fuller we read for our class in jurisprudence was *The Lawyer as an Architect of Social Structures*.¹¹⁵ He described what we were studying as the “order-creating process.” The goal was to discern the principles underlying the bringing into existence of legal, political, economic, and social order. Since this process encompassed more than “law” in the usual sense of the word, Fuller thought that it would be helpful to begin by relating the inquiry to the actual work of the practicing attorney. By the necessities of our profession, we would frequently be called upon to become the architect of social structures. Such structures included not just great affairs of state and international treaties but also commonplace arrangements like a contract for a two years’ supply of paper towels for the rest rooms in a chain of service

¹¹⁴ For a brief biography of Fuller see Robert S. Summers, Lon L. Fuller (Jurists: Legal Profile Series) (Stanford University Press, 1984).

¹¹⁵ Lon L. Fuller, *The Lawyer as an Architect of Social Structures*, in *The Principles of Social Order*, *supra* note 111, at 264-270.

stations. Every contract or legal instrument is a “kind of constitution establishing a framework for the future dealings of the affected parties.”

In speaking of the lawyer as an architect of social structures, Fuller cautioned against assuming that the social structures for which he is responsible consist necessarily of words on paper. Experienced lawyers realized that once a contract has been carefully negotiated and drafted, it could usually be filed away and forgotten. During the process of negotiation, in which they were compelled to work together to work out the framework of their future relations, they came to share an understanding of the problems each of the parties faced in performing their side of the agreement. This understanding was the source of a “set of reciprocally adjusted expectations that function as a basis of order between the parties without reference to the written contract, and often better than the written contract would.”¹¹⁶ The structure in the accommodation of interests worked out during the process of negotiation and drafting well might govern the parties’ actions and prevent future disputes. Experienced lawyers recognize their responsibility for bringing about this informal, and often tacit, accommodation as well as the one formalized in the written agreement. They see to it that “the parties have reached common ground as well as common language.”¹¹⁷

I thought of my experience in international meetings on liability for transboundary damage to biological diversity where the focus seemed to be almost entirely on trying to reach common language. That goal is not unimportant, but judging by the long history of failures in implementing international liability, the likelihood of reaching the goal seems to be remote, at least if we persist in old ways of looking at the problem. If I understood Fuller, the importance of the words in such an agreement are secondary to the importance of forging common understandings of the problems of transboundary damage to biological diversity that the agreement is designed to resolve. Reaching such common ground requires attention to the process. Most importantly, the path to reaching agreement on liability begins with the effort to agree on the necessary

¹¹⁶ *Id.* at 265.

¹¹⁷ *Id.*

measures for preventing harm, and that effort begins with a discussion of the multi-dimensional meaning of harm in a particular situation.

Professor Fuller said that the discussion transcends the boundaries of any particular “social discipline,” especially those of legal study as generally conceived. He suggested that the most appropriate designation for what we were attempting is an essay in general sociology. Unfortunately, professional sociologists and anthropologists have little to say about the order-creating process. A practicing attorney might find more help by turning to active, problem-solving directions of thought and research. One familiar with the early history of our own country might suppose that an active interest in the order-creating process is a prominent feature of American legal scholarship. During the period that Roscoe Pound called the Formative Era in our law, which lasted until about the middle of the nineteenth century, almost everything lawyers wrote was filled with the spirit of choice, not simply about substantive rules of law but about ways of law-making and forms of government, great and small. Gradually, however, this spirit faded, so that by around the 1870s, lawyers were no longer thought of as having any special concern with the order-creating process. Instead, they were seen as experts in the necessary implications of certain basic legal concepts, which were regarded as compulsions more or less inherent in the nature of legal thinking.

Professor Fuller mentioned the reaction against the formalistic approach at the turn of the century beginning with Holmes and Gray, which eventually gave rise to the “movement” called American Legal Realism. Unfortunately, this reaction did not redirect the lawyer’s basic concern to the order-creating process. Instead, realists viewed lawyers as experts in predicting and influencing the “behavior patterns” of judges and other state officials. The methodology of legal realism did not include the problem of choosing among alternative social structures, and it tended to stigmatize any concern with such problems as “unscientific,” or “metaphysical,” or idiosyncratic. Realism did not recognize the “middle ground where man creates within the limits of compulsions he cannot remove but must understand.”¹¹⁸ Fortunately, some minds were too active to

¹¹⁸ *Id.* at 270.

accept the restraints of methodological orthodoxy, and certain realist thinkers like Karl Llewellyn and Jerome Frank eventually turned to problems of the order-creating process and made valuable contributions.

Professor Fuller had assembled a set of readings for our jurisprudence course, including a long essay of his own on “The Principles of Order.”¹¹⁹ When the collection was published in a “temporary edition” in 1949 as *The Problems of Jurisprudence*, he included an editor’s note saying that he planned to revise his essay and add more readings. However, he never completed the revision, and no further edition of the book appeared. He later included in the readings a five-page outline of an unwritten final chapter “The Principles of Social Order: An Essay in Economics,” which over time grew into a whole new work. As it happened, only the introductory chapter titled *Means and Ends* got written.

In the late 1950s, Fuller tangled with the English legal philosopher H.L.A. Hart over the question whether law and morality are necessarily related. In opposition to Hart’s version of legal positivism, Fuller argued that law has an internal morality based on certain, largely procedural, obligations that bind any responsible lawmaker. By most accounts, Fuller lost the debate, even though he continued to defend the idea that the law that is and the law that ought to be are logically inseparable. When Fuller died in 1978, his literary executor Kenneth I. Winston examined Fuller’s library looking for clues to his philosophical stubbornness.¹²⁰ His tenacity was not due to lack of philosophical sophistication; his library showed that he was well read in twentieth century philosophy. The principal authors upon whom Fuller drew were William James and John Dewey. Fuller found in these pragmatists a concept of order that he could use against the positivist notion of a legal order as proposed by Hart. The basic distinction was between forms of order and forms of *good* order, which were the subject matter of an inquiry Fuller called *economics*—“the science, theory, or study of good order and workable social

¹¹⁹ See Kenneth I. Winston, *Editors Note to Means and Ends*, in *The Principles of Social Order*, *supra* note 111, at 47.

¹²⁰ See Kenneth I. Winston, *Is/Ought Redux: The Pragmatist Context of Lon Fuller’s Conception of Law*, 8 *Oxford Journal of Legal Studies*, 329-349 (1988).

arrangements.”¹²¹ When Fuller described lawyers as concerned with the order-creating process, he meant the process of creating *good* forms of order. The principles of economics consist of the necessary conditions internal to each of the various forms of good social order. There are also external or environmental conditions necessary to bring about good social and legal order, but our focus in his class on jurisprudence was on the internal conditions or principles.

The metaphor of the lawyer as architect represents the center of Fuller’s philosophical vision underlying his program of economics. He proposed to begin his book on the various forms of social order by talking about means and ends. To some, he said, the book would seem to suffer from a fundamental flaw of logic—“it attempts to chart its course by a compass that lacks a pole towards which it can point.”¹²² The book seems to begin with means—the various forms of ordering human social interactions to achieve individual and collective ends—and to conclude with the ends they serve. Ethical judgments about ends are postponed until a framework for achieving them has been constructed by an analysis that appears to be ethically neutral. However, we cannot judge the effectiveness of social arrangements until we know precisely what the end is. Clarity about ends must exist at the start; otherwise, there’s no subject matter for disinterested analysis or for moral judgments. Fuller first invoked an analogy with the means-ends relation in architecture in order to open up the subject of means and ends in social architecture.

Architecture is a practical art that exists for the satisfaction of certain human ends, which may be roughly classified as utility and beauty. The means to those ends are materials such as cement, lumber, steel, and so forth, along with the technical skill necessary to assemble them. In any structure, such as a house, the means take their character and color from the particular kinds of utility and beauty sought in designing that structure. According to the objection raised above, we must first begin with the ends—a definition of utility and beauty—for only when we have a clear idea of the ends is it

¹²¹ Lon L. Fuller, *American Legal Philosophy at Mid-Century: A Review of Edwin W. Patterson’s Jurisprudence: Men and Ideas of the Law*, 6 *Journal of Legal Education*, 457-485 (1954), at 477.

¹²² Lon L. Fuller, *Means and Ends*, in *The Principles of Social Order*, *supra* note 111, at 48.

possible to deal intelligently with means, or even to know what means are relevant to the objects of architecture. Fuller replied that it would be futile to discuss ends in abstraction from the available means, a point Dewey had emphasized. We have to know what's possible before we can talk about what's desirable. We might like the esthetic appearance of a building suspended in mid-air, but since we have no means of building it, we can forget about it, or perhaps think of how to create the illusion of such a building with the materials at hand.

Fuller emphasized that the point goes deeper, that “some limitation of means is essential to liberate the creative spirit.”¹²³ He quoted a passage from Igor Stravinsky's *Poetics of Music* that said that as a composer, he was terrified by the experience of feeling an unrestricted freedom, that he needed something finite and definite, together with its possibilities and its limitations. In art as in everything else, one can only build upon a resisting foundation. I was reminded of James's point about how terrified he was at the thought of a universe that offered no resistance to his efforts to perform moral deeds. Fuller said that even though the claim that we must know the ends before starting to build is false as stated, it could not be corrected simply by reversing it. We need some vague conception of architectural ends at the outset in order to define the range of means that we will consider. In architecture, the obstinate quest for new forms of utility and beauty had led to the discovery of means capable of realizing them.

In the section of the essay *Means and Ends* on the means-ends relation in social architecture, Fuller's debt to Dewey's notion of an ends-means continuum is clear. He acknowledged the influence in a letter to Professor Philip Selznick in 1965:

About John Dewey. I was at one time quite influenced by his thought, and the influence, I suspect, lingers on. . . . His means-end continuum and his treatment of fact and value were quite congenial to me, and perhaps had a lot to do with my own thinking. What I missed, however, was the Gestalt idea, that means-ends relations fall into a limited number of patterns—what I call “forms of social order.”¹²⁴

¹²³ *Id.* at 51.

¹²⁴ Lon L. Fuller, Letter to Philip Selznick (Aug. 18, 1965), cited in Kenneth I. Winston, *Is/Ought Redux*, *supra* note 119, at 343, fn. 42.

One of the things I noticed as a student in Professor Fuller's jurisprudence class was his penchant for examining critically the assumptions underlying commonly accepted points of view. In his treatment of the means-ends relation in social philosophy, he began by looking at several interrelated assumptions that he believed were clearly untenable. Social institutions as means, included legal, political, and economic institutions as well as more informal types of social arrangements not ordinarily described as institutions.

We discussed five common assumptions about ends and means, and Professor Fuller explained his reasons for rejecting them. The assumptions were:

1. the ends served by social institutions are severable; they stand as distinct entities, each capable of separate appraisal;
2. the first task of social philosophy is to arrange human ends in a hierarchical order;
3. social arrangements are infinitely pliable;
4. elements of formal structure are found only in social means, not in ends;
5. social means—institutions, procedures, rules—are necessary evils, and the world would be better off if their costs could be avoided, if social ends were attainable directly without introducing any rigidities of social structure.

I thought about which of this whole bundle of ideas played an important part in the particular legal problem I was working on, designing workable institutions to deal with transboundary harm to biological diversity.

Certainly, there is some degree to which the tendency to treat ends as severable has entered into the conversation about international liability. Fuller argued against trying to arrange human aims and impulses in a neat row of desired "end states." Instead, he said they "move in circles of interaction," another phrase that reminded me of Dewey. An institution is an active thing projecting itself into a field of interacting forces and reshaping them in various ways and to various degrees. A social institution makes of human life something it would not otherwise have been. We can't simply ask, is the end good and does it serve the end well? Instead, we have to ask a more vague and complicated question such as, does this institution, in the context of other institutions, create a satisfying pattern of living worthy of human capacities?

In the *Trail Smelter* case, the institution designed by the Arbitral Tribunal succeeded because it came to grips with this more vague and complicated problem of

balancing the interests of the parties. The Tribunal did not begin its task by trying to arrange the ends in some hierarchical order although there must have been a consensus that looking at the dispute solely from an economic perspective, the balance tilted strongly in favor of the Canadians. Instead of starting by defining priorities, Fuller recommended that we begin by exploring available means, which is where the Trail Smelter Tribunal began. If we do so, we'll discover two things. First, no abstractly conceived end remains the same after it has been given flesh and blood through some form of social implementation. A social end takes on its "color and character" from the means by which it's realized. Second, we shouldn't just appraise the means-costs—how much of one end will be sacrificed to another if we realize the latter through a particular means—but also consider what he called the means-surplus. Can we find a means of realizing one end that will yield, as a kind of by-product, some satisfaction of the other end? When one takes such complexities into account, it's clear that prioritizing of ends is not the proper place to start in dealing with problems of social architecture.

There is no guarantee of success in designing social institutions to solve a particular problem. Fuller thought that he detected some such belief in the infinite pliability of social arrangements behind the assumption that we should begin the task of social architecture by drawing up a hierarchy of ends. Certainly, there was no guarantee that the Trail Smelter Tribunal would come up with a solution to the transboundary smelter smoke problem. They were diligent in their empirical investigations of the air patterns over the Columbia River basin as well as lucky that they found a way to use the prevailing patterns to prevent significant harm. Fuller argued that the assumption that social institutions can always be shaped to any desired end can be found in the common sense belief that implementation is merely a matter of "technique." Although the technicians capable of designing the apt means for social ends are always anonymous, we seem to assume their competence is unlimited. As hard as it is for us to think this way, we should at least be prepared to acknowledge that a particular problem of transboundary harm might turn out to be unmanageable.

The other item on Fuller's list that struck me as particularly relevant to discussions of liability for transboundary damage to biological diversity was number

four, the notion that elements of formal structure apply only to means and not ends. The language of values pervades discussions about biological diversity. Fuller noted that the current usage of the word *value* assigns to it a moral objective, which he attributed to the influence of Nietzsche. What used to be called ethics is now “value theory.” The problem is that nothing about the word *value* suggests an element of formal structure. In economics, the word suggests a kind of form-less utility, such as the pleasure of eating or an enjoyable outing. Fuller alluded to Lasswell’s “value-oriented” philosophy that explicitly defines a value as a preferred event. We are simply given a table of eight comprehensive “values” without any explicit attention to the problem of their social implementation. Fuller found this line of thinking profoundly mistaken. He said that “[o]ne of the strongest objections against the assumptions that have been rejected in this chapter lies in the fact that they encourage and appear to legitimate what may be called the salesmanship of value preferences.”¹²⁵ Again echoing Dewey, he argued that to be meaningful, a social goal must be conceived in structural terms. The task for a social architect concerned with preserving biological diversity within a particular transboundary context must be to give a flesh-and-blood structure to this abstract goal and to the specific values the institution is designed to preserve. This is the broad meaning of *valuation*, an activity that requires consideration of the complex, reciprocal relation between ends and means in any problematic situation.

One idea we talked about in Professor Fuller’s jurisprudence seminar was the importance of taking the “whole view” of legal questions. In the context of our discussion of mean and ends, the idea of the whole view involves trying to see a particular institution in the context of other institutions and the pattern of living created by their complex interactions. To examine the idea of the whole view of law further, we discussed an essay titled *Reason and Fiat in Case Law*,¹²⁶ which Professor Fuller originally delivered at the second annual Benjamin N. Cardozo lecture in 1942. In his introduction, Professor Fuller talked about Cardozo’s qualities as a legal thinker, but I couldn’t help but think that what he said of Cardozo was true of him as well. He said that

¹²⁵ Fuller, *Means and Ends*, *supra* note 122, at 60.

¹²⁶ Lon L. Fuller, *Reason and Fiat in Case Law*, 59 *Harvard Law Review*, 376-395 (1946).

it is impossible to categorize Cardozo's philosophy of law in any familiar and comprehensive rubric. His insight was too rich and varied, his method too flexible and too finely modulated to the task at hand to fit comfortably under the banner of any philosophic school. However, Cardozo's thinking was permeated by a deeper kind of coherence. The thread of connection running through his philosophy is his persistent effort to solve certain basic and recurring problems of law. One of these problems was suggested by the title of Fuller's lecture. For Cardozo, the law embraced many antinomies or paradoxes, but one of the most pervasive was that of reason and fiat. His work was filled with recognition that judge-made law is partly fiat, a convention that might easily have been otherwise in the absence of any controlling reason. However, Cardozo was not a relativist. The common law continually strives to attain the perfection of reason. Cardozo rejected neither side of the antinomy of reason and fiat. Law is fiat by its limitations and reason by its aspirations, and the whole view of law necessarily involves both its limitations and its aspirations.

To clarify the nature of the judicial process in a common law system, Professor Fuller used a technique he often employed in teaching. He first simplified the process by asking us to imagine a group of shipwrecked men isolated in some corner of the earth. Members of the society have suffered a collective amnesia that wiped out any memory of their previous social existence and its laws and conventions. To settle disputes, one sane, reasonably intelligent individual with a sense of responsibility is appointed to serve as an arbitrator or judge. He recognizes that the nature of the task imposed certain limitations on him. His rulings would be taken as precedents that would serve as a body of rules by which other members of the group guided their actions. He would feel that it's his responsibility to get the decisions *right*—right for the group, in the light of its purposes and the things the members hoped to achieve through common effort. Being conscientious, the judge would study the natural principles of group life so that his decisions could conform to them. He regarded his task as essentially like that of the cooks, carpenters, and engineers of the company who all faced the need to master a certain segment of reality with a view to discovering and using its regularities for the benefit of the group. However, the judge would also see that no amount of study could

answer all the questions he would be called upon to decide. For example, it might be necessary to punish someone, but should the sentence be for a week, two weeks, a month? With regard to such questions, the right law cannot be discovered but must be necessarily be made by the judge who applies it.

In the language of legal philosophy, Fuller said that the system of law that he'd described might be called "positive law" indefinitely approaching "natural law." However, that would be a dangerous way of speaking, "because for many the term 'natural law' still has about it a rich, deep odor of the witches' caldron, and the mere mention of it suffices to unloose a torrent of emotions and fears."¹²⁷ However, it would never occur to the judge to describe the natural law he sought to discover as some "brooding omnipresence in the skies." For him it would be a hard and earthy reality that challenged his best intellectual efforts to capture it. The judge's emotional attitude would not be like that of a priest before the altar, but like that of a cook trying to find the secret of a flaky pie crust, or of an engineer trying to bridge a ravine.

If we now imagine the judge in a normal society, Fuller argued, only one new factor appears in the judging process. The force of established institutions becomes one of the factors the judge must consider in making his decisions. The tension between reason and fiat becomes aggravated and compounded because fiat is itself a reality that reason must take into account. There are many competing sources of "positive law" from which a judge may draw, or appear to draw, in making a decision. Legal fictions are sometimes used to disguise departures from precedents a judge may view as inconsistent with "prevailing conceptions of morality." Such fictions may indicate that a certain area of law is in the process of changing.¹²⁸

Fuller observed that humans have never been very ready to acknowledge that our thinking contains anything like an unresolved tension. We're not comfortable with what the philosopher Morris Cohen called the "principle of polarity" according to which

¹²⁷ *Id.* at 379.

¹²⁸ See Lon Fuller, *Legal Fictions*, 25 *Illinois Law Review*, 363-99, 513-46, 877-910 (1930-31); reprinted as *Legal Fictions* (Stanford University Press, 1967).

apparently contradictory notions form indispensable complements to each other.¹²⁹ In dealing with the antinomy between reason and fiat, the various schools of legal philosophy attempt to get rid of either one branch or the other. Extremists of the natural law school assert that the whole of law is, or can be, an expression of reason. Positivist extremists counter by claiming that the whole of law is essentially fiat. Fuller rejected both extremes:

When we deal with law, not in terms of definitions and authoritative sources, but in terms of problems and functions, we inevitably see that it is compounded of reason and fiat, of order discovered and order imposed, and that to attempt to eliminate either of these aspects of the law is to denature and falsify it.¹³⁰

When Fuller wrote these words, he was for the first time dealing with law in terms of problems and functions in his wartime work as an arbitrator and mediator in labor relations disputes. Although Fuller had philosophical reasons for believing them, the words express the insight of a practitioner of law engaged in the work of legal problem solving.

When Fuller examined why philosophers refuse to accept both branches of the antinomy of reason and fiat, he concluded that they certainly could not be political. Neither one of the branches has any inherent connection with a “conservative” or a “revolutionary” point of view. Fuller noted that the tendency to hold exclusively to one branch of the antinomy was stronger on the Continent than in common law jurisdictions. Continental legal philosophers tended to attribute the refusal of their English-speaking counterparts to take sides in the debate to a certain obtuseness regarding the demands of logic, which they associated with British “muddling through” or American pragmatism. However, Fuller regarded the refusal as the sign of a greater insight and a better logic.

¹²⁹ Peter Teachout, one of the most perceptive readers of Fuller’s writings, argues that the principle of polarity is the organizing principle underlying Fuller’s jurisprudence. Although I place more emphasis upon the analogy with architecture and Fuller’s experience as a practitioner of law in shaping Fuller’s eunomics, I fully agree with Teachout’s insistence on trying to understand Fuller’s legal philosophy on its own terms. Teachout’s interpretation appeared before Winston’s discovery of the pragmatic context of Fuller’s jurisprudence, which may account for the absence of any reference to James and Dewey. See Peter Read Teachout, *The Soul of the Fugue: An Essay on Reading Fuller*, 70 *Minnesota Law Review*, 1073-1148 (1986).

¹³⁰ Fuller, *Reason and Fiat in Case Law*, *supra* note 126, at 382.

The English tendency to stick to the whole view despite the fact that it embraced seeming incompatibles is closely associated with the institution of case law. It's not clear whether the institution produced the philosophy or the philosophy the institution, but in any event, the common law of cases baffles those who demand a clear answer to the question whether law is natural reason or state fiat. To Fuller, the case law method tends to preserve the whole view of the law, in which the logical antitheses of reason and fiat are seen as complementary elements.

As evidence of the case law system's vitality, Fuller cited what was happening during the war when some of the country's most urgent problems were being solved by a method not unlike that of the common law. Since the middle of the 1930s, there existed a crisis in the field of labor relations caused by the movement toward democratization of industry and a demand by workers to participate in decisions that affect them. Business management saw in this movement an interference with the traditional relationship between employees and employers. The result was a conflict of interests that threatened to tear apart the social fabric. It might appear that the methods of case law, with its reliance on precedent, accepted values, and a professional tradition, were ill-suited to solve the problem of a passionate and inclusive conflict between social groups. However, in Fuller's view, the problems of labor were being worked out by methods essentially like those of common law. There were two courts, called boards—the National Labor Relations Board and the National War Labor Board. The first operated under a statute that declared only general policy, leaving it to the board to work out rules to implement the policy. The latter operated under a directive that did not specify policy but only set a problem to be solved. Both boards develop their law through decisions in particular cases. The boards view their goal as searching for formulas and methods that would reconcile conflicting interests and bring a new distribution of power into a pattern of order and justice. They don't think of themselves as "decision-makers" as described by sociologists but as decision-finders looking for clues in the facts and needs of a modern industrial society.

It's true that neither of the boards would have been possible without government power, and their decisions would not be accepted were they not backed by that power.

However, Fuller made two observations on this point. The government power supporting the boards draws its own support from reason, for if people didn't accept the democratic principle as a rational foundation of government, the power would disappear. Second, the system of law developed by the boards would not continue to develop over the long run if it were not accepted as rational and just. If the system resulted in a mal-distribution of resources that hindered productive capacity and created new centers of irresponsible power, it would remain parasitically dependent on the power of the government.

Fuller was confident that the right solution to the problem of industrial relations would eventually be worked out, and he hoped that the same methods would allow us to meet future problems. He believed that we have the capacity to solve these problems and to undertake these responsibilities. Above all, we have the spirit of give and take and of fair play that is one of civilization's most precious gifts. However, it is important to get rid of the philosophy, alien to the American spirit, that deprives law and ethics of the reason branch of the antinomy and leaves them with only the fiat branch to stand on. Despite the claims of its adherents, such a skeptical philosophy does not promote tolerance and compromise. Someone who believes that there is a natural order that has something relevant to say about our social structure may admit, without great loss of face, that he has mistaken its demands. However, no such graceful exit exists for those who assert that social philosophy is essentially the expression of personal predilections or the product of one's "world-view." To change their opinions, they must admit that they are changing themselves, which not many are willing to do. It is less difficult to confess a mistake about an external fact than to confess an inner perversity. Fuller believed that a return to a whole view of the law would not only lead toward a solution to many of our problems but would help to develop a spirit of tolerance and compromise necessary to a democratic society.

Attaining a whole view of the law requires the capacity to hold contradictory points of view at the same time without being unduly perturbed by the tension between them—the capacity Keats called "negative capability."¹³¹ In the essay Professor Fuller

¹³¹ See Teachout, *The Soul of the Fugue*, *supra* note 129, at 1107 ("Polarity in this sense bears a great affinity to Keat's notion of 'negative capability': the capability (uniquely manifested, as Keats saw it, in

wrote for our collection of readings, he presented a “metaphysical thesis” that the existence of tensions, contradictions, and competing principles of order within a society are a sign of vitality.¹³² Any growing society faces the necessity of adjusting to its “environment,” which it in part creates itself. New technological inventions represent one of the greatest sources of change that may require alterations in how society is organized. Humans are constantly faced with the need to choose between competing principles of order, which inevitably results in the appearance of “conflict” and “tensions.” To wish for an end to them is to wish that society should cease to grow. Professor Fuller believed that in many fields of the law there has been too much “either-or” reasoning, too great a readiness to assume that the principles of order are mutually exclusive instead of seeing that they are often supplementary.¹³³

As we talked about the conflicting elements of reason and fiat in case law, I thought about the antinomies in the topic of international liability for transboundary environmental harm. The great antinomy was the schism between some international lawyers who wanted to develop the institution of strict liability to deal with a certain ill-defined class of hazardous activities and other lawyers who thought that the topic of international liability had no basis in international law because State responsibility for wrongful acts covered the whole field. The doctrinal controversy between these two camps threatened to tear the international liability topic apart before there was time to consider the possibility of finding a middle ground. Robert Quentin-Baxter, the first Special Rapporteur, alone seemed to have a whole view of the whole view of the topic. In his schematic outline, he rejected neither branch of the antinomy. The first of his three basic aims was to align the new topic with that of State responsibility.¹³⁴ He emphasized that the because the international liability topic is not an exception carved out of the

Shakespeare’s genius) of holding two conflicting ideas in the mind at the same time without an undue striving after one or the other.”).

¹³² Lon L. Fuller, *The Principles of Order*, in Fuller, *The Problems of Jurisprudence*, *supra* note 112, at 717-718.

¹³³ *Id.* at 737.

¹³⁴ Robert Quentin-Baxter, *Third report on international liability for injurious consequences arising out of acts not prohibited by international law*, U.N. Doc. A/CN.4/360, para. 6 in *Yearbook of the International Law Commission 1982*, vol. II (Part One), U.N. Doc A/CN.4/SER. A/1982, p. 52.

régime of State responsibility and does not compete with that régime, there's no need to find a dividing line between the two régimes. His goal was to persuade international lawyers to use their legal skills to bring order in problematic situations involving potential transboundary environmental harm.

A secondary “antinomy” involved in the international liability topic was the division between prevention and reparation. Quentin-Baxter's second major concern was to ensure that the topic gave pride of place to the duty, wherever possible, to avoid causing injury rather than the substituted duty to provide reparation.¹³⁵ His concept of a continuum of prevention and reparation held both poles of the topic together in a coherent whole. Again, some members of the International Law Commission and the Sixth (Legal) Committee of the United Nations felt that the topic should can, or should, begin only where prevention left off. However, the majority opinion on the Sixth Committee endorsed Quentin-Baxter's proposal to treat both prevention and reparation within the context of the topic.¹³⁶ When his whole view of the topic was lost due to his untimely death, the forces of disintegration prevailed and the topic was eventually split into the two sub-topics of prevention and allocation of loss. All that remained of his whole view was the schematic outline.

Toward the end of the semester in Professor Fuller's jurisprudence class, we talked a lot about the idea of “interactional expectancies.” The notion that a set of reciprocally adjusted expectations provides a basis for order had come up before. However, in the aftermath of the debate with the H.L.A. Hart, there seem to be a renewed emphasis upon the need “to perceive and understand the moral and psychological forces that underlie law generally and give it efficacy in human affairs.”¹³⁷ Perhaps Professor Fuller felt a sense of urgency because of the general perception that he had lost the debate. Perhaps he sensed a change in the philosophical winds. When he published his

¹³⁵ *Id.* at para 9, p. 53.

¹³⁶ Robert Quentin-Baxter, *Fourth report on international liability for injurious consequences arising out of acts not prohibited by international law*, U.N. Doc. A/CN.4/373, para. 50 in *Yearbook of the International Law Commission 1983*, vol. II (Part One), U.N. Doc A/CN.4/SER. A/1983, p. 216.

¹³⁷ See Lon L. Fuller, *Human Interaction and the Law*, 14 *American Journal of Jurisprudence*, 1-36 (1969), at 1.

articles on legal fiction in book form in 1967, he spoke of “portents of a change in our intellectual climate” represented by the works of the recent philosophers Michael Polanyi and Thomas Kuhn. Quite likely, Fuller sensed that, after many years of neglect among mainstream philosophers, pragmatism was finally about to have its innings.¹³⁸

The subject of our conversation was about the foundation of the houses of law. Professor Fuller said that he construed the term *law* very broadly to include not just the legal systems of states and nations but also smaller legal systems—*e.g.* labor unions, professional associations, universities, churches—concerned with their members’ entitlements and obligations. If we begin the inquiry into the foundations of law by turning to treatises on jurisprudence, we find that they commonly begin by distinguishing between two kinds of law—enacted or authoritatively declared law on the one hand and customary law on the other. These treatises commonly tend to gloss over customary law as largely irrelevant in the modern world, a subject of study only for anthropologists. Professor Fuller believed that neglecting the phenomena of customary law greatly impaired our thinking about law generally. Much of international law—and perhaps the most vital part in his opinion—is customary law. However, the thesis he proposed was “something more radical than an insistence that customary law still has considerable importance in the world today. He claimed that we cannot understand “ordinary” or made law unless we first understand customary law.

Professor Fuller confessed that he had experienced great frustration in trying to obtain an understanding of customary law from treatises of jurisprudence. The term *customary law* hopelessly obscured the phenomenon it purported to designate. “Customary law” was seen as a by-product of mere habit and usage. Against this view, he argued that the phenomenon of customary law “can best be described as *a language of interaction.*”¹³⁹ I noticed knowing smiles among my fellow students when Professor Fuller made the analogy between customary law and language—another metaphor

¹³⁸ See Winston, *Is/Ought Redux*, *supra* note 120, at 349 (“It is worth noting that the pragmatist account of knowledge has gained a currency in contemporary knowledge—as Fuller was aware—that it did not enjoy when he first made his arguments. . . . Undoubtedly, Fuller viewed this change as a sign that the philosophical world was at least catching up to the position he had staked out long before under the influence of James and Dewey.”).

¹³⁹ Fuller, *Human Interaction and Law*, *supra* note 137, at 2 (emphasis in original).

designed to open up a subject. The problem our professor had with the treatment of language in elementary linguistics texts is that they didn't tell us what language is *for*. Clearly, its purpose is *communication*. That explains why we generally go on using the same sounds as our ancestors did—we want to be *understood*. However, in treatises on jurisprudence there's no hint that customary law originates in interaction or that it serves the purpose of organizing and facilitating interaction. In most of the literature on the social function of law it's described as an instrument of social control. Professor Fuller said that in contrasting these two functions, he did not mean to suggest that one or the other is “right.”¹⁴⁰ Each is a meaningful way of talking about what humans try to accomplish through law. As one looks at different branches of law, it may appear that one function is more relevant than the other. Across various social contexts, the relation between these two purposes of law ranges from open conflict to indispensable reciprocal reinforcement.

The example of language itself shows how the two purposes of social control and facilitation of interaction can reinforce each other. Every language has rules of grammar and syntax that speakers are required to conform to in their linguistic behavior or risk being misunderstood. At the same time, the restrictions make possible not only a free communication of meanings but also esthetically pleasing, creative uses of language. In the same way, customary law consists of rules of conduct that arise directly from social interaction for the purpose of facilitating interaction. Such rules allow us to anticipate the behavior of our fellow human beings in future interactions. Professor Fuller gave the example of the rule that when driving, one passes the oncoming vehicle on the right, a rule that existed in many societies before it was incorporated into statutory law. Such rules work by creating reciprocal expectations between motorists so that they may shape their behavior toward each other. A sense of obligation arises when these interactional expectancies have stabilized so that parties come to guide their conduct toward each other by them. We are not aware of most of the anticipations that guide our behavior and

¹⁴⁰ See Lon L. Fuller, *Law as an Instrument of Social Control and Law as a Facilitation of Human Interaction*, 1975 Brigham Young University Law Review, 89-96.

attitudes towards others—unless we happen to do something that brings them to consciousness, perhaps in an unpleasant way.

Although we may speak of a system of stabilized interactional expectancies as customary law, many of these expectancies do not appear to have much meaning in a legal context. In what sense are they “law”? Professor Fuller rejected the idea that a social norm becomes a legal norm when the social norm is accompanied by a threat, or by the actual use, of force by an individual or group having the social privilege of acting to enforce the norm. His main objection was that this notion ignored the *systematic* character of customary law. Customary law is not a list of do’s and don’t’s. The basic logic of customary law inheres in the system as a whole. To use the example of the “rule of the road,” one passes oncoming vehicles on the right not because it is reasonable but because it is the rule. Traffic is guided by a system of interlocking roles, and when someone steps out of the role, or a situation arises where the roles have lost some or all of their meaning, adjustments have to be made. There’s no formula to guide these adjustments beyond the rule of “reasonableness.”

Professor Fuller argued that contract law and customary law are close cousins, both having a consensual element. By “contract law,” he meant the law established by the contract, rather than the law of or about contracts familiar to most law school students. As a form of social order, the contract is one means of establishing stable interactional expectancies. International lawyers are familiar with the idea of contract law in Fuller’s sense because almost all of international law originates in treaties or agreements. On a simple level, one can say that in customary law, the relevant interactional expectancies are created by actions whereas in contract law, they are created by words. However, wherever words are used, they have to be interpreted. Interactional regularities in the world outside the contract get written into the contract during the process of interpretation. Also, the interactions of the parties after the contract is formalized may determine its meaning in a kind of “practical” construction of the document. Professor Fuller noted that in the actual carrying out of a contract between friendly parties, the written contract often furnishes a kind of framework to guide the ongoing relationship rather than a precise definition of the relationship. For that

definition, one has to look to a kind of two-party customary law implicit in the parties' actions rather than to the verbal formulations of the contract.

Similarly, Professor Fuller pointed to the problem of interpretation as “at once the most crucial and most neglected problem of customary law.”¹⁴¹ It has been made more difficult by inept theories about the nature of customary law as “the force of habit” with its roots in the early history of the race. The central problem of interpretation is knowing when to read into an act, or a pattern of repeated acts, an obligatory sense like that of a promise spelled out in the words of a contract. Fuller found the doctrine of *opinio necessitatis*—the idea that the act must be performed due to a sense that it is obligatory—to be a curiously inept solution. In clear cases, the principle becomes a tautology, whereas in cases where customary law is in the process of being born, it defaults. He suggested that a more reasonable approach would be to say that when a stabilized pattern of interaction between two parties A and B spreads throughout the relevant community, a rule of general customary law will have been created. The rule becomes part of a larger system that involves a complex network of reciprocal expectations. Absorption of the new rule into the larger system will be facilitated by the fact that the interactions that gave rise to it took place within the system and derived part of their meaning from this wider interactional context. In short, new customary law arises by spreading from one social context to another.

One might be prepared to accept Fuller's thesis that customary law and contractual law, in his sense, arose out of human interaction for the purpose of facilitating interaction. However, his thesis was more radical—he claimed that we cannot understand enacted law, such as statutes, unless we first understand customary law. Enacted law depends upon stable interactional expectancies between lawgiver and subject, and it also serves the purpose of facilitating the interactions of citizens with each other. Professor Fuller tested this concept of law first by looking to see how well it could be applied to certain branches of the law. In some areas, such as contracts, property, agency, and marital rights, one could interpret the principal function of the law as

¹⁴¹ Fuller, *Human Interaction and Law*, *supra* note 137, at 15.

facilitating interaction. Other areas of law appeared more problematic, such as the law of murder, although Fuller argued that one looks at the law from a historical perspective, its interactional origins appeared more clearly. As the result of legal and moral progress, interactional issues once central to the law of murder got pushed to the periphery, where in Fuller's view "they remain as lively as ever." Perhaps the most significant class of crimes where the theory appeared to fail is in so-called "crimes without victims" such as laws against selling alcohol or marijuana, prostitution, or gambling. These are areas where the element of "social control" appears to predominate. It was no accident in Fuller's view that these are also areas where the grossest failures of law occur. Fuller pointed out that in dealing with some primitive legal systems, a distinction is sometimes made between sins and wrongs. A wrong is some act that inflicts a palpable damage on the fabric of social relations whereas a sin works a more diffuse harm by spreading corruption. Fuller believed that we might adopt the wisdom in this basic distinction—and add to it the insight that the best way for the law to deal with some modern sins is to leave them alone.

Even if we accept that enacted law serves to facilitate human interaction, there still remains Fuller's more radical thesis that enacted law depends for its existence upon stable interactional expectancies between lawgiver and subject. Fuller acknowledged that his claim contradicted the view generally accepted in jurisprudence and sociology that the essential characteristic of law lies simply in the fact that it is an exercise of authority. But, Fuller asked, authority to do what? How does one distinguish the functions performed by a boss, for example, and a lawgiver? Both represent forms of "social control." Both may issue general rules for others to obey. The difference in Fuller's view is that the lawgiver does not tell people what they should do to accomplish specific ends set by the lawgiver but instead lays down *baselines* by which individuals may use to organize their lives with their fellow citizens. Because the basic purpose of law is to furnish baselines, it's clear why the existence of enacted law depends upon the establishment of a stable interactional expectancy between lawgiver and subject. The lawgiver must be able to anticipate that the citizens as a group will accept and observe the promulgated rules as law. Subjects must be able to anticipate that the government will

abide by its own declared rules in judging their actions. A gross failure in either of these expectations—of government toward citizens and of citizens toward government—will result in a failure of even the most carefully drafted code to become a functioning system of law. Because faith of the citizens that the government is playing the game of law fairly plays such an important role in the functioning of the system, a single breach of that faith is enough to undermine the moral foundations of the legal order, both for its subjects and those who administer it.

The reciprocal influence between lawgiver and subject necessary to a functioning legal system had its foundation in a stable system of reciprocal expectations. At the same time, there exists a reciprocal influence between a legal system and its social context. For a given social context, one form of law—customary, contract, or enacted—may be more appropriate than another, and the attempt to force a particular form on a context not suited to it could fail with have harmful results. To describe the various kinds of social contexts, Professor Fuller used a continuum of relationships from intimate at one end to hostile at the other. To represent the intimate end of the spectrum, he used the average family with no servants and young children in the home. At the other end, he had in mind two hostile nations with no superior political power to control their aggressive tendencies. He saw customary law as a suitable means of ordering relationships across the entire social spectrum from the intimate to the hostile pole. He saw contractual law as particularly suited to the middle ground, which he called the “habitat of friendly strangers between whom interactional expectancies remain largely open and unpatterned.”¹⁴² He maintained that this was the area where explicit contracting was first conceived. The “home ground” of enacted law largely coincides with that of contractual law, the region of friendly strangers. The basic need is to impose rules that will serve to set the limits individuals must observe in their interactions with each other while leaving them free within those limits to pursue their own interests.

As we talked about the concept of interactional expectancies, the question arose in my mind, could it be useful way to view the problem of liability for transboundary

¹⁴² *Id.* at 29.

damage to biological diversity? Although Professor Fuller did not have much to say about international law, there had been an attempt recently to apply his insights to that area of law.¹⁴³ In replying to his critics in the debate with H.L.A. Hart, Fuller noted that customary law and international law have been described as “horizontal” orders, in contrast to the “vertical” forms of order imposed by a state on its citizens.¹⁴⁴ Some of those concerned with programs for world peace thought of creating something like a world legal order, “vertical style.” Others favored the opposite strategy of achieving reciprocal accommodations, which may take the form of explicit treaties or may develop through tacit adjustments that gradually harden into law. As usual, Professor Fuller sought to put the problem of international order in a different light and to soften the opposition of viewpoints. He pointed out that even so-called “vertical” forms of social order have “horizontal” elements in the reciprocal expectations between lawgiver and subjects. And his notion that a gradual spread in “horizontal” forms of order might lead to more global forms of order in certain areas of law offered a way of building vertical legal structures upon interactional foundations.

Again, my mind went back to the schematic outline of the international liability topic prepared by Robert Quentin-Baxter. The metaphor of law as architecture pervades the schematic outline. In the report to which it was appended,¹⁴⁵ Quentin-Baxter described one section of the outline as listing the “building blocks” or “factors” from which régimes of prevention and reparation may be constructed. Another section lists “the building techniques, and the architectural choices that ought to be considered.” In the report containing the first draft articles, Quentin-Baxter said that he had included only a representative range of supporting materials “so that questions of architecture are not lost in copious illustration.”¹⁴⁶ In the light of our discussions in Professor Fuller’s class, it became clear to me that Quentin-Baxter’s schematic outline is essentially a legal

¹⁴³ See Jutta Brunnée & Stephen J. Toope, *Legitimacy and Legality in International Law: An Interactional Account* (Cambridge University Press, 2010).

¹⁴⁴ See Lon L. Fuller, *The Morality of Law* (rev. ed., Yale University Press, 1969), at 233, 236.

¹⁴⁵ See Quentin-Baxter, *Third report*, *supra* note 134, at para. 40, p. 60.

¹⁴⁶ See Robert Quentin-Baxter, *Fifth report on international liability for injurious consequences arising out of acts not prohibited by international law*, U.N. Doc. A/CN.4/383 and Add. 1, para. 2 in *Yearbook of the International Law Commission 1984*, vol. II (Part One), U.N. Doc A/CN.4/SER. A/1984, p. 256.

architect's blueprint for an institution to facilitate human interaction between State parties in a problematic situation that could lead to transboundary environmental damage.

The process begins with the sense, sometimes just a vague sense, that something is the matter. However, each side may begin with a very different view of what the problem is. I remember Professor Fuller saying that we live in a world threatened by international and internal chaos. The real threat, in his view, comes not from wicked intentions but from our inability to reach an understanding of one another's problems.¹⁴⁷ The duties to inform, to consult, and to negotiate at the heart of the schematic outline are implicit in the circumstances of international life in a technological era. While States have no obligation to look at the world in the same way, there is a practical need for States to be able to anticipate, at least in a rough, practical way, how other States will view their acts, whether favorably or unfavorably. The series of obligations in the schematic outline constitute a means for stabilizing the reciprocal expectations. Ideally, this progressive understanding of each other's problems would result in an explicit formulation in the nature of a written contract setting out the rights and obligations of the States parties. However, there is no guarantee of success, and certainly no obligation, in the absence of any palpable harm, to find a way of working things out. The obligation, both moral and legal, attaches not to individual acts but to the *pattern* of conduct. The logic underlying the set of mutually reinforcing duties in the legal mechanism outlined by Quentin-Baxter is not an either-or type of logic. It's a deeper coherence that can be seen only by trying to view the system as a whole.

The question that naturally arises is how to proceed if harm occurs in the absence of any written agreement between State parties. There seems to be an assumption underlying this question that the absence of any formal agreement implies the absence of any form whatsoever. That assumption needs to be examined more closely. Is it plausible that the interaction between the parties prior to an incident resulting in loss or injury could be completely lacking in any form or pattern, any reciprocal expectations guiding the interaction? To think so seems to me a form of vicious intellectualism in the

¹⁴⁷ Lon L. Fuller, *On Legal Education*, in *The Principles of Social Order*, *supra* note 111, at 281.

law. Even in failed negotiations, there are some things, perhaps many things, the parties agree upon. While the areas of disagreement are usually obvious and dominate our attention, we may make an effort to focus on the tacit forms and try to interpret their meaning as the parties interpreted them by their actions, including acts of forbearance. Quentin-Baxter expressed this idea by saying that the negotiations over reparation should be guided in part by the “shared expectations” of the States concerned. If we adopt Fuller’s metaphor of customary law as a language of interaction, the nature of the judicial problem in situations where harm occurs in the absence of a prior agreement does not appear to be radically different from the ordinary judicial problem of statutory or treaty interpretation.

Professor Fuller concluded by saying that he believed that “there is a profound truth in the statement that the injustices and the cruelties of this world are done, not with the fists, but with the elbows.”¹⁴⁸ We need someone—he looked at us—with the imagination, patience, and skill, to work out a seating arrangement that will put us all within reach of the banquet without our elbows knocking against one another. So it seemed to me that instances of transboundary harm to the environments and to the biological diversity of our neighbors are cases where States assault each other with their elbows rather than their fists. The goal is to find elbow room at the border. I think we can use the blueprint provided by Quentin-Baxter to design an institution under the Convention on Biological Diversity to facilitate the interactional process of constructing workable arrangements. From the point of view of a legal architect, these arrangements represent “houses of international law.” What makes each house interesting is not only how the architect has selected the building materials and used the principles of institutional design, but also how each house fits into the social landscape. That such houses also serve to protect part of the world’s biological diversity is, at least to conservation-minded architects, an end deeply satisfying.

¹⁴⁸ *Id.*

Conclusion

“Looking at Old Things in New Ways”

In his legal work and as a person, Robert Quentin Baxter was always open to new ideas—he was fond of describing the process as “looking at old things in new ways.”¹ Just before he presented his schematic outline of the international liability topic, Quentin-Baxter reflected on the value of a proposed set of articles containing many guidelines but only one obligation whose breach would engage international responsibility for a wrongful act. He found the justification in the nature of the topic. No one doubts the wrongfulness—at least in principle—of causing injury in another state. However, it is equally clear from State practice that if incidental transboundary loss or injury results from legitimate activities carried out in a reasonable way, the acting State is not necessarily viewed as responsible under international law. Between these two poles lies “a wilderness that cannot be reduced to order by prohibitory rules of general application.”² The legal boundaries specifying each State’s rights and obligations have to be charted in some detail, with mutual accommodation. Some of this detailed charting gets done in multilateral treaties dealing with global problems, some in regional treaties, and some in bilateral treaties regulating problematic situations along an international frontier or border. Ultimately, these arrangements result from the free play of negotiation between States, guided by their shared sense of principles and the need to find practical solutions respecting the interests of all parties.

There remains a good deal of this detailed charting yet to do. Quentin-Baxter noted that recourse to legal principle is apt to appear unhelpful. The balance-of-interest principles in global treaties, such as Principle 21 of the Stockholm Declaration, and even conventional legal rules offer States only vague guidance. Moreover, “the law may retreat into a labyrinth of its own devising,” doctrinal controversies over the legal status of obligations that do not engage State responsibility and that extend the ordinary notion of foreseeability to include statistical risks. However, Quentin-Baxter did not think that

¹ Dame Alison Quentin-Baxter, (personal communication, 22 February 2011).

² Robert Quentin-Baxter, *Third report on international liability for injurious consequences arising out of acts not prohibited by international law*, U.N. Doc. A/CN.4/360, para. 50 in *Yearbook of the International Law Commission 1982*, vol. II (Part One), U.N. Doc A/CN.4/SER. A/1982, p. 62.

these inadequacies of international law were the main reason for the discrepancy between our policy aspirations and our actual achievements in the area of the human environment. The main reason “seems to arise from compartmentalized thinking.” We regard prevention of loss as a worthwhile aim, but reparation “conjures up a vision of absolute and automatic commitment to a mechanized legal process with a system of values not accessible to ordinary men.”³ It seemed worthwhile to Quentin-Baxter to arrest these tendencies by looking at old things in new ways. From this new point of view, reparation is in essence a cheaper and imperfect substitute for prevention; liability without wrongfulness is the obligation to pay a fair price; the goal of the international liability topic is to ensure that the legal balance of interest test takes into account all of the elements that go into making an honest bargain; and States seeking the freedom to act and those seeking freedom from the adverse effects of such actions have equal protection in international law.

In the preceding pages, I have tried to provide a psychological and philosophical justification for Quentin-Baxter’s practice of looking at old concepts of international law in new ways. William James’s gave his book *Pragmatism* the subtitle *A New Way of Thinking About Old Ideas*. It’s easy to talk about the need to find new ways of looking at or thinking about old ideas, less easy to find individuals who actually manage to do it. To forget the work of such individuals seems almost perverse. But perhaps that judgment is a bit unfair, at least with respect to the topic of international liability. Quentin-Baxter suggested that there were psychological reasons why we embrace the goal of preventing transboundary loss or injury but shrink from the thought of reparation for it. Reparation conjures up visions of being caught up in some mechanized legal process that doesn’t take sufficient account of the values shared by most of us. We are frightened by an image of the law as some kind of machine that doesn’t recognize the human dimension—the interpretive dimension—of problems. The topic of international liability conjures up visions of the bogieman in international law. We cannot eliminate those fears, but we

³ *Id.* at para 52, p. 62.

may try to re-direct their psychic energy for useful purposes by looking at them in new ways.

One way we may try to speak to the bogieman in human terms is by imagining how the legal process in Quentin-Baxter's schematic outline of the international liability topic might be applied in a concrete case. Article 14.2 of the Convention on Biological Diversity calls upon the parties to examine, on the basis of studies to be carried out, the issue of liability and redress for transboundary damage to biological diversity. Let's suppose that after all the studies have been carried out, the Convention were to implement Article 14.2 by adopting a process similar to that outlined by Quentin-Baxter. And let's imagine that an incident similar to that in the *Trail Smelter* case were to occur today. Suppose that AquaBounty Technologies⁴ is thinking about growing genetically modified smelt in cages within the Columbia River near the town of Trail, British Columbia. Periodic cage-failures are one of the recognized environmental hazards of such aquaculture methods. There's a small but not insignificant risk that genetically modified smelt could escape and migrate into the lower reaches of the Columbia River where they might mate with their wild relatives. In the small town of Kelso, Washington, the "Smelt Capital of the World," where "smelt-dipping is considered a "must-do" activity in January and February, there's concern about the potential impact of "those smelt" on the town's way of life.⁵ In addition, in 2010, NOAA Fisheries Agency accepted the petition of the Cowlitz Indian Tribe in southwestern Washington to have the Columbia River population of smelt listed as threatened under the Endangered Species Act,⁶ and the following year proposed to designate critical habitat.⁷ If Canada and the United States were both parties to the Convention on Biological Diversity, how would the

⁴ AquaBounty Technologies is seeking approval from the U.S. Food and Drug Administration to market its genetically modified AquAdvantage® salmon. See Andrew Pollack, *Genetically Altered Salmon Gets Closer to the Table*, N.Y. Times, June 26, 2010, at A1.

⁵ For a good account of the importance of the Columbia River smelt to the way of life in Kelso and other towns along the Columbia River see Richard A. Hinrichsen, *The Ghost Run of the Cowlitz*, 5-21 (1998). For a lovely song about the smelt-fishing industry in Lake Ontario by the late Canadian singer/songwriter Stan Rogers see <http://www.youtube.com/watch?v=BRUSqO8fObU>.

⁶ See Threatened Status for Southern Distinct Population Segment of Eulachon, 75 Fed. Reg. 13012-13024 (Mar. 18, 2010) (to be codified at 50 C.F.R. pt. 223).

⁷ See Designation of Critical Habitat for Southern Distinct Population Segment of Eulachon, 76 Fed. Reg. 515-536 (Jan. 5, 2011) (to be codified at 50 C.F.R. pt. 226)..

Trail Smelt case, as some called it, be handled using the legal mechanism set by Article 14.2 of the Convention?

We may use the pragmatic test to compare Quentin-Baxter's approach with the approach embodied in the International Law Commission's draft articles on prevention⁸ and draft principles on allocation of loss.⁹ The scope of the International Law Commission's draft articles and draft principles is limited to activities not prohibited by international law that "involve a risk of causing significant transboundary harm through their physical consequences." The scope of Quentin-Baxter's proposed articles refers to "activities and situations" within the territory or control of a State that "give rise or may give rise to a physical consequence affecting the use or enjoyment of areas within the territory or control of any other State."¹⁰ The transboundary element and the element of a physical consequence are common to both scope provisions, so there would be no difference arising from them. However, there would be a practical difference arising from the third element in the scope clauses. In the Law Commission's version, the activity would have to entail "a risk of causing significant transboundary harm," whereas in Quentin-Baxter's clause, the activity would have to affect the use and enjoyment of areas.

To whom should courts or administrative bodies look to determine whether or not an activity entails a risk of causing significant transboundary harm? In the *Trail Smelter* case, the Arbitral Tribunal looked to scientists, with less than satisfactory results. Scientists got caught up in trying to prove or disprove the existence of "invisible injury" to plants from low concentrations of sulfur dioxide fumes. Meanwhile, the people of Northport, Washington looked on, hoping that "their" scientists would win the day. However, science rarely provides the kind of clear and indisputable evidence capable of

⁸ See International Law Commission, *Draft Articles on Prevention of Transboundary Harm from Hazardous Activities*, Official Records of the General Assembly, Fifty-Sixth Session, U.N. Doc. A/56/10, 370-377 (2001).

⁹ International Law Commission, *Draft Principles on the Allocation of Loss in the Case of Transboundary Harm Arising from Hazardous Activities*, Official Records of the General Assembly, Sixty-First Session, U.N. Doc. A/61/10, 106-110 (2006).

¹⁰ Robert Quentin-Baxter, *Fifth report on international liability for injurious consequences arising out of acts not prohibited by international law*, U.N. Doc. A/CN.4/383 and Add.1, para. 1 in *Yearbook of the International Law Commission 1982*, vol. II (Part One), U.N. Doc A/CN.4/SER. A/1982, p. 155.

standing up in a court of law that they were wishing for or that the Tribunal could have used. It's not likely that things would be any clearer in the *Trail Smelt* case. There might be some evidence of genetic introgression in wild type populations, but at what point does it reach the threshold of "significance" required by the scope clause in the draft articles on prevention? And if there were no phenotypic effects, the "injury" would be invisible in a practical sense. However, the people who live in the area might feel injured by the presence of "those smelt" in the waters of the Columbia River. We should not be quick to dismiss those feelings simply as emotional or "irrational" reactions.

Under Quentin-Baxter's scope clause, those potentially affected by the proposal of AquaAdvantage Technologies would need only to show that the fish farm would affect their use and enjoyment of the area. The claim imposes a legal responsibility upon the Canadian government that has its basis in the situation. The freedom of the company to act needs to be balanced against the freedom of residents in the town of Kelso and members of the Cowlitz Indian Tribe to be free from interference in the normal state of things in their part of the Columbia River. As Dewey pointed out, a truly free activity—as opposed to an impulsive assertion of power—must contain an element of responsibility. The foreseen consequence of the action must "react back" upon the agent and modify the activity for it to be free. Obligations are generated in the process, although they are largely indeterminate at this stage because it is not yet clear that the situation demands regulation. Nevertheless, there's a legal obligation, at least in some degree, to find out, to inquire about "what is the matter"? Are the physical consequences, when evaluated using multiple criteria of evaluation, "adverse effects"? And if they are, what is a reasonable way of dealing with them that will give both parties equal protection under international law?

Canada could fulfill its responsibilities by requiring that AquaAdvantage Technologies conduct an environmental impact assessment that takes into account potential adverse transboundary consequences of the project. There's increasing awareness of the importance of "biodiversity-inclusive" impact assessment as a decision

support tool under the Convention on Biological Diversity.¹¹ Although such formal assessment procedures are important, they may leave little opportunity for the kind of human interaction needed fully to evaluate the facts of the case. If the United States were not satisfied that the measures taken relating to loss or injury are sufficient, the government could notify Canada of its desire to talk further about the problem. Under the legal process envisioned by Quentin-Baxter, Canada would have a duty to co-operate, on the basis of a fair distribution of costs and benefits, to reach an agreement on setting up a joint inquiry and establishing fact-finding machinery. The fact-finding body would be responsible for gathering relevant information, evaluating it, and, to the extent possible, recommending solutions.

Setting up the joint inquiry corresponds to the stage in Dewey's analysis of the phases of inquiry in which an indeterminate situation becomes a problematic one by the formulation of problem. The "facts of the case" are what the fact-finding body must determine at the same time that it evaluates the meaning of these facts using multiple criteria. Quentin-Baxter's schematic outline indicates that the fact-finding machinery should rely upon experts, but the term *expert* should not be interpreted in a narrow sense. The technical tools of fuzzy logic require some theoretical expertise, but the perceptions of reality embodied in fuzzy subsets are shared, contextual meanings. Much of the discussion would focus on the legal meanings of the fuzzy terms *harm* and *biological diversity*. In the survey of state practice that Quentin-Baxter would have used to complete his drafting work, it states that the characterization of harm or injury for the purposes of impact assessment may differ from that entailing liability.¹² The joint fact-finding body would try to reach agreement on the criteria by which the environmental impacts of AquaAdvantage Technologies fish-farming project should be measured and

¹¹ See, e.g., International Association for Impact Assessment, *Biodiversity in Impact Assessment* (Special Publication Series No. 3, July 2005); available at <http://www.iaia.org/publications/>.

¹² See International Law Commission, *Survey of State Practice Relevant to International Liability for Injurious Consequences Arising out of Acts Not Prohibited by International Law* (Prepared by the Secretariat), U.N. Doc. A/CN.4/384 (1984), in 1985 Yearbook of the International Law Commission, vol. II(1)/Add. 1, 1-127, para. 14, at 26 ("The characterization of harm or injury for the purposes of impact assessment may differ from that of harm or injury entailing liability; harm or injury requiring prior consultations may or may not be compensable as a consequence of liability.").

assessed. Members would have to deliberate about alternative courses of action and, if possible, recommend one or more solutions to the problem. The recommendations would be advisory only, not binding upon the governments, which could choose to ignore them entirely.

Failure by Canada to co-operate in the fact-finding inquiry would not give rise to any right of action. Legal requirements with no sanctions for their violation are open to the charge that they are “without teeth.” However, such criticism misses the essential fact pointed out by Quentin-Baxter:

The compulsion to regulate dangers is provided by facts, not by law. If law seeks to assert a compulsion of its own, divorced from fact, the impetus to legal development is lost in empty disputation whether States act freely in their own domain, or are constrained by need for prior agreement.¹³

The goal is to provide conditions that will encourage communication between the parties in the hopes of finding a fair solution without having to fear becoming entrapped in an alien legal mechanism. The legal sanction is inherent in the circumstances of the acting State. Canada must bear the liability alone until there can be a fair distribution of costs and benefits freely negotiated with the United States, which may in turn one day permit genetically modified fish farms to operate just south of the Canadian border.

By participating in good-faith consultations with United States over the AquaAdvantage Technologies project, Canada has fulfilled its obligations under Article 14.2 of the Convention on Biological Diversity. Perhaps, the consultations resulted in establishing a fact-finding body, or perhaps they didn't. Perhaps the fact-finding body was established but failed to complete its task within a reasonable period of time. Or, finally, perhaps the fact-finding body issued its report, which could include a recommendation that the governments negotiate a settlement to the dispute. What happens next depends upon desires of the governments. The question before them is whether or not to enter into negotiations to determine if a regulatory régime is necessary and what form it should take. Should either government request negotiations, the other

¹³ Quentin-Baxter, *Fifth report on international liability for injurious consequences arising out of acts not prohibited by international law*, *supra* note 10, para. 46, at 172.

government (governments, if there are more than two parties involved) has a duty to talk further about the need for a régime.

So, how important are smelt to the governments here? One may ask the question more generally—how important is biological diversity to the governments? At this stage in the process, I expect that purely intellectual arguments for the importance of biological diversity will begin to sound increasingly hollow. One may grant the abstract truth of the arguments, but it won't be pragmatic truth, the kind that directly touches the vital interests of governments or the individuals they represent. These interests include but are not limited to economic ones. In the section on balancing of interests in the 1984 survey of state practice relevant to the international liability topic it says:

The balancing of interests appears to be an integral part of treaties and is referred to in judicial decisions and official correspondence concerning activities with potentially harmful impact. The concept of balance of interests in terms of 'cost-benefit analysis' in torts law relates to the balancing of economic and financial interests and factors involved in a tortious act. In international relations, treaties and judicial decisions, the concept of balance of interests appears to have a broader meaning; it includes other values, in addition to economic factors, such as the well-being and health of populations, respect for the territorial sovereignty and integrity of other States, the safety and security of neighbouring States, etc.¹⁴

The broader balance of interests concept in international law provides the standard by which the importance of biological diversity in this case must be measured. The impacts of the AquaAdvantage Technologies' project upon the Columbia River smelt and upon the lives of humans intertwined with this small fish must be assessed in this larger context.

The structure of the negotiations envisioned in Quentin-Baxter's schematic outline is essentially a process of judicial decision making. The negotiations were to apply certain principles set out in a separate section of the outline, which would have been developed further using the survey of state practice. The first principle was ensure to acting States as much freedom of choice in relation to activities within their territory or

¹⁴ International Law Commission, *Survey of State Practice Relevant to International Liability for Injurious Consequences Arising out of Acts Not Prohibited by International Law*, *supra* note 12, para. 196, p. 46.

control as is compatible with adequate protection of the interests of affected States. Adequate protection included measures of prevention, as far as that is possible, to avoid a risk of loss or injury, and, in so far as that is not possible, measures of reparation. Standards of protection should be determined with due regard to the importance of the activity and its economic viability. There is also a principle that innocent victims should not be left to bear their loss or injury, which should be applied in a manner consistent with the earlier principles.

In addition to the section on principles, there is a section on factors that may be relevant to balancing of interests. Some of the factors, such as the likelihood of loss or injury, come from risk assessments of the activity. Others factors pertain to the economic viability of the activity, and the availability of alternative activities or alternative means of carrying out the activity. The degree to which the affected State shares in the benefits of the activity is another consideration. Items on the list of relevant factors make up the empirical criteria by which the physical consequences of an activity should be evaluated. In addition to these, there is a section of the schematic outline on matters that may be relevant to the negotiations concerning prevention and reparation. Decisions about the form of liability are included as topics for discussion.

Let's imagine that, for some reason, the United States government is not satisfied with the report of the joint fact-finding body regarding the AquaAdvantage Technologies project and requests negotiations to settle the matter. The reasons for elevating the dispute to the level of a formal negotiation will probably never be known; the most one can say is that the government considered the matter to be important enough to make a case of it. The Canadian government has a duty to respond to the request for negotiation, regardless of how it views the importance of the problem. It does not have a duty to take any further measures beyond continuing to talk in good faith at a higher level than before. Each government will feel the burden upon their diplomatic resources and energies, which one may hope will act as a restraint upon demanding negotiations on a whim. Some diplomats with too many things to do and too little time to do all of them sometimes may hang a sign on their office door saying, "It Had Better Be Important!" So it should be, but if there is a knock on the door, harried diplomats are obliged by the

nature of their profession to open it and to listen, at least for a reasonable period of time. There is some incentive for Canadian diplomats to open the door. The onus is on the Canadian government to show that it has taken every reasonable step in search of an agreement satisfactory to both sides.

The process of balancing interests proceeds by the kind of interactive process that characterizes Dewey's concept of inquiry. There are no formal procedural rules, but there may be useful guidelines. Quentin-Baxter noted that there are two main ways that the rules and guidelines he was developing could help both source States and affected States to strike a proper balance between freedom of activity and freedom from transboundary effects.¹⁵ One way is by developing a pattern of procedures to facilitate fact-finding and negotiation. The other way is by consolidating the applicable principles and methods. In both respects, state practice could provide a "revolving fund." How Canada and the United States resolve the *Trail Smelt* case—if they manage to come up with an agreement—could furnish parties in future cases with more definite rules to regulate a particular kind of transboundary threat, or with more precise criteria for decision making in similar situations. In so far as new agreements reveal consistent patterns of State practice, they will in turn contribute to the development of customary law and add to the fund of applicable principles and factors. Essentially, this is how the principle announced by the tribunal in the *Trail Smelter* case entered customary international environmental law.

In his book *Pragmatism*, William James asked why we should not view our acts as the "actual turning places and growing places" of the world, the "workshop of being, where we catch fact in the making, so that nowhere may the world grow in any other kind of way than this?"¹⁶ One may transpose James's metaphysical question to the key of international law and ask why we should not regard negotiations within the context of the legal framework set forth by Quentin-Baxter as the workshops where we may catch international environmental law in the making. Lawyers may be told, as James was told,

¹⁵ Quentin-Baxter, *Fifth report on international liability for injurious consequences arising out of acts not prohibited by international law*, *supra* note 10, para. 45, at 172.

¹⁶ William James, *Pragmatism* (Works of William James, ed. by Frederick Burkhardt, Fredson Bowers, Ignas K. Skrupskelis, Harvard University Press, 1975), at 138.

that the idea is irrational. How can new laws, or new being, “come in local spots and patches which add themselves or stay away at random, independently of the rest?” There must be some logical compulsion in the total nature of the world behind the appearance of new law or new being. To which James’s replied:

Talk of logic and necessity and categories and the absolute and the contents of the whole philosophical machine-shop as you will, the only *real* reason I can think of why anything should ever come is that *someone wishes it to be here*. It is *demanded*, demanded, it may be, to give relief to no matter how small a fraction of the world’s mass. This is the *living reason*, and compared with it material causes and logical necessities are spectral things.¹⁷

Lawyers should not be spooked by material causes and logical necessities, or post-modern anxieties over the fragmentation of international law. Responsibilities are rooted in the felt necessities of life as these appear in a particular transboundary context. Why shouldn’t we take them at their face value and view these situations as the growing places of international environmental law where we may codify in a modest way the habits of acting responsibly?

Although everything comes to be because someone demanded it, not all demands are reasonable. Canadian diplomats may listen to demands for a regulatory régime covering prevention and liability and find some of the proposed measures excessive. Negotiations may reach an impasse. Canada is not obliged to agree, although it does have a continuing duty to monitor the activity at the AquaAdvantage Technologies smelt farm and take any measures it considers necessary and feasible to safeguard the interests of the United States. As long as nothing happens, the story is suspended indefinitely. However, suppose that some of the genetically modified fish escape one day and begin to show up in the Columbia River south of the border. Once again, Canada would find itself confronting demands that it act responsibly in the new situation, which is different from the previous one. The difference does *not* lie in a wrongful act by the Canadian government. Nothing either in customary international law or in any agreement between the two governments prohibited the operation of the smelt farm. The difference is that

¹⁷ *Id.*

the risk of harm has been transmuted into the fact of harm. The legal meaning of the fact has yet to be settled, which can only be done through negotiations between the two governments.

The fact of harm has altered the balance of interests between Canada and the United States, and the purpose of negotiations is to find a fair way to restore it. There are no mechanical means of calculating an appropriate redress. Human judgment is required. Some factors and principles that may not have been considered relevant in earlier negotiations might assume new importance. There's now a record of the actions taken by Canada to safeguard the interests of the United States, as well as a record of previous exchanges and negotiations. Quentin-Baxter called these records the best evidence of the context in which the affected State's rights to reparation must be assessed. They help to establish what he called the *shared expectations* of the States. At the very end of the day, "there is a commitment, in the nature of strict liability, to make good the loss"¹⁸ unless making reparations for a loss or injury of that kind does not accord with the shared expectations of the parties. However, the resort to strict liability is by no means automatic. Canada and the United States are compelled by nothing except the logic of the situation, the persuasiveness of guiding principles such as those set forth in the schematic outline, and the need to pay for the damage done if no better arrangement can be worked out. The obligation to provide appropriate reparation for the loss or injury sustained provides the background of the negotiations.

Failure to reach agreement would entail an obligatory reference to a disputes-settlement procedure. However, the purpose of negotiations is to avoid having the matter referred to such formal mechanisms of international law. Use of such procedures is an indication that international law has broken down and that the parties in a dispute feel themselves helpless to do anything about it. They are in a condition similar to the one in which William James found himself in the spring of 1870 when he reported that he had about touched bottom. James found the resilience to overcome despair through his will to believe. If States involved in a dispute feel that they have about touched bottom in

¹⁸ Robert Quentin-Baxter, *Third report on international liability for injurious consequences arising out of acts not prohibited by international law*, *supra* note 2, para. 41, at 60.

their negotiations and are not comforted by the prospect of dispute-resolution therapy, at least they have a choice. They can choose to develop the habit of acting responsibly. But in opting for that path, they should remember Quentin-Baxter's words: "A commitment to voluntarism cannot be half-hearted."¹⁹ Both parties must keep their eyes on the future, which will be determined by what they believe and do here and now. Guided by a sense of what's fair and what has worked in similar situations in the past, they may find ways to create specific forms of international legal order to protect biological diversity in a small part of the world.

¹⁹ Quentin-Baxter, *Fifth report on international liability for injurious consequences arising out of acts not prohibited by international law*, *supra* note 10, para. 47, at 172-173.

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