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Dear Law Review Editor:

      I am pleased to enclose for your examination my article, *Mathematical Determinism: Natural Law's Missing Link - Analytical Jurisprudence's Missing Axioms*. To my knowledge, this is a first-ever attempt to link Natural Law to the physical sciences (in particular, Mathematics and Physics).

Abbreviated CV (Detailed Resume Included With Submission)

Education:

      Ashley S. Lipson, Esq., LL.M (Tax Law, Wayne State University Law School), M.A. (Mathematics, Wayne State University), J.D. (St. Johns University Law School), B.A., (Telecommunications, Michigan State University), Additional studies in Physics (University of Michigan), and two As.D's (Computer Science, and Computer Information Systems).

Authorship (See attached resume):

      7 books (1 Prentice Hall, 2 Matthew Bender/Times Mirror now Nexis/Lexis, 2 James Publishing, Inc., 2 TransMedia Inc.), 3 contributions to books, and more than 60 published articles (including republication).

Notable Innovations and Inventions:

      Author/creator/programmer of entire *Objection!* computer simulation series, comprising the first computer game to ever receive certification for Mandatory Continuing Legal Education. California became the first such state in 1992; presently, every state that permits "home study" has CLE-certified the *Objection!* series. The product is sold throughout the world.

      Author/creator of *The Lawyers Comprehensive Computer Document System* and *The Direct Reference Document System* (appearing in law journals from 1981 through 1988); also published in Lipson, *Law Office Automation (*Prentice Hall, 1989).

      Latest efforts include: *"SivPro,"* a unique game/tutorial, designed to aid first year law students by translating abstract concepts (jurisdiction, etc.) into concrete objects. Works- in-progress include the courtroom based: *"Weavers Needle,"* the first interactive, courtroom based, feature length motion picture.

Occupations:

I am presently an associate law professor, mathematician, computer programmer, author, software creator, cruciverbalist, lecturer and former law practitioner (30 years). My focus, however, is currently directed toward theoretical physics.

Abstract

Until now, "Natural Law" has been loosely predicated upon unscientific notions of "innate human" morality or religion. Biology and its Darwinian notions of survival have provided a dead end for writers seeking to link science and morality. Using a few incontrovertible propositions of mathematics and physics, the paper seeks to establish a link or common bond between a scientifically defined creator (and purpose) and natural law, using three abstract concepts: *Balance, Expansion* and *Restraint*.

Secondarily, an argument in favor of a revised brand of formalism attacks the structure of lawat its roots and the methods by which it has been taught and academically developed.

Lastly, even though quantum mechanics plays an important role, I have kept the mathematical discussions basic and simple.

If you have any questions or if you require any additional information, please do not hesitate to contact me. You may telephone me at the number below on a 24/7 basis.

Thank you

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MATHEMATICAL DETERMINISM
Natural Law's Missing Link - Analytical Jurisprudence's Missing Axioms

- By Ashley S. Lipson, Esq.[1]

Mathematics - A perfect brush that sweeps across an endless multi-dimensional universe painting the invisible fabric of time, space and the laws that govern them; an infinite tapestry, far purer, more complex and more elegant than anything humankind can ever hope to completely comprehend. All nations, religions and distant galaxies bend to the gravity of those laws, and yet, we ignore completely their undeniable impact when constructing our own laws of human conduct. Jurisprudence - Not so perfect.

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[1] © Ashley S. Lipson, 2004, B.A. (Telecom., Michigan State University), M.A. (Mathematics, Wayne State University), J.D. (St. Johns University Law School), LL.M (Tax Law, Wayne State University Law School), As.D (Computer Science), Post Degree (Studies in Physics, University of Michigan). The author is an Associate Professor of Law at the University of La Verne College of Law; he was a trial lawyer for more than thirty years, and has published several practice-related books (Prentice Hall, Times Mirror, Matthew Bender, Lexis/Nexis and James Publishing) along with more than 60 articles. He is the inventor of Lawyers' Comprehensive Computer Document System (See Lipson, *Law Office Automation*, Prentice-Hall, 1986) and the author/programmer of the popular *Objection!* computer game series, and is also the creator and author of *SivPro!,* a computerized interactive tutorial.

MATHEMATICAL DETERMINISM
Natural Law's Missing Link - Analytical Jurisprudence's Missing Axioms
- By Ashley S. Lipson

INTRODUCTION

Einstein, a humanist, once echoed the ubiquitous sentiment that "The existence and validity of human rights are not written in the stars."[2] This paper challenges that notion. For, the same stars that served Einstein and his colleagues so well as they uncovered the physical laws of the universe, might have likewise been employed to derive a predicate for Natural Law and basic morality. Both science and law have continuously ignored that potential interrelationship, perhaps because their common philosophical elements were obscured by ancient[3] standards that lacked a thorough appreciation of relativity, thermodynamics and quantum mechanics. Despite his superior knowledge of these concepts, even Einstein echoed the tenets of *Jurist* Blackstone,[4] who believed that morality and Natural Law were "innate" human qualities,[5] and not subject to scientific observation.[6] Jurists often subscribed to unscientific notions of a "commonly shared morality."[7]

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[2] Albert Einstein (1879 - 1955), Address to the Chicago Decalogue Society (1954) *quoted in* THOMAS F. BURKE, EINSTEIN: A PORTRAIT 102 (1984).

[3] The term "ancient" refers to "pre-1925," the approximate birth year of Quantum Mechanics. See ALBERT MESSIAH, QUANTUM MECHANICS 4 (1999).

[4] *See supra* Section III(B).

[5] Blackstone explicitly tied his discussions of Natural Law to the divine foundations of justice "within individuals." Other celebrated thinkers (including Grotius and Hobbes) described natural rights as "innate features of human nature." Duncan Kelly, *Revisiting the Rights of Man: Georg Jellinek on Rights and the State*, 22 LAW & HIST. REV. 493 (2004).

[6] "The content of scientific theory itself offers no foundation for the personal conduct of life." Einstein, *Science and God: A Dialogue, Forum and Century* 83 (1930) *quoted in* ALICE CALAPRICE, THE NEW QUOTABLE EINSTEIN 273 (2005). "There is nothing divine about morality; it is a purely human affair." Einstein, *The Religious Spirit of Science* 18 (1934).

And, although a link between creation and some vaguely defined "creator" has been accepted by members of the scientific and secular community, no connection has ever been advanced or suggested to link science to Natural Law or basic concepts of "right and wrong."[8]

Discussing morality and science in the same breath inevitably leads to biological and psychological considerations, which, in turn, lead to an inevitable dead end.[9] So that attempted nexus is often sidestepped. Perhaps it is time to examine Mathematics and Physics for solutions to the ancient problem, since the "Innate human" theories, in truth, lead nowhere.

Intuition alone tells us that there is something inherently wrong with murder, theft, assault and even the simple failure to obey a traffic signal. On the more *civil* side of the fence, that same intuition likewise instills a sense of obligation to honor our promises, our contracts and our "words." And, of course, we are all conscious of our duty to refrain from harming our neighbors. But why is this so? And, more significantly, why must we turn to vague notions of "innate" human qualities or religious dogma, instead of science for answers?

Linking morality to law provides its own set of problems. Proponents of Natural Law always seem to speak of vague "hunches" and personal feelings.[10] Oliver Wendell Holmes was certainly troubled by this lack of specificity. On the one hand, he sought to sever or dispel any

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[7] Michel Rosenfeld, *Constitutional Adjudication in Europe and the United States: Paradoxes and Contrasts*, INTERNATIONAL JOURNAL OF CONSTITUTIONAL LAW, INT'L J. CONST. L. 633, F.N. 43 (October, 2004).

[8] Much has been written attempting to link Science and creation, but the discussions seem to break down at efforts to link science and morality. See, for example, DANIEL C. MATT, GOD AND THE BIG BANG (2001). See also MICHAEL SHERMER, THE SCIENCE OF GOOD AND EVIL (2004).

[9] *See infra* II(B).

[10] For a litany of other *non-specifics*, see HANKS, HERZ AND NEMERSON, ELEMENTS OF THE LAW 45 (1994). Among the perennials, expect to find: "intuition," "revelation," "God speaking directly to or through legal persons."

"confusion between morality and law altogether."[11] In another breath, however, he acknowledged that "The law is the witness and external deposit of our moral life. Its history is the history of the moral development of the race."[12] Having encountered such stress over the link between law and morality, we could only begin to speculate whether Holmes ever considered an even more elusive missing link between morality and science.

As crucial as the development of "the law" is to the human race, it would seem that at some point within the past two thousand years, we should have been able to find a minimal amount of scientific support for the law's underlying theory, if only a grain of evidence to defend that which has guided our complex legal structures over the years.[13] After all, Science and Mathematics provide detailed information about virtually every other subject in the universe.

Psychology, if a science, is at best, a descriptive as opposed to a proscriptive discipline; it may tell us how our mind works, but it says nothing in terms of the moral "ought's" or "should's." And even though Biology might provide a partial base (i.e., self - Darwinian self preservation is certainly a valid component of Natural Law), unregulated biological urges would hardly lead us down any moral path. "Survival of the fittest,"lest we forget the 1930's, has its didactic limits.[14] These "natural" psychological propensities were adequate building blocks for

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[11] See *Collected Legal Papers,* 10 Harv. L. Rev. 457 (1897), reprinted in 167 (1920). See also HANKS ET AL., *supra* at 516 (1994).

[12] *Id.* at 513.

[13] Even treatises claiming to link "science" and morality ignore *Mathematics* and *Physics*, preferring instead to stay within the realm of Psychology, superstition and religion. The biological sciences, with Darwin's help, are quickly led down the dark "survival of the fittest" corridor. Not much morality there. So where do the science-driven moralists then wind up? At the doorstep of religion. See, for example, MICHAEL SHERMER, THE SCIENCE OF GOOD AND EVIL 40 (2004) declaring that: "As we have seen, morality is inextricably bound to religion, the first social structure to codify moral behaviors into ethical systems."

[14] *Id.*

Thomas Hobbs (1598 - 1679) and his "Social Compact,"[15] But even Hobbs' ubiquitous assertions

beg the question as to whether there is, in fact, a "higher" purpose for our laws instead of mere

naked self-preservation.

Mathematics, unlike the other disciplines, seems to encompass everything. Not just

physical objects, but even abstract concepts such as color, taste, music, and texture can be reduced

to numbers and physics-related equations, either in the form of primitive components or,

statistical data for those "unexplainables." Even thought processes are traceable to quantifiable

neurons, axons and components of the brain. Nevertheless, with respect to what "ought" to be the

law that guides our lives and determines our moral fiber, neither science nor Mathematics has

come forward; even Physics, a highly respected icon of the new millennium, has remained silent.

In fact, as legal scholars, we seem more eager to erect barriers between scientific thought and

philosophical jurisprudence than we are to create links.[16] Even the sacred realms of Logic and

Mathematics are not safe.[17]

Thus, even though we have scientific answers for virtually everything else, Natural Law

(which is inextricably linked to morality) can quote nothing in the way of scientific or

mathematical data to support its vague underlying assumptions.[18]

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[15] THOMAS HOBBS, THE LEVIATHAN (Chapter 13).

[16] HANKS ET AL., *supra* note 10 at 73 points out the limitations of our physical laws in a strange attempt to justify the inconsistencies and inaccuracies in our legal system. I use the term "strange," because, even without the benefit of quantum mechanics (which the author failed to take into account and which happens to be highly accurate), the error margins between jurisprudence and science are vast. *See infra* Section III(B)(1).

[17] See Mark R. Brown and Andrew C. Greenberg, *On Formally Undecidable Propositions of Law: Legal Indeterminacy and The Implications of Metamathematics*, 43 HASTINGS L.J. 1439 (August, 1992). This excellent article reminded us that even Mathematics has its limitations.

[18] *See infra* Section III(A).

After more than a thousand years of science, where then are we? Are speculation and hearsay the best that we can do? Do we posit our entire body of law solely on the shoulders of religion,[19] which, in turn is based on *hearsay* and *faith*, a duo that both Science *and* Law eschew.[20] Or, are we left to speculate about our so-called "innate" sense of rights, duties and justice?

The dubious reliability of our "innate senses" becomes evident when confronted with the simple question: "Whose innate sense is *correct*?" Is there, for example, any scientific evidence that a cannibal, suicide bomber or even a corrupt dictator harbors beliefs that are any less *innate* than our own? Do they not also provide examples of law and order?

With the foregoing in mind, the purpose of this thesis is threefold: First, to analyze the existence of a scientifically defined "creator" while uncovering a purpose or intelligence behind the creation of the universe, without supporting or demeaning religious dogma.[21] Second, to present a link between creation and morality (encompassing Natural Law), consisting of a "scientifically constructed" purpose on the part of the former.[22] And finally, to briefly synthesize

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[19] Despite the *Establishment Clause*, religious tenets continuously provide directives for both the citizenry and judiciary. In addition to the Establishment Clause, consider *People v. Harlan*, 109 P.3d 616 (2005), wherein a death sentence verdict was invalidated because a juror carried a Bible into the courtroom; and see *Arnett v. Jackson*, 393 F.3d 681 (2005), reversing a judge's habeas order because he quoted the Bible. See also David L. Hudson, Jr., *The Bible Tells Them So*, 91 AMERICAN BAR ASSOCIATION JOURNAL 14 (July 2005).

[20] Before labeling this thesis as "anti-religious," note that it is to be predicated upon the existence of a creator. There has always been dissension among religion, logic and morality. Danish philosopher Soren Kieregaard (1813 - 1855) disagreed with Kant's view that religious belief and morality could be founded on reason. Faith, according to Kieregaard, was utterly irrational and unprovable. As a contrary position, consider: "All justice comes from God - He alone is its source." JEAN JACQUES ROUSSEAU, THE SOCIAL CONTRACT.

[21] In particular, this thesis flows from principles of Mathematics and Physics rather than the ancient philosophical concepts or biblical data (Actually, this undertaking results from a brief detour from an unrelated endeavor, i.e., an attempt, admittedly incomplete, to find a mathematical resolution of the conflict between relativistic gravitational theory and its perennial enemy, quantum mechanics).

[22] Conceptually, at least, there are some similar components to link physical science with scientific

the roles played by Natural Law, Analytical Jurisprudence and the "other" theories of legal philosophy, demonstrating that they are all parts of the same ill-constructed puzzle.[23] The overriding purpose, however, is to derive concepts of Natural Law directly from Science.

The path to the preceding goals exposes a natural relationship between the laws of science and the "science" of law. Today, it should no longer be acceptable for legal scholars to justify a haphazard, non-scientific approach to a poorly constructed subject known as "*law,*" by attempting to distinguish it from the perceived "perfect" disciplines of Mathematics and Physics. That pretext might have worked in the 19th Century, at a time when those twin disciplines shared an illusion of perfection. Today, we know that when viewed close up, as is the case with law, nothing is perfect, not even the laws of classic physics. But you won't find physicists hiding behind a Socratic barrier of "let's make it up as we go" rules and axioms. In short, *Law* is an undisciplined discipline, a pretend science with makeshift definitions and rules. It need not be.

Relying primarily upon the laws of Mathematics and Physics[24] to provide our evidence, the discussions are designed to lead us along the following path of construction:

jurisprudence; those are to be explored.

[23] The various "competing" theories of jurisprudence are, in truth, not competitors. They are really part of interconnected attempts to describe a poorly constructed legal system lacking a uniform logic-based structure. Jurisprudence is not Rocket Science. Its difficulties lie in its poor construction, not its inherent complexity.

[24] According to Robert Crease: "Physicists are trained to investigate a problem before arriving at a decision. Lawyers, advertisers and others are trained to do exactly the opposite: to seek data to confirm a

determination that has already been made." JOHN D. BARROW, THE CONSTANTS OF NATURE 55 (2002).

Scientifically Defined Creator ⇒

Purpose ⇒

Morality ⇒

Natural Law ⇒

Analytical Jurisprudence ⇒

Legal "isms."

The remainder of the paper will show that the glue that binds Mathematics, Physics, Cosmology and Biology to morality and Jurisprudence is a mix of the three basic concepts: **Equality** (Fundamental to Jurisprudence and indispensable to Mathematics), **Expansion** (A proven design or "purpose" for the universe), and finally, **Restraint** (without which there could be no concentric, sub-atomic or elliptical planetary movement, nor could we claim any biological distinction from the animals of the jungle).

Like it or not, we, and all of the matter that surrounds us, are derived from the same erratic, subatomic particles that violently exploded from a single point in space billions of years ago, randomly hurling everything through cold, void space with speed and heat that are unimaginable. Those chaotic particles had no order or arrangement, much like an infant legal system. Unlike our legal systems, however, whoever or whatever set the universe in motion clearly provided direction and purpose. From these elementary particles, some laws quickly developed, without which, there would be no universe or world as we know it. Those laws, though discernable through Physics and Mathematics, possess a "judicial ring."

First, the notion of balance or "Equality," fundamental to our legal system, provides the

lynchpin for the mathematical equations used to make the knowledge of the universe available to us. But more than that, equations can provide evidence of a scheme or design. As compared to our first element, the second one, "Expansion" is more dynamic, suggesting a purpose or direction. In fact, the continuous expansion of the universe, now accepted as fact by the scientific community, provides a discernable instruction dating back to genesis.

Finally, were it not for our third element, "Restraint," the universe would still consist of unrelated particles flying through space. It is this concept of restraint and regulation that causes the wild particles to settle down into predictable orbits along with gravity, lest our Earth should spin away from the Sun along with all of the other planetary bodies, not mention the fact that matter would cease to exist without the restraint of electrons to their designated orbits. At a more abstract level, we can stand back and discern an order or pattern for universe, one that obeys the classic laws of Newton and Einstein, but at a microscopic level we see that our concepts (so smooth when viewed from a distance) are quite chaotic and only predictable through statistics and principles of quantum mechanics. This unpredictability does not, however, give rise to serious nihilistic momentum nor feed movements such as Critical Legal Studies.

Thus, if there is such a thing as "Natural Law" in the scientific sense, its purpose and direction seem discernable via Mathematics and Physics without a need to rely upon superstition, religion, vague anti-Darwinian instincts, or undefinable "innate" human concepts of right and wrong. The building blocks of Natural Law are, in reality, for all to see.

You may ask why we should ever rely upon mathematicians[25] to provide insight into our

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[25] It might be noted that the terms "Mathematics" and "Physics" are sometimes used interchangeably. To be more accurate, however, we might think of Physics as the lawgiver delivering the rules that govern the universe, and Mathematics as the language that delivers them. Mathematics, much like Analytical Jurisprudence is predicated upon its own independently constructed axioms. Mathematics, however, obtains its legitimacy because it so

business (i.e., the business of "law")? Perhaps because Mathematics is so pure in truth or

otherwise exempt from scandal and suspicion; or because "math people" can say more with a few

symbols than jurists can with volumes, and do so with greater accuracy. Or, perhaps it is because,

unlike the statutes and common laws of nations and states, the laws of Mathematics are obeyed

throughout the universe.[26] In any event, Mathematics possesses a certain inherent truth.

accurately describes the provable laws of physics. Analytical jurisprudence, in its present form, on the other hand, has yet to establish comparable legitimacy.

[26] It is safe to assert that Mathematics is the respected method of communication among all sciences, even to the point where a particular "science" cannot be considered as properly fabricated without it. See TIMOTHY FERRIS, COMING OF AGE IN THE MILKY WAY 205 (1988). But see also STEPHEN WOLFRAM, A NEW KIND OF SCIENCE (2002), who takes a contrary view of the world of Science; instead of using Mathematics, he would view pixels on a computer screen, and see the universe represented by "Cellular automata." Ironically, Wolfram is the developer of *Mathemica*, software based on pure, traditional mathematics.

I.
THE ARCHITECTURE OF THE UNIVERSE

Did the universe result from a series of random events, void of a master or creator? Or was there intelligence and, therefore, purpose behind it? Such creation-related discussions have classically traveled down two rapidly diverging avenues - The roads of *Science* and the paths of *Religion. Science,* in particular *Astronomy* and *Cosmology* theorize that "in the beginning" there existed a dense particle from which the entire universe emerged following an explosion popularly referred to as the "Big Bang."[27] Before the *Bang*, there was only that single particle, which interestingly enough was both the largest mass in the universe and at the same time, the smallest. Without at least two objects, the concept of size was, and still is, meaningless. The idea of "time" was also meaningless.[28] Without motion, there can be no concept of time. And, without a second object, there could be no *motion*.[29]

In contrast to the scientific explanation, religion theorizes the existence of a deity or God, who in a finite number of days and nights (depending upon the religious setting) created many things, including the Earth.[30] Without taking sides in this never-ending dispute, let's merely define the "Creator" as that person, entity, thing or concept that created the initial components of the universe. It is interesting to note that *neither* Science nor Religion has ever explained the

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[27] See *infra* Section II(A)(1).

[28] STEPHEN HAWKING, A BRIEF HISTORY OF TIME, 8-9 (1988).

[29] Motion, of course, can only exist with respect to two objects (i.e., at least two objects.). These basic concepts of relativity existed pre-Einstein.

[30] The great mathematicians do not quarrel over the existence of a creator; they are not anti - God. Rather, they disagree over God's methods. For many great thinkers, such as Descartes and Leibniz, "God was the foundationhead and guarantor of the total rationality that pervades the cosmos," PAUL DAVIES, THE MIND OF GOD 77 (1992).

process by which the Creator came into being initially. Perhaps, this mystery presents a final barrier for human intelligence. For, despite the exponential acceleration of our technological expertise, neither the religious nor scientific communities have ever been able to postulate how we get something, however small, from nothing.[31] Only mathematicians can accomplish that feat, and even they require a logic-based slight of hand.[32]

In the interest of full disclosure, I should mention a competing theory of cosmology which suggests that the universe was "always here," if only to point out that such a proposition does not negate, nor detract from the premises that follow. The "Always here" theory, which is contrary to the scientific mainstream might seem to nullify any attempt to discern a purpose or motive behind its construction.[33] Such a theory is, nevertheless, no less difficult to imagine than a particle, however small, springing from nothing. In any event, we are still left puzzling over our *Creator.* For even that which has "always been" requires an explanation as to how *it* "got here."

There have been other attempts to describe how the universe began. But no one has ever truly accomplished that feat. Many present what I refer to as the "Triple C's" (Cockamamie cosmological concepts).[34] A more respectable theory seizes upon the wave - particle duality of

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[31] See *infra*, Section I(B).

[32] Mathematics has the unique power to ideate and manipulate the infinite, the infinitesimal and other concepts that otherwise far exceed our grasp; the ability to create something from nothing is included. We simply employ elementary set theory to define our "nothing" as the Null Set {∅}. Then we merely replicate and "order" our null set elements [{∅}] or "nothings" so that we have a definable set and elements with both cardinal and ordinal properties: [{∅}], [{∅}{∅}], [{∅}{∅}{∅}]. Then, it's merely a matter of assigning a number or order to each of the derivative sets that we have constructed. Or even better, we might merely define the "complement of the null set" [C{∅}] - as everything, and miraculously, we have not only created something from nothing, but indeed, we have created *everything* from nothing.

[33] With respect to the scientific mainstream, "The theory of a universe that has always been around has been rejected." PAUL DAVIES, THE EDGE OF INFINITY 151-152 (1981).

[34] Favorites include terms such as "Parthogenesis (Virgin Birth)" and "Cosmogensis." Their proponents

quantum mechanics to provide some fascinating speculation. It is argued that since all matter

equates to waves and visa versa,[35] we can easily explain the spontaneous creation of matter by

simply claiming that all matter came from waves. This permits us to dispense with the "How did

matter get here?" problem. But, unfortunately, we are then confronted with the equally baffling:

"How did the waves get here?"

Without some type of "creator," it is arguable that there would be no "purpose" behind the

construction of the universe. The underlying predicates for Natural Law would then either be

meaningless or would be required to rely upon our previously considered, inconsistent, ill defined

"innate" concepts of right and wrong. There will never be consensus about the Creator because of

its religious connotations. Some of our most notable scientists and philosophers believe in the

existence of a creator, while at the same time confessing an inability to describe him or her in

concrete scientific terms. [36]

For those who elect the religious route, however, there is little problem in constructing a

set of natural laws, with an accompanying book of morality added at no additional cost. The all

powerful God[37] delivered 10 Commandments (or other religious doctrines depending upon one's

upbringing), and to the extent that they reflect our "innate" notions of right and wrong, they form

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sometimes speak of "Etherons." See PAUL A. LAVIOLETTE, GENESIS OF THE COSMOS (2004). It should noted that any
theory containing the word "ether" seems to be toxic. Such theories have been poison for the reputations of some of
our great scientists, including such notables as Michaelson, Morely and even Einstein. In fact, the farther that Einstein
"got away from" the ether, the closer he traveled toward *General Relativity* (referred to by many as the single most
advanced concept in the history of the human species).

[35] $E = \hbar v$. Energy equals the velocity of the wave times the Planck constant (a constant of the physical
universe).

[36] See MAX JAMMER, EINSTEIN AND RELIGION 73-75 (1999).

[37] Whose only shortcoming is that *he*, according to the televangelists, "always needs money." - Noted
comedian George Carlin.

the foundations of Natural Law.[38] That problem was solved long ago. Deriving morality and

Natural Law from religious sources is, therefore, relatively easy and satisfying, not to mention

pragmatic.[39] Deriving those things from scientific sources, however, is not as easy. Therefore,

Step One involves demonstrating the existence of some kind of "*Creator*" however abstract, who

possesses intelligence and purpose.

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[38] Interestingly, The Ten Commandments were remarkably specific in view of their brevity and, even by modern standards, very well drafted. This point was well highlighted by Cartoonist Wiley Miller who envisioned Moses addressing a resistant crowd with: "I don't care what your lawyer says, they're not the 10 *Recommendations*!"

[39] There are, of course, conflicts among the various religions as far as what is wrong and what is right. But there is, admittedly, more consistency than inconsistency.

A. Mathematical Constants and Relationships:

As suggested earlier, it is best to start with the language of Mathematics because of its undeniable and un-politicized truths; moreover, it seems to provide a special kind of guaranteed knowledge.[40] Mathematics provides the tools to reach beyond our biases, doubts and clouded vision. Unlike the language of law, which delights in making very simple propositions complex, the language of Mathematics does quite the opposite. Whatever universal truths humans can discern can best be conveyed through this language.[41]

If classic physics, quantum mechanics and forensic science agree on anything, it is our ubiquitous, inherent inability to trust our senses, our intuition and, in many cases, even our scientific instruments. Our concepts of time, space and mass can all vary. A yardstick actually becomes shorter when in motion. Subatomic particles often appear to be in two places at the same time, and most incredibly, they act differently if someone is watching them. In fact, there are very few things that we can rely upon with absolute certainty, but they exist, nevertheless. They are the so-called numerical *constants* of the universe. They are those foundation elements that comprise the laws that rule the world of Mathematics, which world, in turn, describes the laws that govern the physical universe.

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[40] "So deep does this belief run that a branch of science is considered not to be properly understood until it can be cast in the impersonal language of Mathematics. FERRIS, *supra* note 24.

[41] Astronomer James Jean once proclaimed that "God is a Mathematician." See FERRIS, note 40 at 205. Consider also: "There is only one pure language made known to mankind - a language of discovery, not invention, of proof as opposed to superstition; a language whose propositions are promulgated by logic instead of hearsay, a language created by God not man. Its truths are not dependent upon race, religion, or country, or even parental upbringing; they are indeed obeyed throughout the entire universe. Its truths are not imposed by wars or threats of damnation or profit seeking preachers. It can take us places and show us things that are otherwise incomprehensible.

1. The Numerical Constants

As we drift off into numbers, it might help to keep in mind our initial problem: "Did the universe result from a series of random events, void of a master and creator or was there intelligence and purpose behind it?" To be completely objective, we should first eliminate hearsay from all sources, scientific and religious alike. We need evidence that is universally undeniable and incontestable, evidence worthy of some "*super*-judicial notice." Such evidence exists only in the form of our "constants." These are numbers that were clearly "put here" by someone or something without any input from the human species. They are dimensionless quantities, uninfluenced by biased scientists or viewer popularity polls. They are unaffected by time, speed, gravitational pull, human meddling, relativity, distortions and parallax perspectives.[42] This paper requires only five. It is no coincidence that they happen to be the five most important numbers in the world of Mathematics.

First consider pi (π), a childhood acquaintance; this particular constant is deceptively elementary, yet extremely mysterious and in some respects impenetrable. The "simple" ratio of the circumference of every circle in the universe to its diameter is the same; it is pi. This ratio holds true regardless of the perspective or numbering system of the person calculating it; the ratio always has and always will equal 3.14159265358979323846264338327952884197 ... Notice the dots; they exist to remind us that we will never truly touch, see or write the exact number. That is because the decimal expansion continues forever and never repeats. This lack of repetition

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It is the language of Mathematics." - *Anonymous*

[42] Physical quantities with dimensions, such as mass, weight, volume, velocity and length are all *relative* as opposed to *constant*. Such quantities are subject to variation and distortion, and personal perception, the only exception, of course, being the speed of light in a vacuum, per Einstein.

follows from the fact that pi is an irrational number and cannot be represented as a fraction.[43] The

fact that ten simple digits can be written forever and never "repeat" is, itself, miraculous and

difficult to imagine. And yet we see the ratio everywhere we turn. Pi is not only irrational, it is

also transcendental, meaning that it cannot even be represented algebraically.

The number represented by π is not subject to human meddling or interpretation.[44] We

could employ a different numbering system or rename the numbers; it would make no difference,

the value would always equal the same irrational number. Whoever or whatever created the

universe and defined pi, placed its grasp deceptively beyond our reach while simultaneously

waiving it in front of our faces.

Next, an equally mysterious and indispensable constant is the number e. Forming the base

for our natural (Napierian) logarithms, $e =$ 2.718281825459045235360 2874 ... As is the case

with pi, this is only an approximation; for like pi, the constant e is both irrational and

transcendental. Raised to the power "x," e produces the only function that equals its own

derivative (i.e., slope).[45] Whereas π has great "static" significance as a mathematical fixture, the

constant e, is an energetic mainstay for calculus and is quite dynamic;[46] and, it is extremely

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[43] The fraction for pi that we first encountered in elementary school (22/7) was only an approximation.

[44] Attempts to legislate mathematical truths by way of law (instead of visa versa) can serve up some very entertaining idiocy. Consider the effort by one Edwin J. Goodman to resolve the irrationality of pi by proposing a different measuring standard. In particular, Indiana House Bill #246 (1897) gave us this: "Be it enacted by the General Assembly of the State of Indiana: It has been found that the circular area is to the quadrant of the circumference, as the area of an equilateral triangle is to the square of one side. The diameter employed as a linear unit according to the present rule in computing the circle's area is entirely wrong." Goodman's method would cause pi to equal = 9.2376, which, is of course, clearly incorrect. See PETR BECKMAN, A HISTORY OF PI 174 (1971). (Petr's name is not misspelled).

[45] If $y = f(x) = e^x$ then $f(x)' = dy/dx \ f(x) = e^x$

[46] "A universe in which e and pi were lacking, would not, as some anthropomorphic soul has said, be inconceivable. One could hardly imagine that the sun would fail to rise, or the tides cease to flow for lack of pi and e. But without these mathematical artifacts, what we know about the sun and tides, indeed our ability to describe all

important with respect to the expansion of the human species, in particular, growth functions.[47] It

is noteworthy that this same constant *e* is a critical component of the solution to the differential

equation describing the rate of radioactive decay of a substance[48] and is, at the same time, a

mainstay for computing compound interest.[49]

The third constant worthy of examination is *farther removed* than even the most irrational

and transcendental numbers; it requires an additional dimension for expression outside the scope

of our real number system. It is the square root of minus one, that headache of headaches that first

appeared in junior high school, commonly referred to simply as "i."[50]

The remaining two required constants are familiar to all; they are "natural," real and

rational. The number representing unity, "1" is referred to by mathematicians simply as the

multiplicative identity, and the number "0," the *additive identity*.[51]

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natural phenomena, physical biological, chemical or statistical, would be reduced to primitive dimensions." EDWARD KASNER AND JAMES NEWMAN, MATHEMATICS AND THE IMAGINATION 89 (1967).

[47] See *id* at 89: "Besides serving as the base for the natural logarithms, e is a number useful everywhere in mathematics and applied science. No other mathematical constant, not even pi, is more closely connected with human affairs. In economics, statistics, probability theory or wherever exponential change is involved, it plays a significant role. It has also played an integral part in helping mathematicians describe and predict a most important natural phenomena - that of growth."

[48] $m = m_0 e^{-at}$

[49] $A = Pe^{rt}$

[50] This constant, which has a very lengthy story of its own, takes us into an expanded universe, one that is beyond our real number system and yet an integral part of it; for there is no number within the "real" number system that, when multiplied by itself yields a negative. Sometimes referred to as "complex," it is needed to complete our "complex" numbering system. See generally, BECKMAN, *supra* note 44.

[51] Quite simply, the Number 1 multiplied by any number will yield that number. So too, the number 0 when added to any number will yield that number.

Five Universal Numerical Constants[52]

1. π = 3.14159265358979323846264338327952884197 ...

2. e = 2.71828182545904523536028747135266624977572 ...

3. i = $\sqrt{-1}$

4. 1

5. 0

It is interesting to note that these five seemingly unrelated constants were "discovered" in different countries at different points in human history and in search of solutions to unrelated problems.[53] It was later discovered, however, that there existed a relationship or force (or "purpose"?) That brought them together, or in the alternative created them, long before humans ever set foot on the planet - A single equation elegantly tells the story.

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[52] Certainly, these are not the *only* significant constants that have been intertwined throughout the affairs of the universe; there are others, most notably the so-called "Golden Ratio" that appears throughout nature. See generally H.E. HUNTLEY, THE DIVINE PROPORTION (1970).

[53] ELI MAOR, *e*: THE STORY OF A NUMBER 160 (1998). According to Maor, this equation "must surely rank among the most beautiful formulas in all of Mathematics." *id*.

2. Euler's Equation

Leonhard Euler, a Swiss mathematician, with the help of De Moivre, a French mathematician, developed the famous equation that ties together the five most important constants of the physical world and it does so in such a way as to transcend human design, construction or tampering. If there were ever an equation targeting the hidden truths about the universe, it is this complex, yet simple relationship:[54]

$$e^{i\pi} + 1 = 0$$

To fully appreciate the elegance and significance of this compact universal law, it is necessary to recall the irrational and transcendental nature of both π and e and then contemplate the magnitude of the *"coincidence"* required to bring about such a relationship.[55] Even if we were to ignore the "imperfect" nature of π and e and, for the moment, treat them both as rational numbers, the *coincidence* required to construct such an equality would still be unfathomable. Keep in mind that only "simple" constants (unvariable numbers) have been employed; no mysterious "x" factors, algebraic unknowns or dimensional manipulations were used. To further illustrate the point, we can ignore our letters altogether as a reminder that we are only dealing with constants:

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[54] A proof follows from basic Trigonometry: $e^{ix} = \cos x + i \sin x \Rightarrow e^{i\pi} = \cos \pi + i \sin \pi = -1 + 0 = -1$.

[55] Leading Harvard Mathematician Benjamin Pierce (1809 - 1880), in awe of Euler's Equation, spoke to his students: "Gentlemen, that is surely true, it is absolutely paradoxical; we cannot understand it, and we don't know what it means. But we have proved it, and therefore know it must be true." MAOR, *supra* note 53 at 160. See also EDWARD KASNER, *Supra* note 46 at 103-104.

$$2.718281825459045235360287 4^{3.14159265358979323846264 3383279(\sqrt{}-1)} +1 = 0$$

In order to obtain a single equation that delivers perfect unity from our irrational and quite

erratic components, a few very simple algebraic operations (including multiplication by -1)

provide the following result:[56]

$$- 2.718281825459045235360287 4^{3.14159265358979323846264 3383279(\sqrt{}-1)} = 1$$

What are the odds of this happening by chance? This single equation for some

"unexplainable" reason ties together the five constants into a single, perfect scheme. Recall that

the numbers are irrational and therefore, no exact representation is possible; i.e., the decimal

expansion continues forever. But the equation itself yields a perfect (*not* an approximate) result.[57]

Euler's equation also happens to represent the four major branches of classical Mathematics:

Arithmetic, Algebra, Geometry and Analysis. [58]

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[56] It should be emphasized that this equation creates a "perfect fit." In particular, there is no rounding or
approximation whatsoever with respect to either side of the equation. I have dropped the "..." notation merely to
increase the comprehension for the non-mathematician.

[57] See generally JOHN D. BARROW, THE CONSTANTS OF NATURE (2002).

[58]   See generally ELI MAOR, *supra* note 53.

Can Euler's perfect fit come about by accident? Or is there an intelligent plan behind it?[59]

Put yet another way, anyone claiming that there is no intelligent design will always be confronted with the question: "What are the odds?" Does Euler's equation demonstrate an intelligent purpose behind the construction of the mathematical laws of the universe?[60] And, if so, can we not then derive an intelligent purpose behind the construction of the universe itself?

An extreme position suggests that Mathematics is at the very top of the power chain, accompanied by the heady notion that God is bound by, and subject to, its laws.[61] Such a notion would constitute "mathematical determinism" in its purest form.[62] Not wishing to step on toes (very big toes), I back away from this notion by asking the proponents: "Who created the mathematical laws in the first instance?"

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[59] Srinivasa Ramanujan: "An equation for me has no meaning unless it expresses a thought of God." *quoted in* John D. Barrow, "The Constants of Nature," Vintage Books, a Division of Random House, New York, 2002, Pg. 55 (Chapter 4 titled: Further, Deeper, Fewer: The Quest for a Theory of Everything.")

[60] A very respected group of mathematicians known as Platonists (including Physicist Roger Penrose and Mathematician Kurt Godel) firmly believed that such equations and Mathematics in general, is "discovered, not invented." SHERMER, *supra*, note 8 at 141.

[61] Einstein boldly suggested that God "may" have had no choice in the construction of the constants, and may have been bound to its results. For followers of that path, I would suggest that Einstein may have mis-labeled the top of the chain. Someone or something had to put the constants where they are. On the other hand, if the notion of a God bound by the limits of Mathematics is tenable, then perhaps mathematics is, indeed the determinate, governor and lawmaker of the universe.

[62] See also CLIFFORD A. PICKOVER, A PASSION FOR MATHEMATICS 17 (2005), quoting JOHANNES KEPLER, THE HARMONY OF THE WORLD (1619): "The Christians know that the Mathematical principles according to which the corporeal world was to be created, are co-eternal with God. Geometry has supplied God with the models for the creation of the world. Within the image of God it has passed into man, and was certainly not received within, through the eyes [sic]."

B. Legal Constants and Relationships:

To move through a universe of jurisprudence in a manner that both parallels and corresponds to the preceding mathematical discussions, we might well ask whether or not there are any undeniable constants of jurisprudence. Admittedly, this question may very well be considered as premature since we have yet to fully develop any purpose or meaning for either discipline. So with that cautionary directive in mind, it might nevertheless be fair to point out that the "equality" present in Euler's equation seems to be the lynchpin of the relationship among the key mathematical components of the universe. Perfect unity (i.e., "1"), which is pure, rational, real and non-transcendental, would stand alone as a meaningless icon were it not for the notion of equality. Thus, the equal sign is significant, at least in the eyes of whatever entity "may" have created the laws of the universe.

Is there, then, a parallel between mathematical equality and "equality" as a legal concept. It is worth considering momentarily, even though such an analogy delivers no great messages or truths, at least at this juncture. But it is interesting to note that Euler's equation and its concepts of equality hold true everywhere in the universe, for the elements of every complex plane regardless of the size, color, movement or position of its individual components. Likewise, as a proposition of jurisprudence, some might argue that equality of *its* elements (i.e., people) under the law should prevail without regard to wealth, color or physical characteristics. But even more, isn't the very concept of "law" predicated on the notion that a "rule" by its very definition is meant to apply to more than one; and, if this is so, then it should logically apply to all.[63]

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[63] This analogy can't help but conjure up our childhood memories of Mathematical Induction. In particular, if we can prove that a proposition holds for the constant "1" and that it applies for any "n," then it must apply to "n+1" and then eventually to all numbers.

Before traveling further down our comparative path, it might help to better define what we mean by "law." Even though the concept is far more abstract than our tangible universal constants, we might nevertheless, postulate that "law" is the sum of all rights and duties in our relevant community or universe. The following equation, therefore, is certainly reasonable if not intuitive:

$$\sum \text{Rights} + \sum \text{Duties} = \text{Law}$$

As the above equation suggests, we might also note that for every right that an individual person or entity might possess, there must equal a corresponding duty of the part of everyone else in the "legal" universe to refrain from committing an act that might otherwise violate, negate, infringe upon or chill that right. We might therefore conclude that the sum of all rights in the universe equals the sum of all duties, or stated another way:

$$\sum \text{Rights} = \sum \text{Duties}^{64}$$

It might be worth noting at this juncture that the "law" without its corresponding duties would equate to a meaningless and hollow concept of unenforceable "rights." For, it is clearly the business of the law to enforce rights by imposing and enforcing duties. It is the imposition of these "Duties" that fills the void between the "Law" and other empty "Rights" :

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[64] Constructing this equation was not difficult. It is an old trick that we can learn from Newton. Whenever a new dimension (i.e., unit) is employed, the equation assumes a definitional aspect. And, of course, there is no way to disprove a definition. When, for example, Newton proposed his famous F = ma (The fundamental equation for classic physics), he was merely defining the concept of "Force" (now using "Newtons") in terms of mass (measured in grams) and acceleration (distance per second squared), the equation could never be proven "wrong." The value, therefore, is not its *correctness*, but rather its usefulness, which I fear is substantially greater than the equations that I have proposed. By sharp contrast, note that Euler's equation, which consists of un-manipulatable constants (which have no assignable dimensions), presents a great truth while defining nothing.

$$\sum \text{Duties} = \text{Law} - \sum \text{Rights}$$

The notion of equality is, indeed, a strong force, in both the laws of physics and the physics of law.[65] The very idea of "balance" is predicated upon the notion of equality.[66] To draw a simple parallel between physics and law, consider a brick sitting idly on a table. The force that the brick exerts downward on the table must equal the force that the table exerts upward on the brick. Because the forces are in equilibrium, the brick does not move. Should the downward force of the brick exceed that of the force exerted upward by the table, the brick would or crash through or collapse the table. If the brick is to remain stable on the table, therefore, any increase or decrease in force for the table must recognize an opposing force for the brick.

$$F_{\text{Downward}} = F_{\text{Upward}}$$

As is the case with the laws of physics, so too must the physics of law recognize its own fundamental equalities. And, as with physics, there are times when stability in law is required and other times when movement is paramount; such movement is fundamental for jurisprudence.

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[65] In law, the term "equal" has multiple meanings other than the ones that are now being discussed. The current discussion is unique and should not be confused with these other more traditional *"Gettysburg Address"* type usages such as "Equity," "parity," "uniformity," and "equality." No one denies that: "One of the most fundamental social interests is that the law shall be uniform and impartial." BENJAMIN N. CARDOZO, THE NATURE OF THE JUDICIAL PROCESS 112 (1921).

[66] Even Aristotelean concepts of the "contract" were based on an exchange of "things of equal value." JAMES GORDLEY, THE PHILOSOPHICAL ORIGINS OF MODERN CONTRACT DOCTRINE 7 (1991).

Pound said it best: "Law must be stable and yet it cannot stand still."[67]

For an example of legal dynamics, consider the Americans With Disabilities Act (ADA), which grants relatively new and additional rights to individuals with both physical and mental disabilities. The rights include requiring unprecedented measures to permit disabled Americans to have access to jobs that they would never otherwise hope to perform prior to passage of the Act. But in order for those rights to have meaning, corresponding duties must have been added. In particular, employers must accept and acknowledge the corresponding duties or the rights would not have meaning. Without that addition, the following imbalance would follow:

$$\Sigma \text{Rights} + \text{Rights}_{\text{ADA}} \quad \neq \quad \Sigma \text{Duties}$$

Thus, in order to keep our equation in balance, as soon as we add rights to the left, we must likewise balance them with duties on the right:

$$\Sigma \text{Rights} + \text{Rights}_{\text{ADA}} \quad = \quad \Sigma \text{Duties} + \text{Duties}_{\text{ADA}}$$

Another example and one that is also self-evident involves the right to freedom of speech. If, for example, there exists a right to free speech, there must be a corresponding duty on the part of others to refrain from interfering with that free speech. An even better example is provided by the "civil rights movement," with particular emphasis on "movement." That movement can be viewed as constant struggle by a minority to impose duties on the right side of our equation in

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[67] ROSCOE POUND, INTERPRETATIONS OF LEGAL HISTORY.

order to secure rights for the left side.[68] There are those who see these "movements" in law as a never-ending struggle. Much of history, they would argue, is filled with a struggle for human rights, "an eternal struggle in which final victory can never be won."[69]

The development of the law can be viewed as a never-ending*expansion* of the equation of rights and duties.[70] This brings us to another focal points of the paper.

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[68] Of course, it might properly be argued that the only thing sought was equality or parity with persons who already possessed those rights. Nevertheless, the equation remains equally applicable.

[69] Einstein, *supra* note 2.

[70] Kelly, *supra* note 5.

II.

THE DRIVING FORCE OF THE UNIVERSE

Back to our initial question - Is the universe, the planets and all of its subatomic particles merely a product of chance, with humankind as nothing more than mere happenstance? Or, is there a driving force or intelligence behind the universe and its physical laws?[71] And if so, what is it? And for our purposes, is there a corresponding force with respect to Natural Law?

Like many legal concepts, "Natural Law" is a poorly defined,[72] a term that relies upon input from several diverse and often conflicting sources. Simply stated, proponents of Natural Law believe that legal principles, standards and rules are all derived from some natural pre-existing "source." But the best that the philosophers can provide are notions of intuition, human psychology and perhaps a little glancing reference to Biology. But even that brush with Science was to be avoided lest we base our laws on raw biological needs. Philosophers debate such matters endlessly. But there are some answers that may lie in our ability to reason mathematically, and use a telescope.

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[71] "I do not believe that any scientist who examined the evidence would fail to draw the inference that the laws of nuclear physics have been deliberately designed with regard to the consequences they produce inside the stars." See BARROW, *supra* note 4 at 157 (Chapter titled: The *Anthropic Principle*).

[72] If our Mathematicians and Physicists were as "loose minded" as our revered legal scholars, we would still be in the developmental phases of the Abacus, debating over which colored beads were being discriminated against.

A. The Laws of Physics:

Proceeding chronologically, keep in mind that as we back up to the so-called beginning of the universe, there is only a single particle. Recall that there is no such thing as "time," and there are no "laws" of physics.[73]

There is only a single motionless particle under a lot of pressure and possessing a lot of potential.[74] This single particle then exploded with a "bang."[75]

1. Edwin Hubble's "Big Bang"

In 1929, Astronomer Edwin Hubble[76] noticed that no matter where we focused our lenses, the galaxies, planets and heavenly bodies in general would display a "red shift," which electromagnetically is associated with objects that are moving away from the viewer. With literally everything moving away, there was only one conclusion to be drawn - The universe was

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[73] "One may say that time had a beginning at the big bang, in the sense that earlier times simply would not be defined. It should be emphasized that this beginning in time is very different from those that had been considered previously. In an unchanging universe a beginning in time is something that has to be imposed by some being outside the universe; there is no physical necessity for a beginning. One can imagine that God created the universe at literally any time in the past. On the other hand, if the universe is expanding, there may be physical reasons why there had to be a beginning. One could still Imagine that God created the universe at the instant of the big bang, or even afterwards in just such a way as to make it look as though there had been a big bang, but it would be meaningless to suppose that it was created before the big bang. An expanding universe does not preclude a creator, but it does place limits on when he might have carried out his job!" HAWKING, *supra* note 28 at 8-9. For an opposing view, see Quentin Smith, *Big Bang Cosmological Argument for God's Nonexistence*, 9 FAITH AND PHILOSOPHY 217(1992).

[74] Recall that before the Big Bang, there was only a single particle, which implies that there could be no concept of motion (relativity, if not common sense alone suggests that "motion" requires at least to objects), which in turn meant that there was no such thing as "time."

[75] Our current view of the evolution of the universe is based upon the Friedman - Robertson - Walker (FRW) cosmologic model, a/k/a the *Hot Big Bang* model. The model is so successful that it has become known as "The Standard Cosmology." See EDWARD W. KOLB & MICHAEL S. TURNER, THE EARLY UNIVERSE 1 (1990).

[76] For whom was named the *Hubble Space Telescope.*

expanding.[77] Hubble's theory of expansion provided some interesting corollaries:[78] If galaxies

are receding, then: (1) Tomorrow they will be further away from us, (2) yesterday, they were

closer to us, (3) last year they were closer still, and finally at some point, (4) all galaxies were

right on top of us. In fact, the galaxies are receding away from us at a velocity proportional to

their distance.[79]   Philosophers may debate forever about who or what created the bang, but

we now know that following this explosive event, the universe set about its task of continuous

enlargement.[80] The universe has been expanding ever since and is currently expanding.[81]

Hubble postulated that "galaxies are engaging in systematic recession from each other, a

phenomenon readily explained in terms of Einstein's theory of relativity as the swelling or

expansion of intergalactic space."[82] During this expansion, which has now been occurring for

more than 20,000,000, 000 years (give or take a few billion), the planets, galaxies, chemical

elements and laws of physics were all exploded into being. Some of these events occurred within

the first millionth of a second. The very first items on the list involved the creation of time,

motion and space, which are, of course, the fundamental components of our "physics."

The expansion discovery ended a great debate between Einstein (who had developed a

cosmological constant to account for the apparent motion) and physicists Freidman and Lemaitre

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[77] HAWKING, *supra* note 28 at 8-9.

[78] SIMON SINGH, BIG BANG: THE ORIGIN OF THE UNIVERSE 263 (2004).

[79] Hubble's Law provides us with a rate of recession: v (Velocity) = H_0 (The Hubble Constant) x d (Distance). The Hubble constant is 558 kilometers per second per megaparsec; a megaparsec is 3,260,000 light years.

[80] "A most fundamental feature of standard cosmology is the expansion of the universe." KOLB & TURNER, *supra* note 75 at 2.

[81] Though irrelevant, It is still interesting to note that this great "expansion" discovery came about in the same year as our greatest economic collapse.

who championed the expansion theory. The issue was, as previously indicated, resolved in favor of expansion, by Hubble's discovery of the red shift.[83]   The result satisfied even Einstein, who, in a 1933 Pasadena tribute to Lemaitre, said about his theory: "This is the most beautiful and satisfying explanation of creation to which I have ever listened." [84]

2. The Second Law of Thermodynamics

Inextricably associated with the expansion of the universe is the concept of entropy. In other words,"things spread out." Did you ever wonder why a lump of sugar spreads out when it is dumped into a cup of coffee? More significantly, did you ever wonder why no amount of shaking or stirring of the cup will ever cause the sugar to re-gather itself back into a lump again? Science and Thermodynamics, in particular, tell us that if any system is isolated from other environments, over time, it will tend to become disordered, but never the reverse.[85] An isolated system always tends to evolve toward a state of increased entropy and expansion toward equilibrium.

If there is a goal or purpose behind the creation of the universe, and unless we turn a blind eye to accepted scientific principles of physics and mathematics, it would seem difficult, if not impossible to ignore the fact that *expansion* is at the forefront. The concept seems to one incontestable directive for the universe, regardless of whomever or whatever created it. Like our mathematical constants, this expansion is undeniable.

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[82] See generally, FERRIS, *supra* note 24 at 205. (Chapter 11, *Expansion of the Universe*).

[83] It has been claimed (or speculated) that Einstein's insistence uon a cosmological constant was influenced, in part, by Spinoza, who declared that "God is immutable." JAMMER, *supra* note 36 at 63.

[84] SINGH, *supra* note 78 at 276.

[85] This follows from the Second Law of Thermodynamics, and provides one of the most important equations

B. The Physics of Law:

From this derived "purpose," would it not then be *natural* to assume that our own "human" laws should promote and encourage their own "expansion" as a foundational premise for Natural Law? Is there any other predicate for Natural Law based on hard scientific logic? The concept of "expansion" may be general, but it is certainly more specific, provable and tangible than our vague notions of "innate humanism." And, of course, it certainly has more scientific substance than religious underpinnings. In fact, at this point in time, no purpose or intention is more clear, precise and unambiguous than a universal movement of expansion. Vague, though it may be, does it not link us to Natural Law? The concept is certainly not foreign to our jurisprudence.

The law of contracts, for example, exists for the very purpose of promoting economic and obligatory "expansion." Historically, the concept of the "contract" was a subject for Aristotelian moral concepts about virtue and metaphysical conceptions. "Each type of contract had a certain nature or essence from which certain obligations followed.."[86] The law of contracts was designed to promote certainty and structure to enable mankind to engage in construction, planning, deal making, and an expanded economy. We might simplistically state that honoring a contract, is in general, morally "good." A breach, on the other hand, leads to just the opposite result and is morally "bad."

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in the history of human experience: Entropy > 0.

"Judge Posner... argues that the common law systematically establishes rules of law which maximize the value of production and exchange, thus meeting the Kaldor - Hicks criterion.[87] This is sometimes known as the wealth maximization principle. Judge Posner also advocates wealth maximization as a normative creation for assessing the acceptability." [88]

In addition to matters governing our economy, our laws of domestic relations tend to favor, or at least pay lip service to the notion of an "expansion," this time in the form of people. Murder, trespass, and injury to persons and properties might conceivably be thought of as destructive or "contractive" actions. "Expansion" alone may be indistinct, and, of course, subject to a wide variety of conclusions and interpretations, but as previously indicated, it is capable of definition and recognition.

Before we become unduly critical of this notion of permitting math and physics to serve as legal guideposts, consider the contradictions presented by the "more human" sciences. Using the classic biological theories alone gives rise to some very interesting moral contradictions. There is no doubt whatsoever about the role that "*expansion*" plays in that setting. Survival and multiplication are two undeniable animal instincts for population expansion that, however, unfortunately lead us to a moral dead end. For, if our unchecked biological urges formed a

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[86] JAMES GORDLEY, THE PHILOSOPHICAL ORIGINS OF MODERN CONTRACT DOCTRINE 7 (1991).

[87] Kaldor - Hicks Criterion of Efficiency - A potential economic move is efficient if, after the move, the winners gain more than enough to compensate the losers. See John L. Hanks, "*On a Just Measure of Efficiency of Law and Governmental Policies,*" 8 Cardozo L.Rev. 1-3 (1986).

[88] See HANKS ET AL., *supra* note 10 at 561.

predicate for Natural Law, even Hugh Heffner might be shocked by the results.[89]

Unchecked, unregulated physical expansion could, like biological expansion, lead to moral dilemmas and inconsistencies. But that is where the our third physical element "*restraint*" enters the scene. This is a necessary component of Natural Law. You won't find much restraint in your pure Darwinian model. You will, however, find it everywhere in the world of Physics and likewise in every aspect of regulatory law. To form any type of relationship to notions of Natural Law, expansion must indeed be accompanied by *restraint*, that third element that we can better discern from Mathematics and Physics, *not* Biology.

From a Mathematical perspective, population expansion is discernable and measurable with respect to every species. The importance of the *Second* of our five constants takes center stage for this indispensable biological equation describing unencumbered population growth:[90]

$$Q = Q_0\, e^{kt}$$

The above is a specialized form of the following more general equation, based on the constant "e," describing anything that grows at a rate proportional to its size:[91]

$$y = e^x$$

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[89] According to Immanuel Kant (1724 - 1804), being moral means *not* doing what comes naturally, acknowledging the eternal struggle against wicked desires. Kant suggests that a person should only act on a principle that he or she can will to be "Universal Law." Of course, things break down at attempts to define "Universal Law."

[90] Q (Population at time "t") = The initial population multiplied times "e" (See *supra* I(A)(1)), raised to the power of a growth constant (times t). SEE JOHN A. TIERNEY, DIFFERENTIAL EQUATIONS 49-50 (1979).

[91] In addition to human expansion, our notion of compounding interest also employs exponential movement.

Simply overstated, it would certainly appear that the "creator" or whatever force exists behind the creation of the universe, likes things to grow, expand and multiply, and yet, through restraint, maintain a balance. We know that this is true biologically, thermodynamically and now mathematically. So why not legally? Is there a better derivation or conclusion to connect Natural Law and the "creator" through scientific means?

If we attempt to measure legal fact patterns on a mathematical scale, we can dispose of contracts, torts and criminal law with three overlapping strokes of the pen. There is conduct that expands (good), conduct that "decreases" (bad) and conduct that does neither (and is bad but "less bad"). Killing is easy; it reduces or decreases population. Harm in general inhibits and may damage economic interests. Contract enforcement expands the economy. Cheating on a contract inhibits its value.[92] Stealing is more difficult - Stealing is a zero sum game, it might be argued. But in reality, likened to the work product doctrine, no one will go out and earn if he can merely steal from someone else. Therefore, stealing indirectly acts as contraction; that is, of course, bad.

I am first to concede that as a legal - philosophical concept, "expansion" is susceptible of many meanings and interpretations. But it has two distinct advantages over its competing notions of "innate" human theory. First, it is clear. Second, it is purposeful. If we accept the idea that the creation of the constants were purposeful, then we should likewise accept the equally undeniable truth that the universe is undergoing a state of expansion. Ergo, there is a purpose behind the expansion. Next, as previously discussed, concepts of right and wrong are no less deducible from the concept of "expansion" than from the inconsistent, vague concept of "innate" morality.

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[92] At its most primitive level, the Hobsian "social contract" is a necessary foundational element for any

The rejection of an innate morality should not, however, be construed as anti-religious. On the contrary. I'm not suggesting that any specific religious teachings are "wrong." I am only suggesting that there may be more accurate ways to determine what "purpose," if any, exists for mankind as a race. Science is certainly better than hearsay, intuition or faith, if history is any indicator. Nor am I suggesting that there is no place for these unscientific devices - On the contrary, the more one advances into the clouds of higher mathematics and physics, the deeper and more mysterious things get - The ultimate beauty, as per Einstein, is all of the things that we do not know and will never know - Science will not tell us everything.

advancement of the human species.

III. THE CURRENT STATE OF THE UNIVERSE

Ever since the 1920's, there have been two distinct ways to view and analyze the physical universe; both were proven to be correct, and yet the two are inconsistent with one another. From a distance, the laws of Newton, as modified by Einstein, envision a consistent and perfectly predictable setting wherein every effect has a definable cause; but when viewed up close, particularly at the subatomic level, things go haywire and a new theory is required. Simply put, from a macroscopic view, things are well defined, continuous, and smooth; matter appears as if it could be subdivided forever. In fact, the laws of calculus and relativity, not to mention basic Newtonian mechanics depend heavily upon this "smoothness." But when viewed at microscopic levels,[93] matter becomes quite random, pot-holed, imperfect and discontinuous; there are no causal certainties, only statistically obtainable proximities. Uncertainty rules. Yet, the two theories have rested side by side for more than half a century. Philosophically, we might classify the two views as holistic v. deconstructive, to the extent that any such a comparison makes sense.

Legal theories tend to share a similar set of dual characteristics. When our statutes and constitutions are viewed "from a distance" in a factual vacuum, *they* often appear to be "smooth" and consistent.[94] When applied to specific cases, however, things are often quite troublesome and inconsistent, not unlike the quantum universe.

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[93] "Microscopic" has been defined by the Angstrom Unit, $Å = 10^{-8}$ cm. See MESSIAH, *supra* note 3 at 3.

[94] This is the case in a very general sense without regard to theories of purposivism, textualism or even Old Holy Trinity Church intentionalism.

A. The Laws of Nature:

French scientist and mathematician Marquis de Laplace argued at the beginning of the nineteenth century that the entire universe was deterministic. He claimed that if the complete state of the universe were known at a given time, we should be able to predict everything that would happen in the future. We would, as his argument goes, not only be able to use Newton's laws to predict the motions of the planets and stars, but we could literally predict everything.

La Place went further than most scientists, when he assumed that there were similar laws governing human behavior. This doctrine of scientific determinism was, however, strongly resisted by those who felt that it restricted God's ability to intervene in the world. Nevertheless, it remained the standard assumption of science - Until quantum mechanics entered the picture. The uncertainty principle, in particular, signaled an end to La Place's dream of a completely deterministic theory of the universe. As quantum mechanics teaches, not only can we *not* predict the future - we cannot even accurately measure the present without serious restrictions.

1. The Classic Laws of Physics and Mathematics

The Mathematical foundations for Newtonian Physics, which appear to be precise and perfect, state simple principles of cause and effect. Moreover, as previously indicated, they paint the picture of a predictable, fully comprehensible universe, where waves are waves and particles are particles, where every effect has a cause and every action an equal and opposite reaction. It is a perfect model and a perfect starting point. But it describes a perfect universe that has never existed.

At the structural level, when dealing with models and archetypes we can enjoy the illusion

of perfection. In other words, at the inception of any logic based creation, we should, at the very least, be able to start with a model that appears perfect.[95] This "illusion only" state of affairs flows from the fact that every logic-based system contains some indeterminacy, even mathematical systems according to Godel's Incompleteness Theorem.[96] The Theorem supplies a lynchpin for those who would claim that any attempts to create a legal system based purely on logic would rightfully be doomed to failure.[97] Others disagree.[98]

Though a mainstay of higher Mathematics and, therefore dangerous ground for those with iconoclastic tendencies, at this juncture something should, nevertheless, be said about Godel's Incompleteness Theorem and the manner in which it is cavalierly used by some deconstructionists and even Critical Legal Studies supporters to attack formalism and logic-based systems in general.[99]

If you were to spend a significant amount of time studying and appreciating Godel's Theorem, you couldn't help but notice that the so-called "Godel" indeterminates of Mathematical theory always point to some recursive, internal inconsistency that seems "manufactured" or contrived. The Theorem itself claims that every mathematical or formal system has at least one

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[95] From that point on, only the most unrealistic thinkers would expect continued perfection. According to mathematician-philosopher Bertrand Russell: "All exact science is dominated by the idea of approximation." HANKS ET AL., *supra* note 10 at 73.

[96] In 1931, Kurt Godel (1906 - 1978). See generally, EARNST NAGEL, GODEL'S PROOF (2001).

[97] For an excellent article that probes the shortcomings of a legal system based upon pure logic, see Mark R. Brown & Andrew C. Greenberg "*On Formally Undecidable Propositions of Law: Legal Indeterminacy and The Implications of Metamathematics*," 43 Hastings L.J. 1439 (August, 1992).

[98] "The differences between formal logical systems and our less rigorous legal system are substantial enough that it is probably not useful to attempt a direct application of Godel's theorem to legal or philosophical analyses." Girardeau A. Spann, "*Secret Rights*," 71 Minn. L. Rev. 669 (1987). See also DOUGLAS R. HOFSTADTER, GODEL, ESCHER, BACH: AN ETERNAL GOLDEN BRAID 696 (1979).

[99] *Id.*

internal statement, for which no system could ever determine truth or falsity.[100] A common

example is this statement which can never be labeled true or false: "This statement is false."

There are many others, but all seem to share some very special characteristics. In particular, the

indeterminable statement always to be: [1] Internal or recursive, [2] contrived in such a way that

an inconsistency is built into the statement initially, and [3] related to no external truth or

determination.[101] In other words, the inconsistent statements seem to be very special cases of the

system that do not otherwise impede or diminish the system's efficacy; structurally, such a

statement appears to be nothing more than a manufactured renvoi with a contrived inconsistency

built in. Lawyers, often unwittingly create such problems through poor drafting. Mathematicians,

on the other hand, go to microscopic lengths to celebrate such errors. Mathematicians know better

than to say: "So what!" They are taught at an early age that a single inconsistency renders a

proposition void. But I was never taught that it could render an entire formal system less useful.

So, if not as a Mathematician, then as a lawyer, I might respond to the inconsistencies with a -

"So What"? There is nothing wrong or imperfect about Mathematics. The mere fact that we can

twist a perfect mathematical tool back upon itself in such a manner as to create an internal injury

to the system does not make the tool any less perfect or useful.

The conclusion to be drawn from these imperfections is clear. Even the most solid formal

system may possesses imperfection, but that alone is not an excuse for scrapping formal systems

that are useful.[102] And it certainly does not provide an excuse for failing to construct a decent

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[100] NAGEL, *supra* note 96.

[101] Such statements are no more useful than a ruler used as a device to measure its own length.

[102] Note that Godel never claimed that all formal systems were inconsistent or flawed. He only proved that
our current formal systems cannot evaluate every statement. And even in that regard: "The discovery that there are

system ab initio, especially for a logic based discipline such as law.

2. Factoring in the Laws of Quantum Mechanics

Coming into the 20th Century, the great mysteries of the universe were solved and accounted for by way of a relatively few elegant equations. Sure, there were some minor glitches in basic Newtonian Physics, but with a few simple adjustments[103] to account for near-light speeds, even Einstein was satisfied. With the advent of General Relativity, theories of time-space and matter were nicely smoothed out, balanced, equally applied and obeyed throughout the Cosmos.

In the midst of this era, wherein science claimed that it had an answer for everything, came a single experiment that would shatter everything;[104] it was as if the entire body of laws governing the universe had suddenly been reversed by a higher power. When viewed from a distance, everything was still fine and consistent. But when viewed actinia (i.e., at microscopic dimensions), things were no longer perfectly defined; on the contrary, they were a mess. A different, seemingly "illogical" set of laws applied.[105]

At very small levels, matter was no longer fluid and infinitely divisible; there was a limit. You couldn't cut anything smaller than a quanta. And these small particles moved about in

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number-theoretical truths which cannot be demonstrated formally does not mean that there are truths which are forever incapable of being known." NAGEL, *supra* note 96 at 112.

[103] Lorentz contractions formed the basis for Einstein's special theory of relativity. In a nutshell, the equations reflect contractions of length and increases in mass as objects approaching very great speeds.

[104] The notorious "*Black Body Heat and Light*" experiment was designed to test several different principles of classic physics and yeild predictable results. It did no such thing.

[105] For a leading work (and one that is several inches thick), see MESSIAH, *supra* note 3. If quantum mechanics should turn out to be the "last word" (a proposition doubted by many, including Einstein), it will be difficult, at least for poets, to ignore the fact that this final word was delivered by a "Messiah."

random fashion. Perhaps, God *did* play dice with a very chaotic universe, after all.[106] And worse, we could no longer trust our senses or instruments. The existence of a single simple physical action would vary and depend upon the method and time of observation, much in the way that the facts developed at trial depend upon the witnesses and the methods of observation employed. Instead of certainties, we were now living in a world of statistics, capable of producing results no less haphazard than jury verdicts.[107]

Knowing what we now know about the imperfections in our theories of the physical universe, would anyone seriously argue in favor of scrapping the laws of Newtonian Physics or relativity? Of course not. Likewise, it has made little sense over the ages to treat jurisprudence as a haphazard, "make it up as you go," science. More particularly, just because a model is less than perfect does not warrant the failure to create one to serve as a standard.

Perhaps the truths and inconsistencies of quantum mechanics are telling us lawyers: "It's no sin if your system is less than perfect." But, at the same time, it also seems to be saying that imperfections do not justify a lazy failure to construct a consistent, if not perfect model to begin with. It is safe to say that our legal systems are not shining sign posts on the road of scientific human progress. Poor definitions, makeshift rules, accompanied by a lack of recognized classification schemes and structures are the hallmarks of our "science."

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[106] Ironically, Einstein, who disavowed the basic concepts of quantum mechanics, received a Nobel Prize for his paper on "The Photoelectric Effect," which served as an underlying foundation for the new physics.

[107] After studying quantum mechanics and its impact upon classic physics, it is almost chilling to then read a statement by Oliver Wendel Holmes, Jr. Delivered in 1898: "For the rational study of the law the black-letter man may be the man of the present, but the man of the future is the man of statistics and the master of economics." 10

3. Factoring in the Laws of Survival

As previously suggested, the "natural" urges introduced by way of Biology and Psychology did not lead us toward any moral goals. Their teachings go hand in hand with notions of self preservation and Darwinian "survival of the fittest." They do, however, tie in nicely with Adam Smith Economics. But with respect to morality and natural law, the notion that we are all basically animals provides nothing less than a moral dead end. The law of the jungle is very simple, but hardly a model for morality.[108] In an attempt to smooth over our *immoral* Darwinian urges, Einstein provided the following spin:

> "Darwin's theory of the struggle for existence and the selectivity
> connected with it has by many people been cited as authorization
> for of the encouragement of the spirit of competition. Some people
> also in such a way have tried to prove pseudoscientifically the
> necessity of the destructive economic struggle of competition
> between individuals. But this is wrong because man owes strength
> in the struggle for existence to the fact that he is a socially living
> animal. As little as a battle between single ants on an ant hill is
> essential for survival, just so little is the case with the individual
> members of a human community." [109]

Harv. L. Rev. 457 (1897), reprinted in Collected Legal Papers 167 (1920) and *quoted in* HANKS ET AL., *supra* note 10 at 516.

[108] Kelly, *supra* note 5.

[109] Albert Einstein Address at the Celebration of the Tercetenary of Higher Education in America, Albany, New York (1936).

Einstein's analogy praising the ants, while laudable for its goals, seems nevertheless to reinforce our status as animals. A better answer, however, might involve reliance upon that human ability that animals lack - *Conscious* restraint. Ants are social by virtue of instinct. Humans must rely on restraint; without it, there would be no social structure.

B. The Nature of Law:

Balance, expand and restrain, as a trio seem to dominate the world of Physics and Mathematics. So too do they dominate the world of jurisprudence, regardless of our ability to see the connection. To rapidly name a few examples, *balance* dominates every aspect of our system of remedies, ranging from compensatory damages to equitable relief. Contracts, as previously discussed serves to *expand* business and the economy, and *restraint* is a fundamental purpose for our entire criminal justice system. And with respect to the last element, in particular, even the otherwise amoral biological realities of life can serve as a moral backdrop.

1. Natural Law

Continuing the attempt to draw parallels between scientists and jurists, we might compare proponents of analytical jurisprudence to the classic Newtonian physicists and Einsteinian relativists; at the same time, the realists and proponents of critical legal studies would certainly find comfort in the uncertainties of quantum mechanics. And accepting the primary comparisons of this thesis, the proponents of natural law might compare favorably with mathematicians and theoretical physicists.

2. Analytical Jurisprudence

The champions of "Analytical Jurisprudence," a/k/a "Conceptualism" are referenced by many names and terms, several unflattering.[110] Historically, as classical physics began to disintegrate under the microscope, so too did pure analytical jurisprudence. When examined close up, both classic physics and analytical jurisprudence fail. Neither can stand alone. Uniform smooth, well defined rules cannot decide specific cases; there are always exceptions, modifications and exclusions that compliment the classic structure. So too is the case with physics. But the lack of perfection does not impede the scientists.

True analytical jurisprudence (which previously could derive little from natural law) is currently an illusion. The "Law" has never had a uniform system of definitions (the uncontraverted mainstay of every other formal discipline),[111] nor basic axioms or classification schemes.[112] No one is advocating the construction of a perfect legal system predicated upon Mathematical logic. Even Mathematics, as previously discussed, has some humanly perceived limitations.[113] But any attempt at formalism, while not perfect, would certainly improve our existing system. "Imperfect," for all of its shortcomings, is still better than "chaotic."

Thus, *true* analytical jurisprudence in a scientific sense doesn't exist and it never did, even

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[110] "Legal fundamentalism," "formalism," "deductivism," "photographic theory of law," "mechanical jurisprudence," "automatic law," and my personal favorite - "slot machine jurisprudence." (Elements, Page 500).

[111] For the best proof of such failure (and a monument to ambiguity), see West Publishing Group, Black's Law Dictionary (any ed.).

[112] Even the development of a subject as crucial as territorial jurisdiction (Can you ever forget the thrill of joy of learning about "quasi in rem type 2"?) was left in the hands of a racist journalist (Pennoyer) and an unethical bigamist pedophile attorney named Mitchell. See *Pennoyer v. Neff*, 95 U.S. (5 Otto) 714, 24 L.Ed. 565 (1877).

[113] Philosopher mathematician Gottlob Frege (1848 - 1925) spent much of life devoted to the proposition that a perfect mathematical - logical system could be constructed and that there existed a consistent set of mathematical truths. But this notion was allegedly shattered in 1903 by Bertrand Russell via a single paradox. Then in 1931, Kurt Godel (1906 - 1978), as previously discussed, proved that every mathematical system had at least one

though, without great difficulty, "*Law,*" as we know it, can be structured and organized, with precise elements and logic-based sets and subsets. Our legal philosophers never even attempted to construct such a structure, but instead built and analyzed piecemeal, makeshift edifices.

It is unfortunate that our profession is without structural icons or masters; where is our Descartes, Bach, Newton, Einstein or Mendel? If those masters taught us anything, it was the value of structure, definition and classification. Common sense alone dictates that every logic-based discipline should have lists, groups and subgroups. But as for Law, Dean Gavit summarized the "Classification" situation best when he said:

> Some of the matters discussed are no more than accepted or usable classifications. *It should be emphasized that they are only mental and language conveniences, and that they certainly solve no problems.* We classify things and ideas for the sake of brevity. The validity of a classification involves no more than that. It consists of a grouping or a putting together of things or ideas which are similar in some particulars, but which also are diverse as to others, and giving to the group a name. It saves a lot of talk or language. When we say a dog is a member of the animal kingdom we have said much in a few words. When we say a certain rule of law belongs to the family of procedure, we again have said much in a few words. But that is all (Emphasis supplied).[114]

internal inconsistency, for which no system could ever determine truth or falsity.

Gavit's observation happens to present a very correct description of a very incorrect system. For, despite the historical accuracy of his statement, classification schemes should **not** be mere conveniences that "solve no problems." On the contrary, like the chemist's Periodic Table of Elements, or Maxwell's electromagnetic equations, a properly constructed classification design should lay out before us an exquisite array of information, a photographic symphony of our topic's universe, the very structure of which teaches the key aspects of the discipline. It is safe to conclude that true analytical jurisprudence never had a chance.

No one is condemning or degrading factors such as mercy, good faith and flexibility. Nor is anyone advocating a pure legal system that would be governed exclusively by principles of Boolean Logic, Set Theory and Mathematics. Although, ironically, such methods are often used to decide real cases involving real people, but with a methodology that is more or less haphazard.[115]

To move forward, we should first dispense with the notion that any jurist ever proposed a truly scientific method for teaching or analyzing "the law." To refer to Langdell's method of case study as "scientific" is not only incorrect, but has been responsible for leading jurisprudence down a truly unscientific path.[116] In truth, our teaching methods also fall short.

Long ago, law professors created the so-called Socratic System of instruction, an excellent technique when used properly. But like many good ideas, undesirable myths and methods

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[114] BERNARD C. GAVIT (FORMER PROFESSOR OF LAW AND DEAN OF THE INDIANA UNIVERSITY SCHOOL OF LAW), INTRODUCTION TO THE STUDY OF LAW 97 (1951).

[115] Often, valid, logically consistent laws can lead to absurd results. Consider: "All prisoners are entitled to free prescription drugs. Some prisoners are child molesters. Viagra is a prescription drug. Conclusion: Some child molesters in prison are entitled to free Viagra." In the world of quantum mechanics, correspondingly similar absurdities are not uncommon.

attached themselves, contaminating the main purpose. The most severe Socratic myth fostered

the idea that "In law there are no answers, only questions," which, in turn, implied that there was

no point in constructing logic-based systems, axioms or classification schemes, such as those

common to virtually every other logic-based endeavor. And, as that myth rules the day, law

students are left to wade through a Grand Canyon of cases and notes, pretending to construct their

own sign posts along the way, in an attempt to find their own answers, which we tell them don't

exist.[117] As is the case with physics, there certainly are answers even though some of them must

rest on statistical probability instead of absolute certainty.

Imagine learning physics by a purely Socratic method. Would you hand a student a brick,

tell him to exert force on it and then derive his or her own equation relating force, mass and

acceleration? Absurd. But on top of that, would you then change the letter of the variables every

time a new problem was presented?.[118] No. There is nothing scientific about it and there has

rarely ever been anything scientific about the manner in which law has been taught or

analyzed.[119] Yet ironically, legal - logical structures abound. We just don't see them.[120]

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[116] But see HANKS ET AL., *supra* note 10 at 46 and 72 (Langdell's methods are considered as "scientific.")

[117] Law students pay lip service to their professors' methods, and then purchase outlines behind their backs. The outlines are poor attempts to bring order to a disordered system. We would serve our students best by creating the academic outlines instead of allowing the commercial ones to rule.

[118] Has anyone ever measured the time wasted by the fact that each time a student reads a different case, he or she must waste time "getting the parties' names straight."

[119] "The rules of law are confusing and uncertain, and you are asked to play games to find them... Science is truth (logic, rigor, consistency), and law is a mess (human foibles, politics, economics)." HANKS ET AL., *supra* note 10 at 72-73.

[120] For a purely pragmatic, non-academic attempt at pulling together the existing disarray (a far more difficult than building a sensible structural from scratch), see Lipson, "*The Lawyers' Comprehensive Computer Document System,*" first published in The Michigan Bar Journal, p. 451, July 1981, Vol. 60, No. 7, The State Bar of Michigan. Republished in Law Office Economics and Management, p. 20, Spring 1982, Vol. XXIII, No. 1, Callaghan & Company; Trial, the National Legal Newsmagazine, p. 16, October 1982, Vol. 18, No. 10, The

In summary, the manner in which law has been studied, analyzed and presented to students for the past several hundred years is wrong. To any person of science, who might step down for a closer look, the progress of our particular discipline must appear as nothing more than a chronicle of disconnected rules, inconsistent foundations and poorly constructed definitions. It shows itself in the poor quality of our practitioners; it shows in the inefficiency of our judicial system; it shows in poor wording of our statutes, and worse, it shows in the legacy of our texts and teachings. Science teachers endeavor to take very complex universe and make it simple - Law professors endeavor to take elementary concepts and make them complicated.

3. Positivism, Realism, Critical Legal Studies, et al

There is no shortage of legal theories attacking analytical jurisprudence. As is the case with most philosophical perspectives, there is a quantifiable amount of truth in all of them. The validity of the attack, however, should be directly proportional to the validity of the target system, which as demonstrated above, is quite vulnerable.

Instead of being "created" by humans or advanced to serve the goals of society (in accordance with the beliefs of the "Positivists") and, as opposed to consisting merely of the dictates of a superior sovereign (which, in the Hobsian sense can do no wrong), the pure naturalist

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would tell us that law is discovered, not invented. Thus, according to natural law, there is either a "creator" or an innate human sense of right and wrong; morality does not otherwise spring from a Godless, unsympathetic universe. Morality, it is said, deals with the "should" while science considers the "is."[121] The underlying thesis of this paper, of course, attempts to bridge the two.

Using the proposed model of Natural law derived throughout this paper, the admittedly general concepts of *Balance*, *Expansion*, and *Restraint* are by no means intended to serve as anything other than a thin link to the undisputable driving forces of the scientific universe; though abstract, they nevertheless, provide at least a nominal "scientific" starting point for a logic based legal system. From there, the positivists and realists are free to join in. In fact, it might be argued that our scientifically defined creator, having provided us with the basic building blocks, now expects us to fill in the gaps. Conflict should not, however, occur at the archetypical levels.

As the foundations of Natural Law are accepted from a scientific perspective, the once-competing disciplines of legal realism, pragmatism, positivism and even conceptualism may then be perceived as pieces of the same puzzle. All should work toward common goals; each provides a different type of benefit for the legal system. To devote lengthy philosophic discussion treating them as competitors makes as much sense as would a treatise debating whether the screwdriver or hammer is the most useful tool. A trivial pursuit.

Even the revered Holmes, who would weigh in on behalf of the "community," might be pleased to know that there is no real conflict between natural law (as redefined) and the interests of the "community." [122] Gray would, as a judge, abide by the communities' notions of right and

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[121] According to Einstein , "Science can only ascertain what *is*, not what *should be*."

[122] According to Holmes: "The first requirement of a sound body of law is, that it should correspond with

wrong, and perhaps mix in his own notions of right and wrong,[123] which once again, should not necessarily create a conflict. And, of course, to back up the law, Hobsian restraint or force might be necessary.

The trio is solid, but at the same time abstract enough so as to leave plenty of room for the realists and positivists and all the other "ists" that one might care to dream up. Just as the constants of the universe provide solid, undeniable Mathematical truth with respect to the importance of equality, so too does the notion of Expansion - and- restrain provide undeniable physical truth. To supplement analytical jurisprudence, we have help from several sources. Each set of philosophers is caught up in his or her self-created squabbles. In truth, they are each pieces in the same puzzle. The pieces only fit when there is balance.

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the actual feelings and demands of the community, whether right or wrong." OLIVER WENDELL HOLMES, JR., THE COMMON LAW 41 (1881), *quoted in* HANKS ET AL., *supra* note 10 at 36.

[123] *Id.*

THE CONCLUSION

For eons, proponents of Natural Law have struggled in an unsuccessful attempt to reconcile morality with our basic biological urges. There is an answer, to be sure. But this reconciliation lies not within Biology's exclusive domain, but rather in some simple and very basic observations relating to mathematics and physics. Less than a millionth of a second after the universe's Big Bang, all of the primordial, unrestrained, disorganized subatomic particles of the universe exploded outward with unimaginable heat, speed and force and without order or restriction. Then, of course, there had to come a critical point of *restraint*. Indeed, some subatomic particles had to settle down into stable restrained orbits so that atoms and molecules could form. The law of gravity, likewise had no choice but to reach out and grab masses of matter that would otherwise continue on their unrestrained outward path; orbits were thereby created.

Mathematics and physics were endowed with their own natural laws. Mathematics, in particular, enjoyed a perfect monolithic beauty, mystery and supremacy with respect to truth and objectivity.[124] To many, it is only a language or a messenger. But to others, it *is* the message - the law - the determinant of the universe. Did the creator have a choice?[125] Could the creator have created a different value for pi? If not, then who or what created pi to begin with? In the search to find *"that"* which determines all else, it is reasonable, if not intuitive, to examine the only thing

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[124]   This paper has provided a set of basic truths for a link between Science and Natural Law, it is by no means intended that Mathematics should continue to micromanage the affairs of the judicial process. That could lead to very strange results. (It was rumored that Pythagoras [571 - 496 B.C.], who felt that justice was always equal to the number "4," drowned one of his students, Hipparsus of Tarent, for pointing out that pi was irrational.)

[125]   According to JOHANNES KEPLER, THE HARMONY OF THE WORLD (1619) : "The Christians know that the mathematical principles according to which the corporeal world was to be created, are co-eternal with God. Geometry has supplied God with the models for the creation of the world. Within the image of God it has passed into man and was certainly not received within through the eyes" *quoted in* CLIFFORD A. PICKOVER, A PASSION FOR

in the universe that is constant and unchanging.

Whatever intelligent force there was, and *is* in the universe wants it to expand, but with restraint and balance. Physically speaking, those precepts should be absolute, clear and incontestable. Biologically speaking, all of the grandiloquent treatises boil down to simple concepts of "multiply, grow, and expand," but likewise with varying degrees of restraint and balance. For animals, the restraints are instinctive. Humans, on the other hand, were granted the ability to reason and determine their own restraints in addition to their own laws to govern conduct predicated upon those restraints. Thus, if there is or ever was any notion of a "Natural Law" to be derived, it should best be predicated upon those three irrefutable constants (Balance, Expansion, Restraint), not some vague, undefinable ideas of "innate" human good. With the Natural Law issues thus resolved, a political mix of realism, pragmatism, and positivism can guide things from there. From a mathematical perspective, that is indeed a trivial pursuit and outside the scope of the above-discussed supervening predicate.

It should, however, be noted that our current legal structural, from an architectural as opposed to a philosophical standard, is abysmal. Poorly drafted statutes peppered by fragments of common law abound. Could a scientifically constructed set of laws be worse? Will there be inconsistencies? Of course. Nothing is perfect. Nor is any logic-based discipline quite as imperfect as that subject known as "Law." We may tolerate this state of affairs presently, but with acceleration of information and logic-based digital expansion, before the twenty second century, a failure to provide a better system will not be an option.

MATHEMATICS (2005).

Finally, does all of this mean that our "innate" human values are diminished when compared to the scientifically creator's expanding particles and mathematical laws? Not at all, from the moment of the Big Bang, we are no less composed of stardust than the stars themselves.

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RESUME

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INNOVATIONS:

Author/creator/programmer of the *Objection!* computer simulation series. The original version was the first computer game ever to receive CLE Certification; current versions are used as teaching devices by law schools, governmental agencies and judges throughout the world. Current versions include: *Classic (original) Objection!,   Civil Objection! - AutoNeg, Civil Objection! - Slip/Fall,* and *Expert Witness!*[See "Software" Category, Below]

Author/creator of *The Lawyers Comprehensive Computer Document System* and *The Direct Reference Document System* (appearing in law journals from 1981 through 1988); also published in   Lipson, *Law Office Automation (*Prentice Hall, 1989). Author/creator of the widely syndicated legal-theme crossword puzzles that have appeared in bar journals and law-related publications throughout the country.

Latest efforts include: *"SivPro,"* a unique game/tutorial, designed to aid 1st year students by translating abstract concepts (Jurisdiction, etc.) into concrete objects. Works- in-progress include courtroom based: *"Weavers Needle,"* the 1st interactive, courtroom-based feature, motion picture.

EDUCATION:
B.A.:   Telecommunications, with a Major in Television, Radio and Motion Pictures,
           Michigan   State University, E. Lansing, MI (1966).
J.D.:   Law, St. John's University, New York, NY (1970).
M.A.:   Mathematics, Wayne State University, Detroit, MI (1975).
LL.M.:   Taxation, Wayne State University Law School, Detroit, MI (1978).
As.D.:   Comp. Science and Programming, Oakland Com. College, Farmington Hills, MI
           (1988).
As.D.(2): Comp. Information Systems, Oakland Com. College, Farmington Hills, MI (1992).
Post Deg: Physics, University of Michigan (Senior status).

PROGRAMS:

Lawyers Cooperative Publishing Company Award for Excellence in the Study of Jurisprudence, received while attending Law School; Catholic Lawyer's Guild Award, presented on a non-sectarian basis for written course work, also while attending law school; New York State Attorney General Student Internship Program, selected to serve as an assistant to New York State Attorney General; Moot Court Chief Judge, University of Detroit and Wayne State University; Congressional Advisory Membership Award.

EXPERIENCE:

Teaching experience: University of La Verne, Michigan State University, Detroit College of Law, UCLA, Pepperdine. Courses include: ***Evidence, Discovery, Entertainment Law, Multimedia Law, Trial Practice, Civil Procedure, Business Organizations, Appellate Advocacy, Bioethics, Remedies, Publically Held Corporations & SEC Regulation, The Law of Cyberspace.*** In addition, Lipson constructed the following courses (believed to be the first of their kind): ***Mathematics & Physics for Lawyers*** and ***The Law Of The Computer Games Industry.*** Certified CLE Provider, since 1992, and frequent lecturer for bar associations, trial-lawyer associations and other law-related groups. Practical experience includes more than 25 years as a Litigator, Trial Attorney, Entertainment Attorney, Tax and Transactional Lawyer, and Lawfirm Managing Partner.

SOFTWARE:

1. Objection!, Transmedia Inc. (author/programmer Ashley S. Lipson), Platform: C Programming Language. 1992 - 2005. The original simulation (referred to as "*Classic Objection!*") was the first computer game to ever receive state certification for purposes of Mandatory CLE. California became the first such state in 1992; presently, every state that permits "home study" has certified the *Objection!* computer series (approximately 20 states, some of which legislatively altered their CLE accreditation process solely to accommodate the new product). With approximately 32,000,000 variations of play, the program, which is evidence-based, never gets boring. The *Objection!* series is presently being used, not only by law firms, but also by universities, law schools, high schools, municipalities and prosecutorial agencies. Reviews are available upon request.

2. Civil Objection!, Transmedia Inc. (author/programmer Ashley S. Lipson). Platform: C Programming Language. 1994 - 2005. Capitalizing on its success as the most popular lawyer game, this follow-up game (unlike *Classic Objection!,* which only dealt with a single phase of the trial process) covers all aspects of the trial examination process, both direct and cross-examination, plaintiff and defendant witnesses, expert and lay witnesses, and even demonstrative evidence presentations.

3. Civil Objection! [Slip/Fall], Transmedia Inc. (author/programmer Ashley S. Lipson). Platform: C Programming Language. 1994 - 2005. This simulation, also accredited, provides a variation on the prior *Objection!* themes.

4. Expert Witness!, Transmedia Inc. (author/programmer Ashley S. Lipson). 1994 - 2005. Platform: C Programming Language. This variation on the *Objection!* theme is designed to train attorneys with respect to the qualification, examination and cross-examination of expert witnesses. It too is accredited by all of the states that permit home study CLE.

5. SivPro!, Transmedia Inc. (author/programmer Ashley S. Lipson). Platform: Macromedia Director, Version MX2004. 2004 - 2005. This set of interactive tutorials, on-disk lectures, and action-games, a first of its kind, is designed to revolutionize the manner in which law students review law school subject matter. This first game is designed to structure and clarify some of the most difficult concepts of *Civil Procedure* that confront the first year law student. It is a complex suite of voice lectures, unique logic-based outlines, and action-games that permit hands-on learning and the visualization of otherwise abstract and confusing concepts. In many respects, the presentation is both doctrinal and concrete.

BOOKS:

1. <u>Documentary Evidence</u>, Matthew Bender & Co., Times Mirror Books, 1986-2005. This is a lengthy, annually supplemented treatise intended to serve as a detailed, comprehensive reference to help practitioners accumulate, assemble, store, and determine the admissibility requirements for documentary evidence.

2. <u>Demonstrative Evidence</u>, Matthew Bender & Co., Times Mirror Books, 1988-2005. Intended to serve as the single most comprehensive volume on the subject of Demonstrative Evidence, the treatise contains extensive annotations; it also presents sample authentication procedures, testimony, illustrations, charts, diagrams, checklists and practical information with respect to the acquisition, transportation, admissibility and use of Demonstrative Evidence. In addition, the text contains evidentiary arguments and counter-arguments to assist both proponents and opponents.

3. <u>Law Office Automation</u>, Prentice Hall, Inc., 1989; Prentice Hall, Business & Professional Division. The book contains a unique scheme for organizing, cataloguing, computerizing and creating law office pleadings, files, forms and documents. The book presents detailed descriptions of the *Direct Reference Form Filing System* and the *Lawyer's Comprehensive Computer Document System.*

4. <u>Rules of Evidence - For Witness Testimony</u>, TransMedia Productions, Inc., 1992. After providing some basic foundations and principles for the taking of testimony, the book provides details and annotations with respect to the most common objections encountered in a courtroom setting. The book presented, for the first time, the concept of standardized objections designated as "The Big Twelve."

5. <u>Comprehensive Evidence</u>, TransMedia Productions, Inc., 1994. This book presents a new basis for analyzing the manner in which *Evidence* might be taught in law schools and used in court. The book divides the Universe of Evidence into four components: Testimonial, Documentary, Real, and Demonstrative. Each component, which has been thoroughly annotated, is explained in depth.

6. <u>Is It Admissible?</u> James Publishing, Inc., 1998 [Best Seller of the Year] - 2005. This treatise presents a new comprehensive approach for locating fast answers to evidentiary problems. It provides "restructure" and redefinition for basic evidence classification.

7. <u>Guerrilla Discovery</u>, James Publishing Company, 2003 - 2005. With rules, cases, forms, and discussions covering both federal and state procedures, the book has been designed as the most comprehensive single volume on the subject of *Discovery*.

CONTRIBUTION TO BOOKS:

1. Contribution to <u>Department of Justice - Trial Handbook</u>, The United States, 1997 (Matters pertaining to Documentary Evidence).

2. Contribution only to <u>Art of Advocacy - Preparation of The Case</u>, David B. Baum, Matthew Bender & Co., Times Mirror Books, 1989, Supplement and subsequent editions, Chapter 4 (Decimal Document Indexing System).

3. Advice, direction , contribution and acknowledgment for the Third Revision of the <u>Legal Secretary's Complete Handbook</u>, DeVries, Prentice Hall, 1989.

ARTICLES (Re-publications are separately listed) :

1. "Capital Gains Confusion", Masters Thesis published to Wayne State University Law School (LL.M Tax Law, 1978).

2. "File Your Forms as a Computer Would--Without the Computer" (Cover Story), The Michigan Bar Journal, p. 451, July 1981, Vol. 60, No. 7. The State Bar of Michigan, 306 Townsend Street, Lansing, MI 48933.

3. "Computerized Filing System--No Computer Necessary", Law Office Economics and Management, p. 20, Spring 1982, Vol. XXIII, No. 1. Callaghan & Company, 3201 Old Glenview Road Wilmette, IL 60091.

4. "Computerized Filing System-- An Expansion", Law Office Economics and Management, p. 286, Fall 1982, Vol. XXIII, No. 3. Callaghan & Company, 3201 Old Glenview Road, Wilmette, IL 60091.

5. "Direct Reference Legal Filing System", Trial, the National Legal Newsmagazine, p. 16, October 1982, Vol. 18, No. 10. The Association of Trial Lawyers of America, 1050 31st Street, N.W., Washington, DC 20007.

6. "Direct Reference Legal Filing System", Hawaii Bar Journal, p. 135, 1982, Vol. XVII. The Hawaii State Bar Association, 1106 Castle & Cooke Building, Honolulu, Hawaii 96813.

7. "Direct Reference Legal Filing System" (Cover Story), The Docket, National Association of Legal Secretaries, p. 8, December/January 1983, Vol. 31, Issue 3. National Association of Legal Secretaries (International), 3005 East Skelly Drive, Suite 120, Tulsa, OK.

8. "Direct Reference Legal Filing System", Tennessee Bar Journal, February 1983, Vol. 19, No. 1. The Tennessee Bar Association, 3622 West End Avenue, Nashville, TN 37205.

9. "Form Filing by Logic", The California Lawyer, p. 52, June 1983, Vol. 3, No. 6. The State Bar of California, 555 Franklin Street, San Francisco, CA 94102.

10. "Direct Reference Legal Filing System", Legal Economics, p. 39, July/August 1983, Vol. 9, No. 4, Section of Economics of Law Practice of the American Bar Association, 1155 East 60th Street, Chicago, IL 60637.

11. "Direct Reference Legal Filing System", The Colorado Lawyer, p. 1465, September 1983, Vol. 12, No. 9. The Colorado Bar Association, 250 West 14th Avenue, Suite 800, Denver CO 80204.

12. "The Basics of Basic", The California Lawyer, p. 47, October 1983, Vol. 3, No. 10. The State Bar of California, 555 Franklin Street, San Francisco, CA 94102.

13. "Business Counsel", Trial, The National Legal Newsmagazine, p. 24, December 1983,

Vol. 19, No. 12. The Association of Trial Lawyers of America, 1050 31st Street, NW, Washington, DC 20007.

14.   "Lawyer's Short Course in the BASIC Computer Language", Law Office Economics and Management, p. 283, Fall 1983, Vol. XXIV, No. 3. Callaghan & Company 3201 Old Glenview Road, Wilmette, IL 60091.

15.   "Menswords", Mensa Bulletin, p. 15, December 1983, No. 272, Mensa Bulletin, 1701 West 3rd St., Suite 1R, Brooklyn, NY 11223.

16.   "Lawyer's Short Course in the `Basic' Computer Language", Jurimetrics, p. 154, Winter 1984, Vol. 24, No. 2. the American Bar Association, 1155 East 60th Street, Chicago, IL 60637.

17.   "Lawyers Short Course in Basic Computer Language", The Arkansas Lawyer, p. 104, April 1984, Vol. 18, No. 2. The Arkansas Bar Association, 400 West Markham, Little Rock, AR 72201.

18.   "How to Create a Computer Document File", The Profitable Lawyer, p. 15, November 1984, Vol. 1, No. 4, Harcourt Brace Janovich, Publishers, 855 Valley Road, Clifton, NJ 07013.

19.   "How to Create a Computer Document File", Of Counsel, p. 10, November 1984, Vol. 3, No. 11, Law and Business Inc., 855 Valley Road, Clifton, NJ 07013.

20.   "Computerizing Your Document System" (Cover Story), Trial, The National Legal News Magazine, p. 28, January 1985, Vol. 21, No. 1. The Association of Trial Lawyers of America, 10 South 31st Street, NW, Washington, DC 20007.

21.   "Lawyers Comprehensive Computer Document System" (Cover Story), Economics and Management of Law Practice Section Newsletter, Entire Edition, January 1985, Issue No. 2, The Florida Bar Association, Tallahassee, FL 32301-8226.

22.   "Computer Document System" (Cover Story), The Maryland Bar Journal, p. 4, February 1985, Vol. XIX, No. 2, The Maryland State Bar Association, 207 E. Redwood Street, Suite 905, Baltimore, Maryland 21202.

23.   "Lawyers Comprehensive Computer Document System", Baltimore Association of Legal Assistants, Newsletter, March 1985, P.O. Box 1653, Baltimore, Maryland 21203.

24.   "Computerizing Your Document System For All Computer Models, Legal Specialties, and Software Packages", Law Office Management Digest, p. 1, May/June 1985, Vol. XV, No. 3. Law Publications, Inc., 1180 South Beverly Drive, Los Angeles, CA 90035.

25.   "Lawyer's Manual Computer Document System", Law Office Economics and Management, p. 17, Spring 1985, Vol. XXVI, No. 1 Callaghan & Company, 3201 Old Glenview Road, Wilmette, IL 60091.

26.   "A Comprehensive Computer Document System for Lawyers", The New Hampshire Bar Journal, p. 283, Summer 1985, Vol. 26, No. 4, The New Hampshire Bar Journal, 18 Centre St., Concord, N.H. 03301.

27. "Microtransposedictus Gravis", <u>Law Office Economics and Management</u>, p. 302, Spring 1986, Vol XXVII, No. 3, Callaghan & Company, 2301 Old Glenview Road, Wilmette, IL 60091.

28. "A Reinfection of Microtransposedictus Gravis", <u>Legal Assistant Today</u>, p. 28, March/April 1987, Vol. 4, No. 4, Legal Assistant Today, Inc., 6060 N. Central Expwy., Suite 534, Dallas, TX 75206.

29. "Microtransposedictus Gravis", <u>The Docket</u>, p. 11, Jan/Feb 1987, Vol. 35, Issue #4, The National Association of Legal Secretaries (International) 2250 E. 73rd Street, Ste. 550, Tulsa, OK 74136.

30. "Media Myths and the Legal Secretary", <u>The Docket</u>, p. 23, May/June 1987, Vol. 35, Issue 6, The National Association of Legal Secretaries (International), 2250 East 73rd Street, Ste. 550, Tulsa, Oklahoma 74136-7513.

31. "The Premium Skills of the Future: Repackaging Yourself to Move Ahead" (Cover Story), <u>The Docket</u>, p. 6, July/Aug 1987, Vol. 36, Issue #1, The National Association of Legal Secretaries (International) 2250 E.73rd Street, Ste. 550, Tulsa, OK 74136-7513.

32. "Cross Actions", <u>The Docket</u>, <u>National Association of Legal Secretaries</u>, (International), p. 40, May/June 1988, Vol. 36, Issue 6.

33. "Power Plays", <u>The Docket</u>, p.27, January/February 1989, Vol. 37, Issue 3, The National Association of Legal Secretaries (International), 2250 East 73rd Street, Ste. 550, Tulsa, Oklahoma 74136-7513.

34. "The Future of Document Production" (Cover Story), <u>The Docket,</u> <u>National Association of Legal Secretaries</u>, p. 6, July/August 1989, Vol. 38, Issue 1.

35. "Mixing Midi-Firms and Micro Computers", <u>Law Office Economics and Management</u>, p. 169, Vol. XXX, No.2, Summer 1989, Callaghan & Company, 2301 Old Glenview Road, Wilmette, IL 60091.

36. "Put it in Writing", <u>The Docket, National Association of Legal Secretaries</u>, p. 27, March/April 1990, Vol. 38, Issue 5.

37. "Putting Legal Technology in its Place" (Cover story), <u>The Official Record</u>, p. 16, Fall 1990, Vol. 23, Issue 2, The Michigan Association of Legal Secretaries, printed by Colonial Press, Inc., 2584 Airport Road, Jackson, MI 49202.

38. "Classifying Facts, Files and Forms", <u>The National Law Journal</u>, p. 15, Vol. 13, No. 10, November 12, 1990, Weekly News Journal published by The New York Law Publishing Company, 111 Eighth Avenue, New York, NY 10011.

39. "Putting Legal Technology in its Place", <u>The New York State Bar Journal</u>, p.42 Vol 62, No.8, December 1990, The New York Bar Association, One Marine Midland Plaza, Binghamton, NY 13902.

40.   "The Legal Technological Toolbox", <u>Law Office Economics and Management</u>, p. 326, Vol. XXXI, No.3, Summer 1989, Callaghan & Company, 2301 Old Glenview Road, Wilmette, IL 60091.

41.   "Intellectual Property Puzzle", <u>New Matter</u>, Official Publication of the State Bar of California Intellectual Property Section, p.9, Vol 15, No 3, Fall 1990.

42.   "Putting Legal Technology in its Place", <u>Trial, the National Legal Newsmagazine</u>, p.32 January 1991. The Association of Trial Lawyers of America, 1050 31st Street, N.W., Washington, DC 20007.

43.   "A Special Report From COMDEX" (Cover), <u>The Docket, National Association of Legal Secretaries</u>, p. 19, January/February 1991, Vol. 39, Issue 4.

44.   "Document Assembly: Establishing Universal Goals, Terms and   Standards", <u>Law Office Computing</u>, p.78, Winter 1991, James Publishing, Inc. 3520 Cadillac Avenue, Ste. E, Costa Mesa, CA., 92799.

45.   "Databases: Key to Information," <u>The Docket, National Association of Legal Secretaries</u>, p. 21, March/April 1991, Vol. 39, Issue 5.

46.   "Putting Legal Technology in its Place", <u>Journal of the Missouri Bar</u>, p.193 April/May 1991, Vol 47, No. 3, The Missouri Bar, 326 Monroe Street, Jefferson City Missouri, 65101.

47.   "A Short Course in Document Assembler Programming, "<u>Law Office Computing</u>, p.98, Summer 1991, James Publishing, Inc., 3520 Cadillac Avenue, Ste. E, Costa Mesa, CA., 92799.

48.   "The Five Levels of Legal Technology" (cover), <u>Inter Alia, the Journal of the State Bar of Nevada</u>, p.6, July, 1991, Vol 56, No. 3, The State Bar of Nevada, 295 Holcomb Avenue, Suite 2, Reno Nevada 89502.

49.   "Evaluating the Document Assemblers," <u>Law Office Computing</u>, p. 60, Fall 1991, James Publishing, Inc. 3520 Cadillac Avenue, Ste. E, Costa Mesa, CA., 92799.

50.   "The Very First Steps in Creating an Expert System," <u>Law Office Computing</u>, p. 51, February/March 1992, James Publishing, Inc. 520 Cadillac Avenue, Ste. E, Costa Mesa, CA., 92799.

51.   "The 1992 Comdex Report," <u>The Docket, National Association of Legal Secretaries</u>, p. 9, March/April 1992, Vol. 40, Issue 5.

52.   "A Customer Satisfaction Survey for Document Assemblers," <u>Law Office Computing</u>, p. 132, April/May 1992, James Publishing, Inc. 520 Cadillac Avenue, Ste. E, Costa Mesa, CA., 92799.

53.   Book Review of Paul Bernstein's "Computers for Lawyers" <u>Trial, the National Legal Newsmagazine</u>, p.78, August 1992. The Association of Trial Lawyers of America, 1050 31st Street, N.W., Washington, DC 20007.

54.   "The Latest Wave of Laptop Computers" (Cover Story), <u>The Docket,</u> <u>National Association of Legal Secretaries</u>, p. 13, July/August 1992, Vol. 38, Issue 1.

55.   " 'Real' Real Evidence," <u>Litigation</u>, Vol. 19, No. 1, Fall 1992, American Bar Association, 1155 East 60th Street, Chicago, IL 60637.

56.   "The Lawyer's Computer Terminal Illness," <u>Law Office</u> <u>Computing</u>, p.79, October/November 1992, James Publishing, Inc., 3520 Cadillac Avenue, Ste. E, Costa Mesa, CA., 92799.

57.   "Dictate to Your Computer,"<u>Law Office Computing</u>," p.82, December/January 1993, James Publishing, Inc., 3520 Cadillac Avenue, Ste. E, Costa Mesa, CA., 92799.

58.   "How to be a Less-Stressed Litigator," (Co-author Rachel Glick) <u>Trial, the National Legal Newsmagazine</u>, Vol. 29, No.1, p.38, January 1993. The Association of Trial Lawyers of America, 1050 31st Street, N.W., Washington, DC 20007.

59.   "The Bottom Line," <u>res gestae</u>, The Journal of the Indiana State Bar Association, 230 East Ohio Street, Indianapolis, IN 46204, Vol. XXXVII, No. 1, p. 40, July 1993.

60.   "How to be a Less-Stressed Litigator," (Co-author Rachel Glick) <u>Defense Line</u>, Summer 1993, South Carolina Defense Trial Attorneys' Association, 3008 Milwood Ave., Columbia, SC 29205.

61.   "Your Computer Can't Practice Law,"<u>Law Office Computing</u>," p.120, October/November 1993, Vol 3, No. 5, James Publishing, Inc., 3520 Cadillac Avenue, Ste. E, Costa Mesa, CA., 92799.

62.   "Getting Intimate With Your Office Computer,"<u>National Trial Lawyer</u>," p.69, November 1993, Vol 5, No. 6, Trial Lawyer Publications, Inc., P.O. Box 1217, Millville, New Jersey 08332-8217.

63.   "Short Course in Evidence," <u>Legal Assistant Today</u>, p. 42, September/October 1994, Vol. 12, No. 1, James Publishing, Inc. 3520 Cadillac Avenue, Ste. E, Costa Mesa, CA., 92799.

65.   "Instant Evidence," <u>Trial</u>, The National Legal News Magazine, p. 72, November 1996, Vol. 32, No. 11. The Association of Trial Lawyers of America, 10 South 31st Street, NW, Washington, DC 20007.

66.   "Hollywood's Greatest Cross-examination Scenes" <u>Trial</u>, The National Legal News Magazine, March,, 2004. The Association of Trial Lawyers of America, 10 South 31st Street, NW, Washington, DC 20007.

67.   "Know Your Testimonial Objections" of <u>Trial</u>, The National Legal News Magazine, July, 2005. The Association of Trial Lawyers of America, 10 South 31st Street, NW, Washington, DC 20007.

MEMBERSHIP:

        The Mathematical Association of America, The American Bar Association, The American Trial Lawyers Association, The California Bar Association, The Michigan Bar Association, The Beverly Hills Bar Association (*Order of Distinguished Attorneys*), The New York Committee of Bar Examiners for the New York Bar Association (*Certified by, not a member*), Mensa, Intertel, Lawyers in Mensa (LIM), Delta Theta Phi International Law Fraternity.