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ESSAY

THE CURVATURE OF CONSTITUTIONAL SPACE: WHAT LAWYERS CAN LEARN FROM MODERN PHYSICS

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Twentieth-century physics revolutionized our understanding of the physical world. Relativity theory replaced a view of the universe as made up of isolated objects acting upon one another at a distance with a model in which space itself was curved and changed by the presence and movement of objects. Quantum physics undermined the confidence of scientists in their ability to observe and understand a phenomenon without fundamentally altering it in the process. Professor Tribe uses these paradigm shifts in physics to illustrate the need for a revised constitutional jurisprudence. He argues that judges and lawyers need to recognize the profound impact that the law has in shaping the social background. This background is too often taken as given. Judges, in particular, cannot simply reach in and resolve disputes between individuals without permanently altering the legal and social space. The very act of judging alters the context and relationships being judged. Professor Tribe concludes that, while perspectives resembling those of modern physics have been integrated into some of the most important constitutional cases decided during the twentieth century, the current Supreme Court shows an unfortunate tendency toward relying too often on visions of society and knowledge that have long been rejected as overly formal and sterile.

I. INTRODUCTION

Although my topic is the constitutional lessons of general relativity and quantum physics, I do not address the subject because I am determined to bring science or mathematics into law; I still believe what I wrote in the 1970's about the perils of that enterprise.[1] Nor

* Tyler Professor of Constitutional Law, Harvard Law School. I am grateful to Rob Fisher, Michael Dorf, Kenneth Chesebro, Gene Sperling, and Barack Obama for their analytic and research assistance and to Professor Gerald Holton (Harvard Physics Department) for his helpful comments. This essay builds upon the 43d Annual Cardozo Lecture I gave before the Association of the Bar of the City of New York on May 11, 1989, 44 RECORD OF THE ASS'N OF THE BAR OF THE CITY OF NEW YORK 575 (1989).

[1] *See infra* note 2.

do I wish to suggest that there exists an epistemological hierarchy with the law perched on a lower rung looking up to its superiors for guidance. Rather, my conjecture is that the metaphors and intuitions that guide physicists can enrich our comprehension of social and legal issues. I borrow metaphors from physics tentatively; my purpose is to explore the heuristic ramifications for the law; my criterion of appraisal is whether the concepts we might draw from physics promote illuminating questions and directions. I press forward in this endeavor because I believe that reflection upon certain developments in physics can help us hold on to and refine some of our deeper insights into the pervasive and profound role law plays in shaping our society and our lives.

In the same spirit, I continue to maintain my previous objection to any form of dogmatism that closes down discourse about fundamental values within the law.[2] To search the sciences for authoritative answers to legal questions, or any questions for that matter, is misguided. The formalist philosophy which views science as a "collection" of the "proven" or even of the "provable" is based upon an inappropriate reification. The better vision of science is as a continual and, above all, critical exploration of fruitful insights; the better metaphor is that of a journey. Science is not so much about proving as it is about *im*proving. To look to the natural sciences for authority — that is, for certainty — is to look for what is not there.[3]

This look beyond law in order to understand law is necessary because our formal methods of reasoning about legal problems in general, and constitutional problems in particular, have not always kept pace with widely shared perceptions of what makes sense in thinking and talking about the state, about courts, and about the role of both in society. How we think about these institutions has been fundamentally influenced by new insights into the operation of the physical world. Michel Foucault speaks of "an epistemological space specific to a particular period";[4] he suggests that tacit positive rules of discourse cut across and condition different disciplines in any given

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[2] I still believe that attempts to reduce human issues to cost-benefit equations, as people in the law and economics movement sometimes do, are bound to be distorting. *See* Tribe, *Policy Science: Analysis or Ideology?*, 2 PHIL. & PUB. AFF. 66 (1972); *see also* Tribe, *Constitutional Calculus: Equal Justice or Economic Efficiency?*, 98 HARV. L. REV. 592 (1985); Tribe, *Seven Deadly Sins of Straining the Constitution Through a Pseudo-Scientific Sieve*, 36 HASTINGS L.J. 155 (1984); Tribe, *Technology Assessment and the Fourth Discontinuity: The Limits of Instrumental Rationality*, 46 S. CAL. L. REV. 617 (1973); Tribe, *Trial by Mathematics: Precision and Ritual in the Legal Process*, 84 HARV. L. REV. 1329 (1971); Tribe, *Ways Not To Think About Plastic Trees: New Foundations for Environmental Law*, 83 YALE L.J. 1315 (1974).

[3] For essays on relevant aspects of the philosophy of science, see CRITICISM AND THE GROWTH OF KNOWLEDGE (I. Lakatos & A. Musgrave eds. 1970).

[4] M. FOUCAULT, THE ORDER OF THINGS: AN ARCHAEOLOGY OF HUMAN SCIENCES at xi (1970).

period. Interdisciplinary comparison brings greater awareness of preconceptions, and it is the unearthing of such tacit knowledge that often creates the possibility of choice and intellectual progress. Although our intuitive understanding about the relationships among law, the state, and society has evolved, our vocabulary has lagged behind our intuitions: the language in which we still tend to ask legal questions and express legal doctrine has yet to reflect the shift in our perceptions. The result has been to make it easier for courts and lawyers to couch their analyses of many areas in terms that are deeply out of sync with that shift in underlying perceptions.

Thus, while some aspects of Supreme Court jurisprudence, as I will try to show, have become reasonably congruent with this shift, other aspects of that jurisprudence either have never become so or have fallen perceptibly behind our shared insights. In order to illustrate that failure, this essay will discuss some of the work of the Burger and Rehnquist Courts. Beyond this, the essay will argue that the central conceptual shifts represented in modern physics provide useful new ways of thinking and talking about law, legal argument and legal practice.

I am hardly the first to use science to speak of law. Early in our nation's history it was commonplace, for example, to say that the 1787 Constitution was Newtonian in design, with its carefully counterpoised forces and counterforces, its checks and balances, structured like a "machine that would go of itself" to meet the crises of the future.[5] Later, as the country grew and the pace of social change quickened, and after Darwin's theory of evolution gained acceptance, many thinkers — Justice Holmes, for example, and Woodrow Wilson — saw in the Constitution organic aspects of a living, evolving thing.[6]

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[5] *See* M. KAMMEN, A MACHINE THAT WOULD GO OF ITSELF: THE CONSTITUTION IN AMERICAN CULTURE (1986). In a trenchant essay, Brian Koukoutchos observes:

> After the close of the sixteenth century, a reaction set in against the mystical tradition in the form of a mechanistic view of the universe. If the former paradigm drew upon Plato, the latter one traced its lineage to Archimedes. . . . The Framers — an apt sobriquet for a mechanistic age — naturally thought and expressed themselves according to the prevailing paradigm of their time. . . . It was the legacy of Newton's *Principia* that "[a]ll mechanics acquired, for a while, the charm of complexity controlled."

Koukoutchos, *Constitutional Kinetics: The Independent Counsel Case and the Separation of Powers*, 23 WAKE FOREST L. REV. 635, 641–42 (1988) (footnote omitted) (quoting G. WILLS, INVENTING AMERICA: JEFFERSON'S DECLARATION OF INDEPENDENCE 98 (1978)). In another recent paper, Professor A.E. Dick Howard discusses the influences of clocks, "gadgets," and mechanical metaphors on the founding fathers. He raises the question, "to what extent does the ordering of the constitutional system assume a Newtonian universe — a self-regulating mechanism . . . ?" A.E. Dick Howard, The Mechanical Conception of the Constitution 24 (paper presented at Colloque International: *1789 et l'Invention de la Constitution*, Association Francaise de Science Politique, Mar. 2–4, 1989) (available at the Harvard Law School Library).

[6] As Holmes put it: "However much we may codify the law into a series of seemingly self-sufficient propositions, those propositions will be but a phase in a continuous growth." O.W. HOLMES, THE COMMON LAW 32 (1881). Biological and evolutionary metaphors are prominent

However interesting these metaphors may be, I want to borrow from science not possible images for describing particular legal institutions from the *outside*, but a language for engaging in legal analysis itself. I hope to shed light not on the nature of the Constitution as a thing but on the character and structure of constitutional analysis as a process.

II. THE CONSTITUTIONAL LESSONS OF MODERN PHYSICS

The Newtonian physics of two centuries ago took the view that objects acted on each other across the expanse of a neutral, undifferentiated space in an objective and knowable manner, according to simple physical laws that seemed to explain observed reality without requiring much further reflection about the basic structure of the universe.[7] As in a game of marbles, objects might collide with one another, but they could not alter the field of play.[8]

Since the 1920's, physics has been guided by two key shifts away from this view. On the grand scale, the general theory of relativity has demonstrated, among other things, that the physical universe, as seen through a telescope, can be explained only by realizing that objects like stars and planets *change* the space around them — they literally "warp" it — so that their effect is both complex and interactive.[9] On the subatomic scale, quantum theory has demonstrated

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in Holmes' work: "Just as the clavicle in the cat only tells of the existence of some earlier creature to which a collarbone was useful, precedents survive in the law long after the use they once served is at an end and the reason for them has been forgotten." *Id.* at 31. On Holmes, see Veilleux, *The Scientific Model in Law*, 75 GEO. L.J. 1967, 1977 (1987). On evolutionary theories in the law, see *id.* at 1977 n.57. Woodrow Wilson perhaps put it best: "the Constitution of the United States is not a mere lawyers' document: it is a vehicle of life, and its spirit is always the spirit of the age." W. WILSON, CONSTITUTIONAL GOVERNMENT IN THE UNITED STATES 69 (1911). *See also* Tribe, *The Idea of the Constitution: A Metaphor-morphosis*, 37 J. LEGAL EDUC. 170 (1987).

[7] "Newtonian scientific thought was based fundamentally on metaphysical assumptions involving God, absolute space, absolute time, and absolute laws." M. KLINE, MATHEMATICS AND THE SEARCH FOR KNOWLEDGE 165 (1985); *see also* THREE HUNDRED YEARS OF GRAVITATION 4 (S. Hawking & W. Israel eds. 1987).

[8] In more technical terms, Einstein describes some of the assumptions of pre-relativity physics:

> In the first place, it is assumed that one can move an ideal rigid body in an arbitrary manner. In the second place, it is assumed that the behaviour of ideal rigid bodies towards orientation is independent of the material bodies and their changes of position, in the sense that if two intervals can once be brought into coincidence, they can always and everywhere be brought into coincidence.

A. EINSTEIN, THE MEANING OF RELATIVITY 4–5 (5th ed. 1956).

[9] As Einstein states: "Our world is not Euclidean. The geometrical nature of our world is shaped by masses and their velocities." A. EINSTEIN & L. INFELD, THE EVOLUTION OF PHYSICS: FROM EARLY CONCEPTS TO RELATIVITY AND QUANTA 237 (1938). *See infra* section II.A.

that the universe cannot be observed as though the natural world at the end of the microscope were unaffected by the eye looking into the lens — the very process of observation and analysis can fundamentally alter the things being observed, and can change how they will behave thereafter.[10]

The insights that general relativity and quantum theory have to offer for our purposes require no mastery of technical detail, but do require familiarity with several fairly simple but fundamental concepts. This section offers a brief explication of each of these theories and then examines how their insights might help us arrive at a paradigm[11] of legal reasoning and constitutional analysis to address some of our current difficulties.

A. General Relativity Theory

1. Curved Physical Space. — In popular culture, the phrase "general relativity" has an almost mystical quality,[12] but as a historical matter its effect was largely demystifying. The theory emerged from an attempt to improve on Newton's theory of gravity.[13] In Newton's theory, gravity is a discrete physical force, in which the greater the mass of an object, the more strongly it "pulls" on other objects.[14] For example, the earth exerts a stronger pull on an object placed on its surface than that which the object experiences on the surface of the moon, which explains why the astronauts get to bounce so high when they are on the moon, and how Alan Shepard managed to set a galactic record in 1971 for driving a golf ball — by his account "miles and miles and miles" — with a six-iron attached to a sampling rod. Although Newton developed a precise formula for calculating this

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[10] *See infra* section II.B.

[11] My approach is obviously inspired to some extent by Thomas Kuhn's vision of paradigmatic discourse found in his seminal work, T. KUHN, THE STRUCTURE OF SCIENTIFIC REVOLUTIONS (2d ed. 1970). I do not, however, rely on the specific structure of Kuhn's "paradigm" paradigm, which has been properly criticized on a number of different levels. *See, e.g.*, Lakatos, *Falsification and the Methodology of Scientific Research Programmes* in CRITICISM AND THE GROWTH OF KNOWLEDGE, *supra* note 3, at 91.

[12] As Paul Davies writes:

> Over fifty years ago something strange happened in physical science. Bizarre and stunning new ideas about space and time, mind and matter, erupted among the scientific community. . . . Physicists began to realize that their discoveries demanded a radical reformulation of the most fundamental aspects of reality. They learned to approach their subject in totally unexpected and novel ways that seemed to turn commonsense on its head and find closer accord with mysticism than materialism.

P. DAVIES, GOD AND THE NEW PHYSICS at vii (1983).

[13] Einstein states: "The general theory of relativity attempts to formulate physical laws for all CS [co-ordinate systems]. The fundamental problem of the theory is that of gravitation. The theory makes the first serious effort, since Newton's time, to reformulate the law of gravitation." A. EINSTEIN & L. INFELD, *supra* note 9, at 235.

[14] *See* M. KLINE, *supra* note 7, at 112.

pull,[15] the formula left one huge mystery unexplained: if the sun and planets pull on each other with varying strengths depending on where they happen to be in relation to one another, those bodies must have some way of detecting one another's location. But how? Who or what "tells" the earth where, and how big, the sun is?[16] The only available answers always seemed oddly mystical — as though each atom of the earth were connected to each atom of the sun by an invisible but heavy "rope" of gravity, to each atom of the moon by an equally invisible "string," and to each atom of the distant planets by mere "threads." In this picture, as the planets orbited the sun, the tendrils of this odd "force" called gravity forever shifted; but how such a "force" could act instantaneously and across the vast distances of empty space, between objects that could have no possible "awareness" of one another's existence, or mass, remained a complete puzzle.[17]

General relativity reformulated the theory of gravity from the ground up. In Einstein's view, the planets did not move in reaction to the pull or beckon of some invisible connection to another mass. He posited instead that space itself is bent and shaped by the masses within it,[18] causing masses to move through space and time according to that shape, guided not by invisible forces but by the very curvature of the space around them — much as a marble tossed into a bowl would spin around in accord with the curvature of the bowl itself.[19]

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[15] $F=Gm_1m_2/d^2$ (The masses of the attracting objects are m_1 and m_2; d is the distance between them; and G is the universal gravitational constant.)

[16] Newton expressed his dissatisfaction in a letter to Richard Bentley:

> That one body may act upon another at a distance through a vacuum without the mediation of anything else, by and through which their action and force may be conveyed from one to another, is to me so great an absurdity that, I believe, no man who has in philosophic matters a competent faculty of thinking could ever fall into it.

M. KLINE, *supra* note 7, at 121.

[17] Kline states:

> Newton made many statements about gravity in the three editions of his *Mathematical Principles* . . . . Just how gravitation could reach out 93 million miles and pull the earth toward the sun seemed inexplicable to him, and he framed no hypotheses concerning it. He hoped that others would study the nature of this force. People did try to explain it in terms of pressure exerted by some intervening medium and by other processes, all of which proved unsatisfactory.

Id. at 122.

[18] George Gamow explains: "The great idea, which was included by Einstein in the foundation of his general theory of curved space, consists of the assumption that *the physical space becomes curved in the neighborhood of large masses*; the bigger the mass the larger the curvature." G. GAMOW, ONE TWO THREE . . . INFINITY 106 (1961) (emphasis in original).

[19] Hawking notes:

> Einstein made the revolutionary suggestion that gravity is not a force like other forces, but is a consequence of the fact that space-time is not flat, as had been previously assumed: it is curved, or "warped," by the distribution of mass and energy in it. Bodies like the earth are not made to move on curved orbits by a force called gravity; instead, they follow the nearest thing to a straight path in a curved space, which is called a geodesic.

S. HAWKING, A BRIEF HISTORY OF TIME: FROM THE BIG BANG TO BLACK HOLES 29 (1988).

In a curved space the shortest distance between two points is a line that curves along with space itself. In a sense, the planets couldn't care less where the sun is, and aren't connected to it by rope-like gravitational "threads"; they need no marching orders since the paths along which they travel are determined by the geometry of the space around them. So the problem of "action at a distance" is solved by a paradigm-shift — from a paradigm in which space was seen as absolute and uniform, and simply part of the background,[20] to a paradigm in which space is seen as relative and not uniform at all, and just as much a part of the foreground as the objects within it.

2. Curving Legal "Space." — Newton's conception of space as empty, unstructured background parallels the legal paradigm in which state power, including judicial power, stands apart from the neutral, "natural" order of things. In the realm of physics, Einstein trenchantly criticized the world view in which

> space as such is assigned a role in the system of physics that distinguishes it from all other elements of physical description. It plays a determining role in all processes, without in its turn being influenced by them. Though such a theory is logically possible, it is on the other hand rather unsatisfactory. Newton had been fully aware of this deficiency, but he had also clearly understood that no other path was open to physics in his time.[21]

In Einstein's view, space is not the neutral "stage" upon which the play is acted, but rather is merely one actor among others, all of whom interact in the unfolding of the story. Einstein's brilliance was to recognize that in comprehending physical reality the "background" could not be abstracted from the "foreground." In the paradigm inspired by Einstein, "[s]pace and time are now dynamic quantities: when a body moves, or a force acts, it affects the *curvature* of space and time — and in turn the structure of space-time affects the way in which bodies move and forces act."[22]

A parallel conception in the legal universe would hold that, just as space cannot extricate itself from the unfolding story of physical reality, so also the law cannot extract itself from social structures; it cannot "step back," establish an "Archimedean" reference point of detached neutrality, and selectively reach in, as though from the outside, to make fine-tuned adjustments to highly particularized con-

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[20] Karl Popper nicely describes the Kantian interpretation of Newtonian space and time: "space and time themselves are neither things nor events: they cannot even be observed: they are more elusive. They are a kind of framework for things and events: something like a system of pigeon-holes, or a filing system, for observations." K. POPPER, *Kant's Critique and Cosmology*, in CONJECTURES AND REFUTATIONS: THE GROWTH OF SCIENTIFIC KNOWLEDGE 175, 179 (rev. 4th ed. 1972).

[21] A. EINSTEIN, *supra* note 8, at 140.

[22] S. HAWKING, *supra* note 19, at 33 (emphasis added).

flicts. Each legal decision restructures the law itself, as well as the social setting in which law operates, because, like all human activity, the law is inevitably embroiled in the dialectical process whereby society is constantly recreating itself.

To provide an initial view of how useful the "curved space" metaphor might be in law, we need look no further than two of the most controversial cases that the Supreme Court decided this year.

(a) Child Abuse. — The first case concerns the tragic life of young Joshua DeShaney. Joshua was the infant son of a father who repeatedly beat him severely.[23] Despite the various warnings the social service agencies received about his father's violence, no one came to Joshua's rescue.[24] Joshua now lies in an almost vegetative state, well beyond the powers even of modern science to fully revive.[25] He lies there, forever alone in his own world, because, while the social services authorities of Winnebago County, Wisconsin dutifully recorded the awful things they knew were happening to poor Joshua and kept meticulous, bureaucratically rational records of the child's injuries, they did not lift a finger to help him.[26]

After Joshua was beaten and permanently injured by his father, Joshua's guardian sued the social workers and other local officials who had allowed those terrible beatings to occur, on the theory that their failure to act deprived him of his liberty in violation of the due process clause of the fourteenth amendment,[27] and that Joshua was therefore entitled to recover damages under the civil rights statutes.[28] The Supreme Court held in *DeShaney v. Winnebago County* that there was no violation of the fourteenth amendment, and thus no basis for recovery under the statutes enacted in the wake of the Civil War to enforce that amendment.[29]

The Court spoke movingly of what it called the "undeniably tragic" facts of the case,[30] but proceeded to say:

> nothing in the language of the Due Process Clause . . . requires the State to protect the life, liberty and property of its citizens against invasion by private actors. The Clause is phrased as a limitation on the State's power to act, not as a guarantee of certain minimal levels of safety and security.[31]

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[23] *See* DeShaney v. Winnebago County Dep't of Social Servs., 109 S. Ct. 998, 1002 (1989).

[24] *See id.* at 1001–02.

[25] *See* DeShaney v. Winnebago County Dep't of Social Servs., 812 F.2d 298, 300 (7th Cir. 1987).

[26] *See DeShaney*, 109 S. Ct. at 1010 (Brennan, J., dissenting).

[27] *See* 109 S. Ct. at 1001.

[28] 42 U.S.C. §§ 1983, 1985, 1988 (1982); *see* DeShaney v. DeShaney, No. 85-C-310, slip op. at 1 (E.D. Wis. June 20, 1986).

[29] *See* 109 S. Ct. at 1001.

[30] *See id.*

[31] *Id.* at 1003.

Near the close of the majority opinion, written by Chief Justice Rehnquist, the Court paused to note:

> Judges and lawyers, like other humans, are moved by natural sympathy in a case like this to find a way for Joshua and his mother to receive adequate compensation for the grievous harm inflicted upon them. But before yielding to that impulse, it is well to remember once again that the harm was inflicted not by the State of Wisconsin, but by Joshua's father. The most that can be said of the state functionaries in this case is that they stood by and did nothing when suspicious circumstances dictated a more active role for them.[32]

The Court went on to say, in defense of the officials, that

> had they moved too soon to take custody of the son away from the father, they would likely have been met with charges of improperly intruding into the parent-child relationship, charges based on the same Due Process Clause that forms the basis for the present charge of failure to provide adequate protection.[33]

Justice Blackmun, in a bitter dissent, chided the majority for purporting "to be the dispassionate oracle of the law, unmoved by 'natural sympathy.'"[34] He compared the Rehnquist Court to "the antebellum judges who denied relief to fugitive slaves."[35] He had little sympathy for the Court's claim that "its decision, however harsh, is compelled by existing legal doctrine."[36] In his view, the question was "an open one."[37] He argued that the fourteenth amendment precedents could "be read more broadly or narrowly depending upon how one chooses to read them."[38] He wrote that, faced with such a choice, *he* "would adopt a 'sympathetic' reading, one which comports with dictates of fundamental justice and recognizes that compassion need not be exiled from the province of judging."[39]

My purpose here is not to take any position on who has the better of the argument. My distress centers neither on the majority's result, nor on the notion that the majority was too hard-hearted — too unwilling to allow reason to be tempered with mercy. Indeed, I would reject the idea that the majority's mode of analysis really *had* "reason" on its side, or that the dissenters came out where they did principally because they allowed themselves to feel more sympathy for Joshua. My trouble is with the majority's quite primitive vision of the state

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[32] *Id.* at 1007.
[33] *Id.*
[34] *Id.* at 1012 (Blackmun, J., dissenting).
[35] *Id.*
[36] *Id.*
[37] *Id.*
[38] *Id.*
[39] *Id.*

of Wisconsin as some sort of distinct object, a kind of machine that must be understood to act upon a pre-political, natural order of private life. From the majority's perspective, the state of Wisconsin operates as a thing, its arms exerting force from a safe distance upon a sometimes unpleasant natural world, in which the abuse of children is an unfortunate, yet external, ante-legal and pre-political fact of our society.[40] Courts, as passive and detached observers, may reach in to offer a helping hand only when another arm of the state has reached out and shattered this natural, pre-political order by itself directly harming a young child.

Within the majority's stilted pre-modern paradigm,[41] there is no hint that the hand of the observing state may itself have played a major role in shaping the world it observes. Thus when the Supreme Court majority looked out at one of the most defenseless persons in the universe we know — an abused child — it did not inquire whether the hand of the state may have altered an already political landscape in a way that encouraged such child-beating to go uncorrected. The majority's question in *DeShaney* was simply, "did the State of Wisconsin beat up that child?" and not, "did the law of Wisconsin, taken in its entirety, warp the legal landscape so that it in effect deflected the assistance otherwise available to Joshua DeShaney?"

Only Justice Brennan's dissent bothered to ask whether the state of Wisconsin — by establishing a child welfare system specifically to help children like Joshua, by creating a system for investigating reported instances of child abuse, and by outlawing private intrusions into a home where a child seems imperiled — effectively *channeled* all reports of such abuse, and all actions in response to such reports, to specific agencies. In this way, the state invited citizens and others "to depend on local departments of social services . . . to protect children from abuse."[42] The dissenters, in what I would praise as an

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[40] In my book, L. TRIBE, CONSTITUTIONAL CHOICES (1985), I argue that there is a psychological and ideological predilection to perceive the existence of a private sphere — albeit circumscribed by law and by the state — in which actions are autonomous: "Many of us . . . cling to such institutions as freedom of contract and private property, viewing them as a natural, 'given' part of the legal landscape which provides a background for our private, consensual transactions." *Id.* at 264.

[41] I use the term "modern" to capture the movement in both the sciences and the arts. In a discussion of cubism, Eugene Lunn states:

> While the symbolists and impressionists had exploited metaphor and color to aestheticize reality, the cubists more directly assaulted the notion of art as leading an independent hermetic existence insulated from the outer visible world. At the same time, they sought to show through such means as incorporating 'found objects' (e.g., news pages, pieces of cord or of wood) that art is not a window into the 'external' world but an aspect of 'reality' itself.

E. LUNN, MARXISM AND MODERNISM: AN HISTORICAL STUDY OF LUKACS, BRECHT, BENJAMIN, AND ADORNO 49 (1982).

[42] 109 S. Ct. at 1010 (Brennan, J., joined by Marshall and Blackmun, JJ., dissenting).

admirably post-Newtonian insight, concluded that it belied reality to contend that the state had done *nothing* with respect to Joshua. On the contrary, Wisconsin's child-protection program "actively intervened in Joshua's life" and "effectively confined [him] within the walls of Randy DeShaney's violent home until such time as DSS took action to remove him."[43] "Conceivably, . . . children like Joshua are made worse off," the dissenters reasoned, "by the existence of this program when the persons and entities charged with carrying it out fail to do their jobs."[44]

Justice Brennan relied heavily on *Youngberg v. Romeo*[45] and *Estelle v. Gamble*[46] — cases holding that the due process clause requires that persons institutionalized by the state be provided with services sufficient to meet basic needs. (In *Youngberg* the institution was a psychiatric hospital; in *Estelle*, it was a prison.) Justice Brennan read these cases "to stand for the . . . generous proposition that, if a State cuts off private sources of aid and then itself refuses to aid, it cannot wash its hands of the harm that results from its inaction."[47] From there he found the *DeShaney* case but a small jump away.

But *Youngberg* and *Estelle*, like two will-o'-the-wisps, seem to have lured Justice Brennan away from the perhaps deeper insights offered by *Boddie v. Connecticut*.[48] In *Boddie*, an indigent couple could not obtain a divorce because they could not afford the filing fee. The Court held:

> given the basic position of the marriage relationship in this society's hierarchy of values and the concomitant state monopolization of the means for legally dissolving this relationship, due process does prohibit a State from denying, solely because of inability to pay, access to its courts to individuals who seek judicial dissolution of their marriages.[49]

Of course, Justice Brennan did cite *Boddie* — for the proposition that "the monopolization of a particular path of relief may impose upon the State certain positive duties."[50] He labeled it as "instructive"

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[43] *Id.* at 1011.

[44] *Id.*

[45] 457 U.S. 307 (1982).

[46] 429 U.S. 97 (1976).

[47] 109 S. Ct. at 1009. *See also* RESTATEMENT (SECOND) OF TORTS § 324 (1965) (stating that one who comes to the aid of a person and then leaves that person in a worse position is liable for that person's injury); Black v. New York, N.H. & H.R.R., 193 Mass. 448, 79 N.E. 797 (1907) (holding defendant liable for leaving intoxicated plaintiff in a dangerous position after helping him off a train); Zelenko v. Gimbel Bros., 158 Misc. 904, 287 N.Y.S. 134 (Sup. Ct., Special Term 1935) (holding defendant liable for rendering insufficient medical aid when defendant's action cut off plaintiff's intestate from other sources of aid), *aff'd*, 247 A.D. 867, 287 N.Y.S 136 (1936).

[48] 401 U.S. 371 (1971).

[49] *Id.* at 374.

[50] 109 S. Ct. at 1009.

and included it within a class of cases that "signal that a state's prior actions may be decisive in analyzing the constitutional significance of its inaction."[51] Justice Brennan portrayed *Boddie* as a close parallel to *Youngberg* and *Estelle*: "I . . . would locate the DeShaneys' claims within the framework of cases like *Youngberg* and *Estelle*, and more generally, *Boddie* . . . ."[52]

Yet there is a fundamental distinction to be made between *Youngberg* and *Estelle* on the one hand, and *Boddie* on the other. In both *Youngberg* and *Estelle*, it was the state's institutionalization of a *particular individual* that had isolated that person from alternative means of fulfilling his or her basic needs. In *Boddie*, however, there had been no previous state action directed at the particular individual. It was the legal structure itself — combined, to be sure, with the economic and social circumstances of the individual — that had isolated the person from the fulfillment of an important need.

Boddie, instead of focusing in a Newtonian way on the isolated forces acting on particular individuals, introduced the curved space of a post-Newtonian world in which the focus broadens to encompass the larger geometry of the "space" in which the relevant events and persons interact. If the law creates a state monopoly over the fulfillment of certain needs (dissolution of a failed marriage, protection from a violent parent) and thereby renders some, but not all, individuals particularly vulnerable, can the very act of creating this legal *structure* constitute state action violative of due process? Has the creation of a state monopoly over the fulfillment of a category of needs warped legal space itself in a cognizable fashion? *Boddie* answers "yes," at least where the state's interest in preserving that legal structure inviolate is insufficient to "override the interest" of the plaintiff.[53]

Although Justice Brennan stressed *Youngberg* and *Estelle*, the spirit of his argument seems to derive from *Boddie*. From a post-Newtonian perspective, *Boddie* is the more dramatic case and provides the stronger parallel to *DeShaney*. As in *Boddie*, the governmental act in *DeShaney* that isolated Joshua — that is, the establishment of a legal structure that narrowly channeled all information and action in regard to child abuse — was not a force directed at Joshua personally; his isolation was a result of the simple juxtaposition of Wisconsin law and his personal situation. And, again as in *Boddie*, it was the monopoly created by the legal structure in *DeShaney* that made the plaintiff peculiarly vulnerable.[54]

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[51] *Id.* at 1010.

[52] *Id.*

[53] 401 U.S. at 381.

[54] A similar analysis helps shed light on the Supreme Court's less distressing but still quite primitive 5–4 decision in National Collegiate Athletic Association v. Tarkanian, 109 S. Ct. 454 (1988). There, the Court reasoned that the NCAA was not a "state actor" suable under 42

We may all be engulfed by, and dependent upon, the structure of the law, but we are not all rendered equally vulnerable by it. If the special dependence upon the law and its omissions that is experienced by the most vulnerable among us could be dismissed as irrelevant because it was not directly created by any state force targeting such individuals, their heightened dependence might be seen as legally immaterial. But if the systemic vulnerability of some — battered children are perhaps prime examples — is instead regarded as centrally relevant to how the law's shape should be understood, then one is more likely at least to ask whether the legal system's very failure to do more for such persons might not work an unconstitutional deprivation of their rights. The Newtonian judge, viewing those whose fate she determines as though from a removed, objective vantage point, can easily absolve the state of responsibility for their plight. But her post-Newtonian judicial counterpart, viewing the perspectives of those whom her ruling affects as no less legitimate than her own, and asking what social space the body of legal rules helps to define, may find it more difficult to distance the state from the helplessness of the most vulnerable.

The approach I am suggesting here need not lend itself to, nor embrace, an ideology of paternalism. A post-Newtonian heuristic does not force answers upon us; rather, it pushes us to more probing questions. It is not a cry for "all power to the judges," but rather a plea for circumspection and questioning in assessing how the distribution and direction of all public powers — including those of judges — define the legal space through which we all move, and in whose recesses some of us are lost. It may well be that those who are most likely to be lost are those for whom this plea would make the greatest difference. For it is the most vulnerable, the most forgotten, whose perspective is least akin to that of the lawmaker or judge or bureaucrat and whose fate is most forcefully determined by the law's overall design — by its least visible, most deeply embedded gaps and deflec-

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U.S.C. § 1983 by the University of Nevada's basketball coach, Jerry Tarkanian, who had been suspended by the University of Nevada in direct compliance with the NCAA's rules and recommendations. The Newtonian lines of force pointed from the state university to the coach. There was a powerful argument that the NCAA action was procedurally unfair and that it decisively shaped the action of the state university, but only the four dissenters saw in that joint relationship a basis for treating the NCAA as part of the state structure. The fact that the majority opinion was written by Justice Stevens and that "conservative" Justices White and O'Connor (as well as Justices Brennan and Marshall) saw the space warp through more modern eyes illustrates the fact that the Newton-Einstein dichotomy need not be congruent with a simple conservative-liberal division. Justice Stevens, observing for the majority that the traditional state action case is one where the state lurks in the background, says "the mirror image presented in this case requires us to step through an analytical looking glass to resolve it." 109 S. Ct. at 462. When Justice Stevens and his four brethren step through, they ignore the way the mirror bends what they can see.

tions. By another route we arrive at philosopher John Rawls' conclusion that the fundamental fairness of a society is best judged by an examination of its treatment of the least advantaged.[55]

The fact that Justice Brennan's arguments were the impassioned words only of a dissent in *DeShaney* unfortunately reflects the reality that the still-reigning paradigm of constitutional law stands in sharp contrast to most contemporary modes of social thought.

(b) Abortion. — Perhaps an even more dramatic illustration of the persistence or resurgence of the pre-modern paradigm in law is the perspective expressed by my colleague Charles Fried, who served as Solicitor General during the Reagan years, when he returned to the Supreme Court on behalf of the Bush Administration to urge the Court to overturn *Roe v. Wade*.[56] In his argument in *Webster v. Reproductive Health Services*,[57] Mr. Fried was asked by Justice O'Connor:

> Do you think that the state has the right to, if . . . we had a serious overpopulation problem, . . . require women to have abortions after so many children?

Mr. Fried answered:

> I surely do not. That would be quite a different matter.

Justice O'Connor pressed on:

> What do you rest that on?

Mr. Fried responded:

> Because unlike abortion . . . , that would involve not preventing an operation but violently taking hands on, laying hands on a woman and submitting her to an operation . . . .[58]

In drawing his distinction between a forced abortion and a forced pregnancy, Mr. Fried implicitly invoked the notion that, when the state makes abortion a crime, it is not *intervening* in the natural order of things but is simply requiring people to let "nature" take its course. It is as though the state were not genuinely "acting" at all.

Whatever one's position on a woman's "right to choose" in reproductive matters, it seems extraordinarily difficult to justify the constitutional distinction pressed by Charles Fried in *Webster* between the state's power to *require* an abortion in certain circumstances and the state's power to *forbid* one. One could as well define "natural" in a way that allowed a woman who desires an abortion, and a doctor

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[55] *See* J. RAWLS, A THEORY OF JUSTICE (1971).

[56] 410 U.S. 113 (1973).

[57] 109 S. Ct. 3040 (1989).

[58] N.Y. Times, Apr. 27, 1989, at B12, col. 5.

who has the skills and equipment to perform one, to engage in a transaction undisturbed by the state.[59]

To be sure, even if a woman were still deemed to have a fundamental right to make her own choice regarding the continuation or termination of a pregnancy, the state *might* be said to have a compelling justification that offsets her right from the moment of conception, in the case where the woman's choice is to *terminate* the pregnancy but not in the case where her choice is to *continue* it. But any such view collapses the woman's "right to make her own choice" into a pseudo-right to "choose" in only one direction. In what would this asymmetry be grounded? Once the state reaches the threshold of eliminating the woman's choice by taking control over a woman's womb from the point of conception, there remains no logical demarcation — no hierarchy of "natural" and "artificial" — that would preclude the declaration at some future time of compelling state interests supporting mandatory abortions.

I have elsewhere observed that the state makes women and men unequal before the law by automatically translating biology into social destiny, thereby denying women power over both their bodies and their futures.[60] This manipulable concept of a "natural" social order, providing a backdrop to state action, is often employed to negate the state's role in and responsibility for creating and reinforcing power relations.[61] The Court's willingness to uphold laws whose apparent

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[59] It would be hard to say what the "natural" outcome of the Davis couple's divorce dispute over seven frozen "pre-embryos" (fertilized ova) would have been. *See* Davis v. Davis, 1989 Tenn. App. LEXIS 641 (No. E-14496 Sept. 21, 1989) (granting Mrs. Davis "temporary custody" of the pre-embryos for purposes of implantation).

[60] *See* L. TRIBE, *supra* note 40, at 243. Of course, treating nature as social destiny can also disadvantage men — as shown in Michael H. v. Gerald D., 109 S. Ct. 2333 (1989), where a plurality of the Court, led by Justice Scalia, rejected a California man's claim that he had a constitutionally protected "liberty" interest in protecting his parental relationship with a daughter whom he had fathered with a woman who was then married to another man. *Michael H.* again reflects the view that the Constitution is satisfied so long as the law merely "mirrors" and thereby reinforces what is "natural" — such as marital fidelity and continuation of female pregnancy. Indeed, the plurality offers the revealing remark that "California law, like nature itself, makes no provision for dual fatherhood." *Id.* at 2339. For an argument that equal protection might be better suited than due process to the task of challenging traditional practices, see Sunstein, *Sexual Orientation and the Constitution: A Note on the Relationship Between Due Process and Equal Protection*, 55 U. CHI. L. REV. 1161, 1170–79 (1988).

[61] In *Constitutional Choices*, I propose another example of the manipulation of the "natural" in discussing the vanishing procedural rights of the dispossessed

> when creditors are invited by law to seize and sell, without a whisper of official involvement, the items for which such creditors claim not to have been paid. This practice was held by the Court in *Flagg Brothers, Inc. v. Brooks* to be immune from constitutional scrutiny . . . essentially on the ground that this is what creditors would 'naturally' tend to do in the economic jungle: authorizing creditors to do what they would do anyway, the *Flagg* Court reasoned, mirrors economic reality accurately enough to free the state from any responsibility at all — and thus to render inapplicable the protections afforded by the Fourteenth Amendment.

L. TRIBE, *supra* note 40, at 242 (footnotes omitted).

injustice is thought simply to reflect the world's own cruelty — to women, to the poor, or to both — seems most vivid in the abortion funding cases, which upheld bans on federally funded abortions for those otherwise unable to pay for them.[62] If we can define social problems as within the "natural" order, then we can quietly blame a god or, as Social Darwinism did, biology. But perhaps "[t]he fault, dear Brutus, is not in our stars, [b]ut in ourselves."[63]

In *Webster*, the Supreme Court went further than it had in the abortion funding cases: *Webster* upheld a ban even on *privately* financed abortions in a public facility, under a statute that defined the concept of "public facility" broadly enough to include essentially the only hospital in a large part of the state of Missouri — a hospital that was privately owned but happened to be located in a space rented from the government.[64] This was predictable not solely because the Court's composition has shifted rightward since *Roe v. Wade*, but also because, having won abortion rights in the name of personal privacy on the basis of a distinctly Newtonian vision of separate spheres of private life and public power, women have been poorly situated ever since either to demand public funds for the exercise of such "privacy" rights or to resist governmental actions that deliberately cement the "wall of separation" between the public sphere and the supposedly private choice to terminate a pregnancy.

The *Roe v. Wade* opinion ignored the way in which laws regulating pregnant women may shape the entire pattern of relationships among men, women, and children. It conceptualized abortion not in terms of the intensely *public* question of the subordination of women to men through the exploitation of pregnancy, but in terms of the purportedly *private* question of how women might make intimately personal decisions about their bodies and their lives. That vision described a part of the truth, but only what might be called the Newtonian part.

The mode of thought that, I believe, led Mr. Fried to draw the distinction he did, and that gives it considerable appeal, is one that regards the state as a kind of "thing" which the Constitution both confines within its public, political sphere, and fences out of certain

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[62] *See* Harris v. McRae, 448 U.S. 297 (1980); Poelker v. Doe, 432 U.S. 519 (1977); Maher v. Roe, 432 U.S. 464 (1977).

[63] W. SHAKESPEARE, JULIUS CAESAR, act I, scene 2, ll. 140–41, at 110 (A. Humphreys ed. 1984).

[64] *See* 109 S. Ct. at 3053. Although I gave the Cardozo Lecture several months prior to the *Webster* decision, in rewriting this paragraph I had to change little but the tenses of the verbs. The role played by *DeShaney* in the *Webster* plurality opinion is also noteworthy. *See, e.g.*, *id.* at 3050 (quoting *DeShaney* for the proposition that "the Due Process Clauses generally confer no affirmative right to governmental aid, even where such aid may be necessary to secure . . . interests of which the government itself may not deprive the individual." 109 S. Ct. at 1003). I mention these things less from the pride of a prognosticator than as a modest corroboration of the framework I am presenting.

pre-political private spheres of personal property or individual liberty. Carried to its limit, this physicalist conception of the state suggests that, whether by deploying carrots or by wielding sticks, as long as the state keeps its hands to itself, any change in social parameters simply constitutes a different menu of outcomes within which private citizens remain free to make their own choices. On this view, only the extreme situation in which the state literally grabs someone and drags her off to a jail cell or to a surgical ward would implicate the Constitution. Given the typical rhetoric of those who would reify the state, it is both sad and ironic that it is precisely this objectification which leaves personal freedom at its most vulnerable. For it is the lack of recognition that a change in the surrounding legal setting can constitute state action that most threatens the sphere of personal choice. And it is a "curved space" perspective on how law operates that leads one to focus less on the visible lines of legal force and more on how those lines are bent and directed by the law's geometry.

B. Quantum Theory

1. Altering the Physical World in the Process of Observing It. — A second advance over Newtonian physics — quantum theory — also offers significant heuristic insights for legal analysis. One of the most familiar postulates of quantum theory is the Heisenberg Uncertainty Principle, which exploded the assumption that, by taking enough care and remaining sufficiently uncoupled from the system, one could detect, with any desired degree of precision, the behavior of all objects in the universe. According to Heisenberg, the more accurately you measure where a particle is, the less accurately you are able to measure where it's going.[65] This effect grows more and more pronounced as you try to measure ever smaller things.

To see how the Heisenberg Uncertainty Principle works, imagine first a really *big* hypothetical "particle" — say, a basketball. Assume the ball is at rest, and you want to figure out where it is in relation to some fixed point — say, the floor directly beneath the basket. One obvious approach would be just to *look* at the ball — you might see that it is sitting on the rim exactly 10 feet above that fixed point. Where does the Uncertainty Principle come in? The answer is that our *viewing* the ball, in the sense of measuring its position, necessarily changes where it is. How can that be? Surely it's impossible to move a basketball just by looking at it.

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[65] For a brief but illuminating account of Heisenberg's Principle, see S. HAWKING, cited above in note 19, at 54. Hawking states: "The uncertainty principle signaled an end to Laplace's dream of a theory of science, a model of the universe that would be completely deterministic: one certainly cannot predict future events exactly if one cannot even measure the present state of the universe precisely!" *Id.* at 55.

The problem is that, for the ball to be visible, at least a little light must shine on it, and reflect off it. True, the light particles individually seem ephemeral. But when they bounce off the ball they still move it a little — although the movement usually is too small to detect with the naked eye. Of course, if light particles had the momentum of moving marbles, the movement would be obvious. And if you could tell where the basketball was located only by hitting it with light particles that had the momentum of moving basketballs, the process of finding its location would inevitably cause quite a change in velocity

That is precisely the situation at the subatomic level, the province of quantum theory. Because light particles, which physicists call photons, can easily act on the tiny electrons, using a light beam to figure out the precise location of an electron at an instant in time would significantly disturb its velocity.[66] This tradeoff is the result of the Uncertainty Principle at work. For this reason, the principle is sometimes put in terms of a relationship between the observer and the observed: the more you try to learn about an object's position, the less you can know about its velocity, and vice versa. In any case, the act of observing always affects what is observed.

The Heisenberg Principle may be applied successfully beyond the micro-level of quantum mechanics. It relies generally on two premises: first, that any observation necessarily requires intervention into the system being studied; and second, that we can never be certain that the intervention did not itself change the system in some unknown way. Consider this example:[67] You have a very ill friend in the next room at a hospital. You want to find out how she is faring. (This corresponds to the "black box" of nature — the unknown contents of which we are attempting to fathom.) You call to her, "How are you doing?" (This corresponds to the "experiment" — the question we ask of nature — the inevitable intervention into the system.) She replies, "Fine." But the effort kills her. (The word "fine" corresponds to the "outcome" or "observation" of the "experiment.") Clearly, the outcome

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[66] In more technical terms, Heisenberg states:

> The position of the electron will be known with an accuracy given by the wave length of the gamma ray. The electron may have been practically at rest before the observation. But in the act of observation at least one light quantum of the gamma ray must have passed the microscope and must first have been deflected by the electron. Therefore, the electron has been pushed by the light quantum, it has changed its momentum and its velocity, and one can show that the uncertainty of this change is just big enough to guarantee the validity of the uncertainty relations.

W. HEISENBERG, PHYSICS AND PHILOSOPHY: THE REVOLUTION IN MODERN SCIENCE 47–48 (1958).

[67] For this example I am indebted to Professor Robert Fisher, a former economist who is now a law student at Harvard. Professor Fisher is reluctant to take credit for the example's originality.

is sadly misleading — the very process of observation changed the system under study.

The deeper philosophical insight underlying the Heisenberg Principle is, of course, that the observer is never really separate from the system being studied, even though the contrary presumption might occasionally be a useful abstraction. In some disciplines the importance of this insight is obvious. For example, no culture can ever be studied in its "pristine" state since the very presence of an anthropologist is bound to have a significant impact on the way of life of the people being studied.[68]

Applications of the Heisenberg Principle within the social sciences are not limited to such circumstances. For example, in the heyday of "scientific management," an experiment was conducted at General Electric's Hawthorne plant to see if improved lighting would lead to greater labor productivity. The experimenters found that it did. Just to be sure of their results, however, they also turned the lights down for a while. To their surprise, productivity increased yet again. As a recent article stated: "just about anything done to the Hawthorne workers increased productivity. They liked the attention."[69]

Although quantum theory arose to deal with very small phenomena, whereas general relativity seeks to explain very large phenomena, these key revolutions appear to be connected in important ways. Contemporary physicists like Stephen Hawking and Steven Weinberg are trying to unify general relativity — the very big — and quantum theory — the very small — by studying black holes and exploring what the universe was like in the infinitesimal fractions of a second following the "Big Bang" that marked its creation. They aim to explain the basic forces of the universe in a "Unified Field Theory." Physicists ultimately hope to arrive at what they have termed a "Theory of Everything."[70]

For our more modest purposes we should note a conceptual link between these two revolutions in physics. Both general relativity and quantum theory deny the possibility of isolation. Modern physics is dynamic as opposed to static — in the sense that it recognizes the

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[68] *See generally* J. CLIFFORD, THE PREDICAMENT OF CULTURE (1988); J. CLIFFORD & G. MARCUS, WRITING CULTURE (1986); G. MARCUS & M. FISHER, ANTHROPOLOGY AS CULTURAL CRITIQUE (1986).

[69] *Management Brief: To MBA or Not To MBA*, ECONOMIST, July 8, 1989, at 66.

[70] Hawking explains:

> The quest for such a theory is known as "the unification of physics." Einstein spent most of his later years unsuccessfully searching for a unified theory, but the time was not ripe: there were partial theories for gravity and the electromagnetic force, but very little was known about the nuclear forces. Moreover, Einstein refused to believe in the reality of quantum mechanics, despite the important role he had played in its development. Yet it seems that the uncertainty principle is a fundamental feature of the universe we live in.

S. HAWKING, *supra* note 19, at 155–56.

importance of interaction between background and foreground,[71] between subject and object, between observer and the phenomena observed. As we have noted, it is this recognition of *pervasive interaction* that is now quite commonplace in many disciplines besides physics.[72] It is this recognition that I think has come to affect our ordinary understanding of the legal world — so deeply as to make some of what the Court says in a case like *DeShaney*, and much of what the Justice Department argued in a case like *Webster*, appear quite counterintuitive to many of us, even if we have a hard time saying exactly *why*. As I have said, our formal conceptions of constitutional law have yet to catch up with our intuitions. Like Moliere's gentleman who had been speaking prose all his life but did not know it, we have become physicists behind our backs.

2. Altering the Legal World in the Process of "Observing" It. — If law is, in fact, best understood through some such post-Newtonian framework, then courts do not have the luxury of deciding who did what to whom, measuring that conduct against pre-existing norms, awarding appropriate relief, and then proceeding as though the relief granted or withheld were all that ultimately mattered. Instead, courts must take account of how the very process of legal "observation" (i.e., judging) shapes both the judges themselves and the materials being judged. The results courts announce — the ways they view the legal terrain and what they say about it — will in turn have continuing effects that reshape the nature of what the courts initially undertook to review, even beyond anything they directly order anyone to do or refrain from doing. The law is thus not simply a backdrop against which action may be viewed — even a "backdrop" that may be "curved" by the acting objects themselves — but is itself an integral part of that action. As Clifford Geertz puts it: "The state enacts an image of order that — a model for its beholders, in and of itself — orders society."[73]

The case of *Wooley v. Maynard*[74] well illustrates how the process of observation alters the thing observed. In *Wooley*, two Jehovah's Witnesses, George and Maxine Maynard, sought declaratory and injunctive relief under 42 U.S.C. § 1983 against the enforcement of a state statute that forbade obscuring the state motto, "Live Free or Die," on New Hampshire license plates.[75] The Maynards objected to being forced to display this statement on the ground that it was

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[71] There is a fine chapter (Ch. III) on *Figure and Ground* in Douglas Hofstadter's Pulitzer Prize winning book GÖDEL, ESCHER, BACH: AN ETERNAL GOLDEN BRAID 64–81 (1979).

[72] Anthropology and history are two examples.

[73] C. GEERTZ, LOCAL KNOWLEDGE: FURTHER ESSAYS IN INTERPRETIVE ANTHROPOLOGY 30 (1983).

[74] 430 U.S. 705 (1977).

[75] *See id.* at 707.

contrary to their religious and political beliefs.[76] The district court had held that covering over the motto was constitutionally protected expression.[77] The Supreme Court did not reach the symbolic speech issue, upon which the district court had relied, and instead focused on "the proposition that the right of freedom of thought protected by the First Amendment against state action includes both the right to speak freely and the right to refrain from speaking at all."[78] The majority held that the state may not "constitutionally require an individual to participate in the dissemination of an ideological message by displaying it on his private property in a manner and for the express purpose that it be observed and read by the public."[79]

The *Wooley* Court implicitly regarded itself as occupying an Archimedean reference point — a removed observation post from which all could be safely viewed. How else can one understand the Court's description of the Maynards' request for license plates without the state motto as "hardly consistent with [their] stated intent to communicate affirmative opposition to the motto"?[80] The Court assumed that, if the Maynards were trying to *say* something by covering over the motto, they would want to continue to keep it covered. Their request for the "expurgated" plates was thus seen by the Court as inconsistent with their defense of symbolic expression.

For this analysis to make sense, the Court had to ignore its own existence and the impact of its own statements on the situation before it. For might not the Maynards *change* what they wanted to express if they went from a world in which they were coerced to advertise the state motto (the pre-judgment situation) to a world in which they are no longer required to do so (the post-judgment situation which they have requested)? Any subsequent display by the Maynards of license plates *without* the state motto would surely be symbolic expression — especially if one focuses on the fact that the Maynards would have one of the small number of New Hampshire automobiles (barring the few legal exceptions) not displaying the state motto. In fact, the very existence of the controversy may have made the Maynards public figures in New Hampshire. In such a scenario, their display of license plates without the state's motto may well be understood by many as a symbolic expression. Indeed, why go to jail, as Mr. Maynard did, over a symbol if *not* as a symbol?

In cases such as this — perhaps in all cases — social meaning can be understood only from a post-Newtonian perspective. The Court, the Maynards and the rest of society are interlocked in a complex grid

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[76] *See id.* at 707–09.
[77] *See id.* at 713.
[78] *Id.* at 714.
[79] *Id.* at 713.
[80] *Id.* at 713 n.10.

of meanings, linking message to context, context to judicial and other state actions, and state action back to message. The law, as it develops, constantly alters the warp and woof of the relevant epistemological space. The Court cannot delete its own existence from its analysis and still arrive at sensible results.

A post-Newtonian perspective obviously cannot dictate the conclusions a court must reach, but it can suggest the questions it should ask. Nor need the post-Newtonian view tilt those questions toward supposedly "liberal" outcomes. For example, a post-Newtonian might well note, as Justice Rehnquist did in his dissent in *Wooley*, that the very existence of the challenged New Hampshire law in a sense *protected* free speech rights. For it was well known that people had no choice about whether the state motto was to appear on their license plates.[81] Hence, to have the state motto on one's plates in no way implied any particular feelings or beliefs on the part of the owner of the car.[82] Why, then, did the Court see any first amendment problem at all? The majority did not really offer an explanation.

Ironically, by requiring the state to give people the option whether or not to have its motto displayed on their license plates, the *Wooley* Court forced people into a symbolic expression. Once they had been given the choice as a matter of law, it would have become well-known that there was indeed such an option. Hence, whether or not one displays the motto in a post-*Wooley* world will come to be seen as a personal statement. All car owners *must* then express themselves one way or the other. This forced symbolic expression may itself be problematic, given the Court's statement that the first amendment "includes both the right to speak freely and the right to refrain from speaking at all."[83] An adequate constitutional analysis cannot ignore the impact on social meaning of the Court's own action.

Similar insights provided by a post-Newtonian paradigm become even more poignant in the constitutional analysis of laws requiring children at school to salute the flag and to pledge allegiance.[84] When it is known by all that such a salute and pledge are required, the actual performance by any one individual is unlikely to be perceived by others as an expression intended by that person to convey anything about the individual's views. On the other hand, once one introduces — whether by statute or by Supreme Court decree — such options as leaving the room, or remaining silent and motionless, an expression of views is in a sense coerced. Only making the pledge mandatory at one extreme — or eliminating it altogether, at the other extreme — can remove that effect. It does not follow that the Court's "opt-out"

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[81] *See id.* at 721 (Rehnquist, J., dissenting).

[82] *See id.* at 722.

[83] 430 U.S. at 714.

[84] *See* West Virginia State Bd. of Educ. v. Barnette, 319 U.S. 624 (1943).

solution was inappropriate — either in its flag pledge case, or in *Wooley*. But it *does* follow that, in assessing any judicial solution, a post-Newtonian would feel constrained at least to consider how the judiciary's own action would necessarily alter the social reality under adjudication, by changing the meanings of the various acts or omissions at issue.

So too, when the Court observes and describes the legal phenomena at issue in cases like *DeShaney* and *Webster*, we sense, among other things, that it is not simply taking measurements and making a record of something that is already "out there." Rather, it is bending and changing the legal and social landscape so that, after such cases are decided, people will be guided by assumptions and premises and patterns that differ from those that shaped their behavior before those cases were decided.

Thus it is the picture of the court as a largely passive observer, and of the state as a subject exerting force from a safe distance upon the natural world regarded as an external and pre-political object, that, for most of us, is false to our sense of reality. And it is this picture that I think can be usefully dissolved, and then helpfully refocused, from the perspective of twentieth-century physics.

III. Changing Legal Paradigms

Lawyers and judges have incorporated post-Newtonian insights into some areas of law, but those insights still have a tentative foothold in the culture of accepted legal argument and analysis. As I seek to show in what follows, perhaps the earliest dramatic break with the Newtonian vision of a pre-political and pre-legal background came with the demise of *Lochner v. New York*[85] in the early twentieth century. Later, in *Shelley v. Kraemer*[86] and in a series of first amendment cases beginning with *New York Times v. Sullivan*,[87] the Supreme Court extended what might be understood as post-Newtonian conceptions into other areas of the law. However, as the Court's decisions in *Pasadena City Board of Education v. Spangler*[88] and *Milliken v. Bradley*[89] suggest, the pre-modern paradigm still reigns in much of legal analysis (notably also in some law and economics scholarship[90])

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[85] 198 U.S. 45 (1905).

[86] 334 U.S. 1 (1948). *See* L. Tribe, *supra* note 40, ch. 16.

[87] 376 U.S. 254 (1964).

[88] 427 U.S. 424 (1976).

[89] 433 U.S. 267 (1977).

[90] Insights and images traceable to physics may already have played a significant role in shaping law and economics scholarship. Neoclassical economics, upon which much of law and economics draws, assumes, like Newtonian physics, a fixed background: the structure of markets and the motivations of consumers. It then attempts to predict the behavior of markets and consumers without considering how they might fundamentally alter each other in the process of

and appears to have undergone a revival under the Burger and Rehnquist Courts.

A. The Delayed Demise of Lochner v. New York

During the early twentieth century, lawyers began to question whether the background of social and economic relations that legislation sought to change might not itself be part of what the law had wrought. Many observers were unpersuaded by the reasoning of judicial decisions from the 1890's to the 1930's that treated "property" and "contract" as categories somehow preexisting the artifice of law. It was the formal rejection of such treatment that finally ended the now infamous *Lochner* era in 1937. The Supreme Court accommodated its doctrine to the growing belief that the "brooding omnipresence" of the common law was not a fact of nature, but an artifact of politics and government and of judge-made rules. In essence, the post-*Lochner* Court acknowledged that the property interests available

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interacting. The neoclassical economic assumption that people are rational optimizers is also akin to the Newtonian postulate that objects in the physical world act on one another according to simple, observable laws.

This parallel is no accident. Economist Phil Mirowski has unearthed a link between neoclassical economics and pre-modern physics. He argues:

> in the final analysis, however coy and ambivalent neoclassicals may appear to be about their physics metaphor, it cannot seriously be repudiated or relinquished, because there is nothing else that can hold the neoclassical research program together. In the absence of the metaphor of utility as nineteenth-century potential energy, there is no alternative theory of value, no heuristic guide to research, no principle upon which to base mathematical formalism.

P. Mirowski, More Heat Than Light 287 (1989) (unpublished manuscript) (on file at the Harvard Law School Library) (emphasis omitted). Mirowski goes on to argue that neoclassical economics borrowed not only its metaphor from nineteenth-century physics, but its legitimacy as well, *see id.* at 280 — a dangerous loan, indeed, to the extent that new ways of seeing the physical world can subvert the claim that economics has finally become scientific. *See id.*

Once we are aware of underlying analytical presumptions that may have been incorporated into at least some versions of the law and economics method, we can consider alternative metaphors from modern physics that may lead us to ask more fruitful legal questions. As I argued in my article, *Constitutional Calculus: Equal Justice or Economic Efficiency*, cited above in note 2, the law and economics school often proceeds as if unaware that constitutional choices affect, and hence require consideration of, the way in which a polity wishes to constitute itself: "A court not only chooses *how* to achieve preexisting ends, but also affects *what* those ends are to be and *who* we are to become." *Id.* at 595 (emphasis in original).

In contrast, some of the best law and economics scholarship, perhaps influenced by post-Newtonian concepts, evokes the warped space notion of general relativity as well as the Heisenbergian view of joint causation and nondeterminism. Whether pre- or post-Newtonian, physics metaphors and concepts have filtered into the development of law and economics but have, thus far, done relatively little to dislodge the persistent notion (reminiscent of neoclassical economics) that the preferences of economic actors are given, rather than shaped by the markets within which those actors' choices are made. *See* Tribe, *Policy Science: Analysis or Ideology?*, *supra* note 2; Tribe, *Constitutional Calculus: Equal Justice or Economic Efficiency*, *supra* note 2.

for people to use as contractual bargaining chips had all along been largely the reflections of prior social choices, expressed through law, about the acquisition and allocation of control over human and material resources, and that a law banning certain employer-employee bargains as unfairly exploitative was therefore no more an affront to the "natural order of things" than were the legal understandings making such one-sided bargains possible in the first place.[91] It is no coincidence that *Erie R.R. Co. v. Tompkins*,[92] which in 1938 ended the *Swift v. Tyson*[93] era in which federal courts had felt free to follow their own views of general common law, was decided within a year of the watershed decision in *West Coast Hotel v. Parrish*,[94] which upheld laws restricting the "liberty of contract" between employers and employees.

In many other areas of law, the Supreme Court has similarly come to recognize that the state cannot be understood as some sort of robot-like thing that one can observe walking about, a machine whose arms — and it's instructive that we still speak of the "arms of the state" — sometimes reach out and grab a Joshua DeShaney, sometimes reach out and perform surgery on an unwilling woman, sometimes interfere with free exchanges between businesses and consumers.

B. The Tentative Emergence of a Post-Newtonian Paradigm

If we are to conduct constitutional discourse through conversation truer to contemporary sensibilities — abandoning the prism of Newtonian physics and its legal analogies — then we must consistently speak of the state not as a thing but as a set of rules, principles, and conceptions that interact with a background which is in part a product of prior political actions. And we must talk of the events and people involved without pretending they are pre-political; they too are in part shaped by political and legal interactions.

The Supreme Court recognized as much in *Shelley v. Kraemer*,[95] when it held that the common law of Missouri violated the fourteenth amendment insofar as that state's common law made racially restrictive covenants, but not other restraints on the alienation of land, judicially enforceable. Notwithstanding the absence of any racist decision by any particular state actor, what was crucial in *Shelley* was the *geometry* of the state's common law: it drew a line between those

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[91] *See* L. TRIBE, AMERICAN CONSTITUTIONAL LAW ch. 8 (2d ed. 1988) (describing the rise and fall of Lochnerism); *see also* Sunstein, *Lochner's Legacy*, 87 COLUM. L. REV. 873 (1987) (suggesting that *Lochner* represents a constitutional requirement of neutrality toward preexisting entitlements, a view that persists in the law to this day).

[92] 304 U.S. 64 (1938).

[93] 41 U.S. (16 Pet.) 1 (1842).

[94] 300 U.S. 379 (1937).

[95] 334 U.S. 1 (1948).

restraints on land sales that courts would enforce and those that they would not enforce, and knowingly put racially restrictive covenants on the enforceable side of that line.

A similar understanding of the "geometry" of law was at work in *New York Times v. Sullivan*,[96] in *NAACP v. Claiborne Hardware Co.*,[97] and in *Hustler Magazine v. Falwell*.[98] In each of those decisions, the Supreme Court held that first amendment principles were violated not by some state official's act of censorship but by the *overall shape* of the state's body of judge-made rules for awarding damages to people allegedly injured by speeches or publications. The fact that the "chilling effect" upon the speech involved in those cases was caused not by any discrete act of a government official, but by the fabric of legal rules developed in a given jurisdiction over time, has not prevented the Supreme Court from perceiving that this fabric of rules might violate the first amendment.

In fact, the Supreme Court's entire development of the "chilling effect" doctrine over the past several decades[99] itself reflects a judicial recognition that widespread private behavior, in the form of self-censorship, can be directly traceable not only to particular enforcement actions by specific state officials but to the very existence of a set of rules or lines that the state stands ready to enforce or to draw. A primitive conception of the state as a mechanism that operates only through exerting direct vectors of force in particular cases could not possibly account for this doctrine. A retreat from the Supreme Court's once vigorous concern with this "chilling" of protected speech might well reflect a partial throwback to a more primitive paradigm.

The paradigm-shift toward a mode of thought that stresses both the geometry of the legal landscape and the interaction between the legal observer and the phenomenon observed thus has deep roots in existing practices and ways of thinking about law. It also accounts for many of the most powerful and salutary insights of contemporary legal analysis. We need not return to the more primitive and simplistic paradigm in which the universe is seen as an empty and apolitical space across whose vast reaches legal actors hurl their thunderbolts of force at distant and discrete objects.

C. Judicial Retrogression[100]

We are not doomed to do so — but we sometimes do. Consider the 1976 case of *Pasadena City Board of Education v. Spangler*.[101]

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[96] 376 U.S. 254 (1964).

[97] 458 U.S. 886 (1982).

[98] 485 U.S. 46 (1988).

[99] *See* L. TRIBE, *supra* note 91, at 861–86.

[100] This section is heavily influenced by Gene Sperling's excellent Note, *Judicial Right Declaration and Entrenched Discrimination*, 94 YALE L.J. 1741 (1985).

[101] 427 U.S. 424 (1976).

That case appears to concern two fairly simple linear relationships: to what extent a federal district court may control a school board, and to what extent a school board may control the movements of the families who live in the school district.

In *Spangler*, the district court had found a history of official segregation and had ordered that, as part of the remedy, there should be "no school in the District . . . with a majority of any minority students."[102] The Supreme Court held that the district court could not "require annual reassignment of pupils in order to accommodate changing demographic residential patterns in Pasadena from year to year."[103] The Court's reasoning contains no hint that the Supreme Court itself might have played some role in encouraging or sanctioning such resegregation.[104] Rather than influencing events themselves, the Supreme Court appears only to be recognizing inherent weaknesses in both linear relationships: in a free society, school boards cannot order parents not to move, no matter how much we may dislike white flight.[105] And, in light of this weak link, district courts should not be able to order school boards to do what is beyond their power.

This perspective of *Spangler* ignores the fact that the legal landscape that creates the perception that white flight is inherently private and beyond the scope of the law has itself been explicitly shaped by Supreme Court decisions. In the parlance of our hypothetical quantum theory experiment, this perspective ignores the disruption caused by viewing a basketball with a basketball. The "inherently private" perspective of *Spangler* is based on several assumptions — every one of them the result of specific Supreme Court decisions.

The first assumption is that parents have the right not to send their children to public schools. Much resegregation is caused not by parents changing their place of residence, but by parents taking their children out of public school systems that are attempting to integrate and putting those children in private schools. The expectation that parents may "of course" do that if they wish is not inherent, but is the specific result of the Supreme Court's 1925 decision in *Pierce v. Society of Sisters*,[106] where the Court held — based on no explicit constitutional clause (although I think correctly) — that no state has

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[102] *Id.* at 428.

[103] *Id.* at 433.

[104] The closest the Court came to recognizing even the possibility that the Court played a role in this resegregation is its statement: "The District Court rejected petitioners' assertion that the movement was caused by so-called 'white flight' traceable to the decree itself." *Id.* at 435. In his dissent, Justice Marshall made as much as he could of the Court's intimation "that it would view this case differently if the demographic changes were themselves a product of the desegregation order." *Id.* at 444 n.2 (Marshall, J., dissenting).

[105] The Court states: "in *Swann* the Court cautioned that 'it must be recognized that there are limits' beyond which a court may not go in seeking to dismantle a dual school system." 427 U.S. at 434 (quoting Swann v. Charlotte-Mecklenburg Bd. of Educ., 402 U.S. 1, 28 (1971)).

[106] 268 U.S. 510 (1925).

"any general power . . . to standardize its children by forcing them to accept instruction from public [school] teachers only."[107]

The second assumption is that school boards and school districts are the parties responsible for ensuring that school systems desegregate. This school board focus creates the perception that white flight is an insoluble problem. Yet, although Supreme Court decisions in 1955 and 1971 created the expectation that school boards must be the primary remedial agents,[108] the fourteenth amendment speaks to the *state* as a single entity. In theory, interstate flight could occur even with a *state-as-a-whole* perspective, but the perception of futility that surrounds judicial efforts to deal with white flight was largely created by the Supreme Court's own focus on school boards as opposed to states.

The third assumption is that suburban school boards cannot be required to participate in integration remedies unless a fairly specific interdistrict segregative impact can be shown. The result is an "inherent right" to keep one's children in white, affluent classes by moving to a suburban school district. But that "right" traces to the 1974 *Milliken v. Bradley*[109] decision, whose compartmentalization of states into school districts, while an outgrowth of the second assumption, is hardly inherent in the natural geometry of the world. As Justice White said in his *Milliken* dissent, "[t]he Court draws the remedial line at the Detroit school district boundary, even though . . . the *State* denies equal protection of the laws when its public agencies, acting in its behalf, invidiously discriminate. *The State's default* is 'the condition that offends the Constitution.'"[110]

Thus, while *Spangler*, like *DeShaney*, appears to be a case in which the Supreme Court is simply recognizing the limits of judicial power to affect private behavior, in fact the case illustrates the profound ways in which judicial power has helped to shape the legal and social landscape so that a white parent who wants to *resist* desegregation feels not a gravitational pull to accept racial integration as inevitable, but instead a pull to follow her worst instincts and flee. For the judiciary has shaped the legal landscape so that there are enormous obstacles for parents who want desegregated schools, and no comparable obstacles for those who do not. Ironically, as parents follow the gravitational pull created in large part by how these Supreme Court cases have tilted the playing field, this very movement is used as proof of the limits of the law in affecting private behavior in matters of social importance.

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[107] *Id.* at 535.

[108] *See* Swann v. Charlotte-Mecklenburg Bd. of Educ., 402 U.S. 1, 16 (1971); Brown v. Board of Educ., 349 U.S. 294, 299 (1955).

[109] 418 U.S. 717 (1974).

[110] *Id.* at 771–72 (White, J., dissenting) (emphasis added).

Even in the extreme case of remedial impotence, what a court says and does can shape the political dialogue in profound ways. Justice Powell's busing opinions — saying that the law has severe limits in sensitive social contexts[111] — and Justice Scalia's 1989 Holmes Lecture at Harvard[112] — arguing that arriving at a clear and uniformly applied rule of law is often more important than "getting it right" — both implicitly rest on the view that the only real effect of the law is the linear, direct force it exerts in isolated cases. Yet the differences between the 1954 to 1973 period and the post-*Milliken* period show that the law has a much richer, more pervasive and powerful effect on our lives.

By 1964, less than two percent of southern schools were desegregated.[113] The direct force of the law had been almost a total failure. Yet *Brown v. Board of Education*'s mere declaration of rights profoundly affected the political dialogue in America.[114] One reason was that this declaration of rights had in itself dramatically altered the country's perspective as to which group had law and order on its side.[115] During the Montgomery bus boycotts and throughout the civil rights movement, *Brown* put the force of legal morality behind the demonstrators.[116] And, because most Americans believe in law and respect individual rights, the then unavoidable perception of a right-remedy gap fueled the political dialogue — with Martin Luther King using *Brown* to help propel the passage of major civil rights legislation.[117]

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[111] *See, e.g.*, Keyes v. School Dist. No. 1, Denver, Colo., 413 U.S. 189, 249–50 (1973) (Powell, J., concurring in part and dissenting in part).

[112] Address by Justice Antonin Scalia, Oliver Wendell Holmes Annual Lecture (Feb. 14, 1989) (on file at the Harvard Law School Library).

[113] *See* R. KLUGER, SIMPLE JUSTICE 758 (1977).

[114] Brown v. Board of Educ., 347 U.S. 483 (1954). As Gene Sperling observed:

> The declaration in *Brown I*, that state-maintained school segregation is unconstitutional, instantaneously created a wide discrepancy between constitutional ideals and reality for black school children. In the years between *Brown* and *Swann v. Charlotte-Mecklenberg*, this disturbing gap prompted civil rights advocates to push continually for judicial remedies that would truly realize the rights articulated in *Brown I*.

Note, *supra* note 100, at 1743 (footnote omitted). The central argument in *Brown* is in accord with the theme of this article. As I put it in *American Constitutional Law*:

> The most obvious rationale for the holding in *Brown I* is also the most persuasive. Racial separation by force of law conveys strong social stigma and perpetuates both the stereotypes of racial inferiority and the circumstances on which such stereotypes feed. Its social meaning *is* that the minority race is inferior.

L. TRIBE, *supra* note 91, § 16-15, at 1477.

[115] Gene Sperling put it well: "Whereas *Plessy v. Ferguson* had frozen the anti-caste claims of blacks, *Brown* fanned an already-sparked fire by placing the legal and moral weight of the Constitution behind the black leadership who sought to dismantle the southern caste system." Note, *supra* note 100, at 1745 (footnotes omitted).

[116] *See id.* at 1744–45.

[117] *See id.* at 1745–46.

In the Detroit interdistrict busing case, *Milliken v. Bradley*, the Court confronted a new generation of complex remedial issues.[118] This time, however, the Court sought to close any possibility of a right-remedy gap by simply narrowing the definition of the violation until it fit the very limited intradistrict remedy the Court was willing to mandate.[119] Even if it would have had no impact on judicial *remedies*, a judicial proclamation that inner city ghettoization was constitutionally infirm might have avoided legitimating this nationwide travesty.[120] Had the Court exerted the one thing it clearly can control — its rights-declaration powers — to recognize the role of law and of state action in creating ghettoization, the Court could at least have created positive social and political tension, the sort of tension that makes kids grow up thinking something is wrong, instead of inevitable, about ghettoization. Black leaders could have relied on such a positive tension in 1984, a decade after *Milliken*, to stress, as Martin Luther King did in 1964, how much had been promised and how little delivered. Invariably, the recognition of such tensions has its costs as well as its benefits: too many right-remedy gaps may mock the law and spawn disillusion and cynicism rather than inspire political effort. At a minimum, it seems crucial to focus on how a court's observations about legal responsibility might alter the reality that the court is addressing — both negatively *and* positively.

Frederick Douglass was far ahead of his time when he recognized the positive value of a right-remedy tension in his speech denouncing the Supreme Court's 1883 invalidation of the 1875 Civil Rights Act.[121] Douglass admitted that the Act probably could not have been enforced

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[118] As Sperling described the situation:

> At the trial in *Milliken v. Bradley*, Judge Roth was forced to confront the limitations of focusing only on particular school boards when defining both the violation and the remedy. Roth realized that where a network of state policies had created a condition of inner-city racial containment, any remedy *within* the contained area would *perpetuate* rather than eliminate the discriminatory violation. Holding the state of Michigan ultimately responsible, Roth contemplated a busing remedy reaching into fifty-four white school districts surrounding the Detroit inner-city area.

Id. at 1750 (footnotes omitted) (emphasis in original).

[119] As Sperling explains:

> with no remedial decree before it, the Court could have spoken purely in terms of the right involved. Instead, the Court carefully defined an intra-district, local school-board-oriented violation that allowed for matching intra-district remedies at the expense of exploring the deeper causes and potential cures for racial containment in the inner cities.

Id. at 1751 (footnotes omitted).

[120] When courts view a fragment of the state (e.g., a local school district) as the party remedially responsible for segregation, flight from or racial isolation of that district denies possibilities of meaningful remedies while allowing for judicial denial of the continuation of constitutional harm. When courts view the state as a whole as responsible, white flight and racial containment, however troublesome as remedial obstacles, would not obscure the judicial recognition and societal perception of constitutional tension.

Id. at 1754 (footnotes omitted).

[121] *See id.* at 1764.

in the America of the 1880's, but he reminded his listeners that the Civil Rights Act, "like all advanced legislation, was a banner on the outer wall of American liberty, a noble moral standard. . . . There are tongues," he said,

> in trees, books, in the running brooks, — sermons in stones. This law, though dead, did speak. . . . It told the American people that they were all equal before the law. . . . The Supreme Court has hauled down this flag of liberty in open day . . . . It is a concession to race pride, selfishness and meanness . . . .[122]

Thus did Frederick Douglass, a former slave, recognize a half-century before Heisenberg that the act of observation changes the reality observed — in law no less than in nature.

Justice Jackson made a similar point in his impassioned dissent from the Supreme Court's decision in *Korematsu v. United States*, which upheld a conviction of an American citizen of Japanese descent for violating one of the infamous "military exclusion" orders applicable to thousands of similarly situated citizens of Japanese ancestry on the West Coast.[123] Quoting Justice Cardozo from *The Nature of the Judicial Process* to the effect that a principle, once judicially pronounced, tends to "expand itself to the limit of its logic,"[124] Justice Jackson argued that, when a military commander oversteps the Constitution's bounds,

> it is an incident. But if we review and approve, that passing incident becomes [constitutional] doctrine . . . , [where] it has a generative power of its own, and all that it creates will be in its own image. . . . [O]nce a judicial opinion rationalizes . . . [race-based exclusion] to show that it conforms to the Constitution, or rather rationalizes the Constitution to show that the Constitution sanctions such an order, . . . [t]he principle of racial discrimination . . . lies about like a loaded weapon . . . .[125]

What Frederick Douglass, Benjamin Cardozo, and Robert Jackson all recognized, each in his own context, is the profoundly flawed character of the notion that there exists a natural, pre-political and pre-legal state of things — such as the "natural" separation of the races, or the "natural" flight of whites to the suburbs, or the "natural" condition of a pregnancy continuing to its conclusion despite a woman's wish to end it — and that the process of making and interpreting law has no effect on that "natural" background. But in what sense *is* it "natural" that a woman must continue to remain pregnant, even

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[122] *Id.* (quoting 4 P. FONER, THE LIFE AND WRITINGS OF FREDERICK DOUGLASS 401 (1955)).
[123] Korematsu v. United States, 323 U.S. 214 (1944).
[124] B. CARDOZO, THE NATURE OF THE JUDICIAL PROCESS 51 (1921).
[125] *Korematsu*, 323 U.S. at 246 (Jackson, J., dissenting).

against her will, when there is a doctor willing to perform a surgical procedure that will terminate her pregnancy? When there is a pharmaceutical firm willing to produce RU-486, which will prevent the implantation of the embryo in the wall of her placenta? If these things seem "natural," is it not only by virtue of an entire background of legal arrangements — including the licensing and regulation of physicians and the control of new drugs by the FDA? This means that the transmutation from biology to destiny is mediated not by an inexorable order of nature, but by a set of prior legal observations that have changed the very universe being observed.

Thus, if an activist Supreme Court should begin losing the traditionalists' respect for precedent, that, too, would be a kind of throwback. For, in a sense, the doctrine of stare decisis represents essentially a judicial recognition that, when courts make observations about the legal landscape, they may so deeply alter the terrain itself that future decisions must take sensitive account of how expectations have been built upon such prior judicial decisions.[126] However old and venerable the notion of stare decisis might be, its incorporation into legal reasoning might best be understood as a recognition of the operation in our law of a principle analogous to Heisenberg's.

I am not suggesting that a post-Newtonian viewpoint would always or even usually provide us with different constitutional doctrines; as I have said, it cannot yield determinate *answers* to constitutional problems. What I am suggesting is that, by taking seriously insights and perspectives parallel to those of contemporary physics, we might avoid regressing in the kinds of questions we ask. It is for this reason that I have focused less on "better" outcomes in the cases I have explored than on the questions that I believe might better have been asked.

The inquiries pursued in Justice Brennan's dissent in *DeShaney*, probing the state's role in shaping a legal environment which isolated the abused Joshua, were indeed post-Newtonian in spirit. Similar questions should be asked in the abortion context. Whether one is talking about a criminal prohibition (as in *Roe*), a decision to expel certain abortions from public facilities (as in *Webster*), or a decision not to fund certain abortions (as in *Harris v. McRae*), the relevant question is not, "did the state physically force pregnancy upon the woman?" The question is whether the state's combination of acts and omissions, rules, funding decisions and the like, so shaped the legal landscape in which women decide matters bearing on their reproductive lives as to violate the Constitution's postulates of liberty and equality.

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[126] *See* Schauer, *Precedent*, 39 STAN. L. REV. 571 (1987).

D. Institutional Limits

Once one puts questions in this form, there are, of course, important institutional considerations to be kept constantly in mind about the limits of appropriate judicial intervention. For example, in the context of ghettoization, I suggested above that the Court should be much more willing than it has thus far been to recognize governmental responsibility for the racially separationist consequences of neutrally motivated acts — as in cases like *Washington v. Davis*,[127] for instance, where a verbal skills test produced a largely black ghetto ringed by a largely white police force; or in cases like *City of Memphis v. Greene*,[128] where a decision about re-routing traffic forced black people to circumnavigate a largely white and wealthy suburb.

But this need not imply that it would be appropriate for a court, lacking the remedial authority and flexibility of Congress acting under section 5 of the fourteenth amendment, to rectify each of these situations in an ordinary lawsuit — for a court to require the redesign of selection methods for police in Washington, D.C., for example, or the re-routing of roads and road-building plans so as to minimize the adverse impact on racial minorities.

In the 1987 case of *McCleskey v. Kemp*,[129] the Supreme Court refused to award any relief to a black man sentenced to death for killing someone who was white. The statistical evidence before the Court was overwhelming that the race of the victim makes an enormous difference in the probability of any given defendant's being executed.[130] Recognizing that little short of a radical overhaul in the structure of the criminal justice system, and perhaps in the structure of our society as a whole, could eliminate this tragic link between the victim's race and the system's response, the Court let the sentence of death stand in the case before it. As in the police selection case and in the road re-routing case, it is not at all clear that the Supreme Court's bottom line could realistically have been different.

But saying this is very different from announcing from the bench, as the Court unfortunately did in each of those cases, that the government bears no responsibility for the plight of the blacks who did not do well on the verbal test in *Washington v. Davis*, or for the devaluation of the lives of black citizens whose attackers may expect to be punished less severely than the attackers of white citizens in *McCleskey*. To announce that government bears no responsibility for these problems is to *legitimate* government's actions, and to relieve

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[127] 426 U.S. 229 (1976).
[128] 451 U.S. 100 (1981).
[129] 481 U.S. 279 (1987).
[130] *See id.* at 286–87.

both governmental and nongovernmental actors of responsibility for solving these problems in institutionally appropriate ways.[131]

In an article bristling with what I have here called post-Newtonian insights, Randall Kennedy expresses concern over "the manner in which the *McCleskey* majority articulated and defended its decision," which he argues displayed "an egregious disregard for the sensibilities of black Americans."[132] Kennedy asks us to focus on the impact of that decision upon the black community:

> I am . . . concerned with the plight of black communities whose welfare is slighted by criminal justice systems that respond more forcefully to the killing of whites than the killing of blacks. . . .
>
> . . . I argue that even in the absence of discriminatory purpose, the unjustified racial disparities that characterize capital sentencing in Georgia should be viewed as giving rise to a constitutional violation: the failure of Georgia to provide to its black residents the equal protection of the laws.[133]

The constitutional violation Kennedy identifies is all but invisible unless one takes a post-Newtonian perspective. "At issue" for Kennedy "is the legal significance of discrete, isolated decisions that are susceptible to a non-racial explanation when considered individually, but reveal a pattern clearly shaped by racial sentiment when considered en masse."[134] The post-Newtonian view readily exposes the injury caused by systematic violation and exacerbated by Newtonian judicial blindness.

E. Choosing Legal Paradigms

Implicit throughout my discussion of scientific and legal paradigms have been two criteria for choosing among competing paradigms. The first is empirical — which paradigm best explains the available "data"? Although the mathematics needed to work it all out is complex, Einstein's theory is not only simpler in basic conception and more elegant in design than Newton's; it makes better predictions about a

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[131] *See* L. TRIBE, *supra* note 91, at 16–17, 34–42, 101–02, 340–50, 1336–37, 1351, 1502–14; *see also* Sager, *Fair Measure: The Legal Status of Underenforced Constitutional Norms*, 91 HARV. L. REV. 1212 (1978).

[132] Kennedy, McCleskey v. Kemp*:* *Race, Capital Punishment, and the Supreme Court*, 101 HARV. L. REV. 1388, 1417 (1988).

[133] *Id.* at 1394–95.

[134] *Id.* at 1406. It is not clear that anyone could be found with standing to demand a remedy absent Kennedy's "community-oriented" perspective. *See id.* at 1422–23. Nor is it clear that the limits of an article III court make this perspective, or the remedies it might entail, entirely appropriate.

number of real-world phenomena[135] — including the degree to which a star's light ray that passes in the sun's vicinity appears to be *deflected* by the sun's mass when visible during a solar eclipse.[136] Similarly, I have tried to suggest that the post-Newtonian legal paradigm fits better our modern intuitions about the state, the courts, and law.

A second criterion for choosing among competing paradigms might be called the "progressivity" of the paradigm — the resilience and usefulness of the paradigm in a new context.[137] A progressive paradigm adapts in a constructive fashion to new "data" — new situations and problems; a "degenerative" paradigm must be revised in an ad hoc fashion to handle these new facts or contexts.[138]

Consider Newtonian physics. Its major limitation was that it did not yield a consistent and principled account of events[139] — an explanation that worked independent of the kinds of changes in surrounding conditions that scientists have increasingly agreed should make no difference to the operation of basic physical laws. The most

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[135] As Hawking explains:

> For example, very accurate observations of the planet Mercury revealed a small difference between its motion and the predictions of Newton's theory of gravity. Einstein's general theory of relativity predicted a slightly different motion from Newton's theory. The fact that Einstein's predictions matched what was seen, while Newton's did not, was one of the crucial confirmations of the new theory.

S. HAWKING, *supra* note 19, at 10.

[136] Gamow describes the famous experiment:

> The light rays from two stars SI and SII located (at the moment of observation) at opposite sides of the sun disk converge into a theodolite, which measures the angle between them. The experiment is then repeated later when the sun is out of the way, and the two angles are compared. If they are different we have proof that the mass of the sun changes the curvature of the space around it, deflecting the rays of light from their original paths. Such an experiment was originally suggested by Einstein to test his theory. . . .
>
> . . . [T]he test was actually made in 1919 by a British astronomical expedition to the Principe Islands (West Africa), from which the total solar eclipse of that year could best be observed. The difference of angular distances between the two stars with and without the sun between them was found to be 1.61" (plus or minus) 0.30" as compared with 1.75 predicted by Einstein's theory. Similar results were obtained by various expeditions at later dates.

G. GAMOW, *supra* note 18, at 108.

[137] *See* Lakatos, *supra* note 11, at 116–22.

[138] *See id.*

[139] As Imre Lakatos explains:

> Einstein's theory is not better than Newton's *because* Newton's theory was 'refuted' but Einstein's was not: there are many known 'anomalies' to Einsteinian theory. Einstein's theory is better than — that is, represents progress compared with — Newton's theory *anno 1916* (that is, Newton's laws of dynamics, law of gravitation, the known set of initial conditions; 'minus' the list of known anomalies such as Mercury's perihelion) *because* it explained everything that Newton's theory had successfully explained, and it explained also *to some extent* some known anomalies and, in addition, forbade events like transmission of light along straight lines near large masses about which Newton's theory had said nothing but which had been permitted by other well-corroborated scientific theories of the day; moreover, *at least some* of the unexpected excess Einsteinian content was in fact *corroborated* (for instance, by the eclipse experiments).

Id. at 124 (emphasis in original).

fundamental of the so-called "equivalence principles" that Newton's theories were too primitive to yield is the principle that the basic laws of science should be the same for a body that is undergoing uniform acceleration as they are for a body that is at rest in a uniform gravitational field.[140] You who feel as though you and anything you happen to drop are being pulled toward the floor by the "force" of gravity, would feel exactly the same "pull" if the entire earth vanished and the building you happened to be occupying were accelerating quite rapidly in the direction you *used* to call "up" — so that the building would be going about 65 miles per hour after the first three seconds, about 130 miles per hour three seconds later, about 200 miles per hour after another three seconds, and so on, and you were in fact continuously being pressed against the floor with a force equal to the earth's gravitational field — one "g," or "gravity."

To understand how much more coherently and consistently Einstein's paradigm can deal with this equivalence between acceleration and gravity, imagine that somebody just outside the room in which you sit as you read this were to shine a laser beam through a small opening located where the wall to your left meets the ceiling, shooting it horizontally across the room.[141] Where would it hit the wall to the right? If the building you occupy were rapidly accelerating in deep space, and if there were a device on the wall to the right to measure it *very* accurately, you would find that the laser beam hits *not* where the wall meets the ceiling, but slightly *below* that point. And if you could trace the path of the laser beam across the room, you would notice it *not* zipping perfectly across the ceiling, but dropping toward the floor in a very slight arc. The reason is clear: as the beam crosses the room, the room continues to speed up, leaving the beam further and further behind as it crosses.

A Newtonian would be satisfied with that discrete explanation. But an Einsteinian would say that the acceleration of the room creates "g" forces that *warp* the space in the room, and the light beam is *bent* by this curved space. Why is that a better explanation? Because with it, an Einsteinian would not be in the least surprised to find, if you performed the laser beam experiment on earth in your room right

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[140] Einstein states:

> The ratio of the masses of two bodies is defined in mechanics in two ways which differ from each other fundamentally; in the first place, as the reciprocal ratio of the accelerations which the same motive force imparts to them (inert mass), and in the second place, as the ratio of the forces which act upon them in the same gravitational field (gravitational mass). The equality of these two masses, so differently defined, is a fact which is confirmed by experiments of very high accuracy (experiments of Eotovos), and classical mechanics offers no explanation for this equality.

A. EINSTEIN, *supra* note 8, at 56.

[141] Einstein explores the following "idealized experiment" in A. EINSTEIN & L. INFELD, *supra* note 9, at 218–22.

now, that the beam would drop in an arc in *precisely* the same way. Having said that the earth's mass warps the space in your room exactly as the acceleration of the room in deep space would, she would *expect* the effect on the light beam to be identical.

But the Newtonian would be totally mystified to learn that, even on earth, the laser beam curves downward. To account for the curve, he would probably suggest that the beam should be thought of as a stream of water particles, and he would start making special assumptions about the "weight" of individual "particles" of light that are contained in it, and about how the "gravity" of the earth pulled these particles toward the floor. By contrast, Einstein's approach provides a more consistent explanation for why the physical universe is the way it is, and yields a set of physical laws that would work equally well for earthbound creatures and for astronauts accelerating away from earth. Thus an Einsteinian is spared the fate of being forced to rewrite his laws in an ad hoc way to address each new context.[142] The Einsteinian paradigm is, in this way, more progressive than the Newtonian paradigm.

Back down on earth, in the constitutional realm, it is equally important to avoid that fate. The most basic substantive principles affecting the kinds of things that government may do in its dealings with people should not depend on accidents of form and appearance — like the accident of whether the government exerts pressure through a single administrative regulation instead of through a series of judicial rulings, or by imposing a fine on those who *do* something instead of offering a benefit only to those who agree *not* to do it.[143]

I believe that, in law just as in physics, the goal of freeing constitutional analysis from such entirely artificial distinctions is best achieved if we think of law, and of governmental action, as changing the social landscape and redirecting the "geometry" of human interactions, instead of regarding government as a physical entity that, through the "forces" exerted by its component parts, tugs and pulls at people who are "out there" in a "state of nature". In this way, the post-Newtonian legal paradigm is more progressive than the Newtonian paradigm. Whether in the child abuse context of *DeShaney*, in the abortion context of *Webster*, in the symbolic speech setting of *Wooley*, or in the resegregation setting of *Spangler*, we are more likely

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[142] Einstein states:

> The possibility of explaining the numerical equality of inertia and gravitation by the unity of their nature gives to the general theory of relativity, according to my conviction, such a superiority over the conceptions of classical mechanics, that all the difficulties encountered must be considered as small in comparison with this progress.

A. EINSTEIN, *supra* note 8, at 58.

[143] For a splendid article seemingly animated in large part by the desire to avoid just such dependence, see Sullivan, *Unconstitutional Conditions*, 102 HARV. L. REV. 1415 (1989).

to put better questions if we focus on how collective political action has reconstituted the relevant "social space" than if we simply ask who is laying hands on whom.

IV. CONCLUSION

A corollary of responsible modernism is to admit that we can *see* more than we can *do*.[144] But this does not mean that we should lie about what we see. Those lies sap the creative tension that fuels progress. Thus, as we consider whether judicial opinions or other governmental measures unconstitutionally tilt the legal landscape in favor of some groups and against others, it is crucial not to ignore the *social meaning* of whatever the state has done.[145]

To understand such meaning in a way that fully acknowledges the interconnectedness of legal events — and to recognize, as modern physics has, the interdependence between the process of observing and what is observed — is to avoid the parochial fallacy of looking at the legal universe only through the eyes of those in power.[146] It requires abandoning any notion that the "objective" picture of the legal universe is the one seen from the vantage point of those who make legal decisions.[147] Difficult as it is to view the world from someone else's perspective, not to make the effort is to ignore what science learned

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[144] *See supra* pp. 13–14 (discussing *DeShaney* and paternalism).

[145] Clifford Geertz put this idea most succinctly: "[T]his prejudice . . . that the dramaturgy of power is external to its workings, must be put aside." C. GEERTZ, NEGARA: THE THEATRE STATE IN NINETEENTH-CENTURY BALI 136 (1980). In a more extended passage, Geertz writes:

> What our concept of public power obscures, that of the Balinese exposes; and vice versa. . . . [I]t is there, in exposing the symbolic dimensions of state power. . . . Such study restores our sense of the ordering force of display, regard, and drama.
>
> Each of the leading notions of what the state 'is' that has developed in the West since the sixteenth century — monopolist of violence within a territory, executive committee of the ruling class, delegated agent of popular will, pragmatic device for conciliating interests — has had its own sort of difficulty assimilating the fact that this force exists. None has produced a workable account of its nature. Those dimensions of authority not easily reducible to a command-and-obedience conception of political life have been left to drift in an indefinite world of excrescences, mysteries, fictions and decorations. And the connection between what Begehot called the dignified parts of government and the efficient ones has been systematically misconceived.
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> This misconception, most simply put, is that the office of the dignified parts is to serve the efficient, that they are artifices, more or less cunning, more or less illusional, designed to facilitate the prosier aims of rule. . . .
>
> . . . [I]n all these views, the semiotic aspects of the state . . . remain so much mummery. They exaggerate might, conceal exploitation, inflate authority, or moralize procedure. The one thing they do not do is actuate anything.

Id. at 121–23.

[146] One could interpret John Rawls' "veil of ignorance" as essentially capturing this insight into the nature of justice — that "fairness" requires looking at things from the perspective of those on the bottom of the social ladder. *See* J. RAWLS, *supra* note 55, at 136–42.

[147] See Minow, *When Difference Has Its Home: Group Homes for the Mentally Retarded, Equal Protection and Legal Treatment of Difference*, 22 HARV. C.R.-C.L. L. REV. 111 (1987).

long ago. How strange that physics should have to reteach the Golden Rule.

Among the consequences of adhering more consistently to this post-Newtonian perspective might well be a reduced tendency to blame the state's victims for the harm done when the state sets them apart — as though their view of what government has done or failed to do is to be discounted in light of their supposedly limited or distorted perspective. The late nineteenth-century Supreme Court did just that in *Plessy v. Ferguson*,[148] when it indicated that forced separation by race merely tracks nature's law; if such separation makes blacks feel stigmatized, it's all in the construction *they* put upon it.[149] Justice O'Connor, in an otherwise sensitive examination of a city's official celebration of a nativity scene at Christmas, fell into a similar trap when she said that no "objective" observer would take that display as an endorsement of Christianity or as a put down of non-Christians.[150]

Discerning the social meaning of a challenged practice — of a legal space shaped by certain acts juxtaposed with certain omissions — entails inquiry into how the practice affects the human geometry of the situation. Such inquiry in turn demands less an effort to uncover the hidden levers, gears or forces that translate governmental actions into objective effects, than an attempt to feel the contours of the world government has built — and to sense what those contours *mean* for those who might be trapped or excluded by them.

So too with discerning the operative effect of an incomplete social welfare program. Just as the path of a beam of starlight passing near the sun is best understood not as responding to a hidden tug but as moving along the shortest distance between two points in a space bent by the sun's very mass, so the citizens who might have come to Joshua DeShaney's aid but for the assumption that the state's elaborate welfare program would do so are best understood not as reacting to a muffled signal or a gentle push but as following the path of least resistance laid out by the very presence and structure of the state's program. And the judicial declaration that Joshua's fate is not the state's fault but the natural result of private action, operates not simply as a passive *observation* about who caused injury to whom, but as an *action* that may entrench all the more deeply the geometry of public indifference that will shape the lives of Joshuas yet unborn.

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[148] 163 U.S. 537 (1896).

[149] *See id.* at 551.

[150] *See* Lynch v. Donnelly, 465 U.S. 668, 692–93 (1984). *But see* County of Allegheny v. ACLU Greater Pittsburgh Chapter, 109 S. Ct. 3086 (1989) (holding that the creche display, when viewed in its overall context, violates the establishment clause since the creche carried a patently Christian message and nothing in the setting detracted from that message); *id.* at 3117–24 (O'Connor, J., concurring).