2010

Coasean Blindspots: Charting the Incomplete Institutionalism

Gregg P. Macey
Brooklyn Law School, gregg.macey@brooklaw.edu

ARTICLE

Coasean Blind Spots: Charting the Incomplete Institutionalism

GREGG P. MACEY*

This Article outlines what I refer to as the "incomplete institutionalism" of law and economics, a condition that weakens the field's predictions for bargaining and what it has to say about regulatory choice. I chart this condition, borne out of our failure to finish the work that Coase began on institutions, in the area of environmental law. Scholars concerned with the pollution problem make ample use of Calabresi and Melamed's Cathedral *framework, one of the most powerful lenses in legal scholarship. Yet as it is applied in the form of arguments over transaction costs, there are cracks in the glass that blur how we choose among competing regulations. A more complete account of institutions, building on advancements in organization theory, reveals a second set of transaction costs that arise as firms make decisions and carry out regulatory initiatives. These costs rival the holdout, free rider, and bilateral monopoly costs that are of primary interest to property theorists. If properly addressed, they can lead to dramatic improvements in environmental protection.*

TABLE OF CONTENTS

* Visiting Assistant Professor, Fordham University School of Law. Ph.D., Urban Planning, MIT; JD, University of Virginia. I am grateful to Peter Appel, Guyora Binder, John Bronsteen, Jon Cannon, Matthew Diller, Ward Farnsworth, Roberto Fernandez, Sheila Foster, Brett Frischmann, Rachel Godsil, Wendy Gordon, Paul Heald, Sheila Jasanoff, Nicholas Johnson, James Kainen, Sonia Katyal, Errol Meidinger, Julian Mortenson, Jeff Rachlinski, Aaron Saiger, Jim Salzman, Chris Serkin, Rick Su, Lawrence Susskind, Christian Turner, Mike Vandenbergh, Brad Wendel, Amy Wildermuth, and James Wooten for their thoughtful comments on earlier drafts and to Kathryn Chiu and Karin Johnsrud for their research assistance.

INTRODUCTION

Since the founding cornerstone was set in place for Calabresi and Melamed's *Cathedral*,[1] law and economics scholars have worked to enrich our understanding of environmental pollution and how the state should protect the property rights of victims.[2] Beginning with treatments of nuisance law,[3] they have come at the problem from a range of perspectives, whether advocating the primacy of one protective rule over another (for example, liability rules over property rules[4] or vice versa[5]) or applying theoretical models to real-world strategies of environ-

1. Guido Calabresi & A. Douglas Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089 (1972).

2. *See, e.g.*, Daniel C. Esty, *Environmental Protection in the Information Age*, 79 N.Y.U. L. REV. 115, 124 (2004); Daniel A. Farber, *The Story of* Boomer*: Pollution and the Common Law*, 32 ECOLOGY L.Q. 113, 143 (2005).

3. Studies of nuisance law rely heavily on "*Boomer*-like examples." Carol M. Rose, *The Shadow of* The Cathedral, 106 YALE L.J. 2175, 2175–76 & n.6 (1997) (describing use of stylized versions of *Boomer v. Atlantic Cement Co.*, 257 N.E.2d 870 (N.Y. 1970), in articles comparing the use of "property rules" and "liability rules" to protect the rights of residents living near an industrial facility).

4. *See, e.g.*, Ian Ayres & Eric Talley, *Distinguishing Between Consensual and Nonconsensual Advantages of Liability Rules*, 105 YALE L.J. 235, 237 (1995); Abraham Bell & Gideon Parchomovsky, *A Theory of Property*, 90 CORNELL L. REV. 531, 590 (2005); Louis Kaplow & Steven Shavell, *Property Rules Versus Liability Rules: An Economic Analysis*, 109 HARV. L. REV. 713, 721 (1996); Stewart E. Sterk, *Property Rules, Liability Rules, and Uncertainty About Property Rights*, 106 MICH. L. REV. 1285, 1290–92 (2008).

5. *See, e.g.*, RICHARD A. POSNER, ECONOMIC ANALYSIS OF LAW 57 (4th ed. 1992); Daphna Lewinsohn-Zamir, *More Is Not Always Better than Less: An Exploration in Property Law*, 92 MINN. L. REV. 634,

mental regulation.[6] In assessing available tools for environmental regulation,[7] law and economics scholars inevitably turn to transaction costs[8] and their effects on bargaining among the parties to an environmental dispute.[9] Transaction costs, we are told, should guide the state, whether through its courts or its regulatory apparatus, in its choice of one mode of property protection over another.

I argue that this understanding of the problem is incomplete. The focus on transaction costs when deciding how to protect legal entitlements is a natural result of the usual pairing of *The Cathedral* with the writings of Coase, particularly his conception of nuisance law as a bargaining problem.[10] Yet law and economics scholars' study of nuisance law and environmental protection sidesteps a second set of transaction costs that arise from a proper understanding of Coase's broader concern with *institutions*.[11] Mention is given to the

---

689 (2008); Henry E. Smith, *Property and Property Rules*, 79 N.Y.U. L. REV. 1719, 1721–23, 1732–36 (2004); Sterk, *supra* note 4, at 1290.

6. *See, e.g.*, Daniel C. Esty, *Toward Optimal Environmental Governance*, 74 N.Y.U. L. REV. 1495, 1540–41 (1999) (arguing that as information costs decrease, "so do transaction costs, bringing us closer to the day when a Coasian world of informed, low-cost exchanges of rights becomes possible," meaning market controls will become more substitutable for regulatory restrictions); Kaplow & Shavell, *supra* note 4, at 713, 750–51 ("Another implication of our analysis is that pollution taxes are preferable to the system of tradeable pollution rights that is in partial use today.").

7. Regulatory comparisons are often fit problematically within a single quadrant in Calabresi and Melamed's now-ubiquitous entitlement protection box. *See* Ian Ayres & Paul M. Goldbart, *Optimal Delegation and Decoupling in the Design of Liability Rules*, 100 MICH. L. REV. 1, 3 (2001); *see also* Rose, *supra* note 3, at 2191–92 (arguing that Kaplow & Shavell's analogy of command-and-control environmental rules to "property rule" solutions is incorrect and that such rules would more accurately be categorized as liability or inalienability rules).

8. ROBERT COOTER & THOMAS ULEN, LAW AND ECONOMICS 93 (3d ed. 2000) (presenting the "normative Coase theorem," which states that the law should be structured so that it "remove[s] the impediments to private agreements"); David M. Driesen & Shubha Ghosh, *The Functions of Transaction Costs: Rethinking Transaction Cost Minimization in a World of Friction*, 47 ARIZ. L. REV. 61, 69 (2005) ("[S]cholars endorse the view that the choice between property and liability rules should reduce the transaction costs of bargaining around judicial decisions."); Yang Wang, *Now, Later, or Never: Applying Asymmetric Discount Rates in Nuisance Remedies and Federal Regulations*, 105 MICH. L. REV. 2035, 2059 (2007) ("[T]he choice between property rules . . . and liability rules . . . largely turns on the level of transaction costs anticipated in transferring an entitlement protected by a property rule.").

9. For example, we learn that when there is a single plaintiff and multiple defendants or vice versa, bargaining among the parties will prove difficult due to holdout and free rider costs, meaning there will not likely be an exchange of entitlements protected by a property rule. Therefore, liability rules should be applied. Calabresi & Melamed, *supra* note 1, at 1106–08. *But see* Sterk, *supra* note 4, at 1290–91 ("[I]n a pollution dispute, if the court awards damages that exceed actual harm, the polluter will stop polluting even though it would be efficient for the polluter to continue, while if actual harm exceeds the damages awarded, the polluter will continue to pollute even though the pollution is inefficient. As a result, a liability rule guarantees efficient results only when damages are equal to actual harm.").

10. R.H. Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1, 4–8 (1960).

11. *See* R.H. Coase, *The Nature of the Firm*, 4 ECONOMICA 386, 386–87 (1937) [hereinafter Coase, *The Nature of the Firm*]. Coase's exploration of institutions began with his observation that markets and firms perform the same function (production of goods and services) yet continue to coexist. *Id.* at 388. This suggests that at times, the costs associated with operating within a market (such as the costs of

Coase theorem[12] or to why certain kinds of transaction costs should lead the state to shift from, say, property rights to liability rule protection when a facility emits a noxious substance that drifts into the yards of neighboring homeowners. But there is an eerie emptiness and mechanically strategic quality to the actors in these scenarios, which scholars draw upon to make claims such as the following: "victims of pollution are unlikely to bargain with those responsible for it";[13] multiple parties on one side of a dispute (such as homeowners) are "bad choosers" such that cost-based decisions should be left to the singular polluting entity;[14] and transaction costs associated with strategic concerns (such as holdouts and free riders) make bargaining impossible among large numbers of parties.[15]

The predictive models also fail some important empirical tests. A growing number of communities, each encompassing hundreds of residents, have in fact solved the initial "problem of reaching an agreement over a public bad,"[16]

---

negotiating contracts) will prove significant, leading a company to regularize some of those market negotiations by bringing them in-house (the famous "make-or-buy" question). *Id.* at 390–92. Institutions continue to serve as the protagonists in new institutional economics. Coase argues that "[i]t makes little sense for economists to discuss the process of exchange without specifying the institutional setting within which the trading takes place, since this affects the incentives to produce and the costs of transacting." R.H. Coase, *The Institutional Structure of Production*, 82 AM. ECON. REV. 713, 718 (1992) [hereinafter Coase, *Institutional Structure*].

12. What is widely regarded as the "Coase theorem" is the notion that in a world with zero or very low transaction costs, "the allocation of resources is independent of the initial assignment of property rights." Deirdre McCloskey, *Other Things Equal: The So-Called Coase Theorem*, 24 E. ECON. J. 367, 367 (1998) (internal quotations omitted). The true implication of Coase's work is that where transaction costs *cannot* be removed, it does matter, for example, "where the liability for pollution is placed." *Id.* at 368. Coase made this central thesis of *The Problem of Social Cost* clear when he argued that

> [o]nce the costs of carrying out market transactions are taken into account it is clear that . . . a rearrangement of rights will only be undertaken when the increase in the value of production consequent upon the rearrangement is greater than the costs which would be involved in bringing it about. When it is less, the granting of an injunction . . . or the liability to pay damages may result in an activity being discontinued . . . which would be undertaken if market transactions were costless.

Coase, *supra* note 10, at 15–16.

13. Kaplow & Shavell, *supra* note 4, at 749.

14. James E. Krier & Stewart J. Schwab, *Property Rules and Liability Rules: The Cathedral in Another Light*, 70 N.Y.U. L. REV. 440, 470 (1995); *see also* Thomas W. Merrill & Henry E. Smith, *What Happened to Property in Law and Economics?*, 111 YALE L.J. 357, 381–82 (2001) (reviewing the argument that in large-*n* situations, liability rules, or entitlements that permit forced exchange in return for the payment of just compensation, are more appropriate).

15. *See, e.g.*, A. Mitchell Polinsky, *Resolving Nuisance Disputes: The Simple Economics of Injunctive and Damage Remedies*, 32 STAN. L. REV. 1075, 1109 (1980).

16. CHARLES D. KOLSTAD, ENVIRONMENTAL ECONOMICS 109 (2000). Kolstad gives an example of a power plant with the right to pollute an area where twenty people live. The damage to each person from the pollution is $5, and the cost to clean up the plant is $91:

> Suppose first that the right to pollute is vested with the power plant. The Coase Theorem suggests that efficiency (pollution control) can be attained via payments from the individuals to the plant. Indeed, one possibility is that all 20 people get together, each contributes $4.55 (for a total of $91), and the plant is paid to clean-up. . . . However, if two people get the idea to free-ride, there is no way the other 18 people can pool money to raise $91 while

despite the predictions of law and economics scholars. In California, residents from unincorporated towns and a public housing development signed a memorandum of understanding with Unocal, agreeing to parameters for continued refinery operations weeks after the accidental release of a refinery catalyst that can cause neurological damage and other health problems.[17] In Denver, Colorado, residents of several neighborhoods successfully bargained for improvements at a Conoco refinery following a series of nonpermitted emissions.[18] And in Manchester, Texas, Rhône Poulenc and several communities agreed to independent environmental audits, data sharing, and other provisions after a sulfur dioxide release increased scrutiny of a permit modification.[19] These and other agreements[20] were reached between a facility and a multitude of pollution victims who avoided party identification, coordination, free rider, and holdout problems, the standard sources of transaction costs used to predict unsuccessful bargaining.[21]

Such results should not appear surprising. That they do suggests that there are Coasean blind spots that plague law and economics scholars' treatment of environmental disputes. In what are usually very stylized accounts of bargaining, little is said about the organizations (such as a petrochemical facility or regulatory agency) called upon to consider alternatives and make decisions about an ongoing pollution problem, or the institutional environment[22] in which they operate. One-dimensional "injurers" and "victims" cause harm, make offers, and accept payments according to available information on environmental effects and prevention costs.[23] By treating parties to a dispute as essentially unitary and atomistic, with the exception of some

---

> individually paying no more than the $5 of damage. Consequently, the problems of free-riding combined with private information on damages make it very difficult to reach a Coasian solution . . . .

Id. at 110.

17. Good Neighbor Agreement Between the Crockett/Rodeo Coal., Shoreline Envtl. Alliance, Citizens for a Better Env't, & the Unocal Corp. (Apr. 7, 1995).

18. Settlement Agreement & Release Between COPIRG Citizen Lobby, Michael Maes, Lorraine Granado, & Conoco, Inc. (Apr. 29, 1999).

19. Settlement Agreement & Proposed Class 3 Modification to Permit No. HW-50095 Between Texans United Educ. Fund, Manchester Residents & Rhône Poulenc (Nov. 1992).

20. *See, e.g.*, Memorandum of Understanding Between the Cmty. Groups W. County Toxics Coal., People Do!, Citizens for a Better Env't, & Chevron Richmond Refinery (May 31, 1994).

21. *See* Sterk, *supra* note 4, at 1290 ("[H]igh transaction costs [are] typically defined as cases in which multiple parties generate the potential for holdouts and freeriders."); *cf.* Stephen N. Bretsen & Peter J. Hill, *Irrigation Institutions in the American West*, 25 UCLA J. ENVTL. L. & POL'Y 283, 288–89 (2007) ("Several types of transaction costs influenced the development of the type of organizations used by settlers in the American West[, including] . . . asset specificity and opportunism, holdout problems, and free-rider problems.").

22. An institutional context includes "all organizations within a society supplying a given type of product or service together with their associated organizational sectors: suppliers, financiers, regulators, and so forth." W. Richard Scott & John W. Meyer, *The Organization of Societal Sectors: Propositions and Early Evidence*, *in* THE NEW INSTITUTIONALISM IN ORGANIZATIONAL ANALYSIS 108 (Walter W. Powell & Paul J. DiMaggio eds., 1991).

23. *See, e.g.*, Kaplow & Shavell, *supra* note 4, at 733–34.

recent modifications to the rational actor assumption for individuals,[24] the scholarship ignores many of the key insights that a focus on institutions would provide about what shapes organizational behavior in a highly regulated setting. Attempts to incorporate lessons from new institutional economics[25] into nuisance law and environmental regulation leave much to be explained.[26] All the while, transaction cost approaches are scaled up to analyze an array of environmental laws, including the Superfund program[27] and emissions trading.[28]

This Article outlines what I refer to as the "incomplete institutionalism" of

---

24. Several scholars have begun to correct for individual rationality assumptions in the nuisance literature. Farnsworth, in his classic treatment of post-judgment bargaining among parties to nuisance disputes, focused on the "endowment effect," which is an observed difference between what parties are willing to pay for a good and what they demand for it if it already belongs to them. Farnsworth suggested that "a strong endowment effect attaches to judgments from a court," although he cautioned against using the effect as an explanatory tool without carefully defining the concept. Ward Farnsworth, *Do Parties to Nuisance Cases Bargain After Judgment? A Glimpse Inside the Cathedral*, 66 U. CHI. L. REV. 373, 381, 394 (1999). More recently, Rachel Godsil explored the endowment effect and other deviations from individual rationality within the context of *South Camden Citizens In Action v. New Jersey Department of Environmental Protection*, 145 F. Supp. 2d 446 (D.N.J. 2001). Rachel D. Godsil, *Viewing the Cathedral from Behind the Color Line: Property Rules, Liability Rules, and Environmental Racism*, 53 EMORY L.J. 1807, 1813 (2004). Finally, Parchomovsky and Siegelman showed how "community externalities" such as interpersonal networks can facilitate a neighborhood's ratification of a buy out agreement. Gideon Parchomovsky & Peter Siegelman, *Selling Mayberry: Communities and Individuals in Law and Economics*, 92 CAL. L. REV. 75, 113–19 (2004); *see also* Christine Jolls, Cass R. Sunstein & Richard Thaler, *A Behavioral Approach to Law and Economics*, 50 STAN. L. REV. 1471, 1476–79 (1998) (discussing effects of bounded rationality, bounded willpower, and bounded self-interest); Daphna Lewinsohn-Zamir, *The Choice Between Property Rules and Liability Rules Revisited: Critical Observations from Behavioral Studies*, 80 TEX. L. REV. 219, 227–31 (2001) (discussing findings in behavioral studies to illustrate divergence between "conventional economic assumptions of human opportunism and greediness and people's 'real-life' behavior").

25. New institutional economics is a revitalization of Coase's work led by Oliver Williamson. Oliver E. Williamson, *The New Institutional Economics: Taking Stock, Looking Ahead*, 38 J. ECON. LIT. 595, 601–02 (2000); *see* ORGANIZATION THEORY: FROM CHESTER BARNARD TO THE PRESENT AND BEYOND (Oliver E. Williamson ed., 1995).

26. Driesen & Ghosh, *supra* note 8, at 106–10 (focusing on transaction cost economics and arguing for an analysis of costs that includes awareness of the need to generate transaction costs to align private incentives with public goods, as in the context of emissions trading); Esty, *supra* note 2, at 141–42 (extending Williamson's comparison of markets and hierarchy to negotiated exchange of property rights and command-and-control regulation).

27. The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 42 U.S.C. §§ 9601–9675 (2006), and the Superfund Amendments and Reauthorization Act of 1986 (SARA), 42 U.S.C. §§ 11001–11023 (2006), give the Environmental Protection Agency broad authority to respond to and clean up past releases of hazardous substances. Alexander E. Farrell, *Overview of the Superfund Program*, *in* RECLAIMING THE LAND: RETHINKING SUPERFUND INSTITUTIONS, METHODS AND PRACTICES 25, 26–28 (Gregg P. Macey & Jonathan Z. Cannon eds., 2007); *see* George Van Cleve, *Would the Superfund Response Cost Allocation Procedures Considered by the 103d Congress Reduce Transaction Costs?*, 25 ENVTL. L. REP. 10,134, 10,134 (1995).

28. *See, e.g.*, Susan Bruninga, *Water Pollution: Draft Policy Statement Being Crafted by EPA on Market-Based Approaches*, DAILY ENV'T. REP. (BNA), No. 230, Dec. 3, 2001, at A-2; Byron Swift, *Grandfathering, New Source Review, and NO_x—Making Sense of a Flawed System*, DAILY ENV'T. REP. (BNA), No. 136, July 14, 2000, at B-1, B-6 to B-7.

law and economics, a condition that weakens the validity of its predictions for bargaining and what it has to say about competing forms of regulation. This condition stems from law and economics' inordinate focus on one of the two core behavioral assumptions of new institutional economics.[29] It is perpetuated by the lack of a rigorous account of how a firm's response to transaction costs, given its behavioral constraints, will divert it from efficiency in predictable ways. A more careful analysis of the inner workings of organizations reveals how this happens: a second set of transaction costs arises as firms make decisions. These costs, if properly addressed, can lead to dramatic improvements in bargaining efficiency and environmental protection. But so far, we remain oblivious to the blind spots and focus instead on avoiding costs due to holdouts, free riders, and other forms of strategic behavior. In turn, we leave cost-based decisions to complex organizations, heralded as the "lowest-cost avoiders" and viewed as ideally suited for market-based and voluntary regulatory schemes.

To explore how to address this hidden array of transaction costs, I carried out case studies of three environmental bargaining situations. Through my findings I show that a more complete account of institutions, building on advancements in theories of organizational behavior, will lead to richer and more accurate prescriptive advice for agencies, communities, and regulated firms.[30] When we peer into the Coasean blind spots of law and economics, we unearth new transaction costs that hold clear implications for environmental law and the daily enactment of pollution control. I explore how these costs (referred to collectively as "script-based" transaction costs) operate behind the scenes, within organizations brought to the bargaining table after an industrial accident or dramatic regulatory shift. As is true for costs linked to strategic behavior (such as holdout and free rider), I show that script-based transaction costs, which emerge as firms cope with their limited ability to process information and other symptoms of bounded rationality, eliminate much of the potential for an efficient solution.

First, I introduce Coase's work on institutions, its resurrection by new institutional economics and broadened understanding in organization theory, and the roots of incomplete institutionalism in Part I. After analyzing three environmental bargaining situations from an institutionalist perspective in Part II, I turn to how the additional categories of transaction costs should influence our comparative analysis of environmental regulations in Part III.

---

29. *See infra* notes 80–85 and accompanying text.

30. A more comprehensive focus on institutions also provides a bridge for scholars historically concerned with linking economic efficiency and social justice. Edward L. Rubin, *The New Legal Process, The Synthesis of Discourse, and the Microanalysis of Institutions*, 109 HARV. L. REV. 1393, 1424 (1996) (describing how institutional analysis could provide a methodology unifying fields historically concerned with efficiency, such as economics, and justice, such as political analysis).

I. INCOMPLETE INSTITUTIONALISM IN LAW AND ECONOMICS

Incomplete institutionalism echoes one of Coase's foundational critiques of Pigouvian regulation,[31] namely his claim that the root causes of an environmental nuisance are reciprocal. Coase argued that the standard treatment in welfare economics of a factory emitting harmful substances into neighboring properties, which directs lawmakers to either hold the facility owner liable or issue a pollution tax, failed to recognize the reciprocal nature of pollution: "To avoid the harm to [residents] would inflict harm on [the facility owner]. The real question that has to be decided is: should A be allowed to harm B or should B be allowed to harm A? The problem is to avoid the more serious harm."[32] A structurally similar criticism can be made of law and economics: the field does not sufficiently account for the reciprocal nature of *transaction costs*. Transaction costs affect and are shaped by the institutions that firms create to address them. To understand this reciprocal process, I define institutions broadly, in accordance with recent developments in organization theory. Institutions are the "cognitive, normative, and regulative structures and activities that provide stability and meaning to social behavior" and that are perpetuated by routines and other social forces.[33]

New institutional economists focus on how transaction costs drive the structure of an organization, and law and economics scholars compare the efficiency of available regulatory tools given the intensity of transaction costs in a setting. But the opposite causal direction—where institutions, introduced at a prior point in time to manage transaction costs, become entrenched and alter the array of transaction costs that an organization must face—is not given the appropriate level of attention. One of Coase's more recent critiques of economic theory helps to explain this oversight: it does not show sufficient interest "in the internal arrangements within organizations."[34] To appreciate the full array of transaction costs that act upon organizations as they bargain or enact regulations, we need to account for the reciprocal interaction of (a) transaction costs and (b) the institutions firms develop to manage or reduce them. This process often occurs within organizations and spreads across their competitive and regulatory environments.

The incomplete institutionalism of law and economics is striking given the origins of the field, which began as an attack on the supposed rationality of public institutions. Public choice theorists argued that legislators and executives, acting individually to consolidate their power (for example, through re-election), maximized their utility but limited the rational behavior of their

31. *See generally* A.C. PIGOU, THE ECONOMICS OF WELFARE 131–37 (3d ed. 1929).

32. Coase, *supra* note 10, at 2; *see also* Donald H. Regan, *The Problem of Social Cost Revisited*, 15 J.L. & ECON. 427, 436–37 (1972).

33. W. RICHARD SCOTT, INSTITUTIONS AND ORGANIZATIONS 33 (1995) (emphasis omitted).

34. Coase, *Institutional Structure*, *supra* note 11, at 714.

branches of government.[35] Both the organizations where these actors worked and the laws and regulations they imposed were treated as irrational because they were inefficient or furthered something other than their stated objectives.[36] As I will discuss, new institutional economics and, to a greater extent, organization theory also focus on departures from rationality, such as when organizations adopt practices to help manage legitimacy rather than for efficiency purposes. Attention turns from the conscious decision making of public choice theory to the vast array of more tacit assumptions, such as scripts, rules, and classifications that steer organizations away from decisions driven simply by cost–benefit analysis. These forces explain far more of the variance in organizational behavior and departure from rationality, yet theories regarding the effects of these forces have yet to be internalized by law and economics. The intersection of law and economics and environmental law is an ideal space in which to explore such a theoretical upgrade. Few areas of activity involve more efforts by firms to conform to state-sanctioned symbols of legitimacy while neglecting pure performance-based indicators than pollution control and prevention.

A. THE SURPRISING OUTCOMES OF FENCELINE BARGAINING

> In 1973, there was an explosion on my street. A family, and one of my ex-students, was burned by an explosion that was caused by a young man whom I taught. He was cutting grass in his yard and his lawnmower hit one of the pipelines, ethylene pipelines that somehow, some way connected with Shell Chemical that's directly in front of my house . . . it ignited, and there were two lives that were lost, and it was the lady who was in the house sleeping, the house caught afire, and the young boy who was on fire as he cut the grass.[37]

The literal extension of a Shell Chemical facility into the yards of single-family homes, described by a resident of a small town along the Mississippi River, is one of many instances where the boundary between a residential area and a chemical facility is blurred to an uncomfortable degree. Roughly 15,000 of these facilities use or store toxic or flammable substances that are of the greatest risk to human health, not to mention thousands more involved in treatment and disposal.[38] The potential for environmental harms and disputes over property entitlements in these communities is vast. For one who has never

35. *See, e.g.*, DANIEL A. FARBER & PHILIP P. FRICKEY, LAW AND PUBLIC CHOICE 3, 20–23 (1991).

36. *See* RICHARD A. POSNER, ECONOMIC ANALYSIS OF LAW 152–54 (1st ed. 1972); R.H. Coase, *The Federal Communications Commission*, 2 J.L. & ECON. 1, 39–40 (1959).

37. Interview with Margie Richard, President, Concerned Citizens of Norco, in Diamond, La. (Feb. 28, 2001).

38. U.S. GEN. ACCOUNTING OFFICE, HOMELAND SECURITY: FEDERAL ACTION NEEDED TO ADDRESS SECURITY CHALLENGES AT CHEMICAL FACILITIES 1 (2004) (report and statement of John B. Stephenson, Director of Natural Resources and Environment, submitted to the Subcommittee on National Security, Emerging Threats, and International Relations, of the House of Representatives).

been to places such as Norco, Louisiana, the first moments spent in these neighborhoods can be an exercise in sensory overload. In Norco, symbols of risks to human health abound: odors, repetitive noises, loudspeakers, flaring, "blazing" (high flares), and imposing physical structures such as storage tanks are ever present.[39]

Residents of these communities regularly endure industrial accidents. Chemical, refinery, and storage tank accidents "are plentiful, and serious enough in terms of catastrophic potential."[40] Indeed, accident rates in Saint Charles Parish are high. For instance, between January 1998 and June 1999, the Shell Norco complex averaged over 3.5 accidents per month resulting in a chemical release.[41] The Orion refinery experienced forty accidents between May 1 and November 12, 2000.[42] In addition, the Norco facilities are prone to vast quantities of fugitive emissions, which stem from thousands of pumps, valves, and other elements of a chemical facility that degrade or malfunction.[43] Shell Chemical alone has more than 200,000 emissions points. Failure to adequately check these points at the Shell Norco complex has been extensively documented.[44]

In response to industrial accidents, residents take matters into their own hands, asserting their collective security needs and "right to know" as spelled out in the Emergency Planning and Community Right-To-Know Act (EPCRA)[45] and developing innovative right-to-inspect and other citizen participation mechanisms that they promote through negotiations with targeted facilities. Residents organize around industrial accidents and form community-based organizations that operate in areas previously the sole purview of regulatory

---

39. *See* Dara O'Rourke & Gregg P. Macey, *Community Environmental Policing: Assessing New Strategies of Public Participation in Environmental Regulation*, 22 J. POL'Y ANALYSIS & MGMT. 383, 392 n.12 (2003).

40. CHARLES PERROW, NORMAL ACCIDENTS: LIVING WITH HIGH-RISK TECHNOLOGIES 102 (1999).

41. *See* CONCERNED CITIZENS OF NORCO, SIERRA CLUB-DELTA CHAPTER, XAVIER UNIV. DEEP SOUTH CTR. FOR ENVTL. JUSTICE, AND EARTHJUSTICE LEGAL DEF. FUND, SHELL-NORCO, TOXIC NEIGHBOR: THE CASE FOR RELOCATION 5 (1999).

42. NEW SARPY CONCERNED CITIZENS & LA. BUCKET BRIGADE, STATE OF THE ART OR FALLING APART? 3 (2000).

43. For example, fugitive emissions from the Shell Chemical plant's East Site in Norco equaled 345,146 pounds in 2008, compared with 464,238 pounds from stack emissions. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, ENVIROFACTS MULTISYSTEM REPORT ON SHELL CHEMICAL LP NORCO CHEMICAL PLANT, EAST SITE, http://oaspub.epa.gov/enviro/multisys2.get_list?facility_uin=110013831201 (last visited Jan. 22, 2010).

44. Consent Decree, United States v. Motiva Enters., No. H-01-0978 (S.D. Tex. Aug. 21, 2001).

45. Emergency Planning and Community Right-To-Know Act of 1986, Pub. L. No. 99-499, §§ 300–330, 100 Stat. 1613, 1728–58 (codified as amended at 42 U.S.C. §§ 11001–11050 (2006)). EPCRA was enacted after chemical releases involving two Union Carbide plants in 1984 (in Bhopal, India and Institute, West Virginia). In both cases, government officials discovered that the extent of the disaster was heightened by a lack of adequate emergency planning. Following a study commissioned the following year by the Environmental Protection Agency (identifying over 6,900 chemical spill accidents across the country in the previous five years), Congress enacted legislation to improve the public's knowledge of chemicals in their communities and to create plans at each level of government to respond to future accidents. H.R. REP. No. 99–962 (1986) (Conf. Rep.).

agencies, such as environmental monitoring and planning.[46] They begin new initiatives for environmental assessment, monitoring conditions through use of "bucket brigades," "spill teams," "flare cams," "reactant bags," and other low-tech strategies;[47] deliberate over pollution levels and other concerns through "good neighbor agreements";[48] and engage agencies through sophisticated uses of Toxics Release Inventory data.[49] These efforts lead to bargaining situations between community and corporation. That agreements are reached between a polluting firm and informal organizations of hundreds of residents—on everything from the wholesale relocation of the Diamond community in Norco, Louisiana[50] to the appropriate level of emissions[51] to the financial contributions of a refinery owner in exchange for a new operating permit[52]—is only surprising given standard law and economics accounts. I will focus elsewhere on how such agreements are reached.[53] In this Article, I am concerned with the *kind* of agreement reached and its lack of efficiency (from the perspective of cost-effective reduction of environmental burdens). So far, legal scholars have focused on the nature of the surprise: parties overcame strategic barriers to agreement, including transaction costs due to holdout, coordination, and free rider problems.[54] What is absent from the literature is an account of the mechanisms by which the behavioral regularities ("scripts")[55] adopted by an organization to cope with its complex and uncertain environment can diminish its ability to bargain efficiently with other parties.

B. ORIGINS OF INSTITUTIONAL ANALYSIS

Coase is celebrated for introducing transaction costs into economic analy-

46. *See generally* Dorceta E. Taylor, *The Rise of the Environmental Justice Paradigm: Injustice Framing and the Social Construction of Environmental Discourses*, 43 AM. BEHAV. SCI. 508 (2000) (outlining the rise of the community-based environmental justice movement and its influence on environmental research and policy).

47. O'Rourke & Macey, *supra* note 39, at 385; *see* GREGG P. MACEY, SHELTERING IN PLACE: NEGOTIATING WITH IRRATIONAL ORGANIZATIONS 6 (forthcoming 2010) (manuscript on file with author).

48. GREGG P. MACEY & LAWRENCE SUSSKIND, USING DISPUTE RESOLUTION TECHNIQUES TO ADDRESS ENVIRONMENTAL JUSTICE CONCERNS: CASE STUDIES 50 (2003).

49. Section 313 of EPCRA mandates that the EPA give the public access to information collected annually on routine releases of chemicals falling within Standard Industrial Classifications 20–39 and released from facilities that employ ten or more workers and use more than 10,000 pounds of a listed chemical within a calendar year. This information is presented in a searchable index and in map form at http://www.scorecard.org.

50. STEVE LERNER, DIAMOND: A STRUGGLE FOR ENVIRONMENTAL JUSTICE IN LOUISIANA'S CHEMICAL CORRIDOR 245–60 (2005).

51. Settlement Agreement & Release, *supra* note 18, at 2.

52. Good Neighbor Agreement, *supra* note 17, at 1–8, 15.

53. MACEY, *supra* note 47.

54. *See generally* Parchomovsky & Siegelman, *supra* note 24 (exploring how a small town avoided collective action and holdout problems when it accepted a buyout offer from a neighboring power company).

55. *See infra* notes 150–73 and accompanying text.

sis,[56] yet his interest in a series of nuisance cases in *The Problem of Social Cost (Social Cost)*[57] spanned far beyond the "zero transaction cost" thought experiments visited upon thousands of law students each year.[58] In Coase's own words, the Coase theorem is most useful as a "stepping stone on the way to an analysis of an economy with positive transaction costs."[59] The main task at hand is to study not simply the efficient allocation of legal entitlements, but the emergence of institutional arrangements for dealing with an externality. *Social Cost* echoed arguments that Coase developed in an earlier lecture and article, *The Nature of the Firm*,[60] explaining that organizing transactions through a firm rather than the market is "not the only possible answer"[61] to problems such as polluting factories:

> In the standard case of a smoke nuisance, which may affect a vast number of people engaged in a wide variety of activities, the administrative costs might well be so high as to make any attempt to deal with the problem within the confines of a single firm impossible. An alternative solution is direct Government regulation. Instead of instituting a legal system of rights which can be modified by transactions on the market, the government may impose regulations . . . .
>
> . . . .
>
> . . . But the governmental administrative machine is not itself costless. It can, in fact, on occasion be extremely costly. Furthermore, there is no reason to suppose that the restrictive and zoning regulations, made by a fallible administration subject to political pressures and operating without any competitive check, will necessarily always be those which increase the efficiency with which the economic system operates. . . . [I]t follows that direct governmental regulation will not necessarily give better results than leaving the problem to be solved by the market or the firm.[62]

The basic insight linking *The Nature of the Firm*, *Social Cost*, and more recent work by new institutional economists is that in a world where contracting is necessarily incomplete (given positive costs of search, information, negotiation,

---

56. John Commons also wrote in the early 1930s that transactions should be the basic unit of analysis in economics. JOHN R. COMMONS, INSTITUTIONAL ECONOMICS: ITS PLACE IN POLITICAL ECONOMY 4–9 (1934).

57. Coase introduced *Social Cost* as a work "concerned with those actions of business firms which have harmful effects on others," including the "standard example" of "a factory the smoke from which has harmful effects on those occupying neighbouring properties." Coase, *supra* note 10, at 1.

58. Coase tried, admittedly in vain, to distance himself from the legal academy's focus on hypothetical, zero transaction cost bargaining situations. *See* R.H. COASE, THE FIRM, THE MARKET, AND THE LAW 15 (1988).

59. Coase, *Institutional Structure*, *supra* note 11, at 717.

60. Coase, *The Nature of the Firm*, *supra* note 11.

61. Coase, *supra* note 10, at 17.

62. *Id.* at 17–18.

and enforcement),[63] negotiation costs can be reduced by bringing them within the boundaries of a firm (where hierarchies are substituted for contractual bargaining) or addressing them via government regulation.

Legal scholars often take a circuitous route to institutional analysis, starting with Coase's thought experiment involving the costs of trading legal rights after they are assigned. This was particularly true after entitlement assignment and protection were so elegantly systematized in the form of a typology in *The Cathedral*. Much of the literature is devoted to crafting directives for use after an initial question is answered about a given situation: "Are transaction costs high?" Such rules of thumb include: assign entitlements to parties who value them most;[64] when valuation is difficult, give entitlements to parties who can most easily initiate an exchange;[65] and when transaction costs are low, absolute entitlements (that is, property rules) are preferable.[66] Not concerned with the institutions that guide organizational decision making, these rules for choosing among property rules, liability rules, and hybrids of the two[67] are analogized to various environmental regulations.[68] In turn, the directives frame choices among an array of solutions to the pollution problem, from command-and-control to common law to market to informational approaches.

The dominant framework of law and economics also explains why a more

---

63. Coase first defined "transaction costs" in *The Nature of the Firm*. Coase, *The Nature of the Firm*, *supra* note 11, at 390–91. His definition appeared in simplified form in *Social Cost*:

> In order to carry out a market transaction it is necessary to discover who it is that one wishes to deal with, to inform people that one wishes to deal and on what terms, to conduct negotiations leading up to a bargain, to draw up the contract, to undertake the inspection needed to make sure that the terms of the contract are being observed, and so on.

Coase, *supra* note 10, at 15. Other definitions abound, focused to varying degrees on identification, information, negotiation, and enforcement costs. *See, e.g.*, EIRIK G. FURUBOTN & RUDOLF RICHTER, INSTITUTIONS AND ECONOMIC THEORY: THE CONTRIBUTION OF THE NEW INSTITUTIONAL ECONOMICS 40 (1997) (defining transaction costs as the costs of measuring resources or claims, understanding and utilizing rights, and negotiating and enforcing transactions); Guido Calabresi, *Transaction Costs, Resource Allocation, and Liability Rules—A Comment*, 11 J.L. & ECON. 67, 68 n.5 ("By transaction costs, I have in mind costs like those of getting large numbers of people together to bargain . . . .").

64. POSNER, *supra* note 5, at 45–47.

65. Calabresi, *supra* note 63, at 72.

66. RICHARD A. POSNER, THE ECONOMICS OF JUSTICE 70–71 (1981).

67. Wang, *supra* note 8, at 2060 (arguing that in *Boomer v. Atlantic Cement Co.*, 257 N.E.2d 870 (N.Y. 1970), the court considered "the possibility of time dividing the protection of an entitlement between liability and property rules").

68. *See, e.g.*, Murray B. Rutherford, Jack L. Knetsch & Thomas C. Brown, *Assessing Environmental Losses: Judgments of Importance and Damage Schedules*, 22 HARV. ENVTL. L. REV. 51, 94 (1998) (analogizing property rules and liability rules to environmental damage assessments); Jonathan Baert Wiener, *Global Environmental Regulation: Instrument Choice in Legal Context*, 108 YALE L.J. 677, 682, 704–13 (1999) (considering whether property-based rules or liability rules should be used to address global environmental problems); João C.J.G. de Medeiros, Note, *How the Presumption Against Extraterritoriality Has Created a Gap in Environmental Protection at the 49th Parallel*, 92 MINN. L. REV. 529, 562 nn.230–31 (2007) (outlining the differences in application of the National Environmental Policy Act (described as a rule-based property regulation) and the Comprehensive Environmental Response, Compensation, and Recovery Act (labeled as a liability rule regulation)).

complete understanding of institutions (which Coase defined broadly as the legal, political, and social systems that determine "the costs of exchange"[69] and which new institutional economics often views narrowly as how a firm's structure is shaped by transaction costs[70]) has yet to develop in legal scholarship. Following public choice theory, law and economics focuses on the relative performance of predetermined institutional choices. Institutional alternatives, such as the market, political branches, and the courts, are imperfect yet readily available options, evaluated for their degree of fit with a market failure that demands attention.[71] This has been called the central post-Coase question: "[W]hether significant transaction costs are present and, if so, which social arrangement" will best address them.[72] The mechanisms by which a host of other (at times more subtle) institutions emerge, respond to transaction costs, and become embedded within organizations, grow faint by the time these comparative analyses are made, joining a variety of other background assumptions.

C. THE PROJECT OF NEW INSTITUTIONAL ECONOMICS

Coase acknowledged that his work on institutions remains unfinished.[73] For example, he did not indicate which factors influence the choice of whether to organize a collective pursuit within a firm, within a market, or via government regulation, or how such decisions shape the precise boundaries of a firm. That task was left to Williamson and other scholars, who sought to explain the structure of market actors as well as how their behavior is affected by their institutional setting.[74] Williamson set out a theory of "transaction cost economizing," where, based on several critical dimensions of transactions (such as asset specificity, which is the degree to which investments specific to a proposed transaction have to be made in order to realize least cost supply),[75] a firm will decide whether to, for example, make a product's components itself, buy them from an autonomous supplier, engage in a joint venture, or pursue some other arrangement that could alter the firm's boundary.[76] The "efficient boundary" of a firm is defined as core production plus "additional stages for which own

69. Ronald Coase, *The New Institutional Economics*, 88 AM. ECON. REV. 72, 73 (1998).

70. *See, e.g.*, OLIVER E. WILLIAMSON, THE ECONOMIC INSTITUTIONS OF CAPITALISM 85–162 (1985).

71. *See* NEIL K. KOMESAR, IMPERFECT ALTERNATIVES: CHOOSING INSTITUTIONS IN LAW, ECONOMICS, AND PUBLIC POLICY 3–13, 53–150 (1994).

72. Pierre Schlag, *The Problem of Transaction Costs*, 62 S. CAL. L. REV. 1661, 1672 (1989).

73. *See* Coase, *Institutional Structure*, *supra* note 11, at 718–19.

74. Williamson also criticized Coase's treatment of the firm as tautological: "[T]ransaction costs are appropriately made the center piece of the analysis, but these are not operationalized in a fashion that permits one to assess the efficacy of completing transactions as between firms and markets in a systematic way." OLIVER E. WILLIAMSON, MARKETS AND HIERARCHIES: ANALYSIS AND ANTITRUST IMPLICATIONS 3 (1975).

75. WILLIAMSON, *supra* note 70, at 41–42.

76. Oliver E. Williamson, *The Economics of Organization: The Transaction Cost Approach*, 87 AM. J. SOC. 548, 555–57, 561 (1981). *See generally* WILLIAMSON, *supra* note 70, at 85–162.

supply can be shown to be the efficient choice."[77] His model was used to illustrate a choice between firm and market governance, and Williamson kept much of his attention on these and other "alternative governance structures—both within and between firms and markets."[78] New institutional economics has had a profound and growing influence over legal scholarship.[79]

New institutional economics was enriched by two behavioral assumptions. Williamson noted that although lawyers and economists are well aware of the transaction costs that stem from complex contracts that are costly to write and enforce, there was scant attempt to figure out why such contracting is costly to begin with or how to remedy it. Two behavioral sources of high transaction costs presented themselves to Williamson: "the recognition that human agents are subject to bounded rationality" and "the assumption that at least some agents are given to opportunism."[80] Contracting is inevitably incomplete on account of these aspects of the human condition. The ability to make rational decisions is limited by the information parties receive and their capacity to process and share that information.[81] Faced with a limited ability to process (receive, store, retrieve, and transmit) information, individuals turn to institutions to simplify and regularize their complex surroundings—they establish settled expectations, decision making heuristics, and other "intendedly rational" ways of reducing complexity.[82] They do not identify and negotiate every possible contingency to a transaction, given time, resource, and cognitive constraints. Complete contracting is therefore impossible. Still, Williamson showed that even boundedly rational parties could comprehensively contract if they were not given to strategic behavior.[83] If parties were fully trustworthy, "[p]rincipals would simply extract promises from agents that they would behave in the manner of steward when unanticipated events occurred, while agents would reciprocally ask principals to behave in good faith."[84] But once one or more parties distorts information, hides issues, or disguises preferences, comprehensive contracting breaks down.[85]

---

77. Williamson, *supra* note 76, at 557.

78. *Id.* at 552; *see also* WILLIAMSON, *supra* note 74, at 8–10 (describing firms and markets as "alternative instruments for completing a related set of transactions" and setting out to determine the factors that contribute to a decision to rely on one or the other governance structure).

79. *See, e.g.*, COASEAN ECONOMICS: LAW AND ECONOMICS AND THE NEW INSTITUTIONAL ECONOMICS (Steven G. Medema ed., 1998); Joseph Blocher, *Institutions in the Marketplace of Ideas*, 57 DUKE L.J. 821 (2008); Robert P. Merges, *Intellectual Property Rights and the New Institutional Economics*, 53 VAND. L. REV. 1857 (2000); Todd J. Zywicki, *Institutions, Incentives, and Consumer Bankruptcy Reform*, 62 WASH. & LEE L. REV. 1071 (2005).

80. Williamson, *supra* note 76, at 553.

81. *See* DOUGLASS C. NORTH, INSTITUTIONS, INSTITUTIONAL CHANGE AND ECONOMIC PERFORMANCE 22–23 (1990); HERBERT A. SIMON, ADMINISTRATIVE BEHAVIOR 93–97 (4th ed. 1997); WILLIAMSON, *supra* note 70, at 133.

82. SIMON, *supra* note 81, at 88–89; WILLIAMSON, *supra* note 70, at 30–32.

83. Williamson, *supra* note 76, at 554.

84. *Id.*

85. *Id.*

From points of market failure caused by bounded rationality and strategic behavior, new institutional economics tries to learn how organizations strive to govern economic relations more efficiently.[86] Williamson credits John Commons for his insight into the behavioral roots of transaction costs and why they open the door for institutional effects.[87] Specifically, the search for efficient action, which calls for some degree of cooperation, will inevitably look beyond the goal of aligning interests (rendered improbable by behavioral constraints) to the invention of institutions that produce order out of conflict. Commons defined institutions as the "working rules" within which individuals must confine their activities if they are to avoid sanctions.[88] North provided a more fine-grained account of institutions, including formal (for example, laws and rules) and informal constraints (for example, norms of behavior and self-imposed codes of conduct) that can lead to increased coordination among boundedly rational and potentially strategic individuals.[89] The conventional understanding of institutions moved beyond Coase's sense of broader legal, political, and social systems, or the institutions arrayed before us for comparative analysis by law and economics scholars (courts, agencies, political bodies, and markets), to include "not just law" but also a set of internal and external rules that guide conduct and respond to transaction costs.[90] North also departed from Commons when he hinted that institutions arise for reasons other than efficiency, noting that "at least the formal rules . . . are created to serve the interests of those with the bargaining power to create new rules."[91]

New institutional economics offers a behavioral-driven upgrade to standard notions of utility maximizing found in law and economics. But decades after publication of *Social Cost*, Coase sensed a continuing oversight in mainstream economic theory: it does not show sufficient interest "in the internal arrangements within organizations but only in what happens on the market, the purchase of factors of production, and the sale of the goods that these factors produce."[92] The notion of "institutions" has certainly flourished, to include macro-level social arrangements[93] and micro-scale regularities in human interactions (such as rules and norms),[94] but the organizations engaged in contractual

86. *See generally* WILLIAMSON, *supra* note 70; WILLIAMSON, *supra* note 74.

87. *See* WILLIAMSON, *supra* note 74, at 3, 6.

88. COMMONS, *supra* note 56, at 6.

89. Douglass C. North, *Economic Performance Through Time*, 84 AM. ECON. REV. 359, 360 (1994); *see* NORTH, *supra* note 81, at 4, 57.

90. For example, a social norm such as "fair dealing" reduces transaction costs by "lessening the need for formal contracting and enforcement mechanisms." Blocher, *supra* note 79, at 841. Ellickson demonstrated that social norms are easier to enforce than legal sanctions. ROBERT C. ELLICKSON, ORDER WITHOUT LAW 282–83 (1991).

91. North, *supra* note 89, at 360–61.

92. Coase, *Institutional Structure*, *supra* note 11, at 714.

93. *See* North, *supra* note 89, at 359–60.

94. *Id.* at 360.

negotiations, particularly firms, continue to be described as "black boxes."[95] Coase observed that "[t]his is very extraordinary given that most resources in a modern economic system are employed within firms, with how these resources are used dependent on administrative decisions and not directly on the operation of a market."[96] To this oversight Williamson added what he considered the absence of a sufficiently robust account of how transaction costs lead to the formation of new institutions.[97] These two oversights help explain the core of the "incomplete institutionalism": its inadequate treatment of the reciprocal nature of transaction costs.

We sense this incompleteness when we are asked to assume that because transaction costs between a firm and multiple residents are prohibitively high, a shift in the mode of property protection is in order. Our awareness is heightened when we are told that the Comprehensive Environmental Response, Compensation, and Liability Act[98] or an emissions trading program is a "generator of high transaction costs" but hear little about the organizations working to enact the statute or program.[99] The incomplete institutionalism of these and other assessments overlooks how institutions, such as routines and standard operating procedures, can emerge and (a) alter the mix of transaction costs that arise as organizations make decisions and reach agreements and (b) apart from their intended use to regularize activity and ensure more efficient coordination, lead to greater inefficiency of exchange.

Absent a more complete account of institutions and their effect on transaction costs, the predictions of law and economics scholars cluster around one of Williamson's behavioral assumptions—the strategic behavior of parties—while ignoring the other, namely their bounded rationality. We formulate predictions for patterns of transaction costs that are due to strategic behavior, including free rider, holdout, bilateral monopoly, and monitoring and enforcing agreements,[100] while institutions to address the limits of human cognition continue to emerge within organizations and affect decision making in ways that are less appreciated.

---

95. Coase, *Institutional Structure*, *supra* note 11, at 714; HANDBOOK OF NEW INSTITUTIONAL ECONOMICS 4 (Claude Menard & Mary M. Shirley eds., 2005).

96. Coase, *Institutional Structure*, *supra* note 11, at 714.

97. Williamson, *supra* note 25, at 597.

98. 42 U.S.C. §§ 9601–9675 (2006).

99. Driesen & Ghosh, *supra* note 8, at 76–79.

100. One widely cited study of nuisance theory noted the conventional understanding of strategic behaviors, from "[holding] out for a disproportionate share of the gains from trade or [freeloading] on the deal made by others" to withholding private information and "[wasting] time and money trying to extract a large share of the gains from trade" in a bilateral monopoly situation. Farnsworth, *supra* note 24, at 378; *see* COOTER & ULEN, *supra* note 8, at 175; A. MITCHELL POLINSKY, INTRODUCTION TO LAW AND ECONOMICS 18 (1989); POSNER, *supra* note 5, at 62–63; Ian Ayres & Eric Talley, *Solomonic Bargaining: Dividing a Legal Entitlement to Facilitate Coasean Trade*, 104 YALE L.J. 1027, 1027 (1995); Louis Kaplow & Steven Shavell, *Do Liability Rules Facilitate Bargaining? A Reply to Ayres and Talley*, 105 YALE L.J. 221, 222 (1995); Kaplow & Shavell, *supra* note 4, at 767; Polinsky, *supra* note 15, at 1092; Schlag, *supra* note 72, at 1673.

Law and economics has moved from Coase's rejection of the neoclassical view of markets as costless pursuit of self-interest[101] to models of purposeful attempts to regularize interactions and respond to transaction costs. To this we must add an account of the effects of institutions, particularly those that arise within or are adopted by firms, on transaction costs, including the ability of parties to bargain effectively over property rights. Just as legal scholars have begun to account for the effects of cognitive biases (such as the endowment effect) on individuals,[102] other scholars, legislators, and firms would benefit from a similar appreciation of the cognitive limits of organizational actors. Whether purposefully introduced or formed silently as background understandings, the limiting effects of institutions on how actors within a firm process information and make decisions add further friction to bargaining over environmental protection.[103] These transaction costs remove much of the potential efficiency of bargaining before it even begins. Accounting for only unitary actors, their strategic behavior, and corrections for cognitive biases among individuals will fail to predict how organizations bargain or how groups of organizations respond to changes in the law.

D. ORGANIZATION THEORY: CONFRONTING INCOMPLETE INSTITUTIONALISM

Organization theory[104] has opened the black box of the kinds of firms and agencies that bargain over entitlements. It provides tools for analyzing institutions that are lacking in law and economics. Institutions are the inevitable outcome of boundedly rational actors trying to make sense of the organizations in which they work. Thus, organization theory shares an appreciation for bounded rationality[105] with new institutional economics and it locates the constraint even more centrally in its analysis. But there is a marked difference in how organization theory explains the growth and change of institutions. New institutional economics predicts change in institutions when economic condi-

101. *See* Coase, *supra* note 69, at 72.

102. *See supra* note 24.

103. These dynamics can be studied in informal organizations as well as public agencies. *See, e.g.*, Gregg P. Macey & Lawrence Susskind, *The Secondary Effects of Environmental Justice Litigation: The Case of* West Dallas Coalition for Environmental Justice v. EPA, 20 VA. ENVTL. L.J. 431, 438–41 (2001).

104. This Article focuses on the work of a single branch within organization theory, namely what Powell and DiMaggio refer to as "neoinstitutionalism." *See, e.g.*, SCOTT, *supra* note 33; Paul J. DiMaggio & Walter W. Powell, *Introduction* to THE NEW INSTITUTIONALISM IN ORGANIZATIONAL ANALYSIS, *supra* note 22, at 1, 12; James G. March & Johan P. Olsen, *The New Institutionalism: Organizational Factors in Political Life*, 78 AM. POL. SCI. REV. 734 (1984); John W. Meyer & Brian Rowan, *Institutionalized Organizations: Formal Structure as Myth and Ceremony*, 83 AM. J. SOC. 340 (1977); Lynne G. Zucker, *The Role of Institutionalization in Cultural Persistence*, 42 AM. SOC. REV. 726 (1977).

105. *See* Simon, *supra* note 81, at 88–89. *See generally* RICHARD M. CYERT & JAMES G. MARCH, A BEHAVIORAL THEORY OF THE FIRM (1963); JAMES G. MARCH & JOHAN P. OLSEN, AMBIGUITY AND CHOICE IN ORGANIZATIONS (1976); JAMES G. MARCH & HERBERT A. SIMON, ORGANIZATIONS (1958); Michael D. Cohen, James G. March & Johan P. Olsen, *A Garbage Can Model of Organizational Choice*, 17 ADMIN. SCI. Q. 1 (1972).

tions lead to market failures or shifts in relative prices, which means gains from adopting new arrangements may exceed the costs of any necessary collective action.[106] Institutions are viewed as "problem-solving devices that actors use to induce stability, contain opportunism, and realize gains from cooperation or trade."[107] In contrast, organization theorists treat the behavior of a firm as a response not just to market pressures, but also to institutional pressures (for example, from regulatory agencies, actions of other firms, or internal rules).[108] Efficiency is not the driving force behind decision making, nor is the formal structure of a firm merely the result of rational adaptations to market conditions, as elaborated by Williamson. In fact, formal structure itself is treated as irrational.[109]

Organizations[110] find themselves adrift in a sea of institutions, which we can define broadly as "socially shared patterns of behavior or thought."[111] They include the "taken-for-granted scripts, rules, and classifications"[112] that "identify categories of social actors and their appropriate activities or relationships."[113] Institutions serve as templates for actions that are considered appropriate or legitimate, and "set bounds on rationality by restricting the opportunities and alternatives we perceive and, thereby, increase the probability of certain types of behaviour."[114] Organizations are constantly looking to one another, the state, and the professions for clues about how to structure their operations,[115] and this process takes many of the routines adopted by an organization and diffuses them across an industry or field,[116] again for reasons

106. Jack Knight, *Explaining the Rise of Neoliberalism: The Mechanisms of Institutional Change*, *in* THE RISE OF NEOLIBERALISM AND THE INSTITUTIONAL ANALYSIS 27–50 (John L. Campbell & Ove K. Pederson eds., 2001).

107. Marc Schneiberg, *Combining New Institutionalisms: Explaining Institutional Change in American Property Insurance*, 20 SOC. F. 93, 99 (2005).

108. Royston Greenwood & C.R. Hinings, *Understanding Radical Organizational Change: Bringing Together the Old and the New Institutionalism*, 21 ACAD. MGMT. REV. 1022, 1025 (1996).

109. DiMaggio & Powell, *supra* note 104, at 13.

110. It is important to distinguish organizations from institutions. An organization is a social collective with a "goal of survival and self-perpetuation, . . . more clearly defined, demarcated, and defended boundaries, and often . . . [a] formal relationship with the state that recognizes [its] existence as [a] distinct social entit[y]." JEFFREY PFEFFER, NEW DIRECTIONS FOR ORGANIZATION THEORY: PROBLEMS AND PROSPECTS 9 (1997). Institutions operate at a number of levels, including that of organizations, subsystems within organizations, and broader organizational fields. SCOTT, *supra* note 33, at 55–60.

111. David Dequech, *Institutions and Norms in Institutional Economics and Sociology*, 40 J. ECON. ISSUES 473, 477 (2006).

112. DiMaggio & Powell, *supra* note 104, at 15. These and other means of expressing institutionalized expectations, including rules, standard operating procedures, and blueprints for action, were the focus of Meyer and Rowan's groundbreaking work on the subject. *See* Meyer & Rowan, *supra* note 104, at 341–43.

113. Stephen R. Barley & Pamela S. Tolbert, *Institutionalization and Structuration: Studying the Links Between Action and Institution*, 18 ORG. STUD. 93, 96 (1997).

114. *Id.* at 94.

115. Paul J. DiMaggio & Walter W. Powell, *The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields*, 48 AM. SOC. REV. 147, 150–54 (1983).

116. *See, e.g.*, Isin Guler, Mauro F. Guillén & John Muir Macpherson, *Global Competition, Institutions, and the Diffusion of Organizational Practices: The International Spread of ISO 9000*

over and above the technical efficiency of the routines.

The driving force behind institutions in this branch of organization theory is not efficiency but legitimation.[117] There is a strong degree of uncertainty in decision making within a firm: legal rules are unclear, technologies are unproven, and means–ends relationships require a considerable degree of guesswork.[118] In response, firms adopt routines, standard operating procedures, and other institutions from what are viewed as legitimate models in their regulatory and competitive environments.[119] At the same time, personnel operating within firms, whose fundamental need is to reduce uncertainty (not to raise efficiency), adopt their own sets of unwritten rules for dealing with bounded rationality. Uncertainty is addressed through routines that direct limited attention to select elements of problems faced by the firm.[120]

All of these institutions are subject to replication. The state acts to force firms to adopt certain forms or obey certain policies, professions suggest normative standards for the activities over which they hold monopolies, and actors within firms imitate strategies used elsewhere that appear successful.[121] As a result, there are strong reciprocal exchanges between a firm (or other organization) and the field in which it operates. Institutional formation flows in either direction. The reciprocal nature of institutional formation has been identified in a number of industries and regulatory activities, including accounting,[122] property insurance,[123] steel manufacturing,[124] chemical processing,[125] government audits,[126] and ISO 9000 quality certification.[127] Here, I focus on the behavior of regulated firms.

Organization theorists gravitate toward definitions of institutions that are in line with Simon's work on bounded rationality, focusing on scripts, rules, and

---

Quality Certificates, 47 ADMIN. SCI. Q. 207, 207–08 (2002); Andrew J. Hoffman, *Institutional Evolution and Change: Environmentalism and the U.S. Chemical Industry*, 42 ACAD. MGMT. J. 351, 352 (1999).

117. Meyer & Rowan, *supra* note 104, at 343; Mark C. Suchman, *Managing Legitimacy: Strategic and Institutional Approaches*, 20 ACAD. MGMT. REV. 571, 571 (1995); Michael Vandenbergh, *The Private Life of Public Law*, 105 COLUM. L. REV. 2029, 2074 (2005).

118. *See* Cohen, March & Olsen, *supra* note 105, at 1.

119. DiMaggio & Powell, *supra* note 115, at 150–54.

120. *See* SIMON, *supra* note 81, at 88.

121. DiMaggio & Powell, *supra* note 115, at 150–54.

122. Greenwood & Hinings, *supra* note 108, at 1027; Christine Oliver, *Strategic Responses to Institutional Processes*, 16 ACAD. OF MGMT. REV. 145, 164–67 (1991).

123. Schneiberg, *supra* note 107, at 120–25.

124. Witold J. Henisz & Andrew Delios, *Uncertainty, Imitation, and Plant Location: Japanese Multinational Corporations 1990–1996*, 46 ADMIN. SCI. Q. 443, 466–69 (2001); Harland Prechel, *Irrationality and Contradiction in Organizational Change: Transformation in the Corporate Form of a U.S. Steel Corporation*, 32 SOC. Q. 423, 428–40 (1991).

125. Hoffman, *supra* note 116, at 354–66.

126. Onker N. Basu, Mark W. Dirsmith & Parveen P. Gupta, *The Coupling of the Symbolic and the Technical in an Institutionalized Context: The Negotiated Order of the GAO's Audit Reporting Process*, 64 AM. SOC. REV. 506, 522–23 (1999); Parveen P. Gupta, Mark W. Dirsmith & Timothy J. Fogarty, *Coordination and Control in a Government Agency: Contingency and Institutional Theory Perspectives on GAO Audits*, 39 ADMIN. SCI. Q. 264, 277–80 (1994).

127. Guler, Guillén & Macpherson, *supra* note 116, at 211–15, 223–29.

classifications that through repeated use assume a taken-for-granted quality.[128] By adopting institutions, the formal structure of an organization "dramatically reflects the myths of [its] institutional environments instead of the demands of [its] work activities."[129] Examples abound of organizations that accommodate institutional expectations even though they have little to do with efficiency. Firms respond to pollution concentration standards by building taller smokestacks, dispersing toxic chemicals across greater distances while ignoring production inefficiencies and lost profits from capture and recycling.[130] Regulatory institutions lead organizations to create "formal safety rules, safety departments, and safety programs" that are necessary to avoid sanction even if they engage in very little rule enforcement.[131] Monitoring and remediation institutions lead an organization to adopt known yet ineffective solutions to PCB contamination.[132] And a refinery enacts a web of emergency response institutions, even as a lone production unit covers neighboring homes in one hundred tons of neurotoxin over a sixteen-day period.[133] These examples of sanction-avoiding behavior are inefficient from a social welfare standpoint in that they narrow the relationship between compliance and the protection of human health and the environment.

What is apparent to observers of these and countless other vignettes is how adopting institutions, often in a sincere attempt to hoist fragile flags of legitimacy for other firms and regulators to see, affects choices available to and decisions made by a firm. Choice is constrained by institutional pressures. In fact, strategic choice is often "preempted when organizations are unconscious of, blind to, or otherwise take for granted the institutional processes to which they adhere."[134] As more of an organization's structure is derived from institutions, it adopts a "logic of confidence," exhibiting "elaborate displays of confidence, satisfaction, and good faith" and enacting ceremonial inspection and evaluation regimes.[135] Slowly, we sense a familiarity in the landscape as organizational forms merge around the templates that available institutions provide.

To understand how complex organizations (such as firms or agencies) bargain or respond to new regulations, organization theory tells us to focus on the institutional environments in which they are embedded.[136] Institutions entail

---

128. DiMaggio & Powell, *supra* note 104, at 15.

129. Meyer & Rowan, *supra* note 104, at 341.

130. BRUCE A. ACKERMAN & WILLIAM T. HASSLER, CLEAN COAL/DIRTY AIR 23–24, 155, 161 (1981).

131. Meyer & Rowan, *supra* note 104, at 350.

132. LEE CLARKE, ACCEPTABLE RISK? MAKING DECISIONS IN A TOXIC ENVIRONMENT 30–58 (1989).

133. Letter from Paul L. Schrader, Acting Chief Refinery Engineer, to Hossain Kazemi, Reg'l Water Quality Control Bd., at 2 (Sept. 15, 1994) ("Estimated Quantity of Material Released"); *see also infra* Part III.

134. Christine Oliver, *Strategic Responses to Institutional Processes*, 16 ACAD. OF MGMT. REV. 145, 146, 148 (1991).

135. Meyer & Rowan, *supra* note 104, at 350–51, 358–59.

136. *See* Walter W. Powell, *Institutional Effects on Organizational Structure and Performance*, *in* INSTITUTIONAL PATTERNS AND ORGANIZATIONS: CULTURE AND ENVIRONMENT 115, 115–16 (Lynne G. Zucker ed., 1988).

sunk costs, taken-for-granted cognitive frames, and privileged means of problem solving.[137] Actors inside an organization are subject to pressures to conform to typical practices from their peers, regulators, professions, and other sources. Feedback from these sources constrains problem solving. Individuals are left to pursue "incremental change, extensions of existing logics, or hybrids" of approaches that are already on hand.[138] The primary question asked at a moment of crisis, such as an industrial accident, is quite different from those asked by new institutional economists, who focus on conditions that give firms incentives to adopt structural innovations such as vertical integration. Organization theorists ask how the legitimacy or taken-for-granted character of institutions is reinforced or subverted.

One of the most accessible models for studying how institutions affect the costs of decision making emerged from studies of how firms adopt new technologies.[139] Scholars analyze how technologies such as e-mail or medical equipment affect the properties of firms and social service providers.[140] They model the dynamic process by which boundedly rational actors interact with the institutional properties of their organization. This reciprocal interaction is observed as individuals, particularly in situations that deviate from "normal" operating conditions, "draw on existing stocks of knowledge, resources, and norms to perform their work."[141] These efforts lead to new patterns of interaction and standardized practices (for example, new roles and responsibilities, modes of decision making, and approaches to learning).[142] The habitual use of these new practices leads to their institutionalization.[143]

The process is reciprocal because actors draw upon certain institutional properties in their ongoing interactions, which in turn strengthens and reinforces existing institutions.[144] In short, the institutions in which we operate are "both a product of and a constraint on human action."[145] From this level of abstraction, we can quickly move to a *Boomer*-like setting and consider how, for example, a petrochemical plant's response to an accident or change in the law will reinforce

137. Schneiberg, *supra* note 107, at 103.

138. *Id.*

139. *See* Wanda J. Orlikowski, *The Duality of Technology: Rethinking the Concept of Technology in Organizations*, 3 ORG. SCI. 398, 409 (1992).

140. For examples of studies exploring these effects, see Stephen R. Barley, *Technology as an Occasion for Structuring: Evidence from Observations of CT Scanners and the Social Order of Radiology Departments*, 31 ADMIN. SCI. Q. 78 (1986); Laura J. Black, Paul R. Carlile & Nelson P. Repenning, *A Dynamic Theory of Expertise and Occupational Boundaries in New Technology Implementation: Building on Barley's Study of CT Scanning*, 49 ADMIN. SCI. Q. 572 (2004); Wanda J. Orlikowski, *Using Technology and Constituting Structures: A Practice Lens for Studying Technology in Organizations*, 11 ORG. SCI. 404 (2000); Wanda J. Orlikowski, JoAnne Yates, Kazuo Okamura & Masayo Fujimoto, *Shaping Electronic Communication: The Metastructuring of Technology in the Context of Use*, 6 ORG. SCI. 423 (1995).

141. Orlikowski, *supra* note 139, at 411.

142. *See id.* at 404–05.

143. *Id.* at 406.

144. Barley & Tolbert, *supra* note 113, at 99–103.

145. *Id.* at 97.

existing institutions, leading to new sources of transaction costs for bargaining and regulation.

Barley and Tolbert's model begins with existing institutions,[146] representing blueprints of behavior that accumulate through prior interactions in the form of rules, roles, and categories. This institutional realm constrains and enables human action by (a) directing how problems are interpreted and work is carried out, (b) influencing how resources are deployed to control what work gets done, and (c) sanctioning particular sets of norms of what is and is not viewed as acceptable practice.[147] There is also a realm of action—the people, objects, and events that emerge as a social setting unfolds.[148] How do the two realms interact? Institutions are encoded in actors' existing knowledge as interpretive schemas.[149] Individuals make use of these "scripts,"[150] or outlines of recurrent patterns of interaction,[151] and in so doing the scripts allow the institutional realm to shape how people communicate, use power, and sanction some behaviors while rewarding others.[152]

The concept of "script" was developed to explain how individuals manage their daily activities and reduce the costs of responding to situational stimuli.[153] When we enter a social situation, we recall frameworks that depict "events or behaviors . . . appropriate for [that] particular context."[154] These scripts impose order on ensuing interactions and allow us to make sense of our environment despite our limited cognitive capacity. They set out "a typical sequence of occurrences in a given situation,"[155] including the turns, roles, and categories of acts that outline how it will unfold.[156] Because we cannot process all of the

146. *Id.*; *see also* ANTHONY GIDDENS, THE CONSTITUTION OF SOCIETY 25–29 (1984) (discussing how social structures and institutions are reproduced over time and analyzed through the prior experiences of social actors).

147. *See* Barley & Tolbert, *supra* note 113, at 97–98.

148. *Id.*

149. GIDDENS, *supra* note 146, at 28–29.

150. Defined as "observable, recurrent activities and patterns of interaction characteristic of a particular setting," scripts are the means through which individual practices and understandings accumulate and set conditions for future action. Barley & Tolbert, *supra* note 113, at 98. They have been defined elsewhere as "routines" or "schemata," but in each case the concepts represent similar phenomena. *See* Martha S. Feldman & Brian T. Pentland, *Reconceptualizing Organizational Routines as a Source of Flexibility and Change*, 48 ADMIN. SCI. Q. 96, 97–98 (2003); Andrew Hargadon & Angelo Fanelli, *Action and Possibility: Reconciling Dual Perspectives of Knowledge in Organizations*, 13 ORG. SCI. 290, 293 (2002).

151. Barley, *supra* note 140, at 83.

152. *Id.* at 82–84.

153. Scripts are based on the notion that cognition is "embedded," or emerges as individuals interact with their environment. Bart Nooteboom, *Elements of a Cognitive Theory of the Firm*, 9 ADVANCES IN AUSTRIAN ECON. 145, 149 (2007). *See* Paul J. Heald & James E. Heald, *Mindlessness and Law*, 77 VA. L. REV. 1127, 1143–1151 (1991).

154. Dennis A. Gioia & Peter P. Poole, *Scripts in Organizational Behavior*, 9 ACAD. OF MGMT. REV. 449, 450 (1984).

155. Blake E. Ashforth & Yitzhak Fried, *The Mindlessness of Organizational Behaviors*, 41 HUM. REL. 305, 306 (1988).

156. Barley, *supra* note 140, at 83.

information embedded in our surroundings, we rely on models of behavior and event sequences viewed as appropriate in the settings where we find ourselves. An early account of script formation suggests the following steps: (a) an individual creates a mental representation of an element of observed behavior; (b) the cognitive representation serves as a guide for the observer's performance of the behavior; (c) the behavior is carried out in response to situational cues; and (d) the representation is internalized through explanation, rehearsal, and repetition, leading to its retention in semantic memory.[157] Once in place, scripts add structure to ambiguous tasks and conserve scarce cognitive resources.

The importance of scripts increases, as both guide to behavior and unit of analysis, as actions become more coordinated. Such is the case in organizations, where the interdependence of roles and activities calls for greater agreement among actors over how best to proceed.[158] Within organizations, individuals must arrive at shared meanings and ways of interpreting their surroundings in order to achieve common purposes. For this reason, a firm's behavior is dominated by routine task performance and role-based interaction,[159] which encourage agreement and the integrated actions that characterize an organization. But although scripts facilitate, predict, and legitimize interdependent behavior, they also develop their own constituencies and sunk costs. Through repetition, they become removed from the context that called for their initial use and are taken for granted, thus reducing a firm's ability to respond to change. Studies of technological disasters provide a number of examples of facility managers and production workers who mistakenly interpret clues of an impending crisis as consistent with available scripts, rely on fewer feedback mechanisms because of existing scripts, or escalate their commitment to scripts under moments of stress.[160] Thus, although scripts initially allow firms to adopt new institutions to resolve matters of efficiency, they can, in predictable ways, lead to departures from effective decision making. At the same time, it is encouraging for the regulation of internal firm practices that scripts are amenable to feedback and revision.[161]

To study the social order of an organization, Barley and others focus on "behavioral scripts," observable streams of behavior that are set in motion when cognitive scripts are activated.[162] For example, Barley catalogued behavioral scripts to investigate the effects of newly acquired CT scanning technology on the performance of radiology departments.[163] The departments operated accord-

157. Dennis A. Gioia & Charles C. Manz, *Linking Cognition and Behavior: A Script Processing Interpretation of Vicarious Learning*, 10 ACAD. OF MGMT. REV. 527, 532 (1985).

158. Ashforth & Fried, *supra* note 155, at 308.

159. *Id.* at 315.

160. *Id.* at 316–19; *see, e.g.*, THOMAS D. BEAMISH, SILENT SPILL: THE ORGANIZATION OF AN INDUSTRIAL CRISIS 46–50, 73–77 (2002).

161. Robert G. Lord & Mary C. Kernan, *Scripts as Determinants of Purposeful Behavior in Organizations*, 12 ACAD. OF MGMT. REV. 265, 274 (1987).

162. Barley, *supra* note 140, at 85–86; Gioia & Poole, *supra* note 154, at 456–57.

163. Barley, *supra* note 140, at 84–86.

ing to unique sets of interaction sequences that shifted once the new scanners were introduced. One behavioral script, "clandestine teaching," was performed by radiologists who did not understand how the CT scanners worked. Through performance of the script, the physicians sought information in a way that allowed technologists to correct them without questioning their relative status. The clandestine teaching script included three categories of acts and two different role categories interacting in the following sequence:

(a) Radiologist asks an irrelevant question or makes a faulty suggestion;

(b) Technologist provides information correcting the faulty information; and

(c) Radiologist adjusts his or her claim to align it with standard protocol.[164]

Each behavioral script enacts a cognitive script in response to situational cues. It gives us clues as to the underlying mental representations that guide behavior in an organization and that over time can lock in a variety of institutional influences. Scripts are identified and catalogued through participant observation or content analysis of archival records.[165] A sample is taken of all interaction episodes that occur in a social context between predetermined breakpoints, such as a period of time before and after an exogenous event or a shift in organizational strategy.[166] Parties are identified and behavioral scripts are mapped according to which parties interact, in what ways, sharing what kinds of information, and at what times. Actors' immediate interpretations of events are also elicited. From these data, categories of actors and the respective roles, actions, and turns that reveal the essential plot of a script are outlined.[167]

An example of a script in the environmental management context comes from the Unocal refinery discussed in Part II.A. Engineers and process foremen at the facility can be observed telling operators what chemicals to add to an ongoing process in order to keep a refinery unit operational. One common behavioral script includes the following turns:

(a) Operator monitors an indicator for "feed gas gravity," a parameter that represents the amount of hydrocarbon to be reformed into hydrogen and carbon monoxide in the D-409 unit;

(b) When the feed gas gravity indicator increases above a certain amount, Operator informs the Process Foreman; and

(c) Operator adds potassium hydroxide to the unit until the indicator falls within an acceptable range.[168]

---

164. *Id.* at 91–92.

165. *Id.* at 81, 84–86; Gioia & Poole, *supra* note 154, at 456–57.

166. Barley, *supra* note 140, at 82.

167. *Id.* at 85–86.

168. *See* MACEY, *supra* note 47, at ch. 4 (manuscript on file with author).

This script embodies an institutionalized response to crisis, represented in this example by a potentially unstable refinery unit. The head operator explained that during unit instability, "it's the wrong time to be asking why. Things are moving too fast and you have to stay on top of things. You run the unit; don't let the unit run you."[169] The above script focused operators on the task of stabilizing parameters, which they interpreted as necessary to avoid unit shutdown (extreme levels of instability can trigger automatic shutoff).[170] In response to a situational cue (parameter increase), operators viewed their role as reversing instability and "running the unit," which included deferring to the process foreman and adding one or more chemicals to the solution. Their role did not include monitoring for accidental emissions. Asking questions or raising counterfactuals, such as the possibility that certain indicators can increase dramatically when there is not enough Catacarb to absorb the carbon dioxide in the system, was not viewed as an acceptable role for a D-409 operator.[171] The decision to add potassium hydroxide to the mixture or increase the unit's stripping steam, so that operators could keep the unit from "running them," actually increased the amount of Catacarb released during an accident at the facility, even as unit indicators remained stable.[172]

Institutions, which are imported from a firm's organizational field (including regulators, competitors, and trade associations) in the form of rules, roles, and categories of behavior, are encoded in scripts and shared by social actors through repeated interaction.[173] There are four means by which the realms of institution and action interact within an organization.[174] In Barley and Tolbert's model, vertical motion represents institutional constraints while diagonal motion represents maintenance or change of an institution through action. The four means of interaction are as follows:

a. **Encoding**: Institutional principles are encoded in scripts, as organizational rules and procedures are internalized, appropriate behaviors are interpreted, and technical designs force actors to engage in certain patterns of activity.

b. **Enactment**: Actors follow scripts, using standardized rationales when they are aware that they are doing so, but often following them without awareness of their origin.

c. **Revision or Replication**: Events such as technological shifts, market adjustments, and contacts across organizations can lead to modifications of scripts. However, because each preexisting arrangement of scripts repre-

169. *Id.*
170. *Id.*
171. *Id.*
172. *Id.*
173. Karan Sonpar, Jay M. Handelman, & Ali Dastmalchian, *Implementing New Institutional Logics in Pioneering Organizations: The Burden of Justifying Ethical Appropriateness and Trustworthiness*, 90 J. OF BUS. ETHICS 345, 348 (2009).
174. Barley & Tolbert, *supra* note 113, at 100–03.

sents the outcome of a previous negotiation, there will be actors who will resist reopening those deliberations to collective questioning.

d. **Externalization**: Following replication or revision, patterned behaviors or scripts are separated from specific actors or circumstances. From this point, scripts become more difficult to identify, isolate, and criticize, as their relationship to the interests of individual actors becomes less clear.[175]

Interactions between each stage are illustrated in Figure 1.

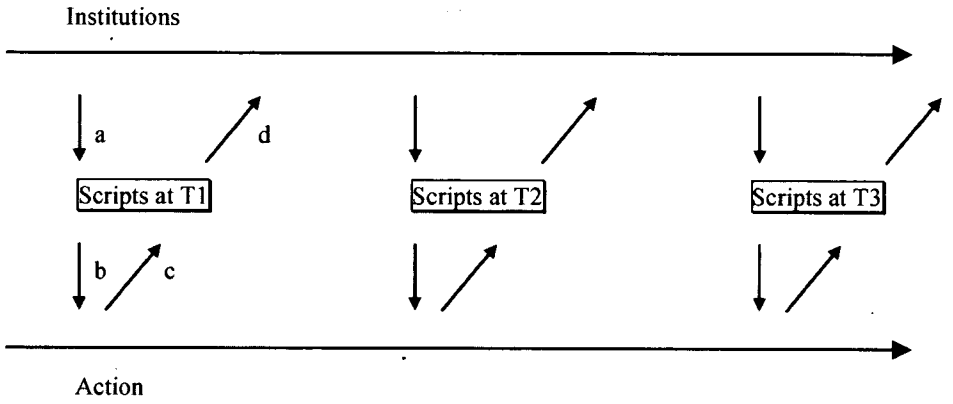

Figure 1. Sequential Model of Institutional Formation.[176]

The cycling of scripts occurs as firms are engaged in normal operations as well as when they react to a crisis or regulatory intervention. Although initially scripts may be adopted for efficiency reasons, over time they can become less compatible with the contexts in which they are performed. This dynamic limits an organization's ability to respond to change or consider more effective modes of operation. By peering inside organizations and identifying the scripts that lead them to reject better outcomes while upholding practices that deviate from efficiency, we can account for a wide range of behavior, such as how firms bargain over property entitlements and enact new regulations.

II. BARGAINING IN AN INSTITUTIONALIZED SETTING: TOWARD A MORE COMPLETE INSTITUTIONALISM

A. RITUALS AND SCRIPTS: THE CASE OF AN INDUSTRIAL ACCIDENT

We can often trace events leading to environmental bargaining to an industrial accident. When an accident occurs at a place such as the Unocal Corporation's San Francisco Refinery, a series of scripts are set in motion. Risk management proceeds according to distinct ritualistic acts by government and

175. *Id.*
176. *Id.* at 100–03 & fig.2.

industry officials. For example, in 1994, the refinery released an estimated one hundred tons or more of Catacarb into the air over sixteen days before managers decided to shut down the responsible unit.[177] Unocal's description of the "Catacarb incident" confidently displays how the appropriate parties were contacted, procedures undertaken, and data (post-accident monitoring, modeling, and sampling) collected. Yet it offers few details of what transpired during the sixteen-day accident.[178]

Unocal's chronology of events begins on August 22 at 0655 hours ("time reported") and 0720 hours ("time CCC HSD notified").[179] The leak was declared "under control" at 0945 hours and "all clear" the following day.[180] The accounts skip ahead to September, outlining calls from residents starting on September 4 (0925 hours) and 5 (0120 hours) and agency notifications beginning September 6 to the Bay Area Air Quality Management District.[181] There is an air of control and predictability to such organizational accounts of accidents.[182] But there are, behind the human errors and incentives commonly used to explain industrial accidents,[183] a series of scripts that constrain choice and lead organizations such as Unocal to make inefficient decisions.

I analyzed refinery worker depositions taken as part of a toxic tort claim filed on behalf of residents affected by the spill.[184] I identified the scripts that allowed the Catacarb release to continue for two weeks *after* it was discovered. One set of scripts guided accident investigation, a complex process at a facility spanning hundreds of acres and thousands of emissions points. Shortly after the Catacarb leak was discovered, hydrotreating engineer Ellen Barker started a formal investigation of the leak by drafting a Management of Change (MOC)

---

177. Memorandum from the Dir. of Enforcement, Bay Area Air Quality Mgmt. Dist., Unocal Refinery, to the Air Pollution Control Officer (Sept. 23, 1994) (on file with author).

178. *See* Unocal Corp. San Francisco Refinery, Catacarb Release Fact Sheet (no date); *see also* MACEY, *supra* note 47, at ch. 4 (manuscript on file with author).

179. Post Incident Analysis, L. Miller, Fire Protection Department (Aug. 31, 1994).

180. *Id.*

181. *See* Unocal Corp. San Francisco Refinery, *supra* note 178; Letter from Paul L. Schrader, Acting Chief Refinery Engineer, to Dir. of Enforcement, Bay Area Air Quality Mgmt. Dist. (Sept. 22, 1994) ("On August 22, 1994, while under normal operating conditions, the D-409 Regenerator Tower developed a leak to the atmosphere in the upper section of the tower. . . . Some time after September 2, 1994, conditions in the tower changed . . . .").

182. Montgomery Watson, Sampling and Analysis Plan for the September 1994 Catacarb Release, Unocal San Francisco Refinery, at 1 (Sept. 1994) ("On Tuesday, September 6, 1994, Unocal personnel at the Unocal San Francisco Refinery (SFR), located in the city of Rodeo, California, determined that a solution with the trade name of Catacarb was being released in the form of a mist from the D-409 . . . . The plant was shut down and regulatory agencies were contacted . . . .").

183. PERROW, *supra* note 40, at 67.

184. Transcripts of twenty-one depositions of refinery workers were coded for worker activities, decisions, and actions during the two-week accident. Their actions were then divided into themes, which guided a second review of their depictions of the accident. Each theme represents an area of activity or organizational design responsible in part for the extension of the leak at the refinery. Acting in combination, the themes represent the root causes of the severity of the Catacarb release and its effects on neighboring communities. *See, e.g.*, Transcript of Deposition of Stephen Plesh, General Manager, Unocal San Francisco Refinery, *In re* Unocal Refinery Litigation, No. 94-04141 (Cal. Super. Ct. July 17, 1996).

proposal. The need for an MOC was justified by the fact that the tower leak was "not a typical situation [and] operational changes outside of design should be reviewed."[185] The MOC Work Request was made because the refinery was "operating at outside of its established design limits, because we normally don't have a vent on the side of the tower."[186] Under an MOC, review of available Material Safety Data Sheets, review by the Health, Safety, and Emergency Response Department, structural integrity review of the tower, environmental review, and Process Hazard Analysis (HAZOP), which contains a matrix of pressures, temperatures, flows, and concentrations under a variety of scenarios (relating to increases, decreases, and unit shutdown) are carried out.[187] The HAZOP team has the authority to recommend shutdown or repair. Instead, management determined that an MOC was not necessary because "[i]t was a change in operation, but it wasn't something that we installed to change the operation."[188] In its place, a Process Review was commissioned, finding the operation stable and "[e]verything appeared to be operating in normal . . . parameter ranges."[189] This review focused entirely on operational issues; no consideration was given to health or safety risks unrelated to general operation of the unit.

Procedures were in place to identify Catacarb emissions from day one. A second set of scripts governed how refinery workers monitored the Catacarb leak. Table 1 is a compilation of the observations they recorded during the accident.

One possible explanation for Catacarb's sporadic appearance in the monitoring logs could be found in its tendency to form around a leak until bits of solid Catacarb are blown free by the pressure behind them.[191] Another set of explanations could be found in observation logs for operating parameters.[192] But

185. Transcript of Deposition of Ellen Barker, Hydrotreating Engineer, Unocal San Francisco Refinery, at 343, *In re* Unocal Refinery Litigation, No. 94-04141 (Cal. Super. Ct. June 24, 1996).

186. *Id.* at 344.

187. *Id.* at 348–61; *see id.* at 378–79; Transcript of Deposition of Lanny Partain, Shift Supervisor, Unocal San Francisco Refinery, *In re* Unocal Refinery Litigation, No. 94-04141 (Cal. Super. Ct. May 23, 1996); UNOCAL PETROLEUM PRODUCTS AND CHEMICALS DIVISION, SAN FRANCISCO REFINERY, PROCESS HAZARD ANALYSIS: UNICRACKING UNIT 240, HYDROGEN PRODUCTION SECTION—PLANT 4 (Feb. 1994); UNOCAL SAN FRANCISCO REFINERY, SAN FRANCISCO REFINERY POLICIES AND PROCEDURES MANUAL: MOC AND PRE-STARTUP SAFETY REVIEW PROCEDURES (1994) (originally issued in 1992).

188. Transcript of Deposition of Russell Crawford, Superintendent of Hydrotreating, Unocal San Francisco Refinery, at 77–78, 310–11, 327–30, *In re* Unocal Refinery Litigation, No. 94-04141 (Cal. Super. Ct. June 19, 1996); *see* Letter from Randall L. Sawyer, Risk Mgmt. and Prevention Program Specialist, Contra Costa County Health Servs. Dep't, to Warren A. Smith, Superintendent, Envtl. Affairs, S.F. Refinery (Oct. 25, 1994) (expressing concerns over the failure to invoke a Management of Change procedure); Transcript of Deposition of Stephen Plesh, *supra* note 184, at 263.

189. Transcript of Deposition of Ellen Barker, *supra* note 185, at 392–93; *see also id.* at 377–78 (stating that recollection of Process Review was that it was "an endorsement of continued operation").

190. Transcript of Deposition of Adrien Van de Hoef, Bulk Shift Supervisor, Unocal San Francisco Refinery, at 20, *In re* Unocal Refinery Litigation, No. 94-04141 (Cal. Super. Ct. July 17, 1996).

191. Leak Observation Log, Hydrotreating Department (8/24/94–9/6/94) (Sept. 6, 1994) (emphasis added).

192. For example, the amount of Catacarb escaping from the tower increased whenever operators increased the amount of stripping steam, which helps with CO_2 removal, in the tower. Transcript of

Table 1. Monitoring Observations Recorded During Catacarb Accident.[190]

Date	Comments
8/22	Blowing forcefully through insulation; Some **catacarb** leaking to ground level (3 pm); No change (7 pm); Blowing through insulation; Little or no **catacarb** leakage (11 pm).
8/23	No change (3 am); No change (7 am); No change (3 pm); No change (7 pm); No change (11 pm).
8/24	No change (3 am); Can't tell (8 am).
8/25	Blowing forcefully through insulation; Little or no **catacarb** leakage (3 am); Getting worse (8 am); Same (12 pm); Steadily worsening: **No liquid dripping obviously** but forceful steam plume (4 pm); Same (8 pm).
8/26	No change (12 am); No change (4 am); No change (8 am); No change (12 pm); Same? (but **catacarb** visible in plume intermittently) (4 pm); Same? (perhaps **odor** is more detectable behind D409); More **spots on ground** (8 pm).
8/27	Same as above (12 am); No change (4 am); **Catacarb** is starting to **accumulate on over head lines and equipment** (8 am); Same as above. Still **accumulating on equipment, piping** (12 pm); Continuing as noted above (4 pm); Continues (8 pm).
8/28	No change (12 am); No change (4 am); Still blowing **catacarb**. **Catacarb** probably coming down side of D409 (8 am); Same (12 pm); It seems that the **catacarb** puffs have stopped with no new **catacarb** on ground (4 pm); No change (8 pm).
8/29	No change (12 am); No change (4 am); Still blowing **catacarb** (8 am); Same (12 pm); Slightly **discolored cloud/plume** blowing forcefully. Some **wet spots at base** (4 pm); Continuing as noted above (8 pm).
8/30	Slight increase (12 am); Same (4 am); No change (8 am); No change (12 pm); Same (4 pm); Continues (8 pm).
8/31	Same (12 am); No change (4 am); No change (8 am); No change (12 pm); Continues (hole enlarged a bit) (4 pm); Continues (8 pm).
9/1	No change (12 am); Increased slightly (4 am); Same as above (8 am); Same as above (12 pm).
9/2	Same (12 am); No change (4 am); Increased slightly (8 am); Same as above (12 pm); Still blowing (4 pm); Still blowing (8 pm).
9/3	Blowing forcefully (12 am); Continues (4 am); No change (8 am); No change (12 pm); **Catacarb** on the ground; hole seems bigger (4 pm); Still blowing **catacarb** on **equipment behind tower** (8 pm).
9/4	Maybe it's just sinuses on midnight shift but I started **sneezing and watering** when doing readings in area (12 am); Blowing forcefully, perhaps hole is enlarged (4 am); Same as above (8 am); Same as above (12 pm); More noticeable **catacarb** on **pipes and equip**. Very little steam in the cloud. Looks mainly like **vaporized catacarb**. Hole looks bigger (4 pm–8 pm).
9/5	Fire monitor on D407—difficult to tell size of hole (12 am); Mist is definitely brown. Since **puddles and gutters are brown** must be knocking some down from mist (4 am); Leak still the same. Shut off fire hose per RM (8 am); With the increase in steam, **catacarb** coming from the leak is more noticeable (12 pm–4 pm).
9/6	Blowing forcefully; Some operators complained got **mist on windshields** on way to work (12 am); Blowing forcefully (4 am).

because overlapping investigation, monitoring, and operating parameter scripts[193] crowded out or displaced such explanations and did not make them available to management, a case for unit shutdown could not be made despite consensus that the leak was more than "just steam and CO_2." Other scripts that magnified the scope of the accident included internal decision making and emergency response scripts.[194]

I identified similar scripts at the Rhône Poulenc and Conoco facilities using internal documents and interviews with environmental managers. The scripts cluster around four basic categories: (a) scripts governing how a facility responds to and reports accidents;[195] (b) plant-level environmental management scripts such as existing roles and standard operating procedures;[196] (c) regulatory response scripts that involve a predictable set of agendas, data gathering

---

Deposition of Gary Martin, Plant 4 Operator, Unocal San Francisco Refinery, at 124–32, *In re* Unocal Refinery Litigation, No. 94-04141 (Cal. Super. Ct. Apr. 16, 1996). The period between September 1 and 2 when operators did not observe Catacarb in the plume coming out of the tower corresponds with an unplanned shutdown elsewhere in the refinery that caused stripping steam rates to plummet. Transcript of Deposition of Gary Martin, *supra*, at 82–83; Transcript of Deposition of Hamid Raza Arabzadeh, Industrial Hygiene Manager, Unocal San Francisco Refinery, *In re* Unocal Refinery Litigation, No. 94-04141 (Cal. Super. Ct. Aug. 14, 1996); *see also infra* tbl 2. Transcript of Deposition of Diane Wang, Senior Operator, Unocal San Francisco Refinery, at 96–99, *In re* Unocal Refinery Litigation, No. 94-04141 (Cal. Super. Ct. Aug. 14, 1996).

193. An observation log was kept during the accident, including entries for operating parameters that management believed would allow workers to monitor the *stability of the unit*; loss of Catacarb was at best a secondary consideration. *See* Transcript of Deposition of Russell Crawford, *supra* note 188, at 89, 100, 272–74. The entries were to be recorded so that the operators would "be able to notice a trend and try to deal with it before it gets to a critical stage." Transcript of Deposition of Diane Wang, *supra* note 192, at 163–65. Some of the variables could be linked to possible Catacarb loss. Transcript of Deposition of Diane Wang, *supra* note 192, at 164, 187–88; Transcript of Deposition of Gary Martin, *supra* note 192, at 55–57; *see also* Memorandum from K.C. Sadoian to R.A. Crawford (Aug. 24, 1994) ("To minimize the leak stripping steam to D-409 has been reduced by about 10%."); Memorandum from E.C. Scherer to R.H. Ferneau (June 10, 1994) ("Normality—Solution strength affects CO_2 removal."). But because the readings in the log, when they were available for trend analysis, did not necessarily point to Catacarb loss, the clearer objective to avoid catastrophic change prevailed. Transcript of Deposition of Gary Martin, *supra* note 192; Transcript of Deposition of Hamid Raza Arabzadeh, *supra* note 192; *see also* Transcript of Deposition of Diane Wang, *supra* note 192, at 171–73; Memorandum from M.L. Clark to All Operations Personnel and All Maintenance Personnel (Sept. 2, 1994) ("It is possible that the leak will gradually grow in size (typical of a steam leak), but the mechanical integrity of the tower is not in question."); Hydrotreating Department Unit 240 Night Instructions (Aug. 22, 1994) ("There is a log sheet in the control room to be filled out every 4 hours. It lists the H_2 production, steam to D-409, D-408 delta temp., CO_2 slip and a visual description of the leak itself. We have made the decision to run in this condition based on the last ME&I inspection, the knowledge that if the leak gets worse, it will not just crack in half . . . .").

194. For a complete overview of the Catacarb accident, see MACEY, *supra* note 47, at ch. 4 (manuscript on file with author).

195. *See supra* notes 177–94 and accompanying text.

196. For example, Discharge Monitoring Reports that provide quantity and concentration figures for parameters (substances) used each month at Rhône Poulenc (now Rhodia) showed only a narrow range of lost products that, if captured, could be reprocessed and sold to various industries and suggested that little could be done to change the facility's raw material feeds, which fluctuated according to the needs of customers (refineries, carpet producers, and electroplaters). Interview with Environmental Professionals, Rhodia, in Manchester, Tex. (Apr. 23, 2002).

exercises, and timetables;[197] and (d) scripts embedded within the technologies employed by each facility, particularly source reduction, pollution monitoring, and risk regulation.[198] These scripts embody the institutional context in which accidents occur and parties engage in post-accident bargaining. Table 2 presents major land uses in the communities adjacent to the Unocal, Rhône Poulenc, and Conoco facilities and the categories of scripts that worsened the impact of each accident, such as inadequate monitoring and early warning procedures, disaster plans that met EPCRA standards but could not adequately protect residents, safeguards and shutdown procedures that did not prevent the release of substantial amounts of toxic emissions, and state–industry coordination of the interpretation of accidents.

Regulators ignore how scripts can magnify the intensity and duration of an accident. The primary investigators of the Catacarb release were the Bay Area Air Quality Management District (AQMD). The AQMD focused on public nuisance and particulate weight and intensity limitations, issued civil penalties accordingly, and called for extra training for certain individuals.[199] A consent decree required changes to training initiatives and reductions in human error.[200] Two easily reportable and verifiable actions—placement of a hygienist and completion of training hours—marked the only efforts to address organizational precursors to the incident.[201] Thus, regulators ignored the most troubling con-

197. For example, emissions problems at the Conoco refinery led EPA Region VIII to overfile on Colorado Department of Public Health and Environment (CDPHE) enforcement actions, claiming that the state did not adequately interpret regulations concerning inspections, record keeping, hazardous waste discharges, notices to the state, and penalties for RCRA violations. Complaint, Compliance Order and Notice of Opportunity for Hearing, *In re* Conoco, Inc., No. RCRA (3008) VIII-97-03 (Mar. 18, 1997). At the same time, the state filed Compliance Advisories under RCRA and the Colorado Hazardous Waste Act regarding benzene in one of Conoco's wells and groundwater contamination. Compliance Order on Consent, *In re* Conoco, Inc., No. VIII-98-03 (Aug. 7, 1998). A public interest firm filed a citizen suit under section 304 of the Clean Air Act, focusing on inadequate emissions monitoring. Complaint, CoPIRG Citizen Lobby v. Conoco, Inc., No. 98-30 (N.D. Colo. Jan. 8, 1998). And Conoco adapted to a series of regulatory changes: for example, it sought to improve its control over fugitive emissions and on-site continuous monitoring, two areas of concern addressed in subsequent consent orders with the Department of Justice. Telephone Interview with Air Program Leader, Conoco Refinery (Mar. 22, 2001); Interview with Environmental Director, Conoco Refinery, in Commerce City, Colo. (Mar. 7, 2001).

198. Technology, such as the pollution monitoring system adopted as part of the Unocal agreement, introduces its own set of expected behaviors and limitations of operation. *See infra* notes 220–25 and accompanying text. Organization theorists have long posited that a new technology influences the practices that are demanded by its use, which stabilize over time as new roles and responsibilities called for by the technology become apparent. Trevor J. Pinch & Wiebe E. Bijker, *The Social Construction of Facts and Artefacts: Or How the Sociology of Science and the Sociology of Technology Might Benefit Each Other*, 14 SOC. STUD. SCI. 399, 410–19 (1984). As a new technology is adopted, the distance between the intentions of a technology's designers and the practices of its users grows as social networks incompatible with the new technology are not disentangled by those who introduce the new artifact. *Id.*

199. Consent Decree and Final Judgment, Bay Area Air Quality Mgmt. Dist. v. Union Oil Co. of Cal., No. C95-03165 (Cal. Super. Ct. July 19, 1995).

200. *Id.*

201. *See* MACEY *supra* note 47.

Table 2. Land Uses, Accidents, and Organizational Scripts at Case Study Sites.[202]

	Unocal	Rhône Poulenc	Conoco
Affected Communities	Unincorporated towns (Crockett and Rodeo), fenceline communities (Bayo Vista and Tormey) in Contra Costa, CA	Manchester, Smith Addition, Harrisburg communities in Houston, TX	North Denver communities (Swansea, Elyria) and Commerce City, CO
Prominent Industrial Land Uses	Petroleum refinery, sugar refinery	Petrochemical operations along Houston Ship Channel including Rhône Poulenc, Valero, Oxid, Lyondell-Citgo, Mobil	150 industrial land uses, 4 NPL sites, 3 lead smelters, numerous hazardous waste sites within 450 acres
Recent Accidents	2300 wastewater discharge violations, 1977–1989; approx. 20 air episodes per year, 1992–1995	2 sulfuric acid leaks, 1980 (Stauffer); gasoline tank leak, 1986; fire, 1988; oil tank explosion, 1990 (Hill Chemical); numerous explosions (Eddie Oil)	16 incidents involving SO^2 releases, 1995–1996 (Conoco refinery); HCL release from Vulcan Materials rail tanker car, 20–30 blocks evacuated
Pre-Bargaining Accident	Catacarb release (air)	SO^2 release (air)	SO^2 releases (air); benzene contamination (groundwater)
Extent of Accident	16 day, 100 ton release; serious injuries reported	30 plant workers sent to hospital	.02–113 tons released per incident (16)
Implicated Scripts	Internal decision making; accident investigation; visual monitoring; organizational memory; operating parameter procedures; emergency response/warning systems; off-site monitoring and information sharing	Chemical transport/ offloading procedures; release containment; existing permits create perceived limits to process changes and emissions reductions; discharge monitoring; off-site monitoring and information sharing	Overlapping regulatory responses; sulfur reduction unit procedures; inspections; record-keeping; notices to State; lack of safeguards to prevent, respond to releases

cern to emerge during the release: the fact that a heavily regulated, complex facility encourages employees at all levels to adopt scripts, including routines (for example, patterns of visual observation, information, or knowledge transfer), rules (for example, only ask questions or share information under certain circumstances), or means of framing questions (for example, internal decision making) to simplify what is expected of both them and their coworkers during an unexpected event.

B. BARGAINING EFFECTS OF SCRIPTS

The Catacarb accident began as Unocal sought a land use permit in response to new rules issued by the California Air Resources Board. The rules required motor fuel composition changes and modifications to the refineries that produced them.[203] A draft Environmental Impact Report for the project was issued in June 1994.[204] The county responded by conditioning permit approval on Unocal's negotiating with residents over refinery conditions,[205] essentially giving residents of two incorporated towns (Rodeo and Crockett) and a public housing development (Bayo Vista) a property rule protection against refinery expansion and emissions increases that would only occur upon approval of the permit. We would traditionally expect this and similar bargaining situations to collapse under the weight of strategic realities when they involve an entitlement held by multiple parties.[206]

Yet time and again, residents overcome the kinds of positional bargaining behaviors that are encouraged by, for example, a bilateral monopoly situation (such as where negotiation with a set of communities is the only means to a necessary permit and where the plant is the primary source of harm and, therefore, potential improvement to an area's environmental quality). The good neighbor agreement signed between residents and Unocal, the community audit agreement reached by Manchester residents and Rhône Poulenc (which also led to permit approval), and other contracts attest to a growing frequency of agreements that return the entitlement to operate or expand a facility to the polluting firm in exchange for financial and other contributions.

The mere fact of an agreement, which can be presented as a data point in contravention of standard law and economics predictions, is less important than

---

202. Consent Decree & Final Judgment, *supra* note 199.

203. G.R. Hadder, *Future Refining Impacts of the Clean Air Act Amendments of 1990*, 17 ENERGY 857, 857 (1992); R.C. Sherr, G.A. Smalley & M.E. Norman, *Clean Air Amendments Put Big Burden on Refinery Planners*, 23 OIL & GAS J. 35, 35–38 (1991).

204. CONTRA COSTA COUNTY, DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE UNOCAL CORPORATION REFORMULATED GASOLINE PROJECT (LAND USE PERMIT 2038-93; STATE CLEARINGHOUSE # 93121027) (1994); *see also* Statement of Findings and Overriding Considerations for the Union Oil Company of California Reformulated Gasoline Project Land Use Permit Application #2038-93, Adopted by Contra Costa County Board of Supervisors, at 3.

205. Contra Costa County Planning Commission, Community Development Agenda Item #6, Unocal Corporation (Applicant and Owner) (Nov. 15, 1994).

206. *See supra* note 21.

the nature of the agreement itself. When we open up the black box of organizations that negotiate over entitlements, we find a series of scripts that cause or magnify the nuisances and toxic torts that lead communities to organize in opposition to facilities. Unocal, Rhône Poulenc, and Conoco are required to comply with rules governing emissions points, input–output factors, fugitive emissions, storage and shipment of waste products, monitoring, and analysis and prevention of accidents. These requirements are superimposed on existing efforts to maintain production. Similarly, agencies, lacking the ability to continuously monitor or inspect even a small subset of existing sources, must make tough decisions regarding how best to enforce the same regulations and ensure compliance.

Both firms and regulators, faced with pressing demands and limited resources, adopt a series of rule-like means of upholding the appearance that regulations are producing desired effects. Regulators rely on industry emissions estimates, scatter a limited number of fixed monitors that track a small number of pollutants across their jurisdictions, and make use of standard protocols for responding to accidental releases. Firms use common nonthreatening interpretations of accidental releases, calls for residents to "shelter in place," and internal processes for classifying and assessing accidents. Often, these patterns of behavior become second nature to those involved and are no longer open to reconsideration or criticism. They are upheld to save time and energy, minimize disagreement, and provide a shared plan for how workers should proceed under uncertain circumstances.

The enactment and replication of scripts diminish the efficiency of bargaining with a complex organization. Bargaining can grow out of incidents that briefly call attention to organizational scripts. But to varying degrees the relevant role assignments, standard operating procedures, and ceremonial behaviors remain resilient, limiting each negotiation by constraining available solutions, offers, and counteroffers. For example, prior to negotiations with Unocal, residents generated a series of proposals, the most prominent of which concerned emergency response and notification.[207] Proposals included on-site community monitors, odor and spill patrol teams, surveillance cameras linked to web sites, community monitors inside the refinery to help with activation of public notification systems, wiring fenceline monitors to agencies and residents' homes, and neighborhood watch programs to avoid future accidents.[208] The proposals were not adopted. Many were low-cost proposals, particularly in comparison to provisions included in the final agreement, such as emissions monitoring technology that proved ineffective at avoiding future Catacarb-type accidents.[209] None of the scripts responsible for the Catacarb accident were successfully addressed

207. Reports from Committees in Negotiation Packet, Crockett-Rodeo Coalition (Nov. 13, 1994).

208. Emergency Response & Community Warning Issues for Negotiation, Crockett-Rodeo Coalition Emergency Response & Community Warning Committee (Nov. 13, 1994).

209. Good Neighbor Agreement, *supra* note 17, at 9; *see also infra* notes 223–28 and accompanying text.

during post-accident bargaining. Most readily excluded were ideas relating to questioning normal operating procedures at the refinery and establishing new roles for plant inspection, pollution patrols and citizen monitoring, and early warning and notification. Very little of the agreement's financial allocations was devoted to emergency preparedness or safety.[210]

Scripts constrain the negotiations that follow an accident in different ways. Some of the scripts do not lend themselves to consideration by parties within a limited window of opportunity (such as scripts pertaining to accident assessment or how operators monitor emissions at the Unocal refinery).[211] More systemic scripts are resistant to change, having encouraged multiple work groups, firms, or regulatory agencies to follow them (such as the accident reporting and interpretation scripts that are often the initial source of frustration for residents).[212] Whether scripts cycle unseen through a negotiation process or resist efforts at revision, a large portion of the potential gains from trade (surplus from bargaining) are removed from consideration, sometimes before negotiations even begin. This means that more efficient proposals for emissions monitoring, reduction, and emergency preparedness are tabled or discounted in favor of larger investments keyed to the institutional environment of the targeted facility.

A facility also follows an internal decision making structure and values options within the context of existing plant-wide initiatives, which are difficult to decouple and link to isolated proposals raised during a negotiation. For example, at any moment, the Conoco refinery is adapting to regulatory developments by making adjustments in two directions. First, new objectives are tied to specific roles and personnel from upper management through various incentives. Second, middle management use data in what is called a "plant information system" to track emissions points; respond to "upticks" and regulatory exceedances; carry out trend, incident, and root cause analyses; and propose changes that account for budgetary constraints, systems effects, and plant optimization goals.[213] These streams of adjustment and adaptation are in motion when the organization sits down to negotiate with other parties. They are limited by the availability of information and workers' ability to process and interpret it. For example, sulfur, a key focus of the Conoco negotiations, is not uniformly monitored at the refinery; instead, a patchwork of regulations guides the tracking of various chemicals.[214]

---

210. Good Neighbor Agreement, *supra* note 17, at 3.

211. *See supra* notes 179–94 and accompanying text.

212. *See supra* notes 177–83 and accompanying text.

213. Telephone Interview with Air Program Leader, *supra* note 197; Interview with Environmental Director, *supra* note 197.

214. One facility official noted that "environmental regulations apply to specific pieces of equipment, so if your piece of equipment is covered by a specific regulation that requires a certain kind of monitoring that's what you do." Interview with Environmental Director, *supra* note 197 (comparing operations that require a continuous monitor to those for which the refinery uses input–output factors to estimate emissions); *see also* Telephone Interview with Air Program Leader, *supra* note 197

Industry-wide or projected regulatory changes also constitute institutionalized expectations for bargaining, and they grow out of agency protocols and interactions that begin years earlier. For example, Rhône Poulenc's agreement with residents is more an encapsulation of existing and anticipated state requirements (for audits, off-site monitoring, and data provision) and industry-wide initiatives than a response to resident concerns before they assented to a Class-3 Permit Modification for the facility. A public warning system was already negotiated between facilities and officials in nearby cities (Channelview, Pasadena, and Deer Park), particularly as part of the Local Emergency Planning Committees mandated by EPCRA.[215] The facility was already subject to an independent auditor's assessment under Texas law when it included a similar program in its agreement with residents.[216] The only independent audit conducted at the facility identified cost-effective ways to reduce accidental emissions and counter corrosive materials used at the facility that were not addressed during negotiations.[217] Current projects at the facility, such as Layers of Protection Analysis, mechanical integrity programs, and waste reduction efforts suggest opportunities that at the time were not imported from the firm's organizational field, including other firms and regulators.[218]

Similarly, each accident sets off a unique ordering of administrative remedies due to the division of labor among regulators, further constraining negotiations. For example, after Conoco was targeted for sulfur dioxide releases and benzene contamination, EPA and CDPHE initiated overlapping and independent enforcement actions,[219] which encouraged Conoco to fashion a supplemental environmental project to respond to the core concerns of each action. Conoco drafted a response to EPA's RCRA action and used that document as a template for settlement that satisfied the core demands of EPA Region VIII and CDPHE as expressed in the RCRA action and state actions as well as one set of the residents' concerns.[220] By the time residents and Conoco reached an agreement, sulfur dioxide emissions had already been addressed through a consent agreement approved under EPA Region VIII's RCRA action and a compliance order

("[T]here[are] multiple places where we have sulfur dioxide emissions . . . . There's one that has a continuous monitor on it. There's one that's not yet been required. . . . And there are other sulfur dioxide sources in the plant as well. And some of those are monitored more frequently, some less, a lot of that dependent on the regulatory requirements.").

215. Renee Haines, *Cities Near Plants Address Fears*, HOUS. CHRON., Jan. 3, 1993, at 1C.

216. 31 TEX. ADMIN. CODE § 305.147.

217. Independent Auditor's Report Under 31 TAC 305.147: Rhône-Poulenc Basic Chemicals Company 13–15 (Sept. 24, 1993).

218. *See, e.g.*, Bill Dawson, *75 Facilities Promise To Cut Emissions Under State Plan*, HOUS. CHRON., Dec. 11, 1992, at 36A (describing the Texas Water Commission's Clean Industries 2000 program); Interview with Environmental Professionals, *supra* note 196.

219. *See supra* note 197.

220. *See* Status Report and Request for an Extension of Time, *In re* Conoco, Inc., No. RCRA (3008) VIII-97-03 (Jan. 22, 1998); Meeting Notice, Conoco Denver Refinery Sulfur Project Presentation (Feb. 17, 1998); Draft Settlement Discussions Between CoPIRG and Conoco, Suggested Meeting Agenda (Mar. 10, 1998); Minutes of Settlement Discussions Between CoPIRG and Conoco (Mar. 31, 1998).

issued by EPA and CDPHE.[221] These efforts, again keyed to Conoco's organizational field, superseded resident attempts to pursue advanced warning concerns or set precedents for other community–corporate relations.[222]

Finally, as the complexity of a proposed solution grows, it becomes more difficult to identify the technology-based scripts that influence an agreement's implementation. Technologies set limits on which actions their users can carry out. For example, the primary means of avoiding Catacarb-type accidents at the Unocal refinery was to agree to a fenceline monitoring system to keep track of toxic air pollutants as they crossed the refinery's property line.[223] The system employed "open path optical remote sensors," which send beams of light through the air toward reflectors and gather "fingerprints" of the chemicals that pass by the light. Every time chemicals pass by the light, a portion of the beam is absorbed, leaving a distortion in the beam of various wavelengths. These fingerprints are compared to the monitor's internal library to determine the chemical makeup of what passed through the beam.[224] Implementing the technology is exceedingly complex, involving issues such as the kind and location of monitors; monitor spacing; compounds monitored; data recorded, summarized, and made available to the public; system maintenance; and whether the system will trigger the county's Community Warning System.[225]

The system did not lead to improved post-incident analysis, emergency notification, or even information dissemination.[226] This was due to failure of the parties to disentangle incompatible social networks (existing monitoring offi-

221. *See* Consent Order, *In re* Conoco, Inc., No. RCRA (3008) VIII-97-03 (Aug. 11, 1998); Compliance Order on Consent, *In re* Conoco, Inc., No. RCRA (3008) VIII-98-03, at 13 (Aug. 7, 1998); Settlement Agreement and Release between COPIRG Citizen Lobby, Michael Maes, Lorraine Granado, and Conoco, Inc. (Apr. 29, 1999).

222. Minutes to Telephone Meeting with Randy Weiner, Michael Mae, and Lorraine Granado (Apr. 7, 1998).

223. Memorandum of Understanding Between Crockett-Rodeo Coalition, Shoreline Environmental Alliance, Communities for a Better Environment & Union Oil Company of California dba Unocal (Nov. 3, 1996); SHORELINE ENVTL. ALLIANCE, CMTYS. FOR A BETTER ENV'T, CONTRA COSTA COUNTY HEALTH SERVS., AND U.S. EPA REGION IX, OPTICAL OPEN PATH MONITORS AT THE TOSCO SAN FRANCISCO REFINERY AT RODEO FENCELINE 1 (May 2001).

224. CMTYS. FOR A BETTER ENV'T, REFINERY FENCELINE MONITORING USING LIGHT BEAMS TO DETECT CHEMICALS AT THE FENCELINE OF THE TOSCO, RODEO REFINERY (no date); SHORELINE ENVTL. ALLIANCE ET AL., *supra* note 223, at 7–8.

225. CMTYS. FOR A BETTER ENV'T, *supra* note 224; *see also* SHORELINE ENVTL. ALLIANCE ET AL., *supra* note 223, at 1, 5–6, 7–8, 15; Good Neighbor Agreement, *supra* note 17, at 9–10; Unocal San Francisco Refinery, Draft Monitoring Plan for the Unocal Perimeter Monitoring Evaluation Test Program, ENSR Consulting and Engineering, at 1-2, 2-1, 3-1, 4-1 to 4-4 (Jan. 1995); Telephone Interview with Crockett Resident (Oct. 31, 2002); Telephone Interview with Facilitator of Unocal Good Neighbor Agreement (Aug. 29, 2002); Telephone Interview with Member of Shoreline Envtl. Alliance (May 31, 2002).

226. Letter to Debbie Sanderson, Contra Costa County Cmty. Dev. Dep't, from Fenceline Monitoring Comm. (Apr. 12, 1999); Telephone Interview with Crockett Resident, *supra* note 225; Telephone Interview with Member of Shoreline Envtl. Alliance (May 31, 2002); Letter from Kent G. Peterson, Chair, Planning Advisory Comm., Crockett Improvement Ass'n, to Richard A. Belcher, RFG Project Manager, 76 Products Company, at 2 (Jan. 29, 1996); Telephone Interview with Member of Shoreline Envtl. Alliance (May 28, 2002).

cials at the county and within the refinery) or build new networks of interest groups affected by the technology (such as populations that required improved detection time, monitoring of certain compounds, linkages to the county's emergency notification network, and a means of comparing reported concentrations to regulatory standards).[227] Indeed, the technology made it impossible to explore the kinds of efforts and relationships necessary to address future incidents like the Catacarb spill—"level 2" incidents, where a dangerous substance is released over time without either the presence of an explosion with an off-site impact, a fire visible off-site, or an expected off-site impact to human health.[228] At the same time, the kind, location, and spacing of monitors, data recording methods called for by the system, and other decisions inherent in the technology closed off other monitoring solutions from deliberation.

Table 3 summarizes how scripts, enacted to respond to each firm's institutional context, constrained the potential efficiency of the negotiations that followed.

C. NEW TRANSACTION COSTS: BARGAINING WITH COMPLEX ORGANIZATIONS

As scripts cycle through an organization, they respond to and create new kinds of transaction costs in a reciprocal process. The scripts found within a complex organization, such as a petroleum refinery, are largely responses to bounded rationality. Therefore, the transaction costs that they generate differ from those that arise when parties engage in strategic behavior, such as when multiple parties create the potential for holdouts and free riders. The costs differ in two major respects: how they affect the bargaining space (potential surplus) and the resources needed by the parties, courts, and policymakers to address them. These new categories of transaction costs will change how we assess a bargaining situation or compare the costs of various regulatory proposals. I take up the former here and the latter in Part III. Let us return to a standard *Boomer*-like analysis of an environmental nuisance and compare the traditional transaction costs of concern to legal scholars with three additional categories of transaction costs, each of which represents a distinct cost of negotiating and enforcing agreements due to how organizations respond to their institutional environment.

The textbook treatment of transaction costs places three patterns of costs at center stage: holdout, free rider, and bilateral monopoly.[229] For example, in *Boomer v. Atlantic Cement Co.*,[230] the New York Court of Appeals decided not to award an injunction against a cement plant that was affecting neighboring landowners because the large number of plaintiffs presented "high transaction

227. *See generally* SHORELINE ENVTL. ALLIANCE ET AL., *supra* note 223.

228. *Id.* apps. G, H; *see also* Contra Costa County Hazardous Materials Commission, Draft Minutes (Apr. 24, 1997); Telephone Interview with Crockett Resident, *supra* note 225.

229. *See, e.g.*, THOMAS W. MERRILL & HENRY E. SMITH, PROPERTY: PRINCIPLES AND POLICIES 38–40 (2007).

230. Boomer v. Atl. Cement Co., 257 N.E.2d 870 (N.Y. 1970).

Table 3. Bargaining Outcomes and Efficiency Losses Due to Scripts.

	Unocal	Rhône Poulenc	Conoco
Agreement Reached	Good Neighbor Agreement	Community Audit Agreement	Settlement Agreement
Signatories	Crockett-Rodeo Coalition, Shoreline Environmental Alliance, Citizens for a Better Environment, Unocal Corp.	Manchester residents, Texans United, Rhône Poulenc	Cross-Community Coalition representing Swansea and Elyria communities, CoPIRG, Conoco, Inc.
Entitlement Transfer	Approval of land use permit for reformulated fuels project	Approval of Class 3 permit modification	Residents agree not to seek Compliance Order against refinery
Key Provisions	Transportation improvements, financial contributions, fenceline monitoring, job training	Independent annual environmental and safety audit, community advisory committee formed, minimal notification, data sharing efforts	Supplemental environmental project focused on sulfur dioxide reductions
Effect of Scripts on Bargaining Efficiency	Hidden or resistant emergency response and notification scripts result in tabling of more efficient proposals; new or incompatible scripts limit effectiveness of technological innovations	Industry-wide and regulatory scripts shape facility's perceived control over reductions, facility improvements, and timing of when more efficient proposals are viewed as acceptable	Overlapping administrative scripts encourage near-exclusive focus on sulfur recovery problems; resident proposals for joint exploration of odor sources, on-site monitoring, and notification not adopted

costs, especially holdout problems, that would make bargaining around an injunction impossible."[231] The costs involved in a potential holdout include identifying affected plaintiffs and convincing them to agree to a price that, in the case of *Boomer*, is higher than their per capita loss of utility due to exposure to plant emissions but lower than an amount that, when added to the asking

231. Henry E. Smith, *Exclusion and Property Rules in the Law of Nuisance*, 90 VA. L. REV. 965, 1038 (2004).

price of other residents, would discourage a trade of the entitlement. Conversely, if the court awarded the plaintiffs damages, then even if many of them wanted to pay the cement plant to relocate or end its operations, it would only take a small number of free riders to increase the per capita fee for remaining residents to well above their willingness to pay. In either situation, there is a bargaining range defined by potential gains from trade, and one or more holdouts or free riders, who try to gain a disproportionate share of those gains, limits the chance that a trade will take place.

One of the canonical examples of bilateral monopoly arose in the case of *Hendricks v. Stalnaker*, which featured two neighboring landowners with interests in incompatible land uses (a water well and a septic system). [232] Topographical considerations led the defendant to locate a well near the plaintiff's property, while the plaintiff proposed a septic system near the property line for similar reasons.[233] The plaintiff claimed that Mr. Stalnaker's well, completed less than two weeks after he learned of the plaintiff's proposed septic system, was a private nuisance.[234] A balancing of the hardships led the court to reject the plaintiff's claim.[235] This case illustrates a classic bilateral monopoly where each party can only bargain with the other. Again, the parties have an incentive to behave strategically. Because they find themselves in a market with only one seller and one buyer, the plaintiff and defendant are likely to engage in prolonged negotiations and to try to extract a disproportionate share of the gains from trade.[236]

In each of the three situations, the parties cannot effect an efficient trade: multiple parties or a limited market (or both) leads one or more parties to behave strategically, resulting in either no trade (leaving all gains on the table) or one that is extremely costly to execute (eliminating much of the gains from trade). Script-based transaction costs, which I label "overlap," "mismatch," and "rigidity" costs, operate somewhat in reverse. Each cost reflects a different manner in which scripts are embedded within an organization that is asked to bargain or enact a regulatory innovation. A script is embedded when there is an "overlap between artifacts and expectations generated from routine performances and those generated from the enactment of other structures."[237] For example, scripts for settling a particular case, monitoring fugitive releases at a refinery, or handling citizen complaints within an agency might be strongly embedded in guidance documents, a hierarchical organizational structure, or standard operating procedures that suggest certain information is useful and other data are not. The more each script is embedded, the more difficult it will

232. Hendricks v. Stalnaker, 380 S.E.2d 198 (W. Va. 1989).

233. *Id.* at 199–200.

234. *Id.* at 200.

235. *Id.* at 202–03.

236. *See* Robert Cooter, *The Cost of Coase*, 11 J. LEGAL STUD. 1, 17–24 (1982).

237. Jennifer Howard-Grenville, *The Persistence of Flexible Organizational Routines: The Role of Agency and Organizational Context*, 16 ORG. SCI. 618, 631 (2005).

be to open it up for consideration. Choice is constrained by feedback from existing systems, limiting the efficiency of agreements reached. Costs also accrue according to the kinds of resources parties need to use to unearth and revise existing scripts.

One way to distinguish among script-based transaction costs is to identify where in an organization the scripts are embedded. Overlap costs arise when scripts are embedded in coordination structures.[238] Coordination represents the "interdependence of action between multiple actors when accomplishing a complex task,"[239] which can include any aspect of an organization's field: other firms in an industry, suppliers, financiers, or regulators.[240] For example, an industrial organization is at any moment subject to multiple regulatory actions. Each organization is run according to its own expectations and physical objects, which influence who performs various tasks and how they are carried out. During post-accident bargaining between Conoco and residents, several different administrative processes provided expectations for what a settlement should look like and which issues could be considered by the parties. Proposals for joint exploration of odor sources, community technical consultation on equipment upgrades, reduction of benzene emissions to groundwater, and early warning technologies were incompatible with those expectations, regardless of how efficiently they would have contributed to emissions reductions. In their place was an agreement designed to address the overlapping concerns of several agencies, such as their anticipated sulfur dioxide emissions reduction requirements.[241] Reducing overlap costs requires identifying the formal and informal authority needed to reorganize how multiple actors interact, as well as relational resources such as trust across the actors generating each of the parallel administrative actions.[242] Absent these efforts, firms will react by making proposals that satisfy the core of as many of the overlapping requirements as possible while discounting proposals that would prove more efficient but are less in line with ongoing and anticipated requirements. Overlap costs thus operate in reverse of free rider costs: they *encourage* agreement because too many overlapping institutional responses are set in motion at once (reducing efficiency), as opposed to too few offering needed payments (discouraging agreement).

Mismatch costs occur when scripts are embedded in technological structures that guide and constrain what actions their users can carry out.[243] For instance, pollution monitoring choices (for example, continuous, parameter, hand-held) demand widely varying organizational structures, collect different kinds of data that can be used to address unique sets of questions, and allow for or discount a

238. *See id.* at 630.

239. *Id.*

240. Scott & Meyer, *supra* note 22.

241. *See supra* notes 219–22 and accompanying text.

242. Howard-Grenville, *supra* note 237, at 634.

243. Geraldine DeSanctis & Marshall Scott Poole, *Capturing the Complexity in Advanced Technology Use: Adaptive Structuration Theory*, 5 ORG. SCI. 121, 125–26 (1994).

range of interactions between regulators, industry, and residents. Unocal's experience with a fenceline monitoring system is instructive in this regard. To avoid spending millions of dollars on a system that did not accomplish its primary objectives and could not be used to avoid Type 2 accidents like the Catacarb release, parties at the bargaining table would have had to use both allocative and relational resources. Allocative resources such as funding, knowledge, and technical expertise would be needed to alter existing monitoring scripts.[244] Relational resources are necessary to address the networks of actors, operating through mutual respect for certain kinds of skills and expertise, generated by monitoring technologies already in use.[245] Incompatible artifacts and social networks that are not matched to the stated objectives of a new technology constrain the efficiency of an agreement as it is adopted. They serve as holdouts, siphoning off many of the gains from trade including anticipated reductions in emissions, though they often do not become apparent until after an agreement is set in motion.

Rigidity costs are the most pernicious impediments to an efficient agreement. They are the product of scripts embedded in cultural structures, including "norms of appropriate behavior that enable and constrain particular types and sequences of action."[246] An industrial accident briefly exposes what are viewed as appropriate means of addressing facility upsets and accidental releases, sampling and risk assessment, and emergency response—the very issues considered before parties agree to transfer an entitlement. For example, the Catacarb release revealed areas of plant management and operations that magnified the extent of the accident. Those scripts are embedded in cultural structures, which over time frame the shared meanings, norms, and identities of refinery management and operators. Problem solving after an accident is channeled along paths consistent with these cultural structures and ignores options that, although more efficient, would threaten the legitimacy or stability of those institutions. Some rigidity costs are unavoidable because certain scripts are replicated and exported to other parts of a firm's institutional context in the form of recurrent, taken-for-granted rules, activities, and patterns of interaction. Others can be addressed by identifying the authoritative and relational resources needed to reopen scripts, in part through collaboration with regulators familiar with the practices common to facility management.[247] Scripts embedded within both cultural and coordination structures include the kinds of ceremonial and legitimacy-seeking behaviors that are at the heart of organization theory's institutionalist focus. Rigidity costs act in a fashion similar to bilateral monopoly, removing large swaths of the bargaining range regardless of whether an agreement is reached.

Table 4 presents the categories of transaction costs based on bounded rational-

244. Howard-Grenville, *supra* note 237, at 634.
245. *Id.*
246. *Id.* at 630.
247. *Id.* at 634.

Table 4. Transaction Cost Classes and Efficiency Effects.

Transaction Cost Class	Root Cause	Effects on Bargaining Efficiency	Resources Needed
Holdout	Strategic behavior, multiple entitlement holders	Parties seek more than fair share of gains from trade; lower probability of agreement	Party identification, coordination
Free Rider	Strategic behavior, multiple entitlement holders	Parties seek more than fair share of gains from trade; lower probability of agreement	Party identification, coordination
Bilateral Monopoly	Strategic behavior, thin market (usually one buyer and one seller of an entitlement)	Parties seek to exploit joint interest in property, capture large portion of bargaining range; lower probability of agreement	Coordination (of incompatible land uses or expanded market)
Overlap	Bounded rationality, scripts embedded in coordination structures affecting single entitlement holder	Solutions not in line with the core, multiple institutional responses are crowded out pre-agreement	Authoritative, relational
Mismatch	Bounded rationality, scripts embedded in technological structures affecting single entitlement holder	Incompatible artifacts and social networks constrain efficiency post-agreement	Allocative, relational
Rigidity	Bounded rationality, scripts embedded in cultural, possibly coordination structures affecting single entitlement holder	Norms of appropriate behavior remove large portion of bargaining range pre-agreement	Authoritative, relational

ity and compares them to costs related to strategic behavior that are of interest to legal scholars.

As illustrated by the court's hesitance to award an injunction in *Boomer*, courts are concerned about transaction costs because they increase the risk that

an entitlement, when assigned to the wrong party (for reasons of efficiency or equity), will remain in place.[248] Liability and property rule comparisons are therefore made in the context of "overcoming strategic obstacles to successful negotiations"[249] to ensure that rights will come to rest in the parties that value them most. *The Cathedral* set the course for arguments based on strategic behavior, including when liability rules should be used to overcome the potential for holdouts and free riders to lock in an inefficient award of a property right.[250] For example, Ayres and Talley argue that a liability rule, which is a divided entitlement because it gives nonowners a chance to take it and pay damages, reduces each party's incentive to misrepresent how they value an entitlement.[251] Over time, the choice between property and liability rules was also framed in terms of information costs to parties, courts (referred to as assessment costs[252]), or both. Krier and Schwab note that under a liability rule, "the party who is the best chooser," which is usually "the smallest-number party" such as the polluting facility in *Spur Industries*,[253] should be given the choice of whether to engage in a forced entitlement sale.[254] Kaplow and Shavell, also optimistic about the decision making abilities of a single entity, suggest that liability rules allow courts to "harness the information that the injurer naturally possesses about his prevention cost."[255] Similarly, information costs are used to show the optimality of property rules and of placing them under the control of a single owner. For Merrill and Smith, as the number of potential claimants to a property right grows, it makes sense to place within one party the ability to coordinate use of a given resource.[256]

Compared to the strategic and informational problems caused by multiple parties on one side of a dispute, the overlap, mismatch, and rigidity costs that act upon a single firm lead to a different set of considerations for the courts. The unique script-based transaction costs that affect complex organizations suggest that courts should pay closer attention to the lone facility on the other side of the table when they assess entitlement placement. High overlap costs can steer a firm toward an agreement, but one that is suboptimal. The inefficiencies encouraged by overlap costs are at times even apparent to multiple parties on the other side of a dispute who, because they are not prone to the same institutional effects, are able to fashion more efficient terms of an entitlement transfer. The resources needed to address overlap costs rival those demanded by the presence of free riders. Mismatch costs are similarly masked by the willingness of a firm

248. Smith, *supra* note 231.
249. Bell & Parchomovsky, *supra* note 4, at 590.
250. Sterk, *supra* note 4, at 1290–91.
251. Ayres & Talley, *supra* note 100, at 1030–31.
252. Krier & Schwab, *supra* note 14, at 460–64.
253. Spur Indus. v. Del E. Webb Dev. Co., 494 P.2d 700 (Ariz. 1972).
254. Krier & Schwab, *supra* note 14, at 470–71.
255. Kaplow & Shavell, *supra* note 4, at 725.
256. Thomas W. Merrill & Henry E. Smith, *The Property/Contract Interface*, 101 COLUM. L. REV. 773, 793–96 (2001).

to agree to an entitlement transfer based on technological conditions—the costs eliminate much of the perceived efficiency of bargaining post-agreement. Rigidity costs in particular diminish the notion that a complex organization is in the best position to decide whether to engage in a forced entitlement sale because the costs grow out of scripts that operate beyond the scope of cost–benefit analysis and are designed to meet objectives other than efficiency. Taken together, the costs warrant more careful analysis of institutional effects when judges and regulators assign property rights. In particular, forms of entitlement protection that spread decision making authority across parties in ways that uniquely address problematic scripts should be used. I explore implications for environmental regulation below.

III. ENACTING ENVIRONMENTAL LAWS: ACCOUNTING FOR INSTITUTIONAL EFFECTS

Coase took interest in "smoke nuisances" to explore the role of institutions in solving the pollution problem. That concern, dutifully furthered and extended by new institutional economics and organization theory, was perhaps unfortunately reframed by *The Cathedral* in the form of a question: who should have an entitlement to be free from pollution, and what legal rules should protect those rights?[257] Since then, legal scholars have used the property rule/liability rule distinction to evaluate a growing range of regulatory options: pure contractual exchange among polluting firms and affected groups, tort law, command-and-control, market-oriented, informational, and even voluntary initiatives among polluters.[258] The continuum of options, or sometimes just a portion of it, is often presented as evolutionary history.[259] Toward its center, we find lumbering bureaucracies, acting on incomplete information and setting "best available technology" standards from afar.[260] *The Cathedral* led scholars toward either end of the continuum, arguing that property rights should be given to "the party or activity which can with the lowest transaction costs act in the market to correct an error in entitlements."[261] Regulated industries are accepted as the "lowest-cost avoiders," possessed of better information about pollution control options and marginal costs and, under the right conditions, incentives to inno-

257. *See supra* notes 60–68 and accompanying text.

258. For an overview of the range of environmental regulatory options, see Bradley C. Karkkainen, *Bottlenecks and Baselines: Tackling Information Deficits in Environmental Regulation*, 86 TEX. L. REV. 1409, 1414–20 (2008). *But see* Wendy E. Wagner, *The Triumph of Technology-Based Standards*, 2000 U. ILL. L. REV. 83, 98–100, 101, 106, 108 (reminding us of the virtues of technology-based regulation in encouraging meaningful pollution control when compared to incentive-based approaches).

259. For a number of principled criticisms of command-and-control regulation, see Richard B. Stewart, *A New Generation of Environmental Regulation?*, 29 CAP. U. L. REV. 21, 27–36 (2001).

260. *See, e.g.*, Clean Air Act § 111(h), 42 U.S.C. § 7411 (2006); Clean Water Act § 301(b)(2)(A), 33 U.S.C. § 1314 (2006). For a critique of EPA's "best available technology" strategy, see Bruce A. Ackerman & Richard B. Stewart, *Reforming Environmental Law*, 37 STAN. L. REV. 1333, 1335–37 (1985).

261. Calabresi & Melamed, *supra* note 1, at 1096–97.

vate that are crushed under the weight of command-and-control regimes.[262]

From a presumption of "better access to information" or a "better position to assess risks," scholars map what they view as inescapable arguments for how either liability rules[263] or property rules[264] can take advantage of the superior position of polluting firms. The arguments reflect two Coasean blind spots. First, a firm's response to transaction costs generates and embeds scripts within the organization in ways that over time can divert it from efficiency. Second, a firm, particularly when it is considered apart from its institutional context and told to make decisions on its own, is uniquely susceptible to scripts in ways that informal groups or new arrangements of stakeholders are not. The reciprocal nature of transaction costs means that attempts to avoid strategic costs can substitute a different and more pervasive set of costs on regulated entities.

Unknowingly affected by these blind spots, we move away from command-and-control toward either Coasean contracting or market and informational approaches. As we do so, responsibility for decision making and providing needed information shifts to the regulated firm (and in the case of contracting, to both firms and potential victims of pollution),[265] and the state's role is reduced. Among market solutions, a regulatory agency sets either the price (P) of an entitlement to pollute or be free from pollution (through a pollution tax) or the allowable quantity (Q) of an entitlement (under an emissions trading regime).[266] Under informational regulation, agencies reduce information costs by aggregating and reporting firm-generated data and leave the firms to set P and Q.[267] At the other end of the spectrum (pure contracting), polluters and victims, assuming clearly delineated property rights, determine P and Q as an outcome of bargaining.[268]

Transaction costs keep us from moving too far in the direction of purely Coasean bargaining,[269] broadly favoring liability rules. They also affect our ability to enact market-based regulation. Although price and quantity instruments theoretically can generate the same degree of cost-effective pollution reduction,[270] taxes (a liability rule protection) are considered less susceptible to

262. Wiener, *supra* note 68, at 714–19.

263. Kaplow & Shavell, *supra* note 4, at 719; Steven Shavell, *Liability for Harm Versus Regulation of Safety*, 13 J. LEGAL STUD. 357, 359 (1984).

264. Richard A. Epstein, *A Clear View of* The Cathedral*: The Dominance of Property Rules*, 106 YALE L.J. 2091, 2096–2105 (1997).

265. Esty, *supra* note 2, at 149.

266. Wiener, *supra* note 68, at 705.

267. *See, e.g.*, Bradley C. Karkkainen, *Information as Environmental Regulation: TRI and Performance Benchmarking, Precursor to a New Paradigm?*, 89 GEO. L.J. 257, 283–86 (2001).

268. James E. Krier & W. David Montgomery, *Resource Allocation, Information Cost and the Form of Government Intervention*, 13 NAT. RESOURCES J. 89, 96–104 (1973).

269. Abraham Bell & Gideon Parchomovsky, *Of Property and Antiproperty*, 102 MICH. L. REV. 1, 34–35 (2003).

270. Wiener, *supra* note 68, at 728.

transaction costs than tradeable emissions.[271] In the presence of high transaction costs,

> an initial assignment of a property rule entitlement between source and victim may be determinative and the truly efficient reallocation of the entitlement [such as by trading emissions allowances] may be blocked; in such cases, the liability rule [price instruments] with damages set equal to harm is superior to the property rule [quantity instruments].[272]

Thus, transaction costs establish a hierarchy among regulatory options, with pure contracting preferred overall but presumed unlikely due to large-*n* strategic and informational problems,[273] market-based regulations preferred over technology- or standards-based programs,[274] and price-based approaches preferred over tradeable allowances within market-based regulatory options.[275]

The hierarchy of environmental regulatory options is shaped by the notion that a regulated firm is best able to decrease emissions in an efficient way. The "least-cost" decision maker role fuels arguments for market-based regulation, Coasean contracting, and voluntary initiatives.[276] But under the lens of a more complete institutionalism, we find a cautionary version of this brave new world, where greater demands are placed on complex organizations that are not driven entirely by efficiency in their operations. The movement toward market-based solutions, for example, is motivated by a belief in the need to reduce private transaction costs,[277] yet pushing decision-making authority to firms and other large-scale operations can increase script-based transaction costs, as this Article has demonstrated. Our increasing faith in informal, norm-based forms of regulation[278] also fails to consider how norms can lock in behavioral responses that over time increase rigidity costs. And we shy away from property rule solutions when multiple parties appear on one side of a dispute,[279] vesting substantial authority within a single party when it is often the absence or improper

---

271. *Id.* at 730–32. *But see* Michael P. Vandenbergh, Jack Barkenbus & Jonathan Gilligan, *Individual Carbon Emissions: The Low-Hanging Fruit*, 55 UCLA L. REV. 1701, 1755–56 (2008) (discussing how transaction costs can serve as a hindrance to the effectiveness of a carbon tax).

272. Wiener, *supra* note 68, at 733.

273. Inho Choi, *Global Climate Change and the Use of Economic Approaches: The Ideal Design Features of Domestic Greenhouse Gas Emissions Trading with an Analysis of the European Union's CO_2 Emissions Trading Directive and the Climate Stewardship Act*, 45 NAT. RESOURCES J. 865, 882–85 (2005).

274. Robert W. Hahn & Robert N. Stavins, *Incentive-Based Environmental Regulation: A New Era from an Old Idea?*, 18 ECOLOGY L.Q. 1, 12–15 (1991); Jon D. Hanson & Kyle D. Logue, *The Costs of Cigarettes: The Economic Case for Ex Post Incentive-Based Regulation*, 107 YALE L.J. 1163, 1174 (1998).

275. Wiener, *supra* note 68, at 682, 733–34.

276. *See* Driesen & Ghosh, *supra* note 8, at 80; Esty, *supra* note 2, at 145.

277. *See* Driesen & Ghosh, *supra* note 8, at 80; Esty, *supra* note 2, at 145.

278. *See* Cass R. Sunstein, *Social Norms and Social Roles*, 96 COLUM. L. REV. 903, 909 (1996) (describing the importance of understanding social norms in crafting regulatory frameworks).

279. *See supra* note 4.

grouping of important parties that eliminates efficiency gains through mismatch and overlap costs.

Inefficiencies brought about by organizational decision making suggest that the debate over appropriate modes of regulation should move beyond discrete choice to a more integrated analysis of available options. Script-based transaction costs offer a unique lens through which the proper amalgam of command-and-control, market, informational, and norm-based regulations can be set in place. Unlike private or public transaction costs, they arise across organizational fields and demand the attention and resources of firms and regulators alike. The goal of reducing script-based transaction costs can guide parties toward otherwise lost opportunities to achieve cost-effective pollution control and encourage new forms of interaction among regulated firms, agencies, and third parties.

A. BEYOND DISCRETE CHOICE

Arguments for one regulatory approach over another tend to focus on reducing either private or public transaction costs.[280] Rarely are the costs considered together. For example, the acid rain deposition cap-and-trade system enacted under Title IV of the Clean Air Act[281] allowed parties to reduce acid rain precursor emissions with minimal private transaction costs, but only because of preexisting public costs: the system relied on permit, monitoring, and enforcement requirements already in place under the Act; was limited to a single industry whose customers were protected by rate regulation; and concerned only two pollutants for which a network of pollution control equipment was in use.[282] The nation's first emissions trading program, which encouraged the phase-out of leaded gasoline, also experienced low private transaction costs because it was confined to refineries with common trading experience and utilized an EPA-administered banking system for lead rights.[283] Similarly, the EPA's 33/50 program, which sought voluntary toxic emissions reductions, was successful in large part due to related requirements under the Clean Air Act Amendments.[284] Economists note that private transaction costs are not always reduced to a greater extent than corresponding increases in public or administra-

280. Public transaction costs include the costs of administering various regulatory programs and can be compared with the costs of private ordering, such as bargaining among private parties. Driesen & Ghosh, *supra* note 8, at 76, 80–82 (showing how comparisons of public to private transaction costs can implicate whether a liability or property rule is more appropriate under given circumstances); Eugene Kontorovich, *Liability Rules for Constitutional Rights: The Case of Mass Detentions*, 56 STAN. L. REV. 755, 766–67 (2004) (same).

281. 42 U.S.C. § 7651.

282. Thomas D. Peterson, Robert B. McKinstry, Jr. & John C. Dernbach, *Developing a Comprehensive Approach to Climate Change Policy in the United States that Fully Integrates Levels of Government and Economic Sectors*, 26 VA. ENVTL. L.J. 227, 247–49 (2008).

283. Barry D. Solomon, *New Directions in Emissions Trading: The Potential Contribution of New Institutional Economics*, 30 ECOLOGICAL ECON. 371, 375 (1999).

284. Elizabeth Glass Geltman & Andrew E. Skroback, *Reinventing the EPA To Conform with the New American Environmentality*, 23 COLUM. J. ENVTL. L. 1, 32–33 (1998).

tive costs—meaning, in some cases, command-and-control regulation should be preferred.[285]

Debates about private and public transaction costs are helpful in deciding whether to set, and the appropriate scale of, a discrete policy option. For example, public transaction costs can be increased to locate parties or provide dispute resolution resources to avoid protracted litigation,[286] or private transaction costs such as newly required continuous monitoring can facilitate oversight of tradeable emissions permits.[287] But these tradeoffs have yet to encourage a conversation over how the various points of the regulatory spectrum should be brought to bear on environmental problems. Script-based transaction costs, and the unique combinations of resources needed to address them, can encourage such a discussion. Because they are generated across regulated firms and by overlapping administrative efforts, script-based transaction costs speak to the appropriate scale, flexibility, and combination of regulations needed so that opportunities for cost-effective risk reduction are preserved.

B. ORGANIZATIONAL FIELDS AS REGULATORY REGIMES

Property theorists have long treated large-*n* bargaining situations as an obstacle to more efficient assignment and protection of entitlements to pollute or be free from pollution. Script-based transaction costs suggest otherwise. Although multiple parties can increase strategic behavior and coordination costs, it is also true that complex firms, particularly when acting alone, are unable to address a substantial set of independent costs. Drawing broader boundaries around affected parties can be the basis for more efficient solutions. As opposed to the "matching principle" in environmental law, which dictates that "the geographic area affected by a specific pollution source should determine the appropriate governmental level for responding to the pollution,"[288] script-based transaction costs dictate that the scope of a regulatory response should be guided by which parties are in a position to question or change scripts that underlie such costs. The boundaries should map along an issue's unique institutional context or organizational field.[289] The EPA, through its Office of Enforce-

285. Daniel H. Cole & Peter Z. Grossman, *When is Command-and-Control Efficient?: Institutions, Technology, and the Comparative Efficiency of Alternative Regulatory Regimes for Environmental Protection*, 1999 WISC. L. REV. 887, 889–92.

286. *See, e.g.*, Karl S. Bourdeau & Steven M. Jawetz, *25 Years of Superfund Liability*, DAILY ENV'T REP. (BNA), No. 9, Jan. 13, 2006, at B-1, B-7 to B-9 (explaining EPA-issued model administrative orders and consent decrees to encourage settlement).

287. *See, e.g.*, Driesen & Ghosh, *supra* note 8, at 95.

288. Henry N. Butler & Jonathan R. Macey, *Externalities and the Matching Principle: The Case for Reallocating Environmental Regulatory Authority*, 14 YALE L. & POL'Y REV. 23, 25 (1996); *see also* Jonathan H. Adler, *Jurisdictional Mismatch in Environmental Federalism*, 14 N.Y.U. ENVTL. L.J. 130, 157 (2005) (discussing the potential inefficiencies and harms from the matching principle in environmental law).

289. *See* Scott & Meyer, *supra* note 22 (defining institutional context). For a general discussion of how the boundaries of an environmental problem are a function of geography and time, see de Medeiros, *supra* note 68, at 561–62.

ment and Compliance Assurance, has in recent years moved in the opposite direction. In 2000, it shifted from global settlements to consent decrees affecting individual facilities, such as refineries.[290]

When an agency and group of facilities negotiate a settlement, consent decree, or supplemental environmental project[291] concerning, for example, how best to monitor fugitive emissions, the appropriate stakeholders should include not just upper management and federal officials, but also operators, systems optimizers, and engineers who design, use, and rely on existing and competing technologies; officials in environmental, public health, and occupational safety departments who have expertise in how monitoring should proceed; and nongovernmental organizations that have developed their own capacity and techniques for sampling and monitoring emissions.[292] Grouping together parties according to the scripts they uphold will allow them to disentangle social networks and artifacts that are incompatible with proposed technology changes and to determine whether the new technology will conflict with other environmental management goals within a facility or across a regulated industry. At the same time, parties can be encouraged to question existing norms of appropriate behavior, particularly those that are broadly accepted by designers, facility workers, managers, or government officials. And agency officials from various levels of government and seemingly unrelated departments can be brought together to ensure that their actions do not crowd out novel or more efficient ideas that are not immediately compatible with discrete and overlapping enforcement or settlement actions. Using anticipated script-based transaction costs to identify parties and shape the boundaries of environmental regimes provides a mechanism for the kind of modular environmental regulation proposed by Freeman and Farber.[293] The question moves from how to avoid large-*n* bargaining scenarios to which parties, issues, and levels of management, operations, and regulation must be included. The answer is motivated by scripts, where they are embedded, and what resources are necessary to open them up for review. In shaping new regimes, script-based transaction costs encourage boundary work akin to the firm-level adjustments that are of interest to new institutional economics, only on a grander scale. Unlike regimes encouraged by the matching principle or standard media-specific regulatory frameworks, regimes guided

290. Pamela Najor, *EPA Needs To Prod Compliance Efforts by Oil Refineries, Inspector General Says*, 35 ENV'T REP. (BNA) 1409, 1409 (2004).

291. *Id.* (stating that by 2004, refineries agreed to $25 million worth of supplemental environmental projects); Patrice Ware, *EPA Says It Will Concentrate on Cases that Provide Best Results for Environment*, 38 ENV'T REP. (BNA), No. 3, Jan. 9, 2007, at S-34 (noting 80% of refining industry's capacity is covered under consent decree).

292. *See, e.g.*, United States v. Calcasieu Refining Co., No. 2:08-cv-1215 (W.D. La. Aug. 19, 2008), *available at* http://www.deq.state.la.us/portal/portals/0/enforcement/bep/pdf/Calcasieu_Refining_CD.pdf (depicting a typical consent decree between the Department of Justice and a single refinery including an agreement to reduce emissions and install new heater and boiler controls).

293. Jody Freeman & Daniel A. Farber, *Modular Environmental Regulation*, 54 DUKE L.J. 795, 800 (2005).

by the need to address script-based transaction costs should not focus on a single category of emissions or environmental harm. Rather, their scope should be influenced by the categories of scripts at issue (such as those affecting facility responses to accidents, unique groupings of environmental management procedures, or technology adoption) and the organizational field in which they operate. The goal should be to safeguard the efficiency that is otherwise lost when environmental regulation is pushed too far in the direction of either pure command-and-control or internal organizational decision making.

To succeed with a program aimed at questioning and refining organizational scripts, existing regulations will have to be altered. Strict monitoring and evaluation requirements should be in place, and parties should be granted limited immunity for pursuing improvements across areas of operation or environmental media. There is certainly room for such regime formation in environmental law, which is unique in its tolerance for regulatory slippage.[294] Regulated parties have, in the space between existing and enacted standards, gained considerable experience negotiating compliance steps with other parties. But we cannot rely simply on more negotiation, particularly when it involves only a single regulated firm. Existing programs, such as Project XL and Supplemental Environmental Projects, are designed for individual point sources that are in violation of standards in place and that trigger an enforcement response.[295] Although they encourage parties to create pilot projects and implement new measures in order to avoid fines, such programs do not operate at a scale dictated by a firm's institutional context, where script-based transaction costs can be addressed.

C. SHAPING THE MANAGERIAL TURN

The task of assembling unique groupings of parties who can question and reform outmoded scripts has direct implications for "management-based" regulation, which has seen a resurgence in environmental law.[296] Managerial strategies depart from performance- and technology-based approaches that focus on end-of-pipe conditions and ignore the internal workings of firms. The goal is to change organizational norms through targeted influence over a firm's self-regulatory practices and a mandate that firms engage in certain rulemaking efforts. In environmental law, this approach can be traced to the environmental management systems (EMSs) in use at facilities such as those owned by Unocal.[297] EMSs introduce their own scripts, in the form of standard operating

294. Daniel A. Farber, *Taking Slippage Seriously: Noncompliance and Creative Compliance in Environmental Law*, 23 HARV. ENVTL. L. REV. 297, 301–11 (1999).

295. *Id.* at 309–11.

296. Cary Coglianese & David Lazer, *Management-Based Regulation: Prescribing Private Management to Achieve Public Goals*, 37 LAW & SOC'Y. REV. 691, 696–700 (2003) (describing the use of managerial regulation in the areas of food safety, chemical accident avoidance, and pollution prevention).

297. *See, e.g.*, *supra* notes 191–92 and accompanying text.

procedures designed to "ensure compliance with regulatory standards" and "improve the firm's environmental performance"[298] and evaluative institutions developed by regulators and standard-setting bodies such as the International Organization for Standardization. They also hold the potential to disrupt scripts by promoting continuous review and improvement of existing practices:

> To create an EMS, managers begin by establishing environmental goals and creating a specific plan to achieve those goals. Managers and workers are assigned responsibilities for implementing parts of the plan, and they are trained in what they need to carry out these responsibilities. They keep records that document their compliance with the plan and periodically the firm (or an outside auditor) reviews these records and assesses the firm's performance in meeting its goals and following its internal procedures. These periodic reviews are supposed to feed into revisions and continuous improvements in the firm's overall system.[299]

At their best, EMSs encourage practices that mimic some of the characteristics of "high reliability organizations" (HROs), which avoid accidents even though they operate technologically complex systems, such as nuclear-powered aircraft carriers, on a regular basis.[300] The goal is not to identify an ideal array of scripts,[301] but to create a space in which practices such as learning from previous errors and continuous socialization around matters of compliance will take place.[302] At the same time, EMSs might defy other elements of HROs, including underspecification of structures and trial-and-error learning, as they require firms to implement certain kinds of procedures.[303]

A broad range of initiatives, such as the National Environmental Performance Track,[304] risk management planning under the Clean Air Act,[305] and the Massachusetts Toxic Use Reduction Act,[306] promote EMSs and try to shape how firms

298. Cary Coglianese, *The Managerial Turn in Environmental Policy*, 17 N.Y.U. ENVTL. L.J. 54, 55 (2008).

299. *Id.* at 56.

300. *See generally* Karl E. Weick & Karlene H. Roberts, *Collective Mind in Organizations: Heedful Interrelating on Flight Decks*, 38 ADMIN SCI. Q. 357 (1993).

301. Practical drift, the "slow, steady uncoupling of local practice from written procedure" across multiple levels of organization, suggests that calibrating an optimal array of scripts *a priori* would prove difficult at best. SCOTT A. SNOOK, FRIENDLY FIRE: THE ACCIDENTAL SHOOTDOWN OF U.S. BLACK HAWKS OVER NORTHERN IRAQ 179–201, 220 (2000) (demonstrating how practical drift while operating in a no fly zone in Iraq resulted in the destruction of two Black Hawk helicopters by F-15C fighter aircraft).

302. DIANE VAUGHAN, THE CHALLENGER LAUNCH DECISION: RISKY TECHNOLOGY, CULTURE, AND DEVIANCE AT NASA 415–22 (1996).

303. *Id.*

304. Coglianese, *supra* note 298, at 57–58.

305. *Id.* at 59.

306. *Id.* at 59–60.

engage in environmental planning.[307] Each program identifies broader elements of a firm's internal planning, such as monitoring procedures, evaluative measures, hazard identification, and risk reduction.[308] The details of these and other planning practices are often left to the discretion of the firm.[309] Excitement over management-based regulation is bolstered by ethnographic studies suggesting that for industries such as pulp and paper, internal variables including management style explain more of a firm's environmental performance than the degree of regulatory enforcement or external economic conditions.[310] Yet we know little about the success of EMS programs. Research has focused on factors that motivate a firm to adopt an EMS or whether gains in certain indicators post-adoption, such as toxic emissions reductions, can be teased out from broader improvements in an industry.[311] And there is the possibility that, as predicted by the new institutionalists, firms adopt these systems in order to maintain legitimacy rather than to improve performance.[312]

Scripts offer a methodology for further opening the "black box" of the corporation and examining to what extent internal practices and procedures can be revised or improved as part of an EMS. Longitudinal studies could compare clusters of scripts that constitute the interaction order of a firm before and after adoption of an EMS, map their constituencies through network analysis, or examine the resources that were needed for their revision. Cross-sectional analyses could identify scripts at work in different industries or at the plant level across similar facilities within a single industry. The results would suggest whether adjustments to traditional enforcement mechanisms, including penalty mitigation, audit privilege, technical assistance, and reporting requirements, are needed to facilitate a management culture in which scripts are identified and reviewed rather than ignored, retained for performative reasons, or adhered to during a crisis.[313] They would also point to the appropriate scale of a management-based program, from facility groupings to industrial classification codes to unique arrays of parties that form the institutional context for the clusters of scripts that are identified. With scripts as the unit of analysis, organizational

307. EMSs are encouraged by government- or industry group-sponsored programs (such as the National Environmental Performance Track or Responsible Care, respectively) or emerge as individual company efforts to commit to performance goals. Kurt A. Strasser, *Do Voluntary Corporate Efforts Improve Environmental Performance?: The Empirical Literature*, 35 B.C. ENVTL. AFF. L. REV. 533, 534–36 (2008).

308. Coglianese & Lazer, *supra* note 296, at 694.

309. *Id.* at 713.

310. Coglianese, *supra* note 298, at 61.

311. Coglianese, *supra* note 298, at 65–68; Jennifer A. Howard-Grenville et al., *Constructing the License to Operate: Internal Factors and their Influence on Corporate Environmental Decisions* 4–16 (Corporate Social Responsibility Initiative, Working Paper No. 27, 2007; Strasser, *supra* note 307, at 537–542).

312. Neil Gunningham & Darren Sinclair, *Organizational Trust and the Limits of Management-Based Regulation*, 43 LAW & SOC'Y REV. 865, 868 (2009).

313. Allison F. Gardner, *Beyond Compliance: Regulatory Incentives to Implement Environmental Management Systems*, 11 N.Y.U. ENVTL. L.J. 662, 674–98 (2003).

change is considered the adjustment of individual scripts in response to new institutional templates.[314] Better understanding those adjustments would support a new body of research on the effectiveness of management-based forms of regulation.

D. INSTITUTIONAL FLEXIBILITY: ENCOURAGING MARKETS FOR SCRIPTS

An assumption that drives not just management-based regulation but much of the conversation in environmental law is that regulators should give the lowest-cost avoider, the "party who is the best chooser,"[315] unique jurisdiction over entitlement-based decisions. Simply allow a regulated entity to set marginal control costs equal to marginal benefits, and a superior result will follow. These incentives-based arguments suggest that command-and-control regulation is by comparison rigid and inefficient.

Script-based transaction costs demonstrate that regulated firms are not nearly as free to steer their behavior toward efficient risk regulation as we would like to believe. They also suggest we should ensure sufficient flexibility or "slack" in a regulatory system so that existing scripts, particularly those that lead to rigidity costs, can be questioned and replaced. Flexibility remains a goal, but its locus should include not just the internal affairs of a firm but also its institutional context. Scholars are rightfully concerned that command-and-control statutes can lock in suboptimal technologies.[316] They should also contend with regulatory developments that lock in suboptimal scripts. For example, the recent trend toward federal preemption of state, local, and common law regulation in statutes such as the Energy Policy Act of 2005[317] threatens to eliminate sources of competing facility siting, hazardous waste disposal, and risk reduction scripts by state, local, and common law actors.[318] Sadly, federal preemption measures are driven by concerns over free-rider and coordination problems while they remain silent about the effects of displacing "multilayered institutional arrangements offering different actors, venues, and modalities for addressing a social problem."[319]

To avoid the ossification of existing rules and scripts and to safeguard the adaptive capacity of an organizational field, agencies can serve as jurisdictional brokers, setting boundaries and identifying the right mix of parties to address

314. Kathleen E. Voges et al., *The Role of Organizational Template in Radical Change*, 14 J. APPLIED MGMT. & ENTREPRENEURSHIP 27 (2009).

315. Krier & Schwab, *supra* note 14, at 470–71.

316. *See supra* note 274.

317. Energy Policy Act of 2005, Pub. L. No. 109-58, § 311(c), 119 Stat. 594, 685–87.

318. *See* William W. Buzbee, *Asymmetrical Regulation: Risk, Preemption, and the Floor/Ceiling Distinction*, 82 N.Y.U. L. REV. 1547, 1553–56 (2007) (analyzing how federal preemption can displace state and local legal development and the benefits of intersystemic interaction).

319. *Id.* at 1571–72, 1576.

script-based transaction costs. They can also function as information brokers.[320] Apart from simply selecting the best available technology or an ideal emergency response process, they can create new markets for information about competing monitoring, risk management, source reduction, and emergency response solutions. Public agencies can draw out decentralized information about the scripts employed by parties in an organizational field and make it available for nongovernmental organizations and environmental managers to critique, modify, aggregate, and present in new ways.

The roots of such a process, which should be aimed at identifying and reducing script-based transaction costs, can be found in the EPA's "Incentives for Self-Policing" audit policy[321] and the European Union's Eco-Management and Audit Scheme.[322] The latter is particularly bold in its requirement of environmental statements, publicly available assessments of a company's "structure, responsibilities, practices, procedures, processes, and resources" for enacting environmental policy that are checked for compliance by a new profession of "accredited environmental verifiers."[323] This process of drawing out information on scripts and establishing markets for such information to be aggregated, analyzed, and used to spur innovation can also build on the EPA's experience with the Toxics Release Inventory (TRI), an early success in informational regulation.[324] The TRI reduced information asymmetries between agencies and nongovernmental organizations (NGOs) and encouraged innovative data aggregation by community groups.[325]

An audit and environmental disclosure process should combine elements of informational, market-based, and traditional regulation, with government serving auditor, jurisdictional and information broker, and agenda-setting roles. Its primary objective would be to ensure constant scrutiny and innovation of environmental management procedures by multiple parties (including independent professionals and NGOs), with additional statutory flexibility for firms that wish to make adjustments or promote change across an organizational field. There is considerable potential for government to encourage such markets. For example, a recent review of technology-based standards for point sources under

320. *See* Robert N. Stavins, *Transaction Costs and Tradeable Permits*, 29 J. ENVTL. ECON. & MGMT. 133, 134–35 (1995) (explaining how search and information costs may be the most onerous form of transaction costs and how brokers can play a role in reducing those costs).

321. Jodi L. Short & Michael W. Toffel, *Coerced Confessions: Self-Policing in the Shadow of the Regulator*, 24 J.L. ECON. & ORG. 45, 49–50 (2008); Andrew Childers, *Enforcement: EPA Moves Forward with Audit Policy for Violations at Newly Acquired Facilities*, DAILY ENV'T REP. (BNA), No. 148, Aug. 1, 2008, at A-6 to A-7.

322. Eric W. Orts, *Reflexive Environmental Law*, 89 NW. U. L. REV. 1227, 1287–311 (1995).

323. *Id.* at 1300 (citing Council Regulation 1836/93, art. 2(e), 1993 O.J. (L 168) 2).

324. Karkkainen, *supra* note 267. *But see* William F. Pedersen, *Regulation and Information Disclosure: Parallel Universes and Beyond*, 25 HARV. ENVTL. L. REV. 151, 165–77 (2001) (highlighting the informational shortfalls of the TRI).

325. *See generally* Archon Fung & Dara O'Rourke, *Reinventing Environmental Regulation from the Grassroots Up: Explaining and Expanding the Success of the Toxics Release Inventory*, 25 ENVTL. MGMT. 115, 116, 118–19 (2000).

the Clean Water Act and new stationary sources under the Clean Air Act found that the majority have never been revised, despite being in place for an average of over twenty years.[326] Script-based transaction costs provide an avenue for addressing the diminishing returns of existing environmental laws.

CONCLUSION

The Cathedral crafted one of the most powerful lenses in legal scholarship.[327] Yet what is happening in Norco, Swansea, Elyria, Manchester, Crockett, Rodeo, Bayo Vista, and many other communities reveals cracks in the glass that blur how we account for bargaining and set environmental policy. I identified the Coasean blind spots that plague Calabresi and Melamed's heuristic device and the transaction costs that they conceal. I also suggested the source of these blind spots—the incomplete institutionalism of law and economics. Although this Article is only a first step toward more effective pollution control, it is an important one. After centuries of nuisance law and decades of experience with a fragmented administrative state, we continue to leave vast efficiency gains beyond our reach. This should come as no surprise, for when regimes are set in place and rules promulgated without awareness of the complete set of costs acting on a regulated industry, the law will fall short of meeting its goals. And as anyone living near the Shell Chemical plant or Unocal refinery[328] will tell you, those lost opportunities are vital to ensuring a more just distribution of environmental harms.[329]

Correcting for the blind spots starts with a simple admission: as long as complex organizations are charged with implementing our environmental laws, Coase's institutional focus must be extended to more accurately and completely account for organizational behavior. Scripts are an empirically helpful device for accomplishing this goal. They are embedded within every regulated industry, generating transaction costs in predictable ways and challenging our view of the lowest-cost avoider. My analysis of environmental bargaining situations demonstrates how scripts operate, removing gains from trade and agreed-to regulatory changes. But they also provide a roadmap for crafting more effective environmental laws. Scripts, and the transaction costs they generate, can focus our adjustments to the appropriate scale, flexibility, and amalgam of responses to a regulatory problem. They open a new frontier in addressing the diminishing returns of environmental protection.

---

326. Lynn E. Blais & Wendy E. Wagner, *Emerging Science, Adaptive Regulation, and the Problem of Rulemaking Ruts*, 86 TEX. L. REV. 1701, 1720–22 (2008).

327. Calabresi & Melamed, *supra* note 1.

328. The Unocal refinery in Rodeo is now owned by ConocoPhillips. Accidents and shelter-in-place notices continue. *See, e.g.*, Accident Information—Conoco Phillips Rodeo Refinery, May 1, 2006—Contra Costa Health Services, http://www.cchealth.org/groups/hazmat/release_conoco_may_2006.php (detailing a shelter-in-place order given after a power failure caused the refinery to flare combustible materials).

329. *See* MACEY, *supra* note 47.