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Back to School with Coase: The Production of Information and Modes of Knowledge Within and Across Academic Disciplines

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ESSAY

BACK TO SCHOOL WITH COASE: THE PRODUCTION OF INFORMATION AND MODES OF KNOWLEDGE WITHIN AND ACROSS ACADEMIC DISCIPLINES

MANUEL A. UTSET*

TABLE OF CONTENTS

INTRODUCTION	1063
I. PRODUCING AND TRANSFERRING INFORMATION AND MODES OF KNOWLEDGE	1069
A. <i>Production and the Competitive Urge</i>	1071
B. <i>A User's Guide to Information and Modes of Knowledge</i>	1074
II. COASE ON CONTIGUOUS DISCIPLINES: FIRMS, COMPETITION, AND THE TIES THAT BIND	1077
III. PRODUCTION WITHIN DISCIPLINES AND ACROSS DISCIPLINES	1080
A. <i>Borrowing from The Nature of The Firm</i>	1081
B. <i>Production Within Disciplines</i>	1083
C. <i>Production Across Disciplines</i>	1084
IV. SOME MECHANICS AND SOME EXAMPLES	1085
A. <i>Nostalgia for Cross-Disciplining in a World of Technical Refinement: Law & Philosophy</i>	1085
B. <i>Isolationism: A View to In-Where</i>	1090
C. <i>Imperial Production: Overreaching or Underachieving?</i> ...	1091
D. <i>"Interdisciplinary Poaching:" Coase, The Law-Taker</i>	1094
V. CONCLUSION	1096

Information is difficult to transfer, even in the most playful of cir-

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cumstances. Anyone who played the game "telephone" as a child can attest to the ever-present gaps and gaffs in the dissemination of even the simplest of messages. When one grows up and starts playing Bayesian games instead, the gaps and gaffs are exacerbated by the lies and shadowy moves of one's co-players.¹ As playful word changes give way to full-fledged strategic behavior, individuals begin to produce, translate, verify, package, and eventually transfer bits of information: information becomes both sword and commodity.

This Essay distinguishes between the concepts (1) bits of "information," and (2) "modes" or "techniques of knowledge," and examines the intricacies behind their production and transfer. Drawing this distinction between information and modes of knowledge helps bring to the foreground the interrelationship between cooperation and competition in the production and transfer of these two "commodities."²

Although the words "information" and "knowledge" are often used interchangeably,³ this Essay uses the term "information" to refer to facts about the world, or a set of symbols that, once acquired or perceived by an individual, will lead her to revise her probability distribution over potential states of the world.⁴ The concept of "modes" or "techniques of knowledge" refers to problem-solving mechanisms, including any mechanism, heuristic device, or algorithm that allows individuals to identify, manipulate, and solve problems. These problem-solving methods enable individuals to take bits of information or facts about the world and manipulate them, thus transforming their beliefs, comprehension, judgments, insights, and ways of acting.

Information and modes of knowledge gain their value from their ability to help individuals formulate their thoughts and actions; to set goals, identify roadblocks, and deploy plans to achieve their chosen goals.⁵ Although it may not be true of all individuals all of the time—particularly

¹ Those who have not played Bayesian games before, or who may have been involved in them inadvertently, can update their information about the intricacies of these games by seeing ROGER B. MYERSON, *GAME THEORY: ANALYSIS OF CONFLICT* 67-83 (1991).

² This Essay will focus on a small subset of this production/transfer problem, namely the production and transfer of information and modes of knowledge in academia.

³ See generally JACK HIRSHLEIFER & JOHN G. RILEY, *THE ANALYTICS OF UNCERTAINTY AND INFORMATION* (1992).

⁴ Kenneth Arrow refers to information "as a general descriptive term for an economically interesting category of goods which has not hitherto been accorded much attention by economic theorists." 4 KENNETH ARROW, *Information and Economic Behavior*, in *COLLECTED PAPERS OF KENNETH ARROW* 136, 138 (1984).

⁵ Even in a totally "deterministic" world, information would be of relevance, not only to historians and other collectors of curios, but also to individuals generally, given that information is part of what determines our thoughts and behaviors to begin with.

when sleeping—one can, with a little license, view individuals as involved in a continual process of making decisions about what to think and how to act.⁶ If this is the case, then information and modes of knowledge, and what individuals do with them, is of theoretical and practical importance.

In valuing these commodities—information and knowledge—one should take into account *both* the costs of producing them, “production costs,”⁷ and the costs of transferring them in a world of opportunistic actors, “transaction costs.”⁸ Economic interactions generally involve both production and transaction costs. Thus, in determining the optimal way of organizing the production and exchange of information and knowledge, a decision-maker should take into account “total costs:” the sum of production and transaction costs.⁹ This includes taking into account that some individuals may produce information more cheaply, and that others may be better at minimizing transaction costs.

One reason to distinguish between information and modes of knowledge is that even in a world of information super-highways, where technology greatly reduces the cost of transferring bits of information, barriers to the transfer of modes of knowledge may dilute the increased benefit from the lower cost of transferring bits of information. In other words, even as the production and transfer of bits of information become cheaper as a result of technological progress, the production and transfer of modes of knowledge may not follow suit. Although technological progress eases the production and transfer of information and modes of knowledge, dealing with other—more “human” variables—is not as sim-

⁶ Or with Prufrock, we tend to ask:

Do I dare

Disturb the universe?

And if we answer “yes,” then:

In a minute there is time

For decisions and revisions which a minute will reverse.

T.S. ELIOT, *The Love Song of J. Alfred Prufrock*, in *THE COMPLETE POEMS AND PLAYS*, 1909-1950, at 4, 5 (1980).

⁷ See, e.g., ARTHUR A. THOMPSON, JR., *ECONOMICS OF THE FIRM: THEORY AND PRACTICE* 137-38 (1989) (noting that each aspect of creating a final product incurs production costs, including “[c]ollecting taxes, operating a jewelry store, drilling for oil, auditing a company’s financial statements, . . . driving a garbage truck, and interviewing applicants for food stamps”).

⁸ See e.g., OLIVER E. WILLIAMSON, *THE ECONOMIC INSTITUTIONS OF CAPITALISM: FIRMS, MARKETS, RELATIONAL CONTRACTING* 1-2 (1985) (explaining that transaction costs come from preventing, and when prevention fails, resolving friction and conflicts between transacting parties).

⁹ For a more detailed discussion of the reasons for distinguishing between production and transaction costs when assessing optimal forms of organizing transactions, see Manuel A. Utset, *Producing Information: Initial Public Offerings, Production Costs, and the Producing Lawyer*, 74 *OR. L. REV.* (forthcoming 1995) (manuscript on file with author).

ple as flicking on a switch.¹⁰

The production and transfer of information and modes of knowledge is of analytical importance in a number of areas, from industrial organization to the organization of intellect. Moving towards a better understanding of these concepts may help answer questions such as: (1) How does one transfer modes of knowledge within an organization?; (2) How does the organization initially transfer modes of knowledge to new employees, and continually to veteran employees?; (3) How do modes of production and transfer lead to the development of institutions that make transmission easier?; (4) Under what circumstances will such institutions acquire a life of their own, becoming harder to change even when more efficient ways to achieve the same goals become available?; (5) How to best transfer information and modes of knowledge to emerging markets, such as those in Eastern Europe?; (6) Why have such transfers proven problematic thus far?;¹¹ (7) To what extent should a member of an organization acquire firm-specific human capital?; and (8) How can such firm-specific human capital translate into more "general" human capital that can be used in other contexts?

This Essay's principal focus, however, will be on academia, where natural and man-made boundaries often get in the way of the dissemination of information and modes of knowledge.¹² In analyzing the constraints on the production and transfer of information and modes of knowledge within academia, Ronald Coase's essay, *Economics and Contiguous Disciplines*,¹³ will serve as a stepping stone. There he asks, among other

¹⁰ E.g., Lee Dembart, *Thinking Machine Are All in the Mind*, L.A. TIMES, June 30, 1995, at E4 (reviewing PAUL M. CHURCHLAND, *THE ENGINE OF REASON, THE SEAT OF THE SOUL: A PHILOSOPHICAL JOURNEY INTO THE BRAIN* (1995), and observing that traditional artificial intelligence has been unable to keep pace with the "pliable, elastic[,] and inventive" human brain).

¹¹ See Manuel A. Utset, *Emerging Markets in the Age of Mechanical Reproduction*, B.U. INT'L L.J. (forthcoming 1995) (manuscript on file with author).

¹² In examining the transfer of information and modes of knowledge, it is useful to focus on the boundaries that must be crossed to get from Brain-X to Brain-Y, from one microchip to another, or, more generally, from here to there. Boundaries are obviously made to be crossed—or at the very least, crossed because they are made; they are created, modified and destroyed; they are visible and invisible; natural and artificial. The topic of boundaries, however, is a black hole of sorts. See, e.g., RAZIEL ABELSON, *Definition*, in 2 ENCYCLOPEDIA OF PHILOSOPHY 314 (Paul Edwards ed., 1967) (noting that, although nearly all logic books purport to establish rules on definition, "paradoxically, no problems of knowledge are less settled than those of definition, and no subject is more in need of a fresh approach"); accord DON DELILLO, *WHITE NOISE* 126 (1985) ("What is a thing and how do we know it's not another thing?"). This Essay will emphasize the following, hopefully uncontroversial claim about boundaries: boundaries are meant to "keep in" and "keep out."

¹³ R.H. COASE, *Economics and Contiguous Disciplines*, in *ESSAYS ON ECONOMICS AND ECONOMISTS* 34 (1994). It is not surprising that Ronald Coase should serve as a

things, “[H]ow do these boundaries between disciplines come to be what they are[?]”¹⁴ His “broad answer . . . is that it is determined by competition.”¹⁵ Disciplines, he argues, are like firms and are thus subject to inter-disciplinary competition.¹⁶

Coase argues that boundaries between disciplines evolve due to differing “subject matter” rather than differing “technique.”¹⁷ With that assumption in pocket, Coase states:

If I am right about the *relative unimportance of technique* as a basis for the choice of professional groupings, if subject matter is really the dominant factor, with the theory or approach in large part determined by the subject matter, what is the outlook for the work of economists in the other social sciences? I would not expect them to

tour guide of sorts. Coase has spent a large part of his career wondering about the nature and necessity of certain boundaries, both those that we take for granted and deem unimportant, and those whose existence we fail to recognize, but which, once recognized, we take quite seriously. Again and again, Coase raises apparently innocent questions about why certain distinctions exist, why they have become invisible in a web of unexamined assumptions, what the effect of recognizing the existence of a particular distinction or boundary would be, and how and to what effect we can redraw it.

For example, in his recently published collection of essays, Coase addresses boundaries in a number of contexts. On drawing boundaries between the “technical” and the “economic” in economics, see R.H. COASE, *How Should Economists Choose?*, in *ESSAYS ON ECONOMICS AND ECONOMISTS* 15 (1994) and R.H. COASE, *The Institutional Structure of Production*, in *ESSAYS ON ECONOMICS AND ECONOMISTS* 3 (1994). On the boundary between the market for goods and the market for ideas, see R.H. COASE, *The Market for Goods and the Market for Ideas*, in *ESSAYS ON ECONOMICS AND ECONOMISTS* 64 (1994).

Coase examines other boundaries in an earlier collection of his writings, particularly in the two articles for which the Royal Swedish Academy of Sciences awarded him the Nobel Prize in Economics. R.H. COASE, *The Nature of the Firm*, in *THE FIRM, THE MARKET, AND THE LAW* 33 (1988); R.H. COASE, *The Problem of Social Cost*, in *THE FIRM, THE MARKET, AND THE LAW* 95 (1988). In these two works, Coase devotes special attention to the boundaries between (1) the market and the firm; (2) ordering through the price mechanism (private ordering) and ordering by fiat (public ordering); (3) an externality’s “creator” and its “victim;” (4) the government and the market; and (5) production costs and transaction costs.

¹⁴ COASE, *Economics and Contiguous Disciplines*, *supra* note 13, at 35.

¹⁵ *Id.*

¹⁶ *Id.* Coase examines economists’ movement into “contiguous” disciplines—into other social sciences. *Id.* at 37. This application of the word “contiguous” once again conjures up the specter of definition. Coase lists politics, sociology, linguistics, education, law, and “national defence” as areas of study that are “contiguous” with economics. *Id.*

¹⁷ *Id.* at 38, 41 (identifying subject matter as “the normal binding force of a scholarly profession,” but conceding that technique and method will “exert some influence at any given time”).

continue indefinitely their triumphal advance and it may be that they will be forced to withdraw from some of the fields which they are now so busily cultivating. But such a forecast depends on the practitioners in the other disciplines making a *competitive response*. The success of economists in moving into the other social sciences is a sign that they possess certain advantages in handling the problems of those disciplines.¹⁸

According to Coase, the “naturally competitive response” to economists’ incursion into neighboring disciplines¹⁹ is for social scientists to try to master economic insights, in addition to those of their own fields. Thus, economists foraging in other disciplines will, over time, begin to confront competition from academics with a subject-matter advantage.²⁰

This Essay advocates a shift in emphasis in two areas. First, Coase’s competition-centric approach is too restrictive and should be modified to take proper account of potential and actual cooperative interactions among academic disciplines. Second, any analysis of “production” within academic disciplines should accommodate a greater emphasis on the role of technique, that is, “modes” or “techniques of knowledge.”

Borrowing by analogy from Coase’s *The Nature of the Firm*,²¹ this Essay proposes that individuals “produce” information and modes of

¹⁸ *Id.* at 44-45 (emphasis added). *But see* GARY S. BECKER, *THE ECONOMIC APPROACH TO HUMAN BEHAVIOR* 5 (1976) (“[W]hat most distinguishes economics as a discipline from other disciplines in the social sciences is not its subject matter but its approach.”).

¹⁹ Coase employs a vivid analogy from ancient history to demonstrate the dramatic extent of this cross-boundary movement. He argues that disciplines finally create their own boundaries in the same way that empires eventually abandon outlying areas that are too distant to defend. Augustus discovered that “‘Rome, in her present exalted situation, had much less to hope than to fear from the chance of arms; and that, in the prosecution of remote wars, the undertaking became every day more difficult, the event more doubtful, and the possession more precarious, and less beneficial.’” COASE, *Economics and Contiguous Disciplines*, *supra* note 13, at 35 (quoting EDWARD GIBBON, *THE DECLINE AND FALL OF THE ROMAN EMPIRE* 1-2 (Modern Library 1932) (1776-88)).

It is useful to compare Coase’s approach as outlined in the previous paragraph with Part IV of *The Nature of the Firm*, where he examines constraints on the ability of firms to expand indefinitely. COASE, *The Nature of the Firm*, *supra* note 13, at 33. Coase adopts a similar geographical metaphor to illustrate “that there may be a point where it is less costly to organize the exchange transactions of a new product than to organize further exchange transactions of the old product.” *Id.* at 52.

²⁰ COASE, *Economics and Contiguous Disciplines*, *supra* note 13, at 45 (predicting that “[i]n such a situation, only the exceptionally endowed economist” will withstand the competition).

²¹ COASE, *The Nature of the Firm*, *supra* note 13, at 44 (theorizing that transactions will take place within a single firm until the marginal cost of producing one more unit of output equals the cost of purchasing that unit from another source).

knowledge both within and across academic disciplines and that disciplines should encourage such cross-production and transfers. Words like "competition," "imperialism," and "invasion" are often a by-product of discourse on boundaries, particularly where shifts in boundaries lead to the redistribution of wealth. Interdiscipline cooperation requires abandonment of the vocabulary and analysis of the competition-centric view.

In short, this Essay poses two Coasean questions: (1) Why and under what circumstances do academic disciplines carry out "production" of information and modes of knowledge solely or principally within their disciplines?; and (2) Why and under what circumstances do disciplines reach across academic boundaries either to borrow or "purchase" these commodities or to impose their modes of knowledge on others? In other words, when would information and modes of knowledge transgress the boundaries that divide disciplines?

Part I of this Essay addresses the production and transfer of information and modes of knowledge. Part II examines Coase's essay, *Economics and Contiguous Disciplines*. Part III applies the Coasean distinction between production within the firm and production in the market to cross-discipline transfers of information and modes of knowledge. Part IV looks at the obstacles to cross-discipline production and sets forth an example from Coase of how to engage in interdisciplinary poaching.

I. PRODUCING AND TRANSFERRING INFORMATION AND MODES OF KNOWLEDGE

The principal object of our analysis is problem-solving: an individual identifies a goal and sets out to reach it. Problem-solving requires both facts and methods: it requires that an individual makes decisions about both what to learn and how to act.²² Because this Essay emphasizes the distinction between facts and method, it accounts separately for the costs of transferring information and the costs of transferring modes of knowledge.²³

The principal concern here is with decision-making under uncertainty, involving situations in which the decisionmaker does not have complete

²² Problem-solving generally requires that the decisionmaker "call up" information previously acquired and gather or purchase new information to reach her goal. The decisionmaker will deploy certain mechanisms or modes of knowledge to transform her environment and bundle of information, overcoming the obstacles between the starting point and the goal. For an account of problem solving, see generally MOSHE F. RUBINSTEIN, *PATTERNS OF PROBLEM SOLVING* (1975) and JOHN HOLLAND ET AL., *INDUCTION: PROCESSES OF INFERENCE, LEARNING, AND DISCOVERY* (1986).

²³ For an interesting account of some of the constraints on the "transfer of learning[.]" that is, of "how knowledge acquired in one situation applies—or fails to apply—in other situations," see MARK K. SINGLEY & JOHN R. ANDERSON, *THE TRANSFER OF COGNITIVE SKILLS* 1 (1989).

information about the present and/or future state of the world.²⁴ Assuming, however, that the individual has some sense about the current state of the world and of potential outcomes, we can say that she has a prior probability distribution regarding these potential outcomes. As a result, an individual contemplating an action can either choose to take that action with the information set that she possesses, or she may decide to acquire more information to reduce the level of uncertainty.²⁵ One can thus view "information" as a set of symbols that, once acquired or perceived by an individual, will lead her to revise her probability distribution over potential states of the world or potential outcomes.²⁶ Because of the economic importance of informational uncertainty, markets have developed to facilitate the production, transfer, and verification of information.²⁷

The phrase "modes" or "techniques of knowledge" describes any mechanism, heuristic device, algorithm, or group of ideas that allows individuals to identify, manipulate, and solve problems. That is, given some stated goal, individuals can deploy techniques of knowledge to gather, translate, compare, and verify bits of information or facts about the world and, by doing so, transform (1) their beliefs, (2) their existent information set, (3) their comprehension, judgment, and insights, and (4) their ways of producing, communicating, quarreling, or cooperating.²⁸ One guiding

²⁴ As Kenneth Arrow states:

Uncertainty means that we do not have a complete description of the world which we fully believe to be true. Instead we consider the world to be in one or another of a range of states. Each state of the world is a description that is true for all relevant purposes. Our uncertainty consists in not knowing which state is the true one.

KENNETH ARROW, *THE LIMITS OF ORGANIZATION* 33-34 (1974).

²⁵ As Arrow states:

Where there is uncertainty, there is usually the possibility of reducing it with the acquisition of *information*. Indeed, information is the negative measure of uncertainty, so to speak.

Arrow, *Information and Economic Behavior*, *supra* note 4, at 138.

²⁶ This is an oversimplified view of decisionmaking under uncertainty and of the role of information. If we desired more precision, we could draw a distinction between the symbols or "signals" received and "information." We might want to do that, for example, if we were concerned about the cognitive processes by which individuals perceive, transform, and deploy these signals. This Essay, however, draws a sharp distinction between "information" and "modes of knowledge." In doing so, the Essay has conflated "information" and "signal," and reserved the term "modes of knowledge" for cognitive and other manipulation and deployment of these symbols.

²⁷ For a discussion of some of the characteristics and limitations of markets for information, see generally ARROW, *supra* note 24, at 37-43 (1974); JACK HIRSHLEIFER & JOHN G. RILEY, *THE ANALYTICS AND UNCERTAINTY OF INFORMATION PART II* (1992); and W. Kip Viscusi & Wesley A. Magat, *Information Processing and Individual Decisions*, in *LEARNING ABOUT RISK* (1987).

²⁸ It would be useful to set out some examples of the types of modes of knowledge

assumption is that individuals have an interest in achieving their goals as efficiently as possible.

A. *Production and the Competitive Urge*

Information and modes of knowledge do not usually spring out of thin air.²⁹ Instead, they are the product of conscious intervention by individu-

that are of particular concern in this Essay, that is, modes that are important within an academic discipline, but which can also be useful when transferred across disciplines. The following examples come from disciplines including Economics, Law, Philosophy, Mathematics, and Cognitive Science.

In economics, relevant modes of knowledge include: linear programming; quantitative methods (including the employment of statistical and econometric models); equilibrium analysis; cost-benefit analysis; rational choice methodology and expected utility analysis generally; game theory; dynamic systems analysis; the study of the production, valuation, and transfer of information; and decision theory.

In law, modes of knowledge include: analogical thinking; issue- or problem-spotting; careful drafting and interpretation of texts; rhetorical devices; mechanisms for settling disputes; and mechanisms for allocating rights and duties, and for structuring economic and social relations within the bounds of explicit constraints.

Philosophy has traditionally served as a great provider of modes of knowledge, many of which have been more successful outside philosophy than within it. These include: the study of logic and rhetoric; the exploration of the extent and bounds of reason; the examination of the limits of language; the elucidation of ethical considerations and constraints; and the modelling of utopias, republics, democracies, and other types of social organization. From these studies have emerged heuristics and modes of thought that have transferred well into other disciplines, such as law, economics, mathematical logic, cognitive science, and linguistics.

Mathematics, too, is a discipline that has spawned many positive externalities. Some of its modes of knowledge include: quantitative analysis—probability, statistics, and time-series analysis; techniques for abstracting from reality and labelling and manipulating symbols (the art of notation, so useful in many other fields, is one example); techniques for formalizing relations, manipulating them algebraically, and picturing them in Cartesian and post-Cartesian planes; and techniques of turning problems set out in words into analogues set out in numbers and algebraic symbols.

Cognitive science and artificial intelligence are to a large extent the sciences of problem solving, of the means of transferring modes of knowledge embedded in the brains of individuals to the innards of computers (and vice versa). Much of the general work on problem solving has emerged from these fields, with Herbert Simon as one of the great cross-discipline catalysts. Techniques of heuristics, of algorithm formulation for the creation and manipulation of formal languages and for the transfer of cognitive skills generally, have emerged out of the work of cognitive scientists and artificial intelligencers.

²⁹ In some cases, however, they may very well do so. For holy (but not necessarily wholly convincing) examples, see generally *THE OLD AND NEW TESTAMENTS*. The Old Testament's description of God's transmission of law to Moses is one example of information springing out of thin air. *Exodus* 20:1-17, 34:1 (describing God's command to Moses to "chisel out two stone tablets . . . , and I will write on them the words that were on the first tablets, which you broke").

als: individuals produce them much as they produce other commodities, although their transfer is sometimes more problematic. Just as in Adam Smith's pin factory, where division of labor ultimately paid off,³⁰ the production of information and modes of knowledge will become more efficient as individuals specialize in different aspects of producing their commodities. Specialization by producers of information and modes of knowledge is not enough, however, and, in some cases, can be counterproductive.³¹

Transferring the commodities produced is as important as producing them. Transfers, however, are more difficult when the transferor and transferee are competitors. No one expects transfer of information or modes of knowledge to go uncompensated, but, in certain cases, competition makes any transfer impossible. Conflicting egos, concerns for reputation, or existing institutional structure may also prevent the development of "markets" that would facilitate such transfers.

Examples from the area of medical research are particularly persuasive, because one would expect greater incentives for cooperation across boundaries when human lives are at stake. Research surrounding the HIV virus exemplifies the rivalry between competing scientists, particularly their refusal to share information about tissue samples, techniques of isolating the HIV virus, and potential new drugs and treatments.³² The recent confusion surrounding the transfer of information about the risks of the cancer drug vincristine serves as another jarring example. Since 1968, numerous cancer patients have died from receiving injections of the drug into their spines instead of receiving it intravenously.³³ Reports of death had appeared in medical journals and the popular press since at least 1978, but somehow drug name confusion and ambiguous or incom-

³⁰ See ADAM SMITH, 1 WEALTH OF NATIONS 2-3 (Edward Cannan ed., 1965) (1776).

³¹ See, e.g., *infra* Part IV.

³² See, e.g., BRUCE NUSSBAUM, GOOD INTENTIONS: HOW BIG BUSINESS AND THE MEDICAL ESTABLISHMENT ARE CORRUPTING THE FIGHT AGAINST AIDS 15 (1990) (describing one scientist's ambition by noting that "AIDS would be 'good' for [him] in the way that some wars are 'good' for some men"); SANDRA PANEM, THE AIDS BUREAUCRACY 110-15 (1988) (describing intense competition among scientists to be the first to find an answer); Sheryl Stolberg, *Seeking a Cure: Faith, Frustration*, L.A. TIMES, Aug. 7, 1994, at A1, A18 (noting that an activist research group is fighting against FDA approval of a new drug before it is proven effective, and examining the competing scientific approaches to AIDS research, from "basic research" to clinical testing).

³³ See, e.g., Richard A. Knox, *Response Is Slow to Deadly Mixups: Too Little Done To Avert Cancer Drug Errors*, BOSTON GLOBE, June 26, 1995, at 29 ("Accidental spinal injections of vincristine are a case study of how cancer chemotherapy errors happen repeatedly, and how slow hospitals, doctors, professional organizations, government agencies, nurses[,] and pharmacists have been to take even simple actions to prevent them.").

plete instructions from doctors hampered the transfer of the relevant information to those administering the doses.³⁴ The Food and Drug Administration finally adopted labeling requirements in the summer of 1995.³⁵

The competitive urges of doctors and researchers are not the only roadblocks to freer transfers of information within the medical discipline. In certain circumstances, inefficient institutions have been adopted to effectuate these transfers. After a while, these institutions have developed path-dependence which in turn is exacerbated by the insularity of the research and medical communities. Acquiring modes of knowledge from other disciplines on how to best transfer information, verifying that the professionals involved understand how to best deploy these modes of knowledge, and monitoring their implementation can help reduce some of the risks of medical procedures. For example, one may look at the modes of transfers used in transferring information about risk to consumers and workers,³⁶ or the risk management algorithms adopted by NASA in the wake of the space shuttle disaster.³⁷

As one moves away from academic disciplines and examines established commercial markets, one finds that transfers among competitors become easier. When established markets exist where commodities can be valued and transferred, competitors can affect the transfers of information and modes of knowledge without having to cooperate outright. Furthermore, cooperation, even among competitors, is easier when non-profit-maximizing considerations such as conflicting egos and reputation become too costly to deploy. Recent examples, such as the attempt to coordinate research in the production of high resolution television³⁸ and the agreement between MasterCard and Visa to coordinate the development of credit-card purchases and verification on the Internet,³⁹ show an

³⁴ *Id.* at 33 (identifying various recurrent errors, including physicians' poor penmanship, that result in inaccurate and often deadly doses of vincristine).

³⁵ *Id.*

³⁶ See generally VISCUSI & MAGAT, *supra* note 27.

³⁷ A scientific panel recommended risk management procedures to reduce the probability of a disaster similar to the Challenger explosion. See, e.g., Don Irwin, *Panel Finds No Serious Flaws to Delay Shuttle*, L.A. TIMES, Mar. 5, 1988, at 4 (suggesting that "NASA . . . adopt more objective and mathematical standards for evaluating risks").

³⁸ See, e.g., William D. Marbach et al., *Super Television: The High Promise—And High Risks—of High-Definition TV*, BUS. WK., Jan. 30, 1989, at 56, 57 (reporting that the Commerce Department is trying to form a consortium of U.S. companies to develop the technology); *Soviet-Dutch Cooperation in Science and Technology*, TASS, Oct. 9, 1989, available in NEXIS, Europe Library, TAJIK File (describing the agreement between Netherlands Minister of Economic Affairs and Soviet Deputy Premier to develop high resolution television).

³⁹ Visa, MasterCard, and other financial institutions are cooperating on several projects that will computerize payment methods. See, e.g., Saul Hansell, *Checks*

awareness of the apparently wasted resources that accompanied the development of competing video cassette players and the resultant shakeup in the market.⁴⁰ Of course, there is a delicate balance between the benefits of encouraging cooperation and the benefits engendered by the productive and creative impetus provided by competition.⁴¹

B. *A User's Guide To Information and Modes of Knowledge*

Transferring discrete pieces of information is less taxing to one's cognitive skills than transferring modes of knowledge. In fact, with a simple binary code, an individual can transfer tons of information across even the most cognitively-challenged computers. But as individuals move away from transfers of discrete pieces of information to transfers of modes of knowledge, the transfers become harder to achieve. It requires thinking and understanding on the part of the recipient simply to assimilate new modes of knowledge. More importantly, deploying modes of knowledge requires a level of meta-understanding that does not always arrive with the mode of knowledge: instructions are not always included. A person could receive a textbook with the latest findings and formulas of quantum mechanics and would wind up much in the same position as those eagerly developing countries during the Cold War who acquired fancy aircraft, but not the skills to fly, maintain, or fix them.

For information and modes of knowledge to be useful, one must be able to retrieve and deploy them: "I know that face from somewhere, but I just can't remember;" "I knew the 'chain rule' and every other rule, but I still flunked my calculus exam, because that darned professor used problems that were nowhere in the textbook." The first example illustrates the problem of forgotten information; however, it may also reveal a

Delivered Via E-Mail Are Planned, N.Y. TIMES, Aug. 23, 1995, at D2 (noting that the group of companies hopes to identify its initial test group in 1996); Linda Sadlouskos, *Vendors Securing Online Commerce*, COMP. RESELLER NEWS, Aug. 24, 1995, at 24 (reporting that Microsoft Corporation is developing Secure Transaction Technology in conjunction with Visa International and MasterCard International to develop a method for secure bank-card purchases on the Internet).

⁴⁰ See, e.g., Victoria R. Bowles, *Video Cassette Recorders: Luxuries Become Necessities*, UPI, Apr. 9, 1984, available in LEXIS, Nexis Library, UPI File (describing the factors, such as availability and tape capacity, that led to VHS's victory over Beta). See generally Michael A. Cusumano et al., *Strategic Maneuvering and Mass-Market Dynamics: The Triumph of VHS over Beta*, 66 BUS. HIST. REV. 51, 75 (Spring 1992) (citing statistic that, in 1983, the VHS format held 75% of the American market, compared to Beta's 25%).

⁴¹ A decisionmaker may find that a decision that made sense *ex ante* turns out to be a failure *ex post*. That's life. Future decisionmakers, however, will take those *ex post* bits of information and factor them into decisions regarding the extent to which they will cooperate—or compete—in dividing production and sharing information. Of course, in areas where competition and cooperation begin to blur, decisionmakers will have to factor antitrust concerns into the calculus.

weakness or problem with the mode of knowledge that the individual used to connect images of faces with their attendant names.⁴² The second example requires the ability to deploy certain modes of knowledge; an individual may know that she is in a problem-solving situation, but does not know how to deploy what she knows. Modes of knowledge are more difficult to retrieve and deploy, require greater understanding, and are more difficult to purchase and transfer than is information.

In order for an individual to use information and modes of knowledge, she must be able to retrieve the relevant information or mode of knowledge. In certain cases, she must also be able to effect their modification, translation, and verification. As with the issue of transfer, manipulating information is easier because the data comes in discrete bits. Manipulating modes of knowledge is much harder, requiring a good understanding of how the particular mode of knowledge works. For example, correctly changing a positive sign to a negative one in a mathematical equation is impossible without a pre-existing understanding of how the equation or function works. Without this former understanding, the user cannot successfully apply the modes of knowledge.

Producing, transferring, and deploying modes of knowledge must account for bounded rationality⁴³ and opportunistic behavior.⁴⁴ This is also true with the production and transfer of information, but less so. Bounded rationality becomes less critical because the user can store information in hard drives, books, and other more-or-less permanent repositories. Even so, there are some problems for which we may generally “know” a method of solution, but for which finding an actual solution

⁴² Modes of knowledge may not only be forgotten or misused, but may also become obsolete. This fact became clear to me when I found a book describing a technique that would help me better learn the names of my students. In flipping through the book, I soon realized that, notwithstanding my initial interest, the book was mostly useless. It had been published in 1970 and contained numerous photographs and hints on how to remember the type of face and overall look of the photographee. The problem is that we have come a long way from the way we apparently looked in the early 1970s, and tips like, “notice the size of the sideburns” are no longer helpful.

⁴³ Bounded rationality is a product of humans’ limited computational and analytical abilities. Human beings may want to act rationally, but despite their best efforts, many of the problems that they face—especially informational ones—are intractable. See, e.g., HERBERT A. SIMON, *THE SCIENCES OF THE ARTIFICIAL* 36 (2d ed. 1981) (explaining that “economic man is . . . a person who accepts ‘good enough’ alternatives, not because he prefers less to more but because he has no choice”). Risk, uncertainty, incomplete information, complexity, or other variables that “prevent the actor from calculating the best course of action” all bound rationality. HERBERT A. SIMON, *Theories of Bounded Rationality*, in 2 *MODELS OF BOUNDED RATIONALITY: BEHAVIORAL ECONOMICS AND BUSINESS ORGANIZATION* 408, 410-11 (1982).

⁴⁴ Williamson defines opportunism as “self-interest seeking with guile. This includes . . . lying, stealing, and cheating.” WILLIAMSON, *supra* note 8, at 47.

would take too long to make economic—or cosmic—sense.⁴⁵ Modern cryptography basically relies on the fact that in most cases it will not be cost effective, or there will not be enough time, to have a cryptanalyst break the code and decipher the encrypted text.⁴⁶

Similarly, strategic behavior—which is a function of informational asymmetries between the parties involved—presents a lesser obstacle to the transfer of information. This is because it is much easier to verify pieces of information than it is to verify modes of knowledge. Of course, if the cost of verifying bits of information is too high or if time is short, as in a stock exchange on a recently acquired piece of information, strategic behavior by the transferor of information presents a more significant concern.

One last characteristic of information and modes of knowledge that will affect their production and transfer is their level of generality. One can take any bit of information, place it in context, and then identify where it stands in the continuum between the context-specific and the general or transcontextual. The more context-specific information is, the less value it will have if transferred to another context. For example, every semester, when professors learn the names of the students in their classes, they know that the information is very context-specific, that is, of little use beyond the physical limits of the classroom and the temporal limits of the semester. At the end of the semester, the information loses most of its value. Transcontextual information, such as the almost-universal “Green means Go” and “Red means Stop,” enables the user to go from intersection to intersection with little loss in value.⁴⁷

Modes of knowledge can also be placed in a continuum ranging from context-specific to general and transcontextual. Obviously, part of what makes modes of knowledge valuable is the fact that they can be transferred from one context to another.⁴⁸ These transfers can be “horizontal transfers,” that is, movements from one context to a completely different

⁴⁵ For example, there are problems that would take a computer 10^{18} (2^{61}) seconds to solve. Although at first blush, that may not seem like a very long time, the time involved would be equivalent to the total lifetime of the Universe. See, e.g., BRUCE SCHNEIER, *APPLIED CRYPTOGRAPHY* 16 (1994).

⁴⁶ See generally *id.*

⁴⁷ In Boston, however, this information includes “Yellow means speed up” and “Red means stop, unless the car behind you is speeding up.” See, e.g., Thomas C. Palmer Jr., *Stoplight Fright: Driving Through Red Is Common at Boston-Area Intersections*, *BOSTON GLOBE*, Mar. 28, 1994, at 1, 6 (noting that during a one-hour period, 121 vehicles ignored the red light at the intersection of Storrow Drive and Leverett Circle in Boston, not counting drivers who accelerated through a yellow light).

⁴⁸ Coase agrees, arguing that “in the short run, the ability of a particular group to handle certain techniques of analysis or an approach may give them such advantages that they are able to move successfully into another field or even to dominate it.” COASE, *Economics and Contiguous Disciplines*, *supra* note 13, at 38.

one,⁴⁹ or “vertical transfers:” transfers from a general context to a specific subset of that context.

Having laid out the general issues involved in the production and transfer of information and modes of knowledge, this Essay will next examine the methods of production of information and modes of knowledge. The following section analyzes, with Coase’s help: (1) how academic disciplines differentiate themselves—how they erect boundaries to define their scope and exclude outsiders; (2) how disciplines determine the placement and dimensions of these boundaries; and (3) how to characterize transgressions across discipline boundaries.

II. COASE ON CONTIGUOUS DISCIPLINES: FIRMS, COMPETITION, AND THE TIES THAT BIND

In *Economics and Contiguous Disciplines*, Coase provides an analytic sieve for determining the boundaries between economics and the other social sciences. In other words, Coase asks what it is that binds together groups of scholars who have coalesced into separate academic disciplines. Among the ties that bind, he finds “common techniques of analysis, a common theory or approach to the subject, or a common subject matter.”⁵⁰

Coase’s main argument, however, is that to a large extent, competition among practitioners in different disciplines determines the boundaries between disciplines. This competitive interaction, according to Coase, is analogous to that which determines the activities of firms or the extent of empires.⁵¹

The practitioners in a given discipline extend or narrow the range of the questions that they attempt to answer according to whether they find it profitable to do so, and this is determined, in part, by the success or failure of the practitioners in other disciplines in answering the same questions [V]ictory is not necessarily clear-cut, and different answers and different ways of tackling the same question may exist side by side, each satisfying its own market. One group of practitioners need not drive another group from the field but may merely, to use the economist’s terminology, increase their own market share.⁵²

Coase describes how economists, in recent times, have made forays

⁴⁹ “Horizontal transfers” are exchanges of products or information between parties with a similar level of specificity or generality.

⁵⁰ COASE, *Economics and Contiguous Disciplines*, *supra* note 13, at 38 (asserting that in order to forecast the future expansion of economics, scholars must identify the reasons for its past expansion).

⁵¹ *Id.* at 35; *see also id.* at 36 (comparing the waning expansion of economics to Augustus’s abandonment of plans to expand the Roman Empire).

⁵² *Id.* at 36.

into other disciplines, such as political science, sociology, linguistics, education, and law.⁵³ According to Coase, "economics is expanding its boundaries or, at any rate, . . . economists are moving more and more into other disciplines."⁵⁴ Coase raises two important questions: Why the expansion? and, Will it continue?⁵⁵

According to Coase, economic expansion has been effective because economists have successfully been able to export economic modes of knowledge to other disciplines.⁵⁶ Coase identifies an apparent paradox: economic expansion has come in an era when economics has become more technical and mathematical.⁵⁷ However, this turn towards technical finesse has meant a turn towards more abstract mathematical and logical concepts that, because of their generality, are better able to travel across disciplines.⁵⁸

Coase argues, however, that although economists may offer new ways of looking at problems—a different "way of looking at the world"—practitioners in other disciplines will eventually integrate these modes of knowledge into their own way of doing things. In other words, once academics in other disciplines recognize the utility of these new analytical models, "the naturally competitive response" will be to learn these new techniques and send the economists packing.⁵⁹ After all, sociologists, historians, and lawyers have a subject-matter advantage over economists vis-a-vis their own disciplines.⁶⁰ Thus, Coase is skeptical that this "economic expansion" will continue.⁶¹

⁵³ *Id.* at 36-37.

⁵⁴ *Id.* at 36.

⁵⁵ *Id.* at 37, 38.

⁵⁶ Examples include: quantitative methods, including linear programming; cost-benefit analysis; and rational choice methodology.

⁵⁷ COASE, *Economics and Contiguous Disciplines*, *supra* note 13, at 38 (recognizing the apparent inconsistency but arguing that there is a connection between these developments).

⁵⁸ *Id.* at 42 ("This more formal analysis tends to have a greater generality. It may say less, or leave much unsaid, about the economic system, but, because of its generality, the analysis becomes applicable to all social systems.").

⁵⁹ *Id.* at 45 (arguing that this phenomenon is already occurring in law and political science).

⁶⁰ *Id.* (concluding that the competitive response of practitioners in other disciplines will halt the advance of economists). *But see id.* at 40 (suggesting that particular dexterity with economic analysis may offset economists' unfamiliarity with the subject matter of other disciplines, but concluding that this possibility is insufficient support for the prediction that economists will have protracted success in other disciplines).

⁶¹ *Id.* at 44 ("I would not expect [economists] to continue indefinitely their triumphal advance and it may be that they will be forced to withdraw from some of the fields which they are now so busily cultivating.").

Coase's prediction, originally made in 1975, has not materialized.⁶² Economists continue to expand their influence into other disciplines.⁶³ For purposes of this Essay, however, it is useful to distinguish between economists "invading" other disciplines and economists "transferring modes of knowledge" to other disciplines. Coase's prediction relied on the implicit assumption that there was a limited supply of modes of knowledge that economists could transfer, and that the supply was close to exhaustion. Yet economists have continued to develop new mechanisms of knowledge—partly as a product of interacting with other disciplines—that they have continued to transfer to interested takers. Recent developments in game theory⁶⁴ and complex economic dynamics⁶⁵ are two pertinent examples.

Although Coase's analogy between academic disciplines and firms competing in the marketplace is accurate in certain scenarios, he places too much emphasis on the role of competition and the overall importance of demarcating the boundaries between disciplines. The remainder of this Essay will extend Coase's analysis by factoring in the potential for cooperation *across* disciplines and competition—as well as cooperation—*within* disciplines. Coase's own distinction between production across markets and production within firms will serve as an analogue for this discussion. My contention is that we can better understand academic disciplines if we have a better sense of the costs and benefits of producing information and modes of knowledge.⁶⁶

⁶² Coase originally presented *Economics and Contiguous Disciplines* to a conference of the International Economic Association in 1975. *Id.* at 34.

⁶³ On the extent of economics' expansion into law, see Robert C. Ellickson, *Bringing Culture and Human Frailty to Rational Actors: A Critique of Classical Law and Economics*, 65 CHI.-KENT L. REV. 23 (1989) (arguing that economics' influence on the law has lost "its upward trajectory"). For differing analyses of this theory, see generally Ronald A. Cass, *Coping with Life, Law, and Markets: A Comment on Posner and the Law-and-Economics Debate*, 67 B.U. L. REV. 73 (1987); Richard Posner, *The Future of Law and Economics: A Comment on Ellickson*, 65 CHI.-KENT L. REV. 57 (1989).

⁶⁴ See, e.g., DREW FUDENBERG & JEAN TIROLE, *GAME THEORY* (1991); ROGER B. MYERSON, *GAME THEORY: ANALYSIS OF CONFLICT* (1991).

⁶⁵ See, e.g., RICHARD H. DAY, *COMPLEX ECONOMIC DYNAMICS* (1994).

⁶⁶ This analysis can also extend outside the confines of ivory towers and into the realm of general production of information and modes of knowledge. Production in many areas—for example the petroleum industry and the manufacturing of automobiles—requires the cooperation and interaction of individuals in different disciplines or with different areas of expertise. To increase our understanding of the nature of the firm, we must increase our appreciation of the way that individuals who possess knowledge that is useful to others interact with those others.

III. PRODUCTION WITHIN DISCIPLINES AND ACROSS DISCIPLINES

A. *Borrowing from The Nature of The Firm*

This Essay argues that, at a certain level of generality, the production issues faced by academics are no different to those faced by producers within a firm. A physicist faced with an unfamiliar and rare integral may “hire” a mathematician for a quick “in and out” market-like transaction. After integrating the integral, the physicist and mathematician will part ways and return to their respective offices, much as spot market transactors shake hands and say goodbye. This type of interaction occurs in many different areas. The institution of co-authorship, for example, is analogous to a joint venture, where two commercial parties cooperate to produce a commodity and then go their separate ways. Moving along the continuum, it is possible to imagine a political science department hiring an economist or a legal academic. Should one view this as interloping, boundary expansion, or merely as an instance of horizontal integration?

Although it is possible to take any analogy too far, Coase’s original insights in *The Nature of the Firm* can be deployed uncontroversially to extend his analysis of academic disciplines. This Essay argues that Coase’s competition-centric view of interdiscipline relations is too narrow in that it deals with only one aspect of academic production. For example, Coase concludes *Economics and Contiguous Disciplines* by stating that:

[e]conomists may, however, study other social systems, such as the legal and political ones, not with the aim of contributing to law or political science but because it is necessary if they are to understand the working of the economic system itself.⁶⁷

Even though this is all true, I would argue that it places undue weight on a solitary, individualistic view of scholarly production, where the boundaries between disciplines are clearly demarcated and the motto is “you can look but you better not touch.”⁶⁸ An alternative to Coase’s view is to characterize academic production as a mixture of competition and cooperation. This is the view for which I argue in this Essay.⁶⁹ Cooperative production would mean that problem-solving academics would identify a goal, sketch out a means of achieving it, and carry out certain transactions between or within disciplines until they achieve that goal.

⁶⁷ COASE, *Economics and Contiguous Disciplines*, *supra* note 13, at 45.

⁶⁸ When I left corporate practice and went into academia, my biggest surprise (and disappointment) occurred when I realized that academic production is to a large extent a solitary endeavor, much unlike the way corporate transactions are put together and carried out. Although some amount of solitary production may be unavoidable, perhaps adopting a totally solipsistic approach is best left for the Russells and Saint Jeromes of the world.

⁶⁹ My argument here is positive, to the extent that the facts allow, and normative from that point on.

Thus, one useful enterprise would be to identify the factors that affect whether academic production is carried out within or across academic disciplines. This requires focusing on whether the marginal benefit of the production or transfer exceeds the marginal costs. Margins, however, may provide too thin of a slice for our analysis, given the difficulty of monetizing precisely all the variables involved.⁷⁰ One can generally conclude, however, that if the benefits of these transfers exceed the costs associated with them, society should encourage them.

Even if the costs currently involved exceed the benefits, it is important to ascertain which of these costs are production costs and which are transaction costs. In some cases, rearranging institutions—in the broadest sense of the word—may reduce transaction costs and encourage transfers that were previously too expensive to affect. Analyzing the costs and benefits involved is an empirical question, and one that this Essay does not address. However, my working assumption will be that these transfers of information and modes of knowledge across disciplines are in many circumstances worth the cost. Generally, having more information and more problem-solving tools is better than having fewer of them, although there are some exceptions. If rearranging institutions can reduce costs, a net social gain should result.⁷¹

One issue addressed by economists analyzing Coase's theory of the firm is the difficulty of drawing clear boundaries between the market and the firm. This is particularly true in the areas of joint ventures and short-term joint production.⁷² Examination of academic production through the lens of *The Nature of the Firm* raises an analogous problem. One difficulty is trying to determine the proper level at which to analyze academic production—at the university level, the level of individual academic departments, or within entire disciplines. In many instances, university departments and disciplines will completely intersect, but in other areas they may not. Although this Essay examines academic production by focusing on academic disciplines, the analysis can be generalized to examine the interaction between universities, different departments within these universities, and academic disciplines generally.

⁷⁰ COASE, *Economics and Contiguous Disciplines*, *supra* note 13, at 44 (observing that economists' reliance on monetization as a principal mode of analysis has contributed to the greater development of economics as compared to other social sciences).

⁷¹ For an example of how more information is not always preferred by decisionmakers, imagine telling a group of individuals that all of them will win millions of dollars if they vote *unanimously* to play a certain game. Then imagine telling them that in order for them to get the money, one of them must die. In this situation, the players may opt not to receive one piece of information, even if it were free—namely, the identity of the person who would die. If that information is given, so much for unanimity. See HIRSHLEIFER & RILEY, *supra* note 3, at 219-20.

⁷² See generally Steven N.S. Cheung, *The Contextual Nature of the Firm*, 26 J. L. & ECON. 1 (1983); WILLIAMSON, *supra* note 8.

Although such an analysis is beyond the scope of this Essay, we briefly address one relevant question—namely, what are the factors that influence whether an academic discipline is confined within a particular department or is dispersed across various departments?⁷³ Cross-discipline production, such as when mathematicians join economics departments or economists join law schools will, of course, affect the level of dispersion. In other instances, competition over tuition money or contributions from alumni will influence the level of dispersion. In short, the same type of questions that arise when one is analyzing vertical and horizontal integration in economic firms also arise in academic settings.

Of course, academic disciplines are not exactly like “firms.” For one thing, they are not subject to the same economic constraints as business firms competing in competitive markets. There is some competition over tuition money, but, by and large, it is harder for a whole department or a discipline to disappear than for commercial firms to go bankrupt. In fact, the paucity of economic constraints within universities may be one reason there is not more cooperation across disciplines. Managers of a firm selling goods in a competitive market will have to minimize production and transaction costs, and thus will choose to produce goods within the firm or across markets accordingly. Academics, however, do not face the same market constraints. They have more freedom to continue to produce inefficiently within a discipline even when production across disciplines is more efficient.⁷⁴ Institutional path dependence and other norms will also stand in the way of cross-discipline production.

The Manhattan Project in Los Alamos⁷⁵ is an example of cross-discipline production by scholars from different areas. The nuclear bomb

⁷³ For example, within Harvard University, mathematical production is dispersed among various departments, including: (1) Applied Mathematics; (2) Mathematics; (3) Statistics; (4) Computer Science; and (5) Physical Sciences. The issue of dispersion arose in the early years of Computer Science when members of that discipline had to decide whether to stay within mathematics departments or to form their own departments. See Interview with Donald Knuth in *MATHEMATICAL PEOPLE: PROFILES AND INTERVIEWS* 183, 188-92 (Donald Albers & G. L. Alexanderson eds., 1985).

⁷⁴ One alternative explanation is that the goals of production in firms and in academic disciplines differ. The traditional commitment to pure research that characterizes some academic disciplines is not always a central force in firms, even though certain firms such as AT&T and the Bell companies have maintained departments for pure research. The same can be said of pharmaceutical companies. Perhaps applied research (to which firms are more likely to be devoted) is particularly susceptible to cross-discipline production, while pure research of the sort frequently seen in academia is better handled by more isolated production. This notwithstanding, drawing the boundaries between the pure and the applied is not always very easy, or for that matter, very productive.

⁷⁵ See DAVID HAWKINS, *Inception Through Mid-August, 1945*, in *PROJECT Y: THE LOS ALAMOS STORY* 3, 5 (1983).

development team, organized in 1942, included physicists, chemists, metallurgists, and engineers all working together to achieve a common goal.⁷⁶ One explanation for the high level of cooperation notwithstanding the lack of economic incentives is that there were enough counter-vailing incentives to encourage representatives of these otherwise autonomous disciplines to work together.⁷⁷ The next subsections directly examine the issue of production within disciplines and across disciplines, discussing in particular the relative costs of doing each.

B. *Production Within Disciplines*

Just as in the case of production within a firm, relying solely on production within a discipline entails certain costs. For one thing, if disciplines draw bright boundaries around themselves and take an isolationist stance, competitive forces are less likely to have an effect on those within the disciplines. When there is little or no input or competition from outsiders, academic disciplines will tend to acquire “Big Blue-itis” or “Big Red-itis,” a reference to two insular “firms”—IBM and the former Soviet Union—that saw their market position and competitiveness decline because of self-imposed isolation. The dangers of isolation—even in cases where individuals from different disciplines are isolated together, as in the Institute for Advanced Studies—were captured quite well by the physicist Richard Feynman:

When I was at Princeton in the 1940s I could see what happened to those great minds at the Institute for Advanced Study, who had been specially selected for their tremendous brains and were now given this opportunity to sit in this lovely house by the woods there, with no classes to teach, with no obligations whatsoever. These poor bastards could now sit and think clearly all by themselves, OK? So they don't get any ideas for a while: They have every opportunity to do something, and they're not getting any ideas. . . .

Nothing happens because there's not enough *real* activity and challenge: You're not in contact with the experimental guys. You don't have to think how to answer questions from the students. Nothing!⁷⁸

In analyzing production within disciplines, one must take into account the fact that there is some *intra*-discipline competition: competitive forces

⁷⁶ *Id.*

⁷⁷ *Id.* (“Many of the scientists had been engaged in other war research and were convinced of the evils in obstructing the normal flow of information within a laboratory.”).

⁷⁸ RICHARD P. FEYNMAN, “SURELY YOU'RE JOKING, MR. FEYNMAN!": ADVENTURES OF A CURIOUS CHARACTER 149 (1986). Things at the Institute have not changed much since then, according to a recent description. See Adam Begley, *The Lonely Genius Club*, NEW YORK, Jan. 30, 1995, at 60-67.

are not checked at the entrance to the discipline. Alchian and Demsetz made an analogous criticism of Coase's *The Nature of the Firm* when they questioned Coase's assumption that the price mechanism and competition were characteristics present in markets but not in firms.⁷⁹

The area of scientific research is a perfect example of intra-discipline competition. As mentioned above, it is not uncommon for researchers to withhold findings from competitors within their discipline, or even to send out misleading and incomplete information in order to throw competitors off track.⁸⁰ The sciences may be a special area, given that researchers within disciplines compete against each other for scarce funding from government and philanthropic agencies, as opposed to receiving full funding from universities. Not getting one's government grant renewed can mean the end of a career or a move to another city. Even so, there are plenty of examples of intra-discipline competition and non-cooperation in other fields. These are frequently a function of ideological differences or, as in the medical research context, of competition for another limited good: recognition.

C. *Production Across Disciplines*

There are three distinct forms of production across disciplines. The first type occurs when members of one discipline expand their boundaries and engulf all or part of another discipline. This is the type of scenario Coase has in mind when he refers to the expansion of economics into other disciplines. We can refer to this type of cross-discipline production as "imperial production." Imperial production may occur less frequently than Coase and others assert. Its perceived frequency may reflect, for some, a type of "colonialist guilt," or, for others, a xenophobic attitude that tends to fan the flames of rhetoric. Thus, news of "imperial economics," invasions, breached boundaries, retreats, victories, and defeats travels quickly.

The second type of inter-discipline production is that which Coase recommends for economists: production in which economists borrow from contiguous disciplines with something to say about the structure and implementation of economic interactions. Coase himself provides a prime example of the rewards of following such a path of what we can call "interdisciplinary poaching."⁸¹ One would expect that transfers of information rather than modes of knowledge would predominate in interdisciplinary poaching, because these sorts of transfers are, by definition, one-way. When the transferor becomes too involved in the transferee's

⁷⁹ See Harold Demsetz, *Production, Information Costs, and Economic Organization*, in *OWNERSHIP, CONTROL AND THE FIRM* 119 (1988).

⁸⁰ The controversy and lawsuits surrounding the discovery of the HIV virus are painful examples of intra-discipline competition. See *supra* note 32 and accompanying text.

⁸¹ I use "poaching" here in the most honorable sense of the word.

discipline, the transferor will begin to resemble the imperial producer mentioned above. Nonetheless, one may expect to see some short-term market-like transfers of modes of knowledge for particular projects.

A third type of inter-discipline production is similar to a joint venture or relational contract, in which the parties jointly try to identify the relevant problem and then exchange modes of knowledge and information required for the solution. We can call this "cross-discipline" or "joint" production. It is this last type of production that holds the greatest promise in facilitating a movement from an insular model of production to a cooperative one.

Nevertheless, like any form of production across markets, there are a number of impediments that make joint or cross-discipline production generally more expensive. First, there are the obvious transaction costs of effectuating an "agreement," however implicit, to cooperate in joint production and the transfer of modes of knowledge. Second, producers will incur search costs in order to identify modes of knowledge that would be useful to transfer, as well as to identify potential joint venturers. These search costs, along with other costs, such as reputational and ego costs, will lead to obvious collective action problems: members of a discipline may hold back, waiting for others within their discipline to identify potentially beneficial modes of knowledge and academically profitable types of joint production.⁸² Getting around these collective action problems will usually require the efforts of some sort of political entrepreneur.⁸³ However, tenure requirements and path-dependence within disciplines make entrepreneurship unrealistically costly for some academics.

The next Part of this Essay examines two major roadblocks to production across disciplines: the turn toward the technical, and the strategic behavior of certain members of disciplines who either are worried about the sort of imperial production mentioned above, or who prefer an isolationist stance. The Essay concludes with an example from Coase on how to use "interdisciplinary poaching" most effectively.

IV. SOME MECHANICS AND SOME EXAMPLES

A. *Nostalgia for Cross-Disciplining in a World of Technical Refinement: Law & Philosophy*

The turn to the technical is one of the reasons that previously intertwined and cross-producing disciplines have turned their backs on one another.⁸⁴ Academics within disciplines identify pertinent issues to study

⁸² See generally MANCUR OLSON, *THE LOGIC OF COLLECTIVE ACTION* (1965).

⁸³ See TERRY MOE, *THE ORGANIZATION OF INTERESTS* 36 (1980).

⁸⁴ An extreme example in mathematics is the proof of Fermat's Last Theorem, announced a few years ago. On its face, Fermat's last conjecture is simple to understand and simpler to state—Fermat squeezed it casually into the margins of a book.

and attempt to address them in some coherent fashion. Over time, results, advances, and modes of knowledge will accumulate and will be integrated into the discipline's "natural" body of knowledge. As academics within the disciplines address more general problems, new, more technical questions are posed and answered. The more specialized the questions, the answers, and the resulting body of knowledge, the more pronounced the boundary between disciplines becomes. Tenure and Ph.D. requirements no doubt contribute to this centripetal tendency. After all, the requirement that potential entrants be well-versed in certain techniques of knowledge and discipline-specific information acts as an entry barrier to the discipline. Traditional signalling devices, such as obtaining advanced degrees and meeting publication requirements, are ways of dealing with the obvious adverse selection problems.

The interrelation between law and philosophy, two disciplines with a long history of joint production, serves as an example of the turn to the technical. Although the boundaries between law and philosophy are not easily drawn⁸⁵ nor erased,⁸⁶ the turn to the technical in both areas, particularly in philosophy, has led philosophers and lawyers to address the proper interrelation—and the proper boundaries—between the disciplines.⁸⁷

Its proof, however, is so technical and specialized that only a small number of trained mathematicians are in a position to contribute to its verification. See, e.g., Gina Kolata, *A Year Later, Snag Persists in Math Proof*, N.Y. TIMES, June 26, 1994, at C1, C13.

⁸⁵ As Morris Cohen puts it:

The philosophy of any subject-matter, such as the law, I take to be the effort to view it as part of a larger whole wherein it moves and has its being. From this point of view no hard and fast line separates the philosophy from the science or theory of law—the distinction between them can only be one of the degree of generality of our interest.

MORRIS R. COHEN, *REASON AND LAW* 1 (1950).

⁸⁶ This essay leaves aside more recent questionings, transgressions, deconstructions, and problematizing of these issues by the founding fathers of Critical Legal Studies, and their post-modern, post-critical emulators and Brutuses.

⁸⁷ We all draw distinctions all the time, whether arguing about conceptual or theoretical issues or merely trying to decide what actions to undertake. There is a difference, however, between the act of drawing those types of distinctions—distinctions that are merely a means to some other end—and the philosophy of making distinctions generally, of drawing lines, of creating boundaries in the way we think, talk, and act. Reflecting on boundary-drawing itself, the following questions arise: (1) Why were certain boundaries drawn *there*, and why then and not later?; (2) Why have those boundaries stayed the same, or why and how have they changed?; (3) What are the purposes behind the boundaries drawn, and who is affected (and how) by the manner in which they were drawn?; (4) Why have those boundaries not been noticed before, why have they remained invisible to the analyst's gaze and to what effect? For a poetic analogue, see ROBERT FROST, *The Road Not Taken*, in *THE ROAD NOT TAKEN: AN INTRODUCTION TO ROBERT FROST* 270 (1962).

Looking at the history of this interrelation, one sees a series of shifts, from the entrenchment of law in the ordinary language of philosophers, to the emergence of a separate sub-discipline of the philosophy of law, to an episteme shift of sorts by philosophers as they took on the problematics of knowing, abandoning law to political philosophers and to lawyers with an interest in the philosophical. Of course, these shifts were not so clear cut, but such a schema provides us with a starting point hopefully not too devoid of history.

Huntington Cairns' 1949 book, *Legal Philosophy from Plato to Hegel*, gives us a flavor of these shifts in emphasis, in its aptly titled first chapter "Philosophy as Jurisprudence:"

Law as a field of speculative inquiry is a subject in which philosophers nowadays evince little interest. This is a relatively new attitude on the part of philosophers, and an unfortunate one in its consequences for both disciplines. Law until the time of Hegel had been historically one of the main concerns of philosophy. It was a subject of prime importance to the philosophers of ancient Greece, and every philosopher of the first rank from Plato to Hegel occupied himself with its elucidation. Through this activity the problems of law were first established—the problems on the solution of which every task of modern legal thought turns.⁸⁸

Morris Cohen, in the Prologue to *Reason and Law*, offers an explanation for the growing divide between the two disciplines. He bases his explanation on the turn to technical concerns in both law and philosophy:

Though professional legal writings are naturally dominated by practical and technical issues, the great jurists have always drawn directly or indirectly on what philosophers such as Aristotle, Aquinas, Leibniz, Kant, and Hegel have written on the law. It is only in the last century that philosophy almost entirely ceased to pay attention to the nature of legal institutions and other historic realities, and became absorbed in the psychologic or epistemologic problem of how we come to know anything at all. On the other hand, the distrust, if not contempt, for jurisprudence or abstract legal theory has been strongest among English and American lawyers, largely because of the narrowly professional character of our law schools.⁸⁹

As mentioned above, the turn to the technical inevitably makes the boundaries between disciplines more pronounced. Roscoe Pound

⁸⁸ HUNTINGTON CAIRNS, *LEGAL PHILOSOPHY FROM PLATO TO HEGEL* 1 (1949).

Of course, Hegel is personally responsible for obscuring many a clear subject, so it would not be totally surprising if, after Hegel, philosophers and lawyers said "enough is enough," each turning inward toward the more technical matters of their own discipline.

⁸⁹ COHEN, *supra* note 85, at 1.

expresses a similar point in the Preface to the First Edition of his Storrs Lectures, where he sets forth the following *caveat emptor*:

A metaphysician who had written on the secret of Hegel was congratulated upon his success in keeping the secret. One who essays an introduction to the philosophy of law may easily achieve a like success. His hearers are not unlikely to find that he has presented not one subject but two, presupposing a knowledge of one and giving them but scant acquaintance with the other.⁹⁰

Both Pound and Cohen, however, see these technical problems as merely that: technical problems that lawyers can and should overcome if they expect to make any progress in the "science of law." Thus Pound goes on to say:

Until some Anglo-American jurist arises with the universal equipment of Josef Kohler the results of common-law incursions into philosophy will resemble the effort of the editorial writer who wrote upon Chinese metaphysics after reading in the *Encyclopaedia Britannica* under China and metaphysics and combining his information. Yet such incursions there must be. Philosophy has been a powerful instrument in the legal armory and the times are ripe for restoring it to its old place therein.⁹¹

Morris Cohen also thinks that lawyers must become more technically refined, at least in the arts of science and logic:

The growing annexation of [law schools] by our universities tends to make law teachers aim at being scholars rather than mere practitioners, and this promotes a more liberal interest in legal theory. Unfortunately, relatively few teachers of law have had a scientific education, and so their conception of scientific method does not always rise above popular impressions.⁹²

⁹⁰ ROSCOE POUND, AN INTRODUCTION TO THE PHILOSOPHY OF LAW, at vii (rev. ed. 1954). Pound sets out in great detail the technical difficulties faced by the individual who tries to practice both law and philosophy:

If he is a philosopher, he is not unlikely to have tried a highly organized philosophical apparatus upon those fragments of law that lie upon the surface of the legal order or upon the law as seen through the spectacles of some jurist who had interpreted it in terms of a wholly different philosophical system. Looking at the list of authorities relied upon in Spencer's *Justice*, and noting that his historical legal data were taken from Maine's *Ancient Law* and thus came shaped by the political-idealistic interpretation of the English historical school, it is not difficult to perceive why positivist and Hegelian came to the same juristic results by radically different methods. On the other hand, if he is a lawyer he will very likely have been able to do no more than attempt none too intelligently to work with the complicated and delicate engines of others upon the toughest and most resistant of legal materials.

Id.

⁹¹ *Id.* at vii-viii.

⁹² COHEN, *supra* note 85, at 1. Cohen himself authored various texts which were

This turn towards the technical is one of the best ways to draw boundaries around one's discipline so as to keep out interlopers; by the same token, it provides obscure tools that allow well-trained practitioners to interlope into other disciplines. Moreover, the turn towards the technical also affects the level of cooperation within disciplines. Mathematics, physics, and history are all example of disciplines in which members often have more in common with outsiders than with other members of their own discipline.

This shows only that there is nothing essential about the boundaries that surround disciplines; rather, a certain level of path-dependence is responsible for these boundaries. If this were not the case, perhaps mathematics or history would splinter into numerous different disciplines. The difficulty of reforming curricula given the wealth redistributions usually involved, the nature of academic funding, and other historical contingencies are all factors that help enhance the path-dependence of discipline boundaries.

Of course, if all of the existing boundaries between disciplines disappeared, one would expect to see more production across previously existing boundaries as well as the reconstituting of academics within distinct disciplines, some disciplines just as they were before, some comprising an intersection of previous disciplines, and some that were completely new. After a while, however, one would expect that boundaries would once again become entrenched, and production across disciplines would become less natural and more costly.

meant to help with such endeavors. See, e.g., MORRIS R. COHEN & ERNEST NAGEL, *AN INTRODUCTION TO LOGIC AND SCIENTIFIC METHOD* (1934); MORRIS R. COHEN, *LAW AND THE SOCIAL ORDER: ESSAYS IN THE PHILOSOPHY OF LAW* (1933). On the technical requirements for non-lawyers (such as himself), Cohen stated:

[L]et us consider the view that law is a special field requiring technical knowledge and that only lawyers can deal with it. This is an objection which can be brought also against the philosophy of nature, and yet many of us feel that the philosophy of nature is a legitimate field of inquiry for others as well as for technical physicists.

COHEN, *supra* note 85, at 139. He wrote his essay, however, in 1913, before relativity and quantum physics had completely turned the physical world upside down. As physics became increasingly technical, non-physicists had to adopt a more modest attitude. See, for example, Bertrand Russell's more cautious view in 1927:

For one who, like the present author, is not a professional physicist, the exercise of such judgment [about physics] is difficult, and is likely to be occasionally at fault. The subject of the relation of "matter" to what exists, and generally of the interpretation of physics in terms of what exists, is, however, not one of physics alone. Psychology, physiology, mathematical logic, and philosophy are all required, in addition to physics, for the adequate discussion of the theme with which [Russell's current book] deals. Consequently certain shortcomings on the part of a single author, however regrettable they may be, are perhaps scarcely avoidable.

BERTRAND RUSSELL, *THE ANALYSIS OF MATTER*, at vii (1927).

Although the turn to the technical makes interdiscipline production more costly, there are two other bulwarks to interdiscipline production: the call for an isolationist stance by some within disciplines, and the charge of "overreaching" and interference made by members of one discipline against members of another.

B. *Isolationism: A View To In-Where*

Although Cohen and Pound react to the growing divide between philosophy and law by advocating bridging the technical gaps that separate both disciplines,⁹³ another possible approach is to look inward. Isolationists advocate drawing clear boundaries around disciplines not so much to keep interlopers out, but to keep members in; to keep members within a certain set of accepted methods of knowledge that "have been proven to work" by their forbearers. The isolationists' goal is to prevent practitioners within a discipline from reaching across boundaries to borrow from other disciplines.⁹⁴

In *Law's Empire*, Ronald Dworkin advocates analyzing the reach of law's empire from within the discipline of law, and he chastises those who in the past have blurred the boundaries between the discipline of law and everything else:

It was Oliver Wendell Holmes who argued most influentially, I think, for this kind of "external" legal theory; the depressing history of social-theoretic jurisprudence in our century warns us how wrong he was. We wait still for illumination, and while we wait, the theories grow steadily more programmatic and less substantive, more radical in theory and less critical in practice.

This book takes up the internal, participants' point of view; it tries to grasp the argumentative character of our legal practice by joining that practice and struggling with the issues of soundness and truth participants face.⁹⁵

Although Dworkin claims to be undertaking such an internal discourse, his forays into theories of interpretations and moral philosophy, among other things, exemplify the difficulty of doing so: he steps outside of his internal view to take a peek from outside, and in doing so, smuggles in theoretical contraband.

One problem with enforcing discipline isolationism is analogous to that faced by economic cartels: it is extremely difficult to enforce an agreement of non-defection, particularly when individual members of a cartel are better off by defecting, and when such defection is not easy to detect.

⁹³ See *supra* notes 89-92 and accompanying text.

⁹⁴ See, e.g., Charles Fried, *Artificial Reason*, 60 TEX. L. REV. 35, 38 (1981) ("[R]ights will be best and most reasonably respected if reasoning about them goes forward within [a] special discipline.").

⁹⁵ RONALD DWORKIN, *LAW'S EMPIRE* 14-15 (1986).

This is true even if the cartel members as a whole would be better served by retaining the cartel. Individual members of disciplines may in some cases be better off by defecting, even if the discipline as a whole would be better off if such defections did not occur.

C. *Imperial Production: Overreaching or Underachieving?*

Although isolationists draw boundaries to keep their members from looking outside of the discipline, those protesting against imperial production want to draw boundaries to keep interlopers out.⁹⁶ Thus, the challenge is to answer the skeptic who believes that the transfer of information and modes of knowledge across disciplines inevitably leads to “overreaching” by one discipline into another. Coase’s views about “overreaching” by economists and the potential market constraints on such overreaching have been discussed above, and thus I will not examine in greater detail claims against “Imperial Economics.”⁹⁷ Instead, I will

⁹⁶ The words “jurisdiction” and “jurisprudence” provide a nice springboard for a discussion of boundaries, because our concern here is with the boundaries between philosophy and law. “Jurisprudence” is the science, art, or discipline from which emerges our knowledge of the meanderings of law and of the boundaries within which they take place. BLACK’S LAW DICTIONARY 767 (5th ed. 1979). A glance at a jurisprudence bookshelf reveals a great concern with the path of the law, its quest for itself, its anatomy, its morality, its province, its empire, and its authority.

Both lawyers and philosophers have thought quite deeply about the difficulty of drawing boundaries around their own disciplines. In law, the interest in drawing boundaries has arisen from a concern with the practical effects of the “reach” of the law. In philosophy, boundaries have been an afterthought of sorts. As philosophers began to realize that they had been asking the same questions with little success for so long, they became more concerned with the limits and extension of their tools: their ability to reason; their ability to express their thoughts in language; and their ability to convince those “outside” of philosophy that their talk was not just babble strung together with greek letters and existential quantifiers.

⁹⁷ In a recent collection of essays on the reach of economics outside of its “traditional” realm, the editors stated:

The critics [of the “economic approach” in other disciplines] have often viewed the extension of economics, in particular the extension of microeconomic theory to all human affairs, with misgivings. They have accused the Chicago School, Public Choice, the Economics of Law, and similar approaches or extensions of economic theory, of “disciplinary imperialism” and of not being aware of the boundaries of the realm of valid application of economic thinking.

ECONOMIC IMPERIALISM: THE ECONOMIC METHOD APPLIED OUTSIDE THE FIELD OF ECONOMICS, at vii (Gerard Radnitzky & Peter Bernholz eds., 1987). For a sample of the debate among lawyers about the usefulness, integrity, and practicality of relying on economic analysis within the law, compare Richard A. Posner, *The Ethical and Political Basis of the Efficiency Norm in Common Law Adjudication*, 8 HOFSTRA L. REV. 487, 487 (1980) (arguing that common law adjudication should operate with the objective of maximizing wealth and that wealth maximization produces a combination of happiness, rights to liberty and property, and “sharing with the less fortunate”)

focus on how law and philosophy have addressed the issue of overreaching.⁹⁸

Philosophy is an easy discipline from which to overreach, because it concerns itself with very general notions that inevitably have some effect on what others are doing outside philosophy.⁹⁹ The nature of knowledge or of truth, of logic or of beauty, of good or of evil, all have *some* bearing on other disciplines. Take, for example Kant's Preface to the first edition of his First Critique, a work whose principal goal was to set the bounds of "reason:"

In this inquiry I have made completeness my chief aim, and I venture to assert that there is not a single metaphysical problem which has not been solved, or for the solution of which the key at least has not been supplied.¹⁰⁰

Kant is quick to point out that those who came before him had been even more grandiose, professing "to prove the simple nature of the soul or the necessity of a first beginning of the world."¹⁰¹

with Richard Markovits, *Legal Analysis and the Economic Analysis of Allocative Efficiency*, 8 HOFSTRA L. REV. 811, 891-92 (1980) (rejecting Posner's method because economics fails to recognize those "aspects of our moral and psychic reality" that actually inform legal and moral analysis).

⁹⁸ Cynical observers in other disciplines may very well conclude that lawyers, philosophers, and economists all share a great love for the knowledge that they generate, package, quantify, and impose on others. Their dictates—whether in a mumble or a crisp sentence—seem to protrude into every conceivable discipline. For example, the historian, sociologist, or mathematician who is not on constant guard will soon find lawyers, philosophers, and economists among her peers—or at least among her colleagues. Although these cynics will grant that there is nothing inherently wrong with cross-pollination, they will be quick to point out that it behooves us to ask—at least every so often—whether the allergens are worth the sneeze.

⁹⁹ Of course, in evaluating this claim, we should be cognizant of our sources, particularly when examining "self-imposed boundaries" whose descriptions come from the mouths of those drawing them. Thus, although we will principally rely on the words of lawyers and philosophers, we must be careful not to give undue weight to what they have said on the subject. It should come as no surprise that if you are given a knife and asked to cut your share of a cake, you will leave only a sliver for others. One well-known solution to this problem is to hand the knife to the person who will choose last; however, this solution is hard to impose on lawyers and philosophers—they tend to be the ones who speak first *and* last on most subjects, particularly on their own.

¹⁰⁰ IMMANUEL KANT, *CRITIQUE OF PURE REASON* 10 (Norman Kemp-Smith transl. 1929).

¹⁰¹ *Id.* Of course, there is no need to make a scapegoat out of Kant, given that more recent examples abound. Take this century: logicians have attempted to reduce every what-not to the laws of logic; linguistic philosophers, to the rules of language; philosophers of science, to the laws of physics; structuralists, to whatever structures were handy; post-structuralists, to everything other than structure; and deconstruc-

Lawyers have offered “the law” as a useful way of restraining philosophers. In his *Anatomy of Law*, Lon Fuller submits that—

Philosophers find in the law a discipline lacking in their own sometimes errant studies—the discipline, namely, that comes of accepting the responsibility for rendering decisions by which men can shape their lives. . . . When the philosopher descends from the high plateau to share in the tasks of the judge and legislator, he seems to be surrendering the freedom of his thought for a burdensome responsibility.¹⁰²

Fuller is not shy, however, about expanding the domain of law. He acknowledges, for example, that before psychology emerged as an independent discipline, judges dealt with issues of intent and responsibility, “and their way of dealing with these problems seems to many even now to contain a deeper wisdom than that to be found in textbooks on psychology.”¹⁰³ By the same token, economists “who have exhausted the resources of their own science turn to the law for insight.”¹⁰⁴ It is not only the concepts of law that have made their contribution according to Fuller; the “words” of law have in their own way “made indispensable contributions to language[,]” including, according to Fuller’s no doubt non-exhaustive list, the word “thing.”¹⁰⁵ Again, we need not be too harsh on Fuller; he, after all, provides that the law can also “seem the emptiest of sciences.”¹⁰⁶

The interrelation between constraint, isolation, and overreaching is captured in Ronald Dworkin’s aptly titled *Law’s Empire*.¹⁰⁷ It is interesting to contrast the “isolationist” attitude of his quote above with the following quote from the book’s Preface:

We live in and by the law. It makes us what we are: citizens and employees and doctors and spouses and people who own things. It is a sword, shield and menace We are subjects of law’s empire, liegemen to its methods and ideals, bound in spirit while we debate what we must therefore do.¹⁰⁸

tionists, to those edicts never signed by Jacques Derrida and never glossed upon by the never existent, or, at best, partially-erased Paul De Man.

¹⁰² LON L. FULLER, *ANATOMY OF THE LAW* 3-4 (1968).

¹⁰³ *Id.* at 3.

¹⁰⁴ *Id.*

¹⁰⁵ *Id.* at 4.

¹⁰⁶ *Id.*

¹⁰⁷ DWORKIN, *supra* note 95, at vii.

¹⁰⁸ *Id.* at vii.

D. "Interdisciplinary Poaching:" Coase the Law-Taker

As previously mentioned, there is a distinction between overreaching into another discipline—acting as a peer, a knower, and a sayer in that other discipline—and turning to another discipline for advice, techniques, data, new insights on analogous problems, and so on. Coase himself has often turned to the law for examples and to support some of his claims about economic institutions. In *Economics and Contiguous Disciplines*, Coase first sets forth the limitations of economic imperialism and then states quite clearly that economists should not adopt the opposite tack and turn inward:

Economists may . . . study other social systems, such as the legal and political ones, not with the aim of contributing to law or political science but because it is necessary if they are to understand the working of the economic system itself.¹⁰⁹

In looking at the possible reasons for, and benefits of, interdisciplinary poaching, it is useful to look at Coase's first foray into borrowing from other disciplines: *The Nature of The Firm* itself.¹¹⁰ The title of his article betrays an interest in getting to the essence of the concept "firm." This is an interest similar to that of lawyers who ask themselves, "What is law?," a question that one could rephrase as "What—in essence—is law?," or of philosophers who, feeling the Platonic urge, have asked, "What is the essence of knowledge, of truth, of justice?"

In fact, the beginning of Coase's article shows a keen interest in trying to pin down the language that economists use, of exposing the assumptions lurking right underneath their utterances.¹¹¹ In particular, he wants to provide a definition of the word "firm" that will reflect what is out there "in the real world." He states:

[I]t is suggested [by Joan Robinson] that the use of the word "firm" in economics may be different from the use of the term by the "plain man." Since there is apparently a trend in economic theory towards starting analysis with the individual firm . . . it is all the more necessary not only that a clear definition of the word "firm" should be given, but that its difference from a firm in the "real world," if it exists, should be made clear. . . . It is hoped to show in the following paper that a definition of a firm may be obtained which is . . . realistic in that it corresponds to what is meant by a firm in the real world.¹¹²

In determining whether the concept of "firm" that he develops comports to that in the "real world," Coase turns to the world of the law. He does

¹⁰⁹ COASE, *Contiguous Disciplines*, *supra* note 13, at 45.

¹¹⁰ RONALD COASE, *THE FIRM, THE MARKET AND THE LAW* 33 (1988).

¹¹¹ *Id.* at 33.

¹¹² *Id.* at 33-34 (internal citations omitted).

this by comparing the concept of “firm” with the legal relationships of “master-servant” and “employer-employee” and concluding that they are similar in nature. Coase steps outside of the discipline of economics to ascertain what the “plain man” means by “firm” and somehow ends up in the grip of *The Law of Master and Servant*,¹¹³ a treatise, as the quotes Coase provides show quite clearly,¹¹⁴ that no “plain man” would understand—unless of course they had hired a lawyer to translate.

But this literal interpretation of the words of Coase is somewhat unfair. Coase’s strategy in *The Nature of the Firm* was to stand outside of economics in order to find foundations for the statements being made about economic issues, by economists. At the beginning of the article he states quite pointedly that “[e]conomists in building up a theory have often omitted to examine the foundations on which it was erected.”¹¹⁵ Coase quite naturally turned to a discipline, that, at the time,¹¹⁶ could provide—at least in its not too Realistic treatises—well-rooted definitions regarding certain of the same interactions that were of interest to economists, or perhaps to Coase. The boundary, for Coase, between law and economics allowed him to look at law for a basis for his economic definition, without running into the problem of self-reference. Instead of opening an economic dictionary and looking up a number of words that referred him to and from the word “firm,” Coase turned to another book, another discipline all together.

Again and again throughout his career, Coase has turned to the law as a source of example and support.¹¹⁷ One of the reasons that he could do so, I want to argue, is that he has always kept some boundaries between the disciplines: he never tried to reduce economics to law. By the same token, he never tried to reduce law to economics. Although he taught at a law school, Coase continued to see himself as an economist discussing law.¹¹⁸

¹¹³ FRANCIS R. BATT, *THE LAW OF MASTER AND SERVANT* (Sir I. Pitman & Sons, ed., 1929).

¹¹⁴ COASE, *Nature of the Firm*, *supra* note 13, at 53-54.

¹¹⁵ *Id.* at 33.

¹¹⁶ Although Coase developed the ideas in this article in 1932, it was not published until 1937. See Ronald Coase, *The Nature of the Firm: Origin*, in *THE NATURE OF THE FIRM: ORIGINS, EVOLUTION, AND DEVELOPMENT* 32 (Oliver Williamson & Sydney Winter eds., 1993).

¹¹⁷ Perhaps the most famous instance is *The Problem of Social Cost*, *supra* note 14.

¹¹⁸ Coase has often shown discomfort by the fact that many economists have ignored his work, even though several generations of legal scholars regard him with awe. The beginning of his Nobel Prize lecture illustrates this point:

In my long life I have known some great economists but I have never counted myself among their number nor walked in their company. . . . In this lecture I shall explain why, in my view, these features of the economic system were ignored and why their recognition will lead to a change in the way we analyze the workings of the economic system and in the way we think of economic policy.

V. CONCLUSION

Thus, in the end, boundaries between academic disciplines play some pragmatic role—they help to identify particular issues and provide a confine from which to deploy modes of knowledge to address these issues. If all academics were to step out of their disciplines at the same time, what would they step into? This is analogous to asking, What would happen if firms were outlawed and all production would have to take place within markets? Would we still call them “markets” or would they be so different that we would concoct a new word to describe what was really going on?

Conversely, boundaries between disciplines can literally get in the way. What I have argued in this Essay is that we need to use the notion of boundaries as a stepping stone to allow us to get a better view both of what lurks within and without academic disciplines.

In other words, the boundaries between disciplines are merely institutional frameworks that, in certain cases, allow for more efficient production of information and modes of knowledge. These institutions should not be allowed to stand in the way of the transfer or joint production of information and modes of knowledge. Cooperation and competition are necessarily intertwined, but we should be wary of privileging one over the other.

I have principally focused on the production and transfer of information and modes of knowledge within academic settings. The analysis developed in this Essay, however, can be transferred into other settings where the production and transfer of these commodities play an important role and where institutions may have developed that make such production and transfer costlier.

One example of current import is the transfer of information and modes of knowledge about “how to be a good capitalist” to the emerging markets in Eastern Europe. The difficulties faced by capitalist missionaries in transferring the institutions of capitalism are partly a function of the more general issues raised by the transfer of information and modes of knowledge across man-made boundaries: whether these boundaries divide one nation-state from another or an economist from an anthropologist.