



Reviews

MICHAEL I. MYERSON (2002) *Political Numeracy: Mathematical Perspectives on Our Chaotic Constitution*. New York: W.W. Norton & Co., 287 pp., \$24.95

Since the American Progressive Era of roughly a century ago, the law increasingly has come to be seen as an instrument of social policy, rather than as a body of doctrine revealed by black-letter exegesis. The view of law as an instrument for social goals carries with it a mandate for social science – policy-minded judges and legislators need, or at least should have, a theory of human action. If the object is to fashion legal rules to promote desired social ends, then law makers must have a theory of how citizens will respond to changes in legal rules.

Economic theories of law, for example, typically offer rationality, sometimes augmented by self-interest, as a theory of human action. Rational agents do what they most prefer, and self-interested rational agents have preferences that are self regarding. Increase the expected punishment for armed robbery, and some (rational) armed robbery will be deterred. The story doesn't end there, of course. There is the question of whether more enforcement or more punishment best realizes a desired level of deterrence; whether too draconian a punishment will induce (rational) armed robbers to murder their victims, and so on. But these qualifying questions are themselves concerned with incentives. When law is viewed as an instrument of social policy, legal rules matter less for their backward-looking pedigree than for the forward-looking incentives they create.

Public Choice theory simply extends this logic upward. It applies the rationality-plus-self-interest conception of human action to rule makers, which, in turn, requires that we attend to constitutional law when constitutional rules constrain and thus influence the incentives of those who make (and enforce) statutory and common laws. Rules matter because incentives matter, and this is true for rule makers and rule takers alike. Scholars from different jurisprudential traditions might emphasize different kinds of incentives, such as power or class interest, but they too would be concurring with a central implication of the instrumental view of law: because rules create incentives, informed lawmaking needs a theory of how legal rules do their work.

“No law without social science” makes for a splendid motto, and social scientists with interests in the law have been happy to embrace it, even if legal scholars don't always share their enthusiasm. A problem, however, remains. The problem is ignorance. What if, to take a first example, otherwise well intended law makers lack the sophistication to design rules (or systems that encourage the emergence of rules) that will be successful in promoting their social goals? And second, what if citizens are ignorant of the laws designed to affect their choices? The ignorant citizen may simply not know the law, so that law influences him only by accident. Or the citizen may be observing extra-legal rules; that is, informal norms or conventions rather than laws are influencing his choices. Ignorance

matters because rules create good incentives only when rules are well designed, well understood, and well observed.

The Coase Theorem, which may be the most influential bit of social science in legal reasoning, provides an illustration. It does not matter, says the Theorem, whether the law assigns property rights to the farmer or to the rancher whose cattle are trampling the farmer's crops. If transactions costs are low, the rancher and farmer will themselves come to an arrangement, so that the property rights will end up in the hands of the party that values the resource more. The law – to whom legal liability is assigned and by what means – doesn't matter, at least not so far as efficiency is concerned. But if transactions costs are high, which is what Coase in fact imagined, then the assignment of legal liability can indeed affect efficiency, and it then it does matter which rule is chosen. "Minimize social costs," the goal of law and economics since Coase and Guido Calabresi, is easy to say, but hard to do. This should surprise no one, for economics is likewise hard to do. Even judges weaned on the Kaldor-Hicks *ethos* (if there are any) will find it challenging to make decisions that provide efficient incentives, requiring, as this may, knowledge of subjective valuation, risk costs, and potential wealth effects, while simultaneously avoiding moral hazard, activity effects and the like.

In the never-never-land of zero transactions costs, where we are indifferent as to which party gets the legal entitlement, the rancher and the farmer obviously care which of them is made legally liable, since this determines the distribution of surplus. Or do they? The Coase Theorem assumes that the rancher and the farmer reach their bargain in the shadow of the law. But, what if the rules actually guiding dispute resolution are not laws? Robert Ellickson's (1991) famous case study found that ranchers and farmers do indeed reach reasonably efficient outcomes, but do so in ignorance of the relevant law. Norms and extra-legal enforcement of them provided the incentives to Shasta County ranchers and farmers. Examples abound of cooperative behavior guided and enforced by extra-legal rules, especially in common property resource settings. Yes, laws create incentives, but legal rules are not the only rules that govern human action. Legal centralists, as Ellickson calls them, make the mistake of assuming that legal rules are the only rules that influence human action.

Prof. Meyerson's engaging and playful monograph makes a serious case for the importance to law of mathematical modes of reasoning, which are still exotic in law, and commonplace in economics. Meyerson's One-L Torts professor began the semester with two-cultures remark that is at once a sneer and a boast: "If you were any good in math, you'd all be in medical school." With a gentle hand, Myerson picks up this gauntlet, and constructs a brief for numeracy in Law. He wants to show a skeptical audience how mathematical reasoning can illuminate the law and its history.

He makes the case for math in law on the breadth of potential application. Myerson's book is the product of a legal scholar who loves and appreciates mathematics. His infectious enthusiasm for all things mathematical makes for a compelling intellectual tour, but it is a tour with a few too many distracting side trips.

In the later chapters especially, the explanatory light of mathematics gets a bit dim. These excursions are those of the connoisseur who cannot help showing others his favorite out of the way places. Myerson at one point considers the U.S. Constitution as a

topological space; he makes the Declaration of Independence a Euclidian proof, and he tosses in wonderfully compact summaries of famous proofs – that circles cannot be squared, and that prime numbers are infinite in quantity. A discussion of limits in the context of infinitesimals is juxtaposed with legal delays in serving justice. In all these examples, we learn something of mathematical reasoning, as we did in Michael Guillen's *Bridges to Infinity* (1983), another book that uses graceful prose to teach mathematics to the uninitiated. But mathematics used in this allusive way does not illuminate so much as provide occasions for the admittedly pleasurable sport of locating unexpected commonalities between mathematical and legal ideas.

In other places, the law is better illuminated, though it is lit more by logic than by mathematics *per se*. For example, Meyerson employs a discussion of syllogistic reasoning to critically parse infamous U.S. Supreme Court cases, such as *Korematsu*, the Japanese-American WWII internment case. Meyerson's close reading helps expose the false (or at least unsupported) premise of the majority's opinion in *Korematsu*. But logic is not exactly a stranger to legal reasoning, and a constitutional scholar might ask, where's the mathematics?

The mathematics and Meyerson's book really come into their own in the early chapters, where mathematical reasoning does illuminate. Meyerson is especially good on majority (and super-majority) voting rules. We get Condorcet, Borda and Arrow on cyclicity and the hazards of all schemes that aggregate individual into collective preferences by voting. There is an excellent discussion on conditional probability, applied to the problem of burden of proof: in a criminal case, for example, jurors trade off the risk of convicting not-guilty defendants (Type I errors) against the risk of acquitting guilty defendants (Type II errors).

Meyerson also discusses *Bush v. Gore*, and makes the unpopular case for the stabilizing virtues of the Electoral College. A fine short chapter takes up apportionment, the business of determining the right number of congressional seats per state. These compact discussions, with well-chosen numerical illustrations, make fine set pieces for law students or for undergraduates studying social choice or political economy. But they also want for greater elaboration. How might we, for example, use conditional probability to analyze the burgeoning practice of forensic DNA evidence, for example?

In the chapters on voting and apportionment especially, the mathematics illuminate deeply – that is, simple mathematical reasoning provides insight otherwise unobtainable (at reasonable cost, anyway). We can understand the difference between meta-constitutional determinations – who decides a law's constitutionality – and constitutional determinations – whether a law is constitutional – without Kurt Gödel's famous incompleteness theorem. But mathematical reasoning is crucial to a decent understanding of voting mechanisms; here the potential cost of ignorance among rule makers is made most evident.

It is nearly always unfair to criticize an author for not writing the book the reviewer would have had him write. *Political Numeracy* was not written, after all, for sophisticates trolling for applications in Con Law. It was written for students of Con Law and educated lay readers curious about how mathematics, of all things, might illuminate the law. But my quarrel is not with Meyerson's decidedly well-motivated project, which deserves to

succeed in persuading a skeptical audience (assumed to be innumerate) that greater understanding of law can be had by reaching across the two-cultures divide. I quarrel more with Meyerson's rhetorical strategy, which makes the case for numeracy on grounds of breadth rather than depth.

It is not that breadth is immaterial. Some light is better than none, and I will not hesitate to borrow from the wealth of examples, such as making *Marbury v. Madison* a two-person, one-shot game of constitutional chicken. Meyerson's many analogies accomplish the goal of creating "pictures that permit more creative views of constitutional jurisprudence" (p. 15). But I wanted more of Meyerson where his thesis is strongest, that is, where math illuminates law most deeply. The value of math does not come from its limited ability to illuminate every corner of law, but, rather, from its ability to illuminate those corners of law that would otherwise would remain dark to the innumerate. Breadth tells, but depth shows.

Then again, persuasion of the lawyers side of the two-culture's divide, however it is accomplished, may not be sufficient. Meyerson's able case for mathematics may induce legal scholars to ignore rather than study the places where math illuminates most deeply, leaving the field to economists and their ilk. But who will write the laws?

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