Lottery Voting: A Thought Experiment

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When we select representatives to a legislature, what voting rule will best reflect our deepest constitutional ideals? Obviously, we want a voting rule that respects the norm of political equality, so that no person's vote counts any more than any other person's. But there are many ways of counting votes equally, and many different visions of voting equality. Which shall we choose?

Too few of us—citizens and lawyers—recognize that a choice exists. This is largely a failure of education, especially in law schools where professors train students much better in the arts of textual and doctrinal analysis, and now even in certain law and economics and statistical techniques, than in the basic rudiments of social choice theory. Plain meaning, *expressio unius*, judicial review, the Coase theorem, regression analysis, and T tests—these are all part of law school vocabulary. But the Condorcet Paradox, agenda manipulation, May's Theorem, single peakedness, Downsian equilibrium, Black's Theorem and the like, are not—not yet, at least.

We're making progress slowly. Many lawyers are now dimly aware that at least two basic alternative voting schemes exist for choosing a legislature. The first, of course, is the current dominant scheme of single-member districts. Divide a state into, say, one hundred equally populous districts, and have the voters of each district elect a single representative for their district by majority or plurality rule. Within each district each person gets one equal vote and all districts are in some sense equal—in population—at least in theory. The major alternative is to use multimember districts. We could, for example, divide our state into twenty districts of equal population and elect five representatives from each district. Within each district each person gets one equal vote (or five equal votes with the ability to "bullet" or

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"plump" them for a single candidate), and the top five vote-getters are elected. This is, in effect, cumulative voting. Here too, all districts are equal in population, and within each equal district, all votes are equal.

But these two equal schemes, the dominant single-member district model and the cumulative-voting model, generate very different legislatures. Imagine, say, that a geographically dispersed 20 percent minority party exists in our state. Under the first scheme the party could lose in every district and be frozen out of the legislature; under the second it might win one out of the five seats in each district across the twenty districts, accounting for 20 percent—its proportionate share—of the overall legislative assembly. Though less well known than the dominant model, this cumulative system has been used to select legislatures in democracies around the world,[1] and here in America too.[2] Cumulative voting has also been used by American courts as a remedial device to combat illegal vote dilution,[3] and has received well-deserved attention of late thanks in part to people like Lani Gunier, Rick Pildes, Dan Ortiz, and Pam Karlan, who are all here today.[4]

But there is yet another equal voting system that we should think about—think about if only as a thought experiment to help us choose between our first two more familiar and time-tested models, although I'll also suggest some other reasons for thinking about this model. This third model, which I sketched out in a

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[1] See, generally, Arend Lijphart and Bernard Grofman, *Choosing an Electoral System*, in Arend Lijphart and Bernard Grofman, eds, *Choosing an Electoral System: Issues and Alternatives* 3-11 (Praeger Publishers, 1984).

[2] In Illinois, for instance, the lower house of the state legislature was elected by cumulative voting in three-member districts until 1980. See Ill Const of 1970, Art IV, § 2(b) (superseded 1980).

[3] See *Cane v Worcester County*, 847 F Supp 369 (D Md 1994), aff'd in part, rev'd in part, 35 F3d 921, 927-29 (4th Cir 1994), on remand, 874 F Supp 687 (D Md 1995), modification denied, 874 F Supp 695 (1995), cert denied, 115 S Ct 1097 (1995), in which the district court, to remedy a Section 2 violation of the Voting Rights Act, initially ordered that the county commissioners be elected through cumulative voting. The Fourth Circuit reversed, holding that the district court had not properly considered the county's preference for geographic diversity on the commission. On remand, the court ordered that primary elections be conducted in single-seat districts (ensuring geographically diverse candidates) but that the general election be conducted using cumulative voting.

[4] See, for example, Lani Guinier, *The Tyranny Of The Majority: Fundamental Fairness in Representative Democracy* (The Free Press, 1994); Richard H. Pildes, *Gimme Five*, New Republic 16 (Mar 1, 1993); Pamela S. Karlan, *Maps and Misreadings: The Role of Geographic Compactness in Racial Vote Dilution Litigation*, 24 Harv CR-CL L Rev 173 (1989); Note, *Alternative Voting Systems as Remedies for Unlawful At-Large Systems*, 92 Yale L J 144 (1982).

perhaps too exuberant student note in the *Yale Law Journal* a decade ago,[5] is called lottery voting. Here's how it works:

Divide the state into one hundred equally populous single-member districts, as under the current system. Give each person one ballot and one vote, but within each district, after the votes are cast, don't just add up the votes and in effect waste or ignore the votes of those of the minority party or parties—the "losers." Instead, treat all voters, all ballots, equally, but in a different way. Suppose we put all of the ballots from a given district in a twirling drum, pull one ballot out in a lottery, and declare the candidate listed on that ballot the winner from that district. *Ex ante*, each ballot has an equal chance of casting the winning vote. If you get 20 percent of the vote in a district, you have a 20 percent chance of winning the election even if someone else got more votes. Like the current system, lottery voting uses small single-member districts, but because of the law of averages, lottery voting generates an overall legislature that looks much more like the one generated by cumulative voting. A geographically dispersed 20 percent minority party will win around twenty of the one hundred seats. Each party will get its fair share—its proportionate share—of legislative representation, tracking pretty closely the overall percentage of the vote it received statewide.

Now I am sure that some people will think that this lottery voting system is at first blush preposterous, absurd, weird, Yale-ish or whatever; but hear me out. Perhaps this initial reaction is itself a reflection of how little most people understand social choice theory (and sometimes simple math). What else generates the initial reaction of resistance? Let me talk about some of the possibilities, and in the course of doing so I'll lay out some of the things that I think we can learn by taking lottery voting seriously—at least as a thought experiment.

I. DISTRICT OR STATE?

Within a given district, lottery voting at first seems silly: someone who loses the election quite badly—say, 80 percent to 20 percent in a given district—can still get lucky and win, if chosen in the lottery, as will happen 20 percent of the time in that hypothetical. But lottery voting insists that we look beyond the individual district to the overall legislature—and here the results will be anything but random or arbitrary. Because of the mathe-

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[5] See Note, *Choosing Representatives by Lottery Voting*, 93 Yale L J 1283 (1984).

matical law of averages, our overall legislature will rather closely mirror our overall statewide vote. And this leads to a key insight. We should focus on the overall legislature, not on individual districts. The overall legislature, not a single district representative, deliberates. The overall legislature formulates policy. What might look weird in an individual district must be understood as part of an overall state plan. In *Shaw v Reno*,[6] the Supreme Court missed this big idea, I think. The Court looked at a single district and thought it looked funny, but failed to see how the overall congressional delegation from that state in fact fairly reflected the overall distribution of state-wide votes. Or put a different way, as Pam Karlan argued this morning,[7] and as I wrote a decade ago,[8] we need to think more about integrating the legislature itself—the overall assembly. The lottery voting thought experiment nicely helps crystallize this point in our minds because what seems so weird at the district level helps achieve a very sensible overall scheme.

II. GERRYMANDERS

From one perspective, the current single-member plurality vote or majority vote system gets it backwards on this point. It results in a system that looks rational within each equal district, but degenerates into an irrational overall legislative scheme. Rights of minority parties are not protected—a 20 percent minority party can, as we've seen, be completely frozen out of the legislature—but majority rule can also be sacrificed by the current scheme. It's easy enough to show that a minority party with only, say, 40 percent of the vote, could, by cleverly drawing district lines, control over 60 percent of the legislative assembly.[9] What

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[6]   113 S Ct 2816 (1993)(holding that the North Carolina redistricting plan resulted in districts so irregular that it could rationally be seen as an effort to segregate the races, in possible violation of the Equal Protection Clause).

[7]   See Pamela S. Karlan, *Our Separatism? Voting Rights as an American Nationalities Policy*, 1995 U Chi Legal F 83.

[8]   Note, *Choosing Representatives by Lottery Voting*, 93 Yale L J 1283, 1304 (1984)(cited in note 5).

[9]   Consider, for example, the fourteen contested congressional elections in Texas in 1990. Out of the more than two million votes cast in those races, the Democratic candidates received a combined three thousand votes more than the Republican candidates—but won ten of the fourteen seats. Douglas J. Amy, *Real Choices/New Voices: The Case for Proportional Representation Elections in the United States* 44 (Columbia University Press, 1993). See, generally, id at 26-30 (discussing consistent Republican underrepresentation in the United States House of Representatives from 1972-1988). See also *Davis v Bandemer*, 478 US 109, 113-15 (1986)(plurality opinion of White)(noting that

the clever party does is draw clever district lines (a process now facilitated by the use of computers), hiding behind the requirement that states be redistricted every ten years and that each district be equal in population. In our hypothetical state with its one-hundred-member legislature, for instance, the clever party might try to draw district lines so that its members constitute a close but comfortable majority (and there's tension there) in sixty of one hundred districts and a very small—almost negligible—minority in the remaining districts where the other party's members are packed together. A clever party, in other words, can gerrymander so that very few of its party's votes are wasted. Its supporters' votes almost all go to support winning candidates, without overloading that candidate with more votes than are necessary to win, whereas the votes of supporters of the other party are wasted by going to losers, or by providing hugely unnecessary margins of victory for that party's disproportionately few winners.

Stop gerrymanders, you say. This is easier said than done. Within a state all district lines are inherently arbitrary unless one goes all the way back to the kind of a corporate model that Richard Briffault was talking about this morning.[10] There is no neutral district map. I think that's what Sam Issacharoff meant when he said all districting is gerrymandering,[11] and I think you heard Bruce Cain proudly admit that too.[12] Even an odd-shaped district might reveal a political community of interests along a river or railroad line or even I-85 for that matter. And here's the real problem: If we draw the lines one way, Party A will predictably win x seats in the computer model, and if we draw the lines another way, also satisfying the equal-population mandate, that same party will win more seats, x plus y. That's the rub. You draw the lines different ways and you get different outcomes. Cumulative voting creates fewer districts but it still poses the problem, whether you have twenty districts electing five members each or five districts electing twenty members each.

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after a Republican-controlled redistricting in Indiana in 1981, Democrats in the 1982 election received almost 52 percent of the overall statewide vote for the State House, but won only 43 percent of the House seats).

[10] See Richard Briffault, *Race and Representation After* Miller v Johnson, 1995 U Chi Legal F 23.

[11] See Samuel Issacharoff, *Supreme Court Destabilization of Single-Member Districts*, 1995 U Chi Legal F 205, 227, quoting Robert G. Dixon, Jr., *Democratic Representation: Reapportionment in Law and Politics* 462 (Oxford University Press, 1968).

[12] See Bruce E. Cain, *Moralism and Realism in Campaign Finance Reform*, 1995 U Chi Legal F 111.

You still have district lines and you can still draw them in different places to generate different outcomes, unless you treat the entire state as a single multimember district and use cumulative voting or some other proportional representation system—such as single-transferable voting, the Hare system, or what have you.[13]

Lottery voting eliminates the gerrymandering problem. No matter how you draw the district lines, so long as the districts must be equally populous, you can't change the number of seats a party is expected to win. If Party C gets 5 percent of the overall statewide vote, it can expect to win five seats no matter how the district lines are drawn. Whether legislators pack all 5 percent into five districts or scatter them so that Party C members constitute 5 percent of each of the one hundred districts, the expected yield for Party C in that election is going to be five seats.[14] The legislature cannot know behind this kind of Rawlsian veil of ignorance[15] which vote will be the winner in any given district. You don't have winners and losers and fillers and packers and stackers and all that kind of stuff. You treat the voters in each district equally in that sense and thus eliminate gerrymandering, a practice that creates some real justiciability concerns for the courts. That's really what Pam Karlan was talking about this morning,[16] and what Rick Pildes has written about in trying to analyze what makes for an "ugly" district as opposed to an attractive one.[17] How can courts craft principled rules about district lines and shapes? Lottery voting eliminates that problem by changing the rules by which each district is operating.

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[13] For a discussion of single-transferable voting and the Hare system, see Rein Taagepera and Matthew Soberg Shugart, *Seats and Votes: The Effects and Determinants of Electoral Systems* 26-27 (Yale University Press, 1989); Amy, *Real Choices/New Voices* at 18-20 (cited in note 9).

[14] The "variance"—the "plus or minus" spread around the five seats—*will* be affected by the district map. If Party C members are packed into five districts, they will always win five seats—no more, no less. If, instead, Party C members are scattered across 100 districts, in some years they may win eight seats; in other years, two seats.

[15] A veil of ignorance denies individuals access to morally arbitrary and irrelevant information. John Rawls, *A Theory of Justice* § 24 at 136-42 (Harvard University Press, 1971).

[16] See Pamela S. Karlan, *Our Separatism? Voting Rights as an American Nationalities Policy*, 1995 U Chi Legal F 83 (cited in note 7).

[17] Richard H. Pildes and Richard G. Niemi, *Expressive Harms, "Bizarre Districts," and Voting Rights: Evaluating Election District Appearances After Shaw v. Reno*, 92 Mich L Rev 483, 536-59 (1993).

III. LOCAL REPRESENTATION VERSUS PROPORTIONATE REPRESENTATION

And that leads to some points about geography. The current system focuses on local representation through single-member districts. Cumulative voting instead achieves a kind of proportionately representative scheme. The one system vindicates local or geographic representation at a small level; the other system, overall proportional representation. Lottery voting in a way preserves both: it has single-member districts at the local level and yet achieves an overall scheme that's proportionately representative. Under the current system, either very odd district lines must be drawn or minorities must geographically segregate themselves if they wish to guarantee themselves a fair share of representation. That's a real irony under the current system: either you string geographically dispersed minority communities together—Pam Karlan's string of pearls[18]—or racial minorities must constitute a big urban block. They only get their fair share of the overall legislature when they are geographically segregated, which is an odd idea if you think about the spirit underlying *Brown v Board of Education*.[19]

IV. STRATEGIC VOTING

Gerrymandering is about the strategy of drawing districts. By contrast, lottery voting is strategy-proof in one sense: you cannot change the number of districts you expect to win. There are also other senses of strategy. What about voters voting strategically? Today, voters often have to vote strategically because if you vote for your first-choice candidate (call him Marshall Coleman) you may increase the likelihood that your least-favorite candidate (call him Oliver North) will win in a three-way race. So under the current system you may often vote in insincere ways, not for your first-choice candidate. That's a problem under cumulative voting too. By contrast, this kind of strategic voting does not occur under a lottery voting scheme: a voter will always vote for her true first-choice candidate because her vote always increases the chances that this candidate will win, and never increases the chances that any other candidate will win.[20] Alan

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[18] Pamela S. Karlan, *Our Separatism? Voting Rights as an American Nationalities Policy*, 1995 U Chi Legal F 83, 89 (cited in note 7).

[19] 347 US 483 (1954).

[20] This may not be true if minimum vote thresholds are used to weed out some candi-

Gibbard, the social choice theorist, has shown that strategic voting is a problem for any voting system that doesn't incorporate some element of chance or randomness.[21] Interestingly, some versions of the Hare system of single-transferable voting and proportional representation (which Rick Pildes was talking about)[22] use a lottery to reallocate "surplus" votes.[23]

V. BARRIERS TO VOTING AND RUNNING

Right now lots of people might not vote because the predicted outcome of the election is clear. The current system does not count the marginal vote, whereas lottery voting does: it makes a big difference *ex ante* whether you've got 20 percent of the district or 25 percent or 30 percent. This is connected to the strategic voting point—under lottery voting, in contrast to other systems, people don't have to look around to see how other people in their district are voting to decide how they should vote or whether they should vote.

Now let's talk about barriers to running for office. Right now the current system creates obvious barriers to running. One barrier is a big one—money—and it's a big one because, given that only one party can win in a single-member district, in long-term equilibrium the current system will generate only two parties.[24] Given this winner-takes-all system of counting votes, severe electoral economies of scale arise for political parties. Smaller parties are much less likely to get money, media attention, and all the rest. If, by contrast, there's a lower threshold a party

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dates, however. But among the remaining bona fide candidates, lottery voting encourages each voter to vote for her first choice.

[21] See Allan Gibbard, *Manipulation of Voting Schemes: A General Result*, 41 Econometrica 587 (1973); Allan Gibbard, *Manipulation of Schemes that Mix Voting with Chance*, 45 Econometrica 665 (1977).

[22] See, generally, Richard H. Pildes and Kristen A. Donoghue, *Cumulative Voting in the United States*, 1995 U Chi Legal F 241, 251-57.

[23] See, for example, *Moore v Election Comm'rs*, 309 Mass 303, 35 NE2d 222 (1941)(upholding the use of a version of the Hare system that included a lottery to determine which surplus votes would be allocated to the voter's second-choice candidates in Cambridge, Massachusetts); *Campbell v Board of Educ.*, 310 F Supp 94 (E D NY 1970)(upholding a similar method used to elect representatives to New York City's school board); Ruth C. Silva, *Relation of Representation and the Party System to the Number of Seats Apportioned to a Legislative District*, 17 W Pol Q 742, 758 (1964)(discussing methods of election in: Kalamazoo, Michigan; Ashtabula, Ohio; Cleveland, Ohio; and Sacramento, California).

[24] See Anthony Downs, *An Economic Theory of Democracy* 122-24 (Harper & Row, 1957); Maurice Duverger, *Political Parties: Their Organization and Activity in the Modern State* 217 (John Wiley & Sons, Inc., 2d ed 1961).

needs to clear in order to prevail—if it needs only, say, 5 percent of the state-wide vote to get its candidates into the lottery and have a chance of winning—then candidates from smaller, less wealthy parties may have a better chance to enter the market and to be elected. This is true of cumulative voting too; cumulative voting achieves a multiparty system, or at least opens up that possibility—and that's why it will probably not be adopted, because politicians elected under the current two-party system don't want to create that wedge for would-be competitors. But even under cumulative voting, there is a money problem if you have to campaign in a large multimember district, whereas lottery voting creates a much smaller district in which you can run.

VI. LOTTERIES?

But *lotteries*, you say. How can lotteries be anything but an abdication to irrationality and arbitrariness? Well, let's think about a place where we do use lotteries to vindicate ideas of political equality and democratic deliberation: the jury. Here, we might put all the voters in a drum and pick twelve people out and they are your jury. This would be a different way of picking jurors than our current system, but the Supreme Court is, I hope, moving in that direction. It has focused much more in the last decade on the right of jurors to be represented and to participate rather than on the right of defendants to decide who will be on their jury.[25] So the Court has been restricting peremptory challenges and other exclusionary measures. The Justices are moving towards an earlier vision that saw some interesting connections between the people's representation in the lower house of the judicial branch through the jury and the people's representation in the legislature itself.[26]

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[25] See, for example, *Batson v Kentucky*, 476 US 79, 87 (1986)(holding that the state's use of its peremptory challenges to remove black potential jurors solely on account of their race violated the jurors' rights under the Equal Protection Clause); *Powers v Ohio*, 499 US 400, 407 (1991)(holding that *Batson* applies even when the state sought to remove black jurors in a case with a white, rather than a black, defendant); *Edmonson v Leesville Concrete Co.*, 500 US 614, 618 (1991)(holding that *Batson* applies in civil trials); *Georgia v McCollum*, 505 US 42, 59 (1992)(holding that *Batson* applies to criminal cases where the accused, rather than the state, seeks to exercise peremptory challenges in a discriminatory manner); *J.E.B. v Alabama ex rel T.B.*, 505 US 42 (1994)(holding that the state cannot use peremptory challenges to strike men from a jury solely because of their gender).

[26] For more elaboration of that vision, and legislature/jury analogies, see Akhil Reed Amar, *The Bill of Rights as a Constitution*, 100 Yale L J 1131, 1182-99 (1991); Akhil Reed Amar, *Reinventing Juries: Ten Suggested Reforms*, 28 U Cal Davis L Rev 1169; Vikram D. Amar, *Jury Service as Political Participation Akin to Voting*, 80 Cornell L Rev 203 (1995).

Here's another thing that the jury issue exemplifies. The voting system used to select representatives need not be the system that those representatives in turn use to make decisions. Jurors can be selected by lottery, and yet we can have a very different rule in the jury room for deciding guilt or innocence—unanimous rule, or ten to two, or whatever. This insight supports cumulative voting. Cumulative voting doesn't work when it comes to deciding specific issues in the legislature, whereas majority rule does. But the fact that cumulative voting doesn't work on *issues* is not, I think, a good reason in the end for not taking cumulative voting seriously as a method for choosing the *representatives themselves*. Again, I think this is an insight that the lottery voting thought experiment helps to sharpen in our minds: lottery voting can't work for deciding issues, but it can work for selecting representatives.

VII. ROTATION AND TERM LIMITS

Lottery voting achieves a rotation of officeholding *within* the district: even if you've got a very high approval rating in your district, you're not going to win every election despite getting a majority every election year. You're going to be out of office for a while; you're going to take turns with other people. So there's a kind of term limits idea built into lottery voting.[27] It's a more antifederalist notion of rotating, temporary legislators—a vision of rotation built into many early state constitutions.[28] And here again we see why folks at the founding thought that juries and legislatures were more similar than they appear to be now.[29]

This leads to the idea that the candidate of a minority party in a district might sometimes be the representative of that district. And so blacks can sometimes represent whites in a predominantly white district and vice-versa. That's a good thing for people to get used to—thinking that sometimes you should have a system of turn taking, with "losers" taking their turn at the

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[27] A variant of lottery voting, enabling citizens to vote directly for parties rather than candidates, would significantly blunt lottery voting's term limits, and would in fact bring lottery voting even closer in result to cumulative voting. See Note, *Choosing Representatives by Lottery Voting*, 93 Yale L J 1283, 1302 n 103 (1984)(cited in note 5).

[28] Gordon S. Wood, *The Creation of the American Republic, 1776-1787* 87, 140-41, 521-22 (University of North Carolina Press, 1969).

[29] Akhil Reed Amar, *The Bill of Rights as a Constitution*, 100 Yale L J 1131, 1188-89 (1991)(cited in note 26).

helm, too. All this helps to illuminate some of the things that Lani Guinier is trying to put on the agenda—turn-taking and the like[30]—although I'm not sure she has yet connected her musings to the also-hot topic of term limits.

VIII. PROPORTIONAL REPRESENTATION AND MINORITY RIGHTS

"Proportional representation" and "minority rights" are phrases that you hear an awful lot these days. And I think Lani Guinier got skewered (and skewed) in the press in part because both of these phrases are double entendres. "Proportional representation" could mean that the legislature has to be descriptively representative—50 percent women, 17.2 percent minority, 12 percent left-handed, or what have you. Or it could simply mean the mathematical idea that the percentage of seats that a party has in the legislature should roughly track the percentage of votes that it got in the overall state-wide election. "Minority rights" could be a race-specific thing—give vetoes to blacks as blacks—or it could be a color-blind idea of supermajority rules and similar devices that in the end give minorities of every stripe the ability to slow things down or hold things up. Lottery voting focuses on this ambiguity. The pure *lottery* is demographically cross-sectional, as with our idealized jury, but *voting* introduces a big difference. Blacks don't have to vote for blacks and whites don't have to vote for whites. You decide in effect what your identity is through the act of casting a vote. You might cast a vote for someone who looks like you in some ways or you might not. You're never going to be able to cast a vote for someone who looks like you along every dimension—if you are, say, a conservative black Catholic woman, you might have to decide which of those attributes is the most essential part of your *political* identity. And this idea of a self-defining constituency, a kind of self-districting, is a feature of lottery voting, and of all the systems other than the single-member districting that assigns you to a district. It's all perfectly race neutral. People can decide for themselves how they want to vote.

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[30] See Lani Guinier, *More Democracy*, 1995 U Chi Legal F 1.

IX. DEMOCRATIC VISION AND VISIBILITY

And here's the final point. My constitutional ideal of a legislature is similar to my ideal of a jury.[31] Both should·be cross sections of the community, but deliberative. Initiatives and referenda and the like are cross-sectional but they're not deliberative, and minorities can really get squeezed out in the process. Our current legislatures are deliberative, but not often cross-sectional. We need bodies that are both cross-sectional and deliberative. This resembles our jury model, but unlike the jury, we want leaders in the legislature rather than ordinary citizens, so that's why we have *voting* and maybe even thresholds of exclusion—a requirement that a candidate get, say, 5 percent of the vote to be eligible for the lottery. We don't want just everyone voting for themselves, and so if you can't get more than a certain number of votes, maybe you should be excluded from the twirling drum. Now where we draw that line of course is contestable, but let's make that actually visible. Let's try to decide openly, visibly, whether we want to allow lots of parties to exist or just a few.

So just to summarize in a sentence: lottery voting summons up a visible vision of equality. All districts are equal, and within each district, all voters are truly equal in the effectiveness of their vote. We should not have within districts a sense of winners and losers, majority and minority, packers, stackers, crackers, and fillers—that's not the image. The image is equality within districts and equality across districts. And as a thought experiment, lottery voting helps to illustrate that vision.

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[31] This legislative/jury analogy was central to my note, Note, *Choosing Representatives by Lottery Voting*, 93 Yale L J 1283, 1287-89 (1984)(cited in note 5), and has subsequently been elaborated in later work. See note 26.