NINE

Instant Runoff

Among the many statues and fountains in Boston's Public Garden is a bit of eccentrica worthy of Edward Gorey. The Ether Monument is a forty-foot gothic tower topped with a sculptural group commemorating the first use of anesthetic. The stone figures at the top, by John Quincy Adams Ward, represent the Good Samaritan. To conservative Boston tastes, this was a suitable substitute for the bloody actuality being commemorated, the removal of a tumor from a man's neck by Boston dentist Thomas Morton in 1846. The monument was the peculiar design of architect William Robert Ware (1832-1915). Ware had another idea that is important to our story: an electoral system that is now called instant-runoff voting.

Ware was (like Charles Dodgson) a lifelong bachelor interested in preaching, architecture, and voting. The son of a Unitarian minister, Ware filled journals with critiques of sermons. After graduating from Harvard, he did a grand tour of Europe, followed by a stint in the atelier of Richard M. Hunt, the great architect of Gilded Age New York.

Ware set up an architectural practice in Boston, where his firm designed a number of churches (notably Brookline's High Street Church and the Back Bay's First Church), Harvard's Memorial Hall and Episcopal Divinity School, and a train station for Worcester, Massachusetts. Ware decided his true gift was for teaching. In 1865, at age thirty-three, he accepted the challenge of starting a new architecture school at MIT, where he remained until 1881. He left in a pique over an unpaid bilL (He claimed he had been asked to make drawings for an unrealized MIT building in Copley Square and that the institute had stiffed him.) At MIT and later at Columbia, Ware became known as the father of architectural education in America. In 1902 he had a nervous breakdown, followed by retirement as professor emeritus. He spent the remainder of his days living with his sister, Harriet, in Milton, Massachusetts.

Around 1870, Ware became interested in voting, following news of electoral controversies from across the Atlantic. Britain had begun extending the vote to the working (that is to say, non-landowning) class. This swelled the ranks of the Liberal Party. The Conservatives rapidly lost seats in Parliament. The losses were greater than might be expected. Victorian Britain was a relatively homogeneous nation. It was possible to imagine that the Liberals might win 51 percent of the vote in every district and thereby win every single seat in Parliament. The Conservatives could be shut out entirely, even though they still had 49 percent of the vote.

"Predominant power," warned philosopher John Stuart Mill, "should not be turned over to persons in the mental and moral condition of the working class." *Ouch*. Anyway, there was interest in schemes that would guarantee representation in Parliament in proportion to the parties' overall share of the vote. This went by the name *proporlio1Ul1 representation*. Its battle cry was "tyranny of the majority," a phrase Mill plucked out of context from Alexis de Tocqueville's *Democracy in America*. The point of that charged phrase is that majority rule need not be fair. Only proportional representation could guarantee that minority (Conservative) interests got a fair hearing. The British debate resonated with Ware, whose own politics were conservative.

Finding ways to achieve proportional representation is a challenging mathematical puzzle. It is also a *very different* puzzle from that of finding a fair voting system for a single office. A single-office system is supposed to reconcile the electorate's contradictions and find the most reasonable representative for everyone. Proportional representation strives to reproduce the diversity and contradictions of the electorate on the smaller scale of the legislature. In many ways, the problem of proportional representation is *opposite* to the problem of single-office voting.

The most popular system of proportional representation is now known as the single transferable vote (STV). With minor variations, it dates at least to 1821, when Thomas Wright Hill conceived it. In the 1850s a British barrister, Thomas Hare, and a Dane, Carl George Andrae, independently proposed STV systems.

STV uses a ranked ballot. There might be twenty candidates running for six seats on a school board. Voters would rank all twenty from favorite to least favorite. (Yes, that can be a chore.) The vote tallying is fairly complicated. Unpopular candidates are successively eliminated and their votes transferred to other candidates based on the rankings. The system does a good job of making sure that no one's vote is "wasted."

Now here is the proportional representation part. Suppose that women decide that male legislators are hopeless in representing their interests. Women voters can band together and resolve to consistently rank all the female candidates ahead of all the males. Provided *every* woman does this, it guarantees that about half the legislature will be women. Republicans, Greens, Latinos, evangelicals, college students, Marxists, wealthy white males ... all could, *if they wanted*, achieve a representation proportional to their share of the population. This is not to say that everyone has to playa partisan/identity politics game. STV lets the voters decide what kind of distinctions matter. The best argument for proportional representation is ethical. The laws that legislatures pass are binding on everyone. We can't guarantee that every small faction gets its way, of course. We can guarantee that every substantial group has a voice in the legislative debate. That is what proportional representation offers.

STY is not the only possible proportional representation system. Charles Dodgson devised a clever one of his own, with the novel feature that the "eliminated" candidates themselves decide how to redistribute their supporters' votes. In 1884 Dodgson pitched his voting system to Lord Salisbury, leader of the ConselVative Party and future prime minister. "How I wish the enclosed could have appeared as your scheme!" Dodgson wrote. "Then it would have been attended to." Salisbury politely replied that it was difficult to make a sweeping change in voting procedures "however ConselVative the object."

This brought a quick chiding from Dodgson. "Please don't call my scheme ... a 'Conservative' one! ('Give a dog a bad name, etc.') ... All I aim at is to secure that, whatever be the proportions of opinions among the Electors, the *same* shall exist among the Members. Such a scheme may at one time favor one party, at one time another: just as it happens. But it really has *no* political bias of its own."

Dodgson published another pamphlet, "The Principles of Parliamentary Representation" (1884), and sent copies of it to all the members of Parliament. He joined with Hare and sundry Conservative and Liberal members of Parliament to found the Proportional Representation Society (later the Electoral Reform Society, and still active).

Dodgson was not the only celebrity flogging proportional representation. H. G. Wells was a proponent, and John Stuart Mill said that Hare's system "lifted the cloud which hung over the future of civilization."

Hare's system had scant success in Victorian England. It was adopted (under various names and with slight differences) in many Commonwealth nations, including Scotland, Ireland, Northern Ireland, Malta, Australia, and New Zealand. In America, it underwent a slight change in its DNA.

William Ware knew that the geographic representation of the U.S. Congress was written into the Constitution and would be formidably difficult to change. At that, legislatures play less of a role in American politics than they do in Britain. America gives more power to singleseat offices such as mayor, governor, and president.

Ware realized that it was possible to use the single transferable vote to elect a single candidate. Of course, you can't have proportional representation where there is just one seat to fill. But when used for a single seat, STV has another advantage: it can prevent the spoiler effect.

The single-seat form of STV is now called instant-runoff voting (IRV). As the name promises, IRV is much like an open election followed by one or more runoffs among the most popular candidates. The runoffs, if needed, are immediate.

Imagine counting ballots by hand (**it's** easier to explain that way). Ballots are collected and placed in stacks, one for each candidate. Each stack contains all the ballots where a given candidate is ranked number one. Should one candidate get a clear majority of first-place votes, that candidate wins immediately.

Otherwise, you pick up the shortest stack. This represents the candidate with the fewest number of first-place votes. That candidate is eliminated. You sift through the eliminated stack and use the secondplace choices to redistribute the ballots to the remaining stacks. Again you check to see whether any candidate now has a majority of votes. If so, that candidate wins. Otherwise, you continue eliminating candidates and redistributing ballots until one candidate achieves a majority.

ThiS solves the spoiler effect. At least, it does when you have two major candidates and a few minor ones. In such an election, the votes for third-party candidates are successively transferred to the majorparty candidates, and one of the latter wins. You could vote for a minor candidate (as your number one choice) and also have your vote count toward the major-party candidate of your choice.

More good news: IRV can avoid the Borda count's sneaky strategizing problem. A Republican has nothing to gain by ranking Democratic candidates last, and vice versa. That's because ballots ranking one of the two front-running candidates first are not going to be redistributed. The lower rankings don't matter unless you've voted for a minor candidate.

Ware did not publish his voting system or embark on a grand campaign to promote it. He seems only to have used his position at MIT to lobby for its adoption there. MIT began using the system for university elections, and still uses it. IRV spread to Harvard and to the city of Cambridge. Ware's system offered one-stop shopping. You could use MV for single offices and the very similar S1V for proportional legislatures. Over the following decades, IRV and/or STV proportional representation became widely adopted in American cities and especially at universities.

"Instant runoff is an improvement over our current plurality vote, no question," UC Irvine voting theorist Donald Saari told me. "It's bad, though. Let me give you an example. I believe it was in 1991 in the state of Louisiana."

David Duke was not a typical spoiler. He was the second most popular candidate. What *would have* happened under **MV** is probably the same as what *did* happen under Louisiana's open primary. Buddy Roemer, being in third place, would have been eliminated and his votes transferred to second-place choices. Edwin Edwards probably would have won under **MY**.

Like the plurality vote, IRV places a lot of emphasis on first-place rankings (since they determine the all-important order of elimination). The usual rationale is that these first-place rankings are important because they measure voter conviction. "IRV elects candidates with both strong core support and also broad appeal," says a pamphlet distributed by the Center for Voting and Democracy, an fRV advocacy group. By "strong core support" they mean candidates who inspire passion, as true leaders need to do,

No one would object to that. The trouble is that ballot rankings are not a foolproof way of measuring this core support. First-place rankings are funny things. You might be impressed if I told you I was number one in my class. You'd be less impressed if I told you I was home-schooled, and I'm an only child. "Number one" is meaningful only in context. It depends on how much competition you've got and what kind of competition.

IRV is subject to something called the "center squeeze." A popular moderate can receive relatively few first-place votes through no fault of her own but because of vote splitting from candidates to the right and left. The moderate will likely be eliminated early on. The center squeeze can lead to unpalatable, Wizard-or-Lizard dilemmas.

When Betty was the only ice-cream vendor on the beach, everyone rated her stand "the best." Then Alan moved in, positioning his stand six feet to the left of Betty's, and taking away nearly half of Betty's business. Then Christine moved in, with a stand six feet to the right of Betty's. Christine got nearly all of Betty's remaining business. Christine's stand is the first-place choice of everyone on the right side of the beach, Alan's stand is the favorite of everyone on the left side, and practically nobody goes to Betty's stand anymore, It's the old "center squeeze." Does this mean that Alan's and Christine's ice cream is superior to Betty's? No, they all get their ice cream from the same whole-saler! Does it mean Betty is in a bad location? No, it *wasn't* a bad location before the competition stole her territory. All it means is that "first-place choices" aren't a good way of judging how people feel about Betty's ice cream.

IRV is excellent for preventing classic spoilers-minor candidates who irrationally tip the election from one major candidate to another. It is not so good when the "spoiler" has a real chance of winning,

A 1971 article carried the pointed title "Single Transferable Vote; An Example of a Perverse Social Choice Function." The authors, Gideon Doron and Richard Kronick, showed that it is possible for a voter to make an IRY candidate lose by ranking him *higher*. Huh?

This is known as the "winner-turns-Ioser paradox." Thirty-four percent of the voters are for Edwards, 32 percent are for Duke, and 27 percent are for Roemer. (For simplicity, l'1l ignore the lesser candidates in the actual 1991 race. The totals, therefore, won't add to 100 percent.) Since Edwards does not have a majority, the lowest-ranking candidate will be eliminated. That's Roemer. Roemer's votes are transferred to the remaining two candidates, giving Edwards an easy victory over Duke (as actually happened in 1991).

Okay. Now say that Edwards decided to court the Duke vote just before the election. He gave speeches or ran ads or spread rumors, with the result that a few Duke voters (6 percent of the total electorate) switched their votes to Edwards. They ranked Edwards first, ahead of Duke.

The resulting numbers are now 40 percent for Edwards, 26 percent for Duke, and 27 percent for Roemer. See what happens? Duke is now in third place. It's Duke who is eliminated. The runoff is between Edwards and Roemer. Most of Duke's archconservatives rank moderate Roemer ahead of liberal Edwards. Therefore, the Duke vote is transferred primarily to Roemer, who beats Edwards by up to 13 points. This outcome is in line with the perception that Roemer would have beaten Edwards in a two-way contest.

For the 6 percent who switched, voting for Edwards instead of Duke caused Edwards to *lose*. This is through-the-Iooking-glass politics. It is even crazier than the spoiler effect.

One feature that IRV shares with Borda and Condorcet voting is the ranked ballot. It can be a hassle to rank a large number of candidates. In the 2003 recall election for California's governor, there were 135 candidates.

GAMING THE VOTE

Inevitably, most voters have never heard of many of the candidates in a highly contested race. How would you rank these candidates?

Charles Jay (Personal Choice) Earl Dodge (Prohibition) Gene Amondson (Concerns of People) Stanford Andress (Independent) Leonard Peltier (Peace and Freedom)

These are not made-up names. All ran for president of the United States in 2004.

There are various ways of dealing with this problem. In Australia, which uses IRY, voting is mandatory. Any citizen who fails to rank the candidates is required to pay a fine. There is, however, an option called "above-the-line" voting. By choosing this option, the voter accepts a party's default choices.

It's rarely necessary to rank all the candidates on an IRV ballot. In San Francisco, which began using IRV in 2004, ballots have three columns for voters' first, second, and third choices. That's easy to live with and works fine as long as a "major" candidate is among your top three choices. (Otherwise, your three picks could all be eliminated, and it would impossible to transfer your vote to anyone still in the race.)

The logistics of tallying IRV ballots are relatively complex. There is no way of knowing how the votes are going to be transferred until you do the tally. That means it may be necessary to transmit every ballot or its data to a central counting place or computer. Just for the record, you don't have to do that with plurality, Borda, Condorcet, or range ballots. Precinct totals, rather than every ballot's complete ranking, are enough.

"In IRV, every time there is a near-tie among two no-hope candidates, we have to wait, and wait, and wait, until we have the *exact* vote totals for the Flat-Earth candidate and for the Alien-Kidnapping candidate ... before we can finally decide which one to eliminate in the first

round," explains mathematician Warren D. Smith. "Only then can we proceed to the second round."

San Francisco's election board was realistic enough to call its system "ranked-choice" voting, They didn't want people expecting an instant result. **In** the city's first IRV election, in November 2004, "**soft**-ware problems" were blamed for delaying results for several days,