

### **Abstract**

This article explores the assemblage of voting: electoral systems, Direct Recording Electronic voting machines (DREs), ballots and ballot booths, and the central role of secrecy. Its aim is to argue that the contemporary political subjectivity of deliberation is intimately tied up with this assemblage. Based on ethnographic research, this article shows how controversies around DREs can reveal the ways in which the very possibility for deliberation is tied to the structure and implementation of these machines. It argues for a new approach to deliberation that includes debate, participation and co-construction of the technical systems whereby we vote, as well as those where we express opinions.

# Towards an Anthropology of Deliberation

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## introduction

A political scientist, a cognitive scientist, and a computer scientist walk into a room. What sounds like the beginning of a bad joke—something about the anxiety of requiring the word “science” in the job title—was actually a class that I participated in, in the Fall of 2006, called “Election Systems, Technologies and Administration” (see Fig 1).

The class combined approaches from cognitive science, political science and computer science—but it wasn’t necessarily an attempt to combine them into a coherent approach. Rather voting and elections were subjected to an array of approaches, as the course description made clear: “how individuals interact with technology,” “how technologies are engineered to be secure and accurate” and “how the social aspects of voting fulfill democratic goals for elections.” These approaches covered human factors engineering, human-computer interaction and cognitive models of information processing, computer security research, election outcomes analysis, voting behavior and so on. Discussions in class most often centered around practical problems in statistical methodology, interface design, the design of elections or instances of failure or fraud. There was little reflection on the conceptual foundations of voting and elections, and no political theory.

I was there as an anthropologist, as a friend of one of the instructors and as a concerned observer of the politics of electronic voting machines. As part of a project that had emerged out of my previous work on Free and Open Source software, I had begun to investigate the spread of electronic



**NEXT TIME MIGHT BE EVEN WORSE.**

**SPECIAL COURSE**

**Election Systems, Technologies, and Administration**

COMP 435 / POLI 420 / PSYC 480(2)

**DESCRIPTION** This multidisciplinary course will consider how elections are conducted to enhance participation, to accurately measure the will of the electorate, and to be sufficiently rigorous to convince all parties that the results are legitimate. This course will consider the design and evaluation of election technologies, ranging from voter registration through the polling booth and vote tabulation. This course will consider three questions: how do individual voters interact with the voting technology, how are voting technologies engineered to be accurate and secure, and how do the social aspects of voting fulfill democratic goals for elections? A central requirement for this course will be group research projects, many operating in our community, built around the November 2006 election.

**Open to all students, no pre-requisites.** We are especially interested in getting students with a wide variety of backgrounds and interests!

**TIME** Class is scheduled to meet MWF 11am-12:30pm, but we expect to actually meet only twice per week.

**LOCATION** Baker Institute, room 114.



For more information, see the course Web site:  
<http://sys.cs.rice.edu/election-systems/>

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**VOTING TECHNOLOGY  
IS A VERY BIG DEAL**

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Figure 1: Posters for Rice University Course "Election Systems, Technologies and Administration"

voting machines.<sup>1</sup> Consistent with an STS or Actor-Network approach, I wanted to understand not the scene of voting or electing itself so much as the scene of the analysis and production of knowledge about of voting and elections.<sup>2</sup> Ultimately, I wanted to understand what kinds of knowledge made a difference to voting and elections, whether that be political theory, popular punditry or the work of these scientists.

What I learned was that despite the immense volume of scholarship on voting behavior, voter preferences, voter demographics, and the emerging literature in cognitive science and computer science on the act of voting (and as this class demonstrated, the use of electronic voting machines)—despite all this, these scientists were not asking how *deliberation* actually works. They were not asking why we have the voting systems we have, or how we came to them, or whether these procedures had ever been the subject of real debate and discussion. They were not asking how *knowing voting* changes voting.

But is it really possible to see voting as an agreed upon and uncontroversial procedure that is necessarily subsequent to political deliberation? Like good scientists, the instructors of this course concerned themselves with the expression of votes, not their content, and for a very good reason: the

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<sup>1</sup>See <http://frazer.rice.edu/epit> for more details on this project. See also [Kelty, 2008]

<sup>2</sup>Science Studies and Actor Network Theory have not produced much work on voting technology, but see the special issue of *Social Studies of Science* Volume 31, No. 3 (covering the 2000 election debacle) and also [Miller, 2004]. There is more work in anthropology, especially on the anthropology of democracy generally, but nothing rivaling the amount of work in political science and psychology. One very important recent work is Kimberly Coles [Coles, 2004] which treats elections themselves as producing knowledge in the manner of STS, and makes a strong case similar to the one here for understanding voting and elections, and democracy generally, as practices and artifacts in order to explore its “contingent nature and its implication in power relations.” (553)

content of voting is, for lack of a better word *political*—it is not subject to scientific analysis. This class made clear that there is an immense literature, and some very sophisticated tools for observing, measuring and in some cases, engineering the objective act of voting—but stops short of allowing that these tools and analyses might themselves be part of what counts as deliberation.

On the one hand, this is putatively because it is political theory which deals with the content of votes—whether Marxist or classical liberal, whether conservative or progressive. And yet, such theory tends to deal only with the rational structure of political argument in an academic sense and not at all with the ways in which people deliberate every day—or more to the point, the ways in which governments, candidates and their consultants study and attempt to manipulate this deliberative activity, or the ways in which technologies—from the secret paper ballot to the electronic touch screen voting machines shape and format elections and deliberation generally.

On the other hand, theories of “deliberative democracy,” which might seem to be the natural theoretical allies in understanding deliberation, are also of little help here, and for the same reason. Theories of deliberative democracy accept that voting is an uncontroversial procedure subsequent to political deliberation. It is possible to deliberate about voting in such theories (and even to vote on voting), but deliberation, in this literature, is everything except voting. Voting, in theories of deliberative democracy, is procedural and technical—and what’s more a procedure that seems to be a mere detail except, for example, when a term like “hanging chad” suddenly

becomes universally recognizable.

But what if voting were actually considered part of deliberation, and not something separate from deliberation and logically subsequent to it? What if voting—the material act of seeing oneself choose, in secret, inside a government-regulated and funded booth, from a pre-printed ballot of candidates—were understood to be part of political deliberation? What if the political subjectivity which allows for the seemingly obvious experience of political argument and discussion to take place were in fact formed through this “assemblage” of ballots, voting machines, electoral systems and procedures? Would it not then make sense to see the “science of voting” as a key moment in the formation of our contemporary deliberative culture?

The goal of this paper, therefore, is to point the way towards historically and theoretically richer characterizations of deliberation and its relationship to technically complex electoral systems and digital technologies; to think voting and deliberation together with technological systems and electoral culture. Voting—the tools, the systems, the meaning and the practice—is itself the subject of intense scrutiny, constant argument, and creative re-configuration by experts and lay-voters alike. The work that goes into making voting appear to be a transparent system of accounting is in fact also part of an ongoing deliberation. The cultural virtues of political participation today include voting and polling in ways that theories of deliberative democracy simply cannot accommodate. It is the argument of this article that by exploring the controversies around electronic voting machines, some of these blockages might be revealed.

This article has four sections. The first section uses the occasion of the

class mentioned at the outset as a way to explore both the science of and the controversies around electoral systems and electronic voting machines in particular. Though it is only one class, it is a window onto a series of issues and sites, including the research projects of the three instructors. This first section describes the controversies and gives a couple of examples of the kinds of situations which they intend to study. The second section reviews the work of Michel Callon and others as it has been applied to the study of markets, “performativity” and “calculative agencies” and asks: what would it look like if we transferred this approach to the domain of politics. The third section attempts to apply Callon’s insights by looking at the “accidental archaeology” of voting machines and what they reveal about the organization of electoral systems. The fourth section explores in more detail one aspect of the “deliberative agency” of the current electoral system: the centrality of the secret ballot and its associated reforms and technologies.

## **The science of the politics of politics**

The motivation for “Election Systems, Technologies and Administration” was twofold. One was the traumatic 2000 election—the first election since 1876 to have an uncertain outcome for a significant period of time, and the first in memory to have focused nationwide attention on the machinery and mechanisms involved in election systems. The Help America Vote Act of 2002 (HAVA) (Public Law 107-252) passed by the 107th U.S. Congress, provided funds for states to replace the last remnants of the last two major

innovations in voting technology, the lever and punch card machine, from the 1890s and 1960s respectively, with brand new electronic touch-screen voting machines made by various manufacturers. HAVA also created an Election Assistance Commission intended to help initiate nationwide reforms into one of the most antiquated, chaotic, corrupt and confusing election systems on the planet.

The second motivation, however, was the upcoming 2006 mid-term election. The class was an opportunity for research as well as teaching, and each of the scientists had ideas about what they could discover in the course of these elections. The first of these projects, proposed by the computer scientist involved engineering an open source, simulated, electronic voting machine called VoteBox and/or reverse engineering of a voting machine (made by Election Systems and Software, ES&S) from data acquired in the course of a court case to which the computer scientist was an expert witness.<sup>3</sup>

The second project was a study of voting in Jefferson county, Texas (primarily the city of Beaumont, east of Houston) where the county election officials had purchased three different kinds of voting machines (made by ES&S, Hart InterCivic and Diebold) and were giving voters at each precinct the choice of either electronic vote or paper ballot. For all three scientists, this provided a kind of natural experiment concerning the effects that technology would have on the outcome. With voters free to choose which machine to use, the cognitive scientist was provided with a self-selected population of subjects to observe. He wanted to know things such as the time it takes to vote, or the number of assists from machine to machine in

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<sup>3</sup>VoteBox is described in [Sandler et al., 2008]/

a “natural setting.” Meanwhile, the political scientist could conduct exit polls to understand whether using one kind of system or another showed up statistically in the results of the polls, or ultimately in the election results.

Engineering this study proved to be a challenge: for one thing, the only legal way to be inside the polling place was to have the poll workers themselves collect data and be paid by the state to do so. So the scientists tried soliciting the help of poll workers, tried to get students assigned to become poll workers at particular locations, and ultimately resorted to surveying voters on the way out.

But it was the third project that was arguably the most illustrative, involving a bizarre state of affairs in the 22nd Congressional district of Texas—former home to Tom DeLay, who had recently resigned in shame and moved to Virginia, after having won the primary in March of 2006.<sup>4</sup> The candidate to succeed DeLay, chosen behind closed doors by Republican party officials, was Shelley Sekula-Gibbs, a dermatologist and Houston city council member.

Shelley was running with a rather severe handicap against Democrat Nick Lampson. First off, she was on the ballot for two different races for the same seat: one, a special election to determine who would serve the remainder of DeLay’s term (Shelley won this election), and the other a general election for the subsequent term, 2006-8 (which she lost to Lampson). Add to this confusion that in the more important election—the one for a full term in the house—she was a *write-in* candidate. And here write-in meant

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<sup>4</sup>DeLay’s demise came after a series of scandals including violating campaign finance laws and his association with Jack Abramoff. His Grand Jury Indictment in 2005 caused the Republican Party to ask him to step down shortly after he had won the primary.

something more like scroll-and-click-in.

Given this, it perhaps not so hard to understand why her campaign strategy was “Vote for Shelley Sekula-Gibbs. Twice!!. Here’s how...” (see Fig 2).

Shelley’s campaign literature explained in excruciating detail not only how and why she was on the ballot twice because of the bizarre political situation, but also extensive instructions on how to “write in” a candidate on the electronic voting machine which required users to select each letter of her name from an alphabet displayed on scree, using an unfamiliar scroll and click interface on the machine.

This was clearly an amazing, if bizarre, turn of events: for the cognitive scientist the sheer impossibility of imagining anyone scrolling and clicking their way through an unfortunately complex name was a human-computer interaction expert’s dream—or nightmare. All of a sudden the colloquially simple act of choosing a candidate and expressing that choice was filled with hurdles. For the political scientist, it was also a legal and practical question of *intention*: will Shelley count, will Gibbs count what about Shel? What about just S? If it is impossible for a voter to express their intent, does that equal disenfranchisement? Meanwhile, the computer scientist simply seemed boggled that the complexity of the external electoral situation was worse than the tangle of code he was used to critiquing on the inside of the machines.

Taken together, these three class projects encapsulate many of the bizarre issues facing the current U.S. electoral system—and many of its analyses by scholars, scientists and experts. These projects and the situations that en-

**ON TUESDAY  
NOVEMBER 7th**

**VOTE FOR  
Shelley Sekula Gibbs  
for U.S. Representative**

**TWICE!!**

**Vote for Shelley Sekula Gibbs TWICE!!**

1. The Republican Candidate for the Special Election.
2. The Write-in Republican for the General Election.



**Attention Straight Ticket Voters:**

Make sure you voted for Shelley Sekula Gibbs TWICE, once for the Special Election and as a WRITE-IN for the General Election. If you cast a Republican "straight ticket ballot" you will not be casting a vote for Shelley Sekula Gibbs. You will still need to cast a write-in vote in the General Election.

go to Step 1

Ballot

**Step 2: Cast your vote for U.S. Representative**

1. To make your choice for U.S. Representatives, highlight the "WRITE-IN" option on the eState voting machine and click enter.
2. To enter a write-in, just turn the wheel to each letter and space needed to spell SHELLEY SEKULA GIBBS, pressing "ENTER" after each letter and space.

next

Ballot



**Step 1: Special Election**

By voting for Shelley Sekula Gibbs in the Special Election, you are selecting her as your representative only for the remainder of 2006.

Following the vote for U.S. Senate, you will have the opportunity to vote for your United States Representative.

**To vote for Shelley Sekula Gibbs for the full term beginning in 2007, you must proceed to Step 2.**

go to Step 2

Ballot

**Step 2: Cast your vote for U.S. Representative**

1. To make your choice for U.S. Representatives, highlight the "WRITE-IN" option on the eState voting machine and click enter.
2. To enter a write-in, just turn the wheel for each letter and space needed to spell SHELLEY SEKULA GIBBS, pressing "ENTER" after each letter and space.
3. Then turn the wheel to highlight "ACCEPT" and press "ENTER" to return to your ballot.

As long as your letters fit, clear, your vote will be counted.

go to Step 3

Ballot



**Step 2: Cast your vote for U.S. Representative**

1. To make your choice for U.S. Representatives, highlight the "WRITE-IN" option on the eState voting machine and click enter.

next

Ballot



**Step 3: Review your ballot completely**

After you have completed your ballot, carefully review your selections.

Make sure you voted for Shelley Sekula Gibbs TWICE, once for the Special Election and as a WRITE-IN for the General Election. If you cast a Republican "straight ticket ballot" you will not be casting a vote for Shelley Sekula Gibbs. You will still need to cast a write-in vote in the General Election.

Remember, you may ask election officials for assistance at any time while voting!

Thank you for your vote!

Figure 2: Shelly Sekula-Gibbs Campaign Website (Screenshots read left to right)

gendered them also reveal just how difficult it is to make voting work (as much in the US as elsewhere) and more importantly, how voting can be understood as a cultural form.

From the perspective of anthropology or history, the exploration of electoral systems and new electronic voting machines was more like a unearthing of electoral culture and its rules, rituals and technologies, than it was a scientific approach to understanding human behavior. In particular, this approach revealed assumptions about voting, electoral systems, and the “machinery of democracy”—especially concerning the central role of secrecy and anonymity (which I return to in sections three and four). Fraud, intention, security and freedom from coercion all seemed wrapped up inside an electoral culture that held secrecy to be sacred, but couldn’t quite recall why. Something like politics is at stake in working out the proper function of our electoral system—but it feels wrong to suggest this. Voting is itself supposed to be the locus of politics, the locus of, if not deliberation, then at least decision-making; and yet here were a group of scientists vitally and urgently obsessed with the insides and outsides of voting machines and election systems—and not with any issue or candidate per se. It was a course in the politics of politics, without being advertised as such.

## **Restoring the political dimension to politics**

While the class described above provided an excellent introduction to the analysis of voting, and to the bizarre state of affairs today, it was also an introduction to what was lacking in our understanding of that scene. At the

very least, none of these scientists were asking particularly deep questions about what voting and elections are for, or whether they are necessarily connected to the goals of furthering a (more) democratic public. Implicit in their work was the familiar equation  $\text{Voting} = \text{Democracy}$ . Even if these scientists might agree that the meaning of “democracy” is much broader and includes many activities other than voting, there is no denying that the enthusiasm with which they approach the scene of the vote is evidence that they consider it to be the most important component of a functioning democracy. The approaches employed therefore, were explicitly and avowedly non-theoretical (in the sense of “not political theory”). The opening joke about needing to have the term “science” in one’s job title holds some truth for these disciplines. Political scientists are happy to let political theory happen, but not willing to accept its conclusions without empirical, or increasingly, experimental verification. Cognitive science, likewise, does not study how desires form (which is perhaps the domain of social psychology, or psychoanalysis) but only with how or whether the desire possessed by an individual is processed and expressed. Computer science, likewise, has no mainstream tradition of incorporating political or social theory into its work.<sup>5</sup>

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<sup>5</sup>Though of course, there are many non-mainstream approaches that would be entirely appropriate here: social informatics, participatory design, library and information studies, or the one represented here: science and technology studies. The fact that this division of labor has emerged is not at all the fault of the scientists and engineers involved; it is nonetheless something that demands explanation. Very few political scientists have taken the introduction of electronic voting machines seriously, and no one from the “critical” traditions listed above. Indeed, the de facto definition of the problem is being provided by Dan Wallach and Michael Byrne, the computer scientist and the cognitive scientists in this story. Together they run ACCURATE— A Center for Correct, Usable, Reliable, Auditable, and Transparent Elections <http://accurate-voting.org/> . There are only a couple of other groups devoted to this kind of research, such as The Center for Infor-

On the flip side, debates in political theory about democracy and voting couldn't be more stale. Despite the fact that the major political theory debate of the last 15 years is arguably that of "deliberative democracy," it played no role at all in the class I observed. Deliberation in these theories is generally opposed to voting; the theories argue instead that we need more talk, more argument, more understanding, and less mechanical decision-making. It is, to a large extent, in sympathy with the critique that animates this paper—that individuals do not form interests or desires in a vacuum, but do so through interaction. Deliberative democracy, however, is not about how voting is itself *part of the deliberative process*, and practically speaking, is the part that matters. Rather, deliberative democracy theorists are arguing that we should change the *system* to be more humane, to require more deliberation or to make deliberation more common prior to voting, in order to make people vote better.<sup>6</sup> Political scientists (and now cognitive scientists and computer scientists) by contrast are not interested in deliberation prior to the act of voting—these scientists take a more agnostic view of that process and have concerned themselves only with the issue of whether or not, once an individual has made a choice, they can successfully express it, know that it is recorded, and trust that it is counted.

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mation Technology Policy <http://itpolicy.princeton.edu/voting/> at Princeton (run by Ed Felton, one of Dan Wallach's mentors and the Caltech/MIT Voting Technology Project <http://www.votingtechnologyproject.org/home.htm> which appears to be dormant as of 2006.

<sup>6</sup>For Example, Ackerman [Ackerman and Fishkin, 2002] famously called for the creation of a "deliberation day" to mirror voting day, in which people could come together and discuss politics prior to making a choice. Such a proposal seems as far from reality as one could get, and yet mirrors some aspects of an older electoral culture in which voting was a long-term, ritualistic, public process (see section four, below). See also [Mutz, 2008] and [Thompson, 2008] for debates about the status of empirical research on deliberative democracy.

Surely, however, there is a way to understand “deliberation” which charts a course that includes both of these divorced and non-communicating camps. The methodological approaches of actor-network theory, and of fieldwork in anthropology provide one possible alternative. Rather than an empiricism of measurement, fieldwork is an empiricism of characterization. By engaging directly in the ongoing scientific and technical work of making deliberation possible, practically and technically, fieldwork seeks to characterize why certain modes of deliberation make sense—both to voters and those who study them. Such an approach would include not only the science of voting as practiced by academic political scientists, but also the scientific and technical innovation and transformation of voting practices generally. Though not directly addressed in this article, this approach broadens the purview to include things like the technical aspects of campaign management; the information ecology of voter rolls, databases of voting behavior, registration and other demographic data; the explosion of polls and meta-polls that “visualize” voting data for a public eager to consume it, and so on. At the limit, it also includes the empirical work of political, cognitive and computer scientists whose work can itself occasionally change the game for politicians (it is a little remarked upon fact that a large number of political scientists who study voting are also routinely employed by campaigns, both to help candidates win, but also for their own purposes, to gain access to empirical data and experimental conditions that only exist in real elections).<sup>7</sup>

A starting point for this approach is found in the work of Michel Callon

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<sup>7</sup>Many examples of this kind of crossover research exist in the literature; a striking example is Wantchekon’s field experiments in Benin [Wantchekon and Introduction, 2003].

and his notion of “calculative agencies.” The work of Callon, along with other recent work in economic sociology and anthropology [Mirowski, 2007, Zaloom, 2006, MacKenzie, 2003, MacKenzie, 2006, Callon and Muniesa, 2005, Callon et al., 2007, Lepinay, 2007, Beunza and Stark, 2004, Preda, 2007, Preda, 2006] has focused on the central question of re-thinking how choice in economic markets functions [Callon, 1998, Callon, 2002, Callon and Muniesa, 2005]. Rejecting both the standard utility curves of formal economics, and the overly embedded/determined choices of an economic anthropology, Callon has tried to explore how an array, or assemblage, of tools, theories, techniques, people, places and goals come together in order to allow people to calculate and make economic choices. The main advantage of this approach is that it takes the focus off of humans as the core object of study, and instead focuses on the *situations* we call markets. All markets are not created equal, and therefore, every array of tools, theories, humans and goals can create different outcomes—predictable and manipulable to be sure, but singular situations of varying significance, that can never quite be captured by pure economic theory. Philip Mirowski, though at odds with the ANT approach, has in a similar way remarked upon how surprising it is that economists claim to study humans instead of markets, and has begun a research program that combines insights from computer science in order to think about markets themselves as a kind of computer.[Mirowski, 2002, Mirowski, 2007, Mirowski and Somefun, 1998]

It is Michel Callon’s work on “calculative agencies” and the “co-performance of equations and worlds” which I focus on here. Callon initiated this discussion in 1998 by asking a seemingly simple question: “who, or what,

calculates?” Callon’s question refocused attention on a debate long since abandoned in anthropology, namely the famous formalist/substantivist debate played out between economics and anthropology in the 1960s and 1970s, a debate that started from the question of so-called “primitive markets” and sought to answer the question of whether there was only one kind of market calculation, or broad cultural variation in their dynamics. Callon characterized the two positions thus:

The first corresponds to the solution opted for by neoclassical economic theory: agents calculate because they are calculative by nature. The second preferred by sociology and anthropology, attempts to show that in observable behaviours calculation... is marginal and at best an ex post rationalization for choices grounded in other logics.<sup>8</sup>

Neither choice is particularly satisfying. It’s hard to deny that people are calculating, but equally hard to insist that this is all that they do. Callon sought a way to insist that calculation is in fact occurring, but that it is not internal to the human agent—rather, it is a collection of technologies, goods, and rules of operation that make up a “market.” Not human calculation but “calculative agencies.” When such calculations work it is because goods have been made calculable through objectification, singularization, co-elaboration of properties by producers and consumers. Calculations happen when the technical systems that enable calculation, definition and distribution of information about goods make the world look like it contains a set of

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<sup>8</sup>Callon, “Introduction” *Laws of the Markets* p. ?? [Callon, 1998]

weighted choices from which humans can choose— not because these choices pre-exist our theories and tools for identifying them.

Callon called this a “peculiar anthropology.” It focuses our attention not only on humans, and also on the *agencements* (assemblages, arrangements) which are put into place in order to make specific markets and products work— the conditions of felicity wherein the performative illocutionary utterance can have its causal effect, to use the favored linguistic terminology.[Callon, 1998]

One implication of Callon’s approach that is frequently noted is that as a result of seeing the world in this way, it is possible to watch how theories from academic and quasi-academic economics departments and business schools themselves come to shape and format markets in peculiar ways. The strongest example of this so far has been the work of Donald MacKenzie’s on the Black-Scholes equations, and their use by derivatives traders such as Long Term Capital Management [MacKenzie, 2006, Mackenzie, 2006, MacKenzie, 2003]. “Performativity” as it is called, may well be a frequent feature of markets, but as Philip Mirowski points out[?, MacKenzie and Millo, 2003], it is unlikely to be performance only by the abstruse and rarefied work of economists, and just as likely to include that of “financial engineers” and the everyday work of traders and fund managers who help to construct and tweak the “agencies” that allow calculation to happen: software, rules of national and state regulation as well as informal rules governing trading also play a role. Pulling these various threads of research apart has been part of the lively activities of the economic sociology and anthropology in recent years[Zaloom, 2006, Hertz, 1998, Lee and LiPuma, 2002, Lepinay, 2007].

The approach inspired by Callon raises a question, however: why focus on agencies rather than on human agents alone? Why substitute this new understanding of markets for the naturalistic and formalized one offered by economists or the “cultural logics” offered by anthropologists? What exactly is to be gained from this substitution—better models of markets, or something more? Here is Callon’s answer:

[This approach] highlights that there are several ways of calculating values and reaching compromises. Second, it makes empirically observable and theoretically analyzable the fact that certain agencies are exempt (or prevented, depending on point of view) from calculation, whereas others concentrate the most powerful calculative tools in their own hands. Third it suggests that open discussions and even public debates on the way of organizing calculation are possible. In short, it restores to markets the political dimension that belongs to them and constitutes their organization as an object of debate and questioning ([Callon and Muniesa, 2005, 1245])

Callon’s approach relies on a certain intuition about what currently counts as economic transaction and is therefore putatively excluded from politics. Callon points to assumptions shared across both pro-market and pro-regulation actors: that markets function objectively and precisely in well-understood ways, ways which are not affected by the details of their organization or functioning. Callon’s approach challenges this assumption and focuses instead on how the construction of a market affects its func-

tion, with implications for those who construct it, those who operate in it, and especially those who cannot access it. Markets, whether for orange juice[Callon, 2002], strawberries [] or for complex derivatives[Lepinay, 2007] do not have to be the way they are, and through analysis, we can open them up to political deliberation. Even if we agree that we should “let the market decide” this is not the end of the story, but only the beginning. Getting to the point where the market decides better than a handful of humans might be also a techno-political struggle.

While this approach has led to increasingly more sophisticated questions regarding markets and economies and their definition and qualification, the insights have not yet been applied to political decision making. Such a displacement to the field of political science from economics should not be surprising, given that the same tools and approaches that populate economics have long been applied to understand voting as a form of transaction (Anthony Downs’ *Economic Theory of Democracy* [Downs, 1957] is the locus classicus). It was this application of economic theory to the act of voting that created the “voter paradox”—i.e. if it is so costly for an individual to vote, and an individual’s vote has so negligible an impact, why does anyone vote at all? Reams of studies have explored this paradox, as well as exploiting other economic tools to understand how, why, when, where, and whether it matters if people vote.<sup>9</sup> Callon’s approach, however, has not been applied to voting or elections, and it is my contention that if it is, it could reveal new insights, both about the so-called paradox of why people

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<sup>9</sup>Recently, see William Poundstone’s *Gaming the Vote* for a popular examination of these issues.

vote, but also about the background “politics of politics,” the networks that allow the process of political choice to itself become an arena for strategy, agonistic contention, manipulation and... politics.

In order to treat the act of voting not as an isolated individual choice, but as the act of a “deliberative agency,” the focus must be shifted away from isolated, aggregated humans and towards “situations”, and the methodological task becomes one of defining situations more clearly—defining what kinds of assemblages are at stake in setting up the machinery of election. In the political science of voting, the ballot marking and counting machines themselves are almost never included in the analysis (that is, until very recently with the advent of DREs). But it is clear from work in science studies that machines are never in themselves neutral, and what’s more, that they encode entire theories and conceptual schemes that perform what observers often take to be a simple neutral measurement or function—but which are obviously also the subject of games, politics, and strategy. Political scientists excel at including certain kinds of variables in their study of voting behavior—the influence of race, class, gender, districting, media reporting, election night results and so on—but they do not include machines.

Actor network theory, by contrast, can demonstrate how to explore such “situations” by charting how objects and concepts come into being relationally, through the creation or destruction of links that allow different people, groups and things to enroll, resist or translate their aims. Exploring how campaigns function, in the present and in the past, as actor-networks, could reveal something about how elections turn out, why voters turn out, or more generally, how choice making is related to governance today.

But such an approach also raises a troubling question: Why would we need to restore to elections and voting the political dimension that belongs to them? Aren't voting and elections already the locus of political contestation and agonistic struggle over values? What *mise en abyme* do we risk by insisting that the process of politics is also political, meta-political or hyper-political? How can we proceed to clarify, or re-mediate, the concept of the political in this context?

As the brief intro to the politics of electronic voting machines should make clear, there is something going on in the background of politics which is different from the so-called explicit politics going on in the foreground. But what is it? How can it be analyzed? Does it simply “structure” a political field (and is therefore a question of neutrality, fairness and balance)? Or is it in fact part of the political deliberation in which citizens should be engaged before, during or after the political choices they make about candidates, referenda, or proposals?

Applying Callon and friends to the world of politics is in some ways more shocking than applying it to economics: many people, it seems, are willing to side against formal economics and the idea that humans are naturally calculative, or to resist our being made more so— but to resist the idea that we are naturally deliberative, or resist becoming more so? At least for the Aristotelians among us, denying the faculty of political deliberation as essential to our being would destroy our very humanity. At the very least, this experiment in shifting the insights of Callon and others from economics (and economization as a process) to political science (and the formatting of elections and voting as a process) can yield insight in both domains,

by opening up new research approaches to studying deliberation and by revealing assumptions that are at work in the approach to economics and economization as a bounded domain of study.

As a starting point for such an approach, consider the *effect* that the introduction of electronic voting machines has had on the kinds of questions scientists might ask about voting. By virtue of their difference, DREs “de-naturalize” the act of voting and reveal certain deeply embedded assumptions about how deliberation and voting are related. Opening up the black box of voting in this sense reveals not just how these machines work (or don’t) but how we think voting works, generally. The research I report on here can help understand this—and my specific contribution here is to try to make explicit some of these assumptions, even though the scientists themselves do not.

## The accidental archaeology of voting

It was in the wake of the 2000 Electons and the “Help America Vote Act” that computer scientists started to take an interest in voting for the first time.<sup>10</sup> In particular, those computer scientists interested in security and verification took an active interest for reasons that might seem counter-intuitive: they understood intimately that computers cannot be trusted absolutely, and that a new class of precautions is necessary if they are

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<sup>10</sup>Prior to 2000, only Douglas Jones of the University of Iowa had taken an interest, and had made claims about the issues facing electronic voting early on. See <http://www.cs.uiowa.edu/jones/voting/>

to be applied to something as important as voting.<sup>11</sup> The work I conducted at Rice University (with several students, between 2003 and 2007) was part of a project on the “Ethics and Politics of Information Technology” (<http://frazer.rice.edu/epit>). The project didn’t start out about voting machines, but it was through the person of Dan Wallach that this issue came to the forefront. Dan talked to us about his professional life and computer security research. Computer security research, it emerged, is a fascinating and somewhat bizarre form of computer science that consists primarily of looking for trouble. Here is how Dan characterizes his “research pipeline”: “Break Software. Write Paper. Fix Software. Write Paper. Repeat.”

In his early career Dan had sought trouble by finding bugs in early versions of Netscape’s Java interpreter. The work brought him much attention, especially from Netscape itself which subsequently employed him for a summer.<sup>12</sup> Dan’s work on voting machines basically followed this same process, though with considerably different implications than for the standard breaking and fixing of corporate software. What we found most interesting about Dan’s work was what he was agitating for: *more paper and less technology*. That is to say, adding a voter verifiable paper trail, and removing some of the reliance on the machines themselves; reliance that was promoted both by the manufacturers and by election officials.

Together with Avi Rubin at Johns Hopkins, Dan and some of their shared graduate students discovered the source code to one of the Diebold-

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<sup>11</sup>Chief among these computer scientists was noted computer scientist David Dill of Stanford, a pioneer in the study of software verification. His activism led to the creation of the Verified Voting organization (<http://www.verifiedvoting.org/>).

<sup>12</sup>The story is told in more detail in the transcripts of our conversations <http://frazer.rice.edu/epit>

manufactured voting machines (the story is retold in Rubin’s account of the process)[Rubin, 2006]. The crux of the story is that the source code was “found” on a public web-server by Bev Harris, an activist who runs a watchdog group called “Black Box Voting” (<http://blackboxvoting.org/>). Because it was available under uncertain legal conditions, Dan and Avi could look at it, but they were uncertain whether to reveal the problems they found, or how to do so. Rubin and Wallach decided to take the risk of analyzing the code, even though they were unclear on exactly the implications, or its precise status as part of really existing election machinery.

The reason they were forced to do this was simple: the source code to all electronic voting machines is protected by trade secret law, and no vendor would ever reveal the source code to their machines unless under a non-disclosure agreement or a subpoena. And in Texas, as Dan gleefully points out, violating trade secrets is a felony offense. But it wasn’t for want of trying that they took this route, as Dan explains:

I’ve challenged the Diebold CEO by saying “I would like to audit these machines, I would like to read their source code.” He said “only under a non-disclosure agreement.”

I said “No way.”

He said, “No deal.”

I mean, they would be happy to let me look at their source code under a non-disclosure, but that means I can’t tell anybody else the results and that violates the point of me wanting to look at it, which is that the public should know about what [machine]

they're voting on. That's the whole point of doing an audit, it seems to me.<sup>13</sup>.

Wallach and Rubin and their students therefore conducted their analysis in this quasi-legal way, wrote a report detailing the flaws in the source code to which they had access, submitted the report to a conference and subsequently published and publicized the report. The skill and sophistication with which they used the media is another aspect of the story, also detailed in Rubin's book, and resulted in their report receiving coverage in the national pages of the New York Times. What might seem to be mere glory-seeking was in fact central to their understanding of the effectiveness of their research; unless the errors were widely publicized, corporations would not be forced to act to correct them, which was the implicit goal of revealing them publicly in the first place. The practice of "shaming" corporations into fixing their buggy software is well-established in computer security research—though it is not always the preferred approach. As Dan's "research pipeline" makes clear, it would have been better if the corporations hired Dan and Avi to fix the problem, but this was not the course Diebold took in this case.

The report made several claims about the security breaches of the machines, including their susceptibility to well known attacks, the use of hard-coded encryption keys, poor commenting and so forth. The crux of the argument, however, was that if these machines were compromised, there would simply be no way to know. There would be no independently veri-

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<sup>13</sup>Transcript #1, Dan Wallach 2003

fiable trail which one could follow to determine if the machine's count was inaccurate. Running a recount would simply mean spitting out the exact same result over again, with no understanding of whether that result was illegitimate.

In addition to the security issue, Dan and others began to identify problems with the certification process as well:

It turns out that these independent testing authorities that I mentioned, their reports are classified. Not military kind of classified, but only election officials get to read them. They are not public. So you joe-random-voter are told “Just trust us! It's certified.” [Smiles] Not only can't you look at the source code, but you can't even read the certification document. So you have absolutely no clue why it was certified, and you don't even know who you are supposed to trust. You're just told “trust us.” Needless to say, this sets off all kinds of warning bells in the back of my head.<sup>14</sup>

Later, during that 2006 class, Dan half-jokingly described the certification procedures to the class using a bewildering array of acronyms, to demonstrate the complexity and irrationality of the certification system:

Certification is voluntary at the federal level, and conducted in 41 of the 50 states. NASED has produced two VVSGs, a 2002 and a 2005 standard—most states are certified only to the

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<sup>14</sup>Transcript #1, Dan Wallach, 2003

2002 standard. There are currently three ITAs who certify the commercial voting machines according to the simple and very loose VVSGs. The vendors pay the ITA's to certify the machines, and the certifications are covered by NDAs. The only person besides the ITA or the corporation who can see the TDPs is the secretary of state, who has the final say in whether to purchase these machines, but who isn't required by HAVA or NASED to do so. In addition, the vendors appear to be using the ITAs as a sort of outsourced QA system, by repeatedly sending the TDPs to ITA until the ITA certifies them.<sup>15</sup>

As Dan told this story in class, the cognitive scientist, who had once worked as a software programmer at Apple and had firsthand experience with corporate quality assurance procedures, was becoming increasingly incredulous, squirming in his seat and guffawing at each seemingly absurd description, until finally Dan said: "You know, I stopped acting incredulous about this stuff a while ago—it just isn't a helpful emotion."

Incredulity in the face of complexity would imply that there is, or was, an obvious, rational and correct way to design a voting system and the technologies and certification procedures that support it. But what the introduction of electronic voting machines reveals is that the electoral system itself is tied in surprising ways to the tools, media (paper) and technologies we use. And yet we have naturalized this electoral system as the very essence of voting. Changing the technologies involved (introducing DREs) reveals

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<sup>15</sup>Transcribed from Wallach's class lecture. Acronyms here?

gaps and breaks in the structure and organization the existing voting system. These gaps and breaks concern things like security and secrecy, anonymity and transparency, and the way these qualities are related to the expression of democratic will, whether individual or collective.

As a computer security researcher, Wallach is generally content to impishly reveal the shortcomings of systems in order to convince (read: embarrass) corporations to fix the vulnerabilities. In this case, however, embarrassing the vendors doesn't work—incredulity is not a helpful emotion, it only makes people angry. The vendors are angry because they insist their machines are certified to the high quality standards of the VVSGs. The election officials are angry because the scientists are questioning their decision to purchase what they see as modern, efficient and paper-reducing machines. The poll workers are angry because they've been agitating for decades to get the antiquated machines and paper ballots replaced with modern technology. Disability activists are angry because these machines actually improve accessibility for the first time in decades. In turn the computer scientists become angry because they are being so rational and everyone else is so not. And then of course voters become angry, conservatives because uppity ivory tower academics are perpetrating voter uncertainty in order to steal elections, and liberals because evil corporations are creating unaccountable machines with which they will steal elections. All this anger, however, could be read instead as the result of pulling back the curtain: electronic voting machines (or any voting technology, when it breaks down, as in the case of the butterfly ballots in 2000) reveal the inadequacies of democratic elections as a general form, and not just the particular technical difficulties faced by

a new technology.

When Wallach and Rubin published their report, they identified several major problems with the existing generation of DREs:

1. The machines are insecure. They are too complex and too easily susceptible to some of the most well known exploits of sophisticated computer criminals.

2. The certification system is broken. The source code is secret, covered by non-disclosure agreements and intellectual property law. Machines are certified in ad hoc ways, if they are certified at all, county by county, state by state, and the certifications themselves remain secret.

3. Most controversially, there is no system for conducting a credible recount. There is no audit trail nor any mechanism by which voters can independently verify that they voted, that they voted for who they intended to vote for or that their vote was counted.

The first two issues remain unsolved. It was the third issue, however, that motivated a massive nation-wide backlash against the machines, led by computer scientists like Wallach, Rubin and their colleague at Stanford, David Dill. This backlash led to legislation that would require the so-called voter verifiable paper audit trail (VVPAT), or voter verifiable paper record, in over 30 states by 2007.<sup>16</sup>

Changing the device in this way is an interesting outcome. It does not really address the issue of security in terms of hackers and/or fraudulent use of the machines. It does not address the fact that a successful attack on

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<sup>16</sup>See <http://www.verifiedvoting.org/> for more information on current state requirements.

these machines would be *qualitatively and quantitatively* different than fraud with punch cards or lever machines. Which is to say, the change does not address the radically new kinds of problems (or for that matter, the new advantages) that a heterogenous nationwide computerized voting system introduces. What it does address is a very specific and easy-to-understand issue: whether a human voter can double check their own vote, to ensure that the vote they cast was the vote that was counted.

The analysis of the problems with electronic voting machines revealed something that was hitherto invisible to people: that the capacity for a fair and unbiased recount in a contested election, as we think we understand such events, is in fact inextricably linked to the medium of paper and its qualities. Designers of the new machines had not adequately grappled with this issue. They either attempted to simply mimic the paper-based voting machine, or haphazardly explored the differences, resulting in machines that appear, after the fact, to be poorly designed and insecure.

For the computer scientists, however, this was a “researchable moment” so to speak. What the potential failures revealed were not design flaws in the electronic voting machines themselves (though there plenty of those), but bad design theory—assumptions made about computers which were appropriate to another medium altogether. But to take this a step further, I would argue that by showing how the technological medium matters, computer scientists revealed how seemingly universal qualities of voting, like secrecy, neutral government provision of ballots, and the solemnity of an individual decision in private are also tied to this particular medium—something that should not be surprising to any historically minded student

of voting and elections.

Dan Wallach demonstrated how to see the difference in technological media of voting in an almost off-hand way, by constructing in class something he called a “table of illities” — engineer speak for a design spec that accounts for things like, scalability, accountability, usability, extensibility, as well as cost, efficiency and so on. (See Table 1).<sup>17</sup>

On the left, the different historical moments in voting technology: voice voting in a shared space, “Bring Your Own Ballot” (BYOB) in which voters used any paper, including pre-printed newspaper ballots to the famous “Australian Ballot” which was the first anonymous and secret balloting system employed first in Australia, later in England and the US.<sup>18</sup> The implication of the table is that lever machines, punch cards, optical scanners and DREs would come next, though we ran out of time in class.

As I suggested at the outset, none of the three scientists involved were interested in questioning the fundamentals of voting-based democratic politics; they are, however, deeply interested in understanding the detailed differences between different media, from paper to DRE, in order to support (and perhaps) preserve these unquestioned fundamentals. It is in this space of exploration where “the politics of politics” is occurring, primarily in the hands of engineers such as Dan.

When engineers conduct such assessments of a technology, the normal illities include usability, scalability, cost and efficiency. In this case, however,

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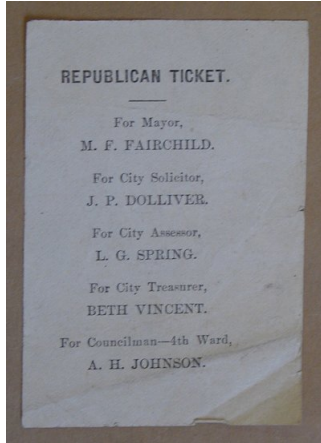
<sup>17</sup>This table was constructed in class in response to student input, and despite its relatively tidy appearance here should not be taken as anything other than a class exercise transcribed here.

<sup>18</sup>Dan’s Table was based on Douglas Jones’ history of voting at <http://www.cs.uiowa.edu/~jones/voting/pictures/>

Table 1: Dan Wallach's Table of Illities for Voting Systems, presented in class, Fall 2006

	Usability	Anonymity	Accuracy	Efficiency	Scalability	Cost	Auditability	Tamper Re-
Voice Vote		no	yes	no/low	no	cheap	good	sistance no/non-anon.
Bring Your Own Ballot (BYOB)	good	by choice	yes	fast	yes	cheap	harder	disaster
Australian Ballot	Compromised For Anonym.	mandatory	Compromised For Anonym.	slower than BYOB	ehhh	higher	better than BYOB	hard
...	...	...	...	...	...	...	...	...
...								

Figure 3: A pre-printed Ballot, “Ballot from an 1880 municipal election in Iowa” from Douglas Jones “A Brief Illustrated History of Voting” <http://www.cs.uiowa.edu/~jones/voting/pictures/>



Wallach has included anonymity, transparency, accuracy, auditability and tamper resistance. Wallach has used the table to reveal how certain aspects of what we value in the abstract (anonymity or secrecy) work out in the concrete. For instance, in the lower left corner, Dan suggests that the usability of an Australian ballot is compromised in order to achieve anonymity, because while voice voting is, one assumes, the simplest way to express one’s preference, it is manifestly non-anonymous. BYOB ballots can be extremely usable (a pre-printed “republican” ballot (see 3) for instance), and yet be a “disaster” from the perspective of tamper resistance.

The table is far from complete, and like most tables, reveals more questions than it answers. Yet Wallach’s table does not attempt to reveal the best voting system—since he makes no assumptions about the criteria—but to explore the technical-social characteristics of different systems (though he perhaps would not describe it as such). Such an approach is bread and but-

ter for a computer scientist who studies security. The goal is not to question security, per se, or to advise on what should or should not be protected (if it can be avoided), but to demonstrate that given a certain “threat model” some designs and systems are more or less vulnerable to compromise and attack than others. It might seem a counter-intuitive approach since common sense suggests that computer scientists have as their interest the expanded use of computers for all purposes. The case of voting machines shows just the opposite: the safest way to preserve the values we associate with successful democratic expression of votes, is to understand how different media enable these values: paper has certain qualities that electronic recording of information never will; and this difference has significant and (as yet) unexplored consequences for the shape of our entire electoral system.

## The secret history of secrecy

Wallach’s accidental archaeology of voting systems revealed a question which has only occasionally confronted scholars of voting and elections, and rarely confronts everyday residents of democracy: why do we insist on anonymity—or more accurately, on secrecy?<sup>19</sup> It was clear from Dan’s history lesson that at some point in American history we voted in public, noisily and with everyone watching.<sup>20</sup> And at some other point we voted with totally un-

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<sup>19</sup>Questioning the role of the secret ballot has happened periodically in the last two decades, but without much impact. Brennan and Petit [?] and [?] have both tried to show that secrecy does not perform as expected, within the terms defined by political science. Bertrand, Briquet and Pels [Bertrand et al., 2007] offer a collection of essays that question the universality of secrecy by presenting ethnographic evidence from around the world.

<sup>20</sup>There is no definitive history of how we (in the US or elsewhere) vote, but, on England, see [O’Gorman, 1992, O’Gorman, 2007]; On France see [Garrigou, 1988, Garrigou, 1992]; and on the US see [Schudson, 1999, Fredman, 1968, Bishop et al., 1893, Evans, 1917,

standardized ballots, even “pre-printed” ballots that would seem to suggest no thought at all on the part of the voter. And then, curiously, we began to vote silently, secretly, and on standardized ballots provided by the government and designed with the aim of allowing voters to accurately express an interiorized interest.

The story of this transformation has been told only in pieces. On the one hand, there are the technical transformations: the introduction of the Australian Ballot, the introduction of the ballot booth (literally, *l'isoloir* in French), the introduction of mechanical voting machines in the 19th century, punch card machines and later the lever machine.<sup>21</sup> On the other hand, there are range of political reforms, including both those responsible for the introduction of the Australian Ballot, voter registration reforms, suffrage and a wide range of reforms across the state and federal jurisdictions concerning the proper modes of committing, recording, counting and communicating votes. And then there are also the cultural changes, such

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Rusk, 1970, Reynolds and McCormick, 1986]. Also see [Niemi and Herrnson, 2003] the general complexity of contemporary balloting procedures in the US

<sup>21</sup>The AVM Printomatic Lever voting machines are among the most sophisticated technologies available for voting, far more carefully engineered than most electronic machines available, Bryan Pfaffenberger characterized them thus: “ These are, in my opinion, far and away the best voting machines ever made. They are able to consistently provide reliable results, and their metrics compare favorably with any technology that has since been developed. What is even more remarkable is that, in the complex mechanical relationships that you will see if you are permitted to look under the hood, you will see a representation of the United States election system, with gearings, interlocks, and other gizmos of fabulous complexity, which are capable of coping with the idiosyncracies and eccentricities of elections in the 48 US states that existed at the time they were made. There are something like 28,000 parts in each of the machines. The American mechanical lever voting machine is a Quixotic, amazing, and tragic accomplishment – it has few peers, save perhaps the Space Shuttle. AVM never sold a single one of them outside the US. Behold, a non-global technology!” (Personal Communication, B. Pfaffenberger. Images of the three lever machines owned by Rice University are here: <http://www.cs.rice.edu/~dwallach/photo/avm-lever/> See also Clive Thompson, “Can You Count on Voting Machines” New York Times Magazine January 6th, 2008. <http://www.nytimes.com/2008/01/06/magazine/06Vote-t.html>

as those outlined in Michael Schudson’s work *The Good Citizen* and Alain Garrigou’s *Le Vote et la Vertu*. Political virtues changed dramatically in the 19th century, as did the scene of elections and the modes of deliberation, influence and power exercised leading up to them.

However, seen through the lens of contemporary scientific research on voting, such historical transformations have become invisible. The reforms of the 19th century are literally built into the systems we use today—especially those that go under the label of the “Australian Ballot.” The machines we use today are designed around these reforms (a fact visible in part in the explosion of patents for new voting machines and booths in the late 19th century, many of which refer explicitly to the Australian Ballot in their design), and the questions political scientists and cognitive scientists ask are deeply structured by these reforms. In writing about the English decision to adopt a version of the Australian Ballot, Frank O’Gorman [?] explains what these reforms replaced:

The Ballot Act [of 1872] did not merely presage the decline of old electoral influence but more fundamentally the passing of a traditional form of electoral culture. This culture with its rowdy and popular pattern of election rituals, was several centuries old. It provided a narrative structure to the election campaign, beginning with the formal entry rituals of the rival candidates into the constituency; continuing with the elaborate formalities of canvassing the electors, with the public processions and speeches, the treating and entertainment of the electors and, what is often

overlooked, of the non-electors too; culminating with the formalities of the nomination of the candidates and, where necessary, the taking of the poll... This pattern of electioneering, boisterous, popular, rowdy and very expensive, frequently brought the normal life of the constituency to a halt for days or even weeks (37).

In place of this culture, the Australian Ballot ushered in an era of quiet elections, silent voting, secret choice, government neutrality with respect to the organization of the act of voting and an apparatus of choice that mapped onto populations conceived of not as groups, but as masses of individuals. Non-voters no longer played any role, and the idea that a vote might be taken only “where necessary” was totally inconceivable.

The question of why the Australian Ballot was adopted is not easily answered. Political culture of the late 19th century in the US, for example, was identified with the power of machine politics and clientalistic control of populations’ political power. The most common argument given in historical and political science work is that voting reforms were introduced to combat this power, to shield individuals from the exertion of excessive, corrupt and occasionally violent coercion. While this no doubt animated some reformers, it also appears to be the case that party machines either approved of the reforms, or quickly discovered ways to make them work for them [Rusk, 1970, Argersinger, 1985, Reynolds and McCormick, 1986, Walker, 2005]. Nonetheless, a new definition of civic virtue, organized around the sanctity of individual deliberation, fair balloting procedures, and secrecy

in the ballot booth took shape in this period, giving form to an ideal typical voter (and voting system) which tended towards this form of expression.

Bertrand, Briquet and Pels argue that something similar happened in France at the same time. Drawing on the work of Alain Garrigou, they report that “The electoral arena [in the third republic] was meant to become a place where the newly defined civic virtues of individual rationality and independent choice would play out, sanctioned by the majesty of state power: an Enlightenment dream come true.(4)” This transformation was not purely ideological, however, but took shape within a particular assemblage of machines, reformed laws, admired virtues, and political parties seeking advantage via all these things:

The new ideology of the citizen-turned-individual-voter was seen as taking concrete form in a set of novel and peculiar technologies: a material culture characterized by literacy, individual isolation, and the neutralization of a public voting space that ensured control by public authorities and political parties in a docile performance of political commitment (4).

It should come as no surprise, therefore, that the introduction of this 19th century voting system to various countries around the globe throughout the 20th century has failed to work in the same way. Such attempts to introduce democracy via the machinery of voting presume that they represent the pure form of democracy, or its highest point, rather than an historically specific outcome of social and political struggles in 19th century Europe and America. The presumption being that if democracy is absent somewhere,

it can be brought about by the application of the proper machines and laws. By contrast, the introduction of the technologies and the laws cannot force “literacy, individual isolation, and the neutralization of a public voting space” to come about, but only cause turbulence in the already existing modes of political expression, and lead to outcomes both similar to and drastically different from the Enlightenment ideal.<sup>22</sup>

In the context of 19th century European and US political culture, however, the Australian Ballot seems to have made sense in terms of achieving a desired form of deliberation. Ballot reform activism was well underway in both the US and England before the adoption of the Australian Ballot (so named because it was first adopted there in 1856, while the UK and US did so in the following decades). Debates about the secrecy of the ballot periodically engaged major political thinkers. A famous supporter was James Mill, who argued that secrecy was a control against the influence of “opulent men”; and a famous detractor was Mill’s son John Stuart who argued that men should be required and capable of justifying their vote—in public and to others—and that secrecy allowed them to forgo that responsibility. But it wasn’t only secrecy that was at stake: as Peter Brent [Brent, 2006] points out, the “Australian Ballot” did not mean only the secrecy of the ballot, but also the fact that it was printed by the government, listed all of the candidates from which a voter must choose, and was to be filled out and deposited away from the view or influence of others, whether party officials, government representatives or friends (See Fig. 4). It thus brought

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<sup>22</sup>Bertrand, Briquet and Pels 2007 includes examples of this turbulence in India, Colonial Tanganyika, Indonesia, Corsica, Mexico, Benin and Iran; Coles 200\* explores the case of former Yugoslavia.

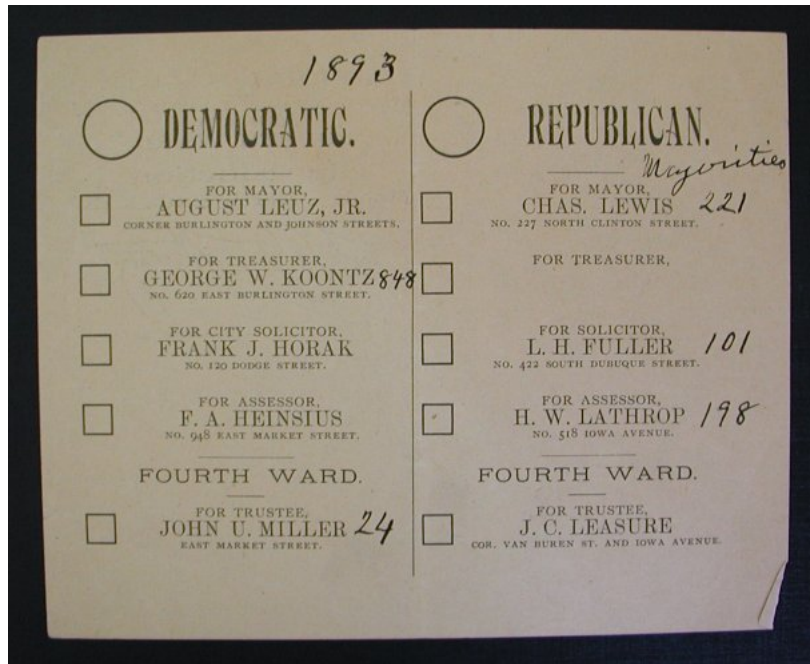


Figure 4: “Australian Ballot from an 1893 Iowa City municipal election” from Douglas Jones Illustrated Voting Machine History, <http://www.cs.uiowa.edu/~jones/voting/pictures/>

a number or reforms together in one system that transformed voting from part of a public deliberation to a separate, isolated, intentional, official and recorded act.

Over the course of the 20th century the specific features of the Australian Ballot have slowly become confused with the very ideal of democratic elections as such. It is thus more precise to say that the problems which emerge in the case of electronic voting machines threaten this particular model of voting, and not democracy per se. What voting activists and computer scientists have been fighting hard to protect over the recent years is in fact a particular form of voting, developed in the 19th century and perfected over

the course of the 20th century in both legislative and technological features specific to a particular medium (paper) and a particular legal category (individualized interests and their authentic expression). And vice versa, the changes that are being introduced today, both technical and legislative, are part of an ongoing historical transformation of our electoral culture—not just a threat to an idealized democratic process.

When I asked Dan and the other scientists why it is so important that we vote in secret, they could only answer in vague terms about the importance of not being influenced or coerced to vote one way or another. If anything, the controversies surrounding electronic voting machines reveal the fact that this question has been transformed into a universal democratic value, so universal in fact that the very idea is enshrined in the the Universal Declaration of Human Rights Article 21(3)

The will of the people shall be the basis of the authority of government; this will shall be expressed in periodic and genuine elections which shall be by universal and equal suffrage and shall be held by secret vote or by equivalent free voting procedures.  
(source)

Indeed, this may be the only place in the modern world where secrecy is explicitly, and approvingly, equated with Freedom.

## **Conclusion**

The computer scientist, the political scientist and the cognitive science repeated their class again in 2008, in the run-up to the presidential election.

Despite the fact that the number of contested and close elections was much lower in this cycle, and the fact that there was no Shelly Sekula-Gibbs in the race, the issues raised by DREs remain. Many states have de-certified the existing machines to be replaced by paper ballots and optical scanning tabulators. Research articles from the 2006 class have also appeared [Stein et al., 2008, Byrne et al., 2007, Everett et al., 2008] which report on the usability of DREs compared to that of paper ballots. It is significant that these published papers, which of necessity make very narrow claims, focus only on usability. In part this reflects the kinds of questions possible to ask in cognitive science and political science—how do users experience these machines cognitively, and how do they understand them with respect to voting behavior (do they vote, and for which races). The results suggest that voters overwhelmingly find DREs more usable than paper ballots and that other factors (such as general election administration) are more likely to affect voter behavior than the machines themselves. Needless to say, the articles do not question the value or function of the secret ballot or of any other aspect of election administration other than the introduction of DREs—experimental design demands that they hold all these other variables constant.

Meanwhile, Wallach’s VoteBox project has also advanced considerably in this time([Sandler et al., 2008], and a number of other such projects have emerged (e.g. PunchScan and pVote). This project maintains a sense of the controversy that initially animated the class and the research, that the machines themselves are unreliable, poorly designed and do not permit reliable recounts. So how to balance the obvious advantages of DREs (including

the result that voters prefer them) with the fact that DREs reveal problems that are novel and specific to digital devices?

The accidental archaeology of the current generation of voting systems raises a troubling question: if the way we vote (on paper, in secret, on ballots provided by the government) is specific to a particular time, electoral culture, and medium, then what kinds of deep changes are we introducing with the advent of DREs? Wallach's project and others attempt to engineer towards goals that are only partially understood: anonymity, tamper-resistance, tamper-evidence, and "end-to-end verifiability." Cryptographic tools, logic testing, complex ballot-challenging and verification schemes are just some of the changes proposed in order to deal with the evident failures of the current machines. While these changes might well be considerably more sophisticated, reliable and robust than those engineered by Diebold or ES&S, that by no means implies that they will be adopted. To understand why requires turning instead to the broader, historically evolving electoral culture that exists today, and asking whether the values embedded in the 20th century election system persist.

By approaching the problem as an "anthropology of deliberation" we might start to ask questions about the ongoing reform of elections, and the evolution of electoral culture after the introduction of DREs. DREs, it must be said, are a very small part of this change, but as I've tried to demonstrate, one through which it is possible to diagnose broader historical trends like the dominance of the secret ballot in definitions of democracy. Cryptographic approaches sediment and maybe even radicalize this dominance, without ever raising the question of what secrecy is, or why it is important. Who

will debate how the electoral system we use is designed? How shall we enter the “politics of politics” in order to understand not only the choices people make in the ballot booth, but the choices made about the design of elections generally? What kind of “deliberative agencies” are we bringing into existence, and how will they re-organize the possible choices in the future? Will they be provided by unregulated corporations whose primary goal is user-satisfaction rates and feature-rich innovation? Or will they be overseen and regulated by governments just as the Australian Ballot has always been? Or are there yet other ways?

Consider this: most of the new, academically motivated DRE systems like Wallach’s VoteBox are open source. Most of the creators are animated by the ideas and successes of Free Software and Open Source Software. Such a decision is made in order to open up the design, verification and innovation of these systems to something like politics. I have argued elsewhere ([Kelty, 2005, Kelty, 2008]) that Free Software is an exemplary instance of what I have called a “recursive public.” That notion was intended to capture the way in which the design and evolution of Free Software projects was open to politics in a radical way. Rather than just being subject to the discourse, pro or con, of communicatively engaged actors with stakes in the way a system is build, Free Software gives people the option to change systems directly, to propose alternatives by building them. It preserves this right at each subsequent layer as well; it is a process devoted to ensuring that the infrastructures that allow people the freedom to hack are themselves open to hacking, as far down a “recursive” stack as possible. In the world of free software, applications matter, formats matter, programming

tools matter, protocols and standards matter, goverances structures matter, and even in some cases, hardware and physical infrastructure matter to the freedom of debate so essential to democracy.

By contrast, the current systems of voting machines, elections and polling exhibit none of this openness—and the computer scientists offering critiques of these systems are implicitly (and sometimes explicitly) drawing on the same kinds of definitions of openness as in the case of Free Software. When hackers argue, whether about technology, policy or anything else, they argue both as individuals expressing opinions and arguments, and also as skilled practitioners of the art of building things—hacking is arguing, and often a competent hack is experienced as *decisive*, as a moment when there is, for the time being, no longer any argument. Algorithms and the answers they produce are often just as meaningful as the most eloquently worded defense—provided everyone is on the same page, and provided each can examine the algorithm. Voting, in many ways, is just such an algorithm, but one which currently is both unexamined and unexaminable.

To return to Callon then, this is why I think it is important to think in terms of “deliberative agencies” rather than through the ideologically weighted, practically produced democracy of the secret ballot and the methodological individualism that is its constant and trusty companion. To get at the “politics of politics” requires an archaeology of deliberation. What would it look like if, rather than starting with humans as the locus and origin of deliberate choice, we inserted them into the technologies, practices, ideologies... the “agencements” that produce deliberation? What if we took them out of the ballot booth, literally the *isoloir* of theory, and stuck them back

into the madding cyborg crowds of democracy?

One outcome I suspect, is that it could change the terms of debate around the notions of deliberation, dialogue, argument, influence, interests, and decisions. Rather than deliberative democracy and its oppositions between the embodied, deliberative and argumentative actions of individuals engaged in discussion, and the isolated, individualized subjects of surveys, polls and elections, we need an approach to politics in which voting for a president is one kind of deliberation, and discussing, hacking or examining a voting system is another. And this kind of politics needs to extend beyond the voting booth as well. One much-noted new arrival in politics during the 2008 campaign was Nate Silver's 538.com, a site devoted to polling and the analysis of polls. What set Silver's approach apart however, was his willingness to disclose every choice he made about the design of his 'meta-polls' and to encourage debate not just about the statistics generated thereby, but the methods that generate them as well. For a subset of voters, the 2008 election was a massive education in polling methodology, and it no doubt enlightened many as to the reliability, trustworthiness and power of polling. No such political participation exists when it comes to the design of electoral assemblages: the machines, the ballots, the administration of elections are conducted out of sight of public scrutiny, and increasingly behind closed corporate doors, sealed with the powerful rights of intellectual property law. If we cannot deliberate about deliberation, the choices we think we make no longer have any authentic meaning.

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