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Can We Trust These Machines?

In the Alabama 2002 general election, machines made by Election Systems and Software (ES&S) flipped the governor's race. Six thousand three hundred Baldwin County electronic votes mysteriously disappeared after polls had closed and everyone had gone home. Democrat Don Siegelman's victory was handed to Republican Bob Riley, and the recount Siegelman requested was denied. Six months after the election, the vendor still shrugged. "Something happened. I don't have enough intelligence to say exactly what," said Mark Kelley of ES&S. [1]

When I began researching this story in October 2002, the media was reporting that electronic voting machines are fun and speedy, but I looked in vain for articles reporting that they are accurate. I discovered four magic words, "voting machines and glitch," which, when entered into the DJInteractive.com [2] search engine, yielded a shocking result: A staggering pile of miscounts was accumulating. These were reported locally but had never been compiled in a single place, so reporters were missing a disturbing pattern.

I published a compendium of 56 documented cases in which voting machines got it wrong.

How do voting-machine makers respond to these reports? With shrugs. They indicate that their miscounts are nothing to be concerned about. One of their favorite phrases is: "It didn't change the result."

Except, of course, when it did:

In the 2002 general election, a computer miscount overturned the House District 11 result in Wayne County, North Carolina. Incorrect programming caused machines to skip over several thousand party-line votes, both Republican and Democratic. Fixing the error turned up 5,500 more votes and reversed the election for state representative. [3]

This crushing defeat never happened. Voting machines failed to tally "yes" votes on the 2002 school bond issue in Gretna, Nebraska. This error gave the false impression that the measure had failed miserably, but it actually passed by a 2 to 1 margin. Responsibility for the errors was attributed to ES&S, the Omaha company that had provided the ballots and the machines. [4]

According to the *Chicago Tribune*, "It was like being queen for a day — but only for 12 hours," said Richard Miholic, a losing Republican candidate for alderman who was told that he had won a Lake County, Illinois, primary election. He was among 15 people in four races affected by an ES&S vote-counting foul-up in the Chicago area. [5]

An Orange County, California, election computer made a 100 percent error during the April 1998 school bond referendum. The Registrar of Voters Office initially announced that the bond issue had lost by a wide margin; in fact, it was supported by a majority of the ballots cast. The error was attributed to a programmer's reversing the "yes" and "no" answers in the software used to count the votes. [6]

A computer program that was specially enhanced to speed the November 1993 Kane County, Illinois, election results to a waiting public did just that — unfortunately, it sped the wrong data. Voting totals for a dozen Illinois races were incomplete, and in one case they suggested that a local referendum proposal had lost when it actually had been approved. For some reason, software that had worked earlier without a hitch had waited until election night to omit eight precincts in the tally. [7]

A squeaker — no, a landslide — oops, we reversed the totals — and about those absentee votes, make that 72-19, not 44-47. Software programming errors, sorry. Oh, and reverse that election, we announced the wrong winner. In the 2002 Clay County, Kansas, commissioner primary, voting machines said Jerry Mayo ran a close race but lost, garnering 48 percent of the vote, but a hand recount revealed Mayo had won by a landslide, receiving 76 percent of the vote. [8]

Apparently voting machine miscounts have been taking place for some time. In a 1971 race in Las Vegas, Nevada, machines declared Democrat Arthur Espinoza to be the winner of a seat on the city assembly, but Republican Hal Smith challenged the election when he determined that some votes had not been counted because of a faulty voting machine. After unrecorded votes were tallied, Smith was declared the winner. [9]

The excuses given for these miscounts are just as flawed as the election results themselves. Vendors have learned that reporters and election workers will believe pretty much anything, as long as it sounds high-tech. They blame incorrect vote counts on "a bad chip" or "a faulty memory card," but defective chips and bad memory cards have very different symptoms. They don't function at all, or they spit out nonsensical data.

In the November 2002 general election in Scurry County, Texas, poll workers got suspicious about a landslide victory for two Republican commissioner candidates. Told that a "bad chip" was to blame, they had a new computer chip flown in and also counted the votes by hand — and found out that Democrats actually had won by wide margins, overturning the election. [10]

We usually don't get an explanation for these miscounts. In 1986 the wrong candidate was declared the winner in Georgia. Incumbent Democrat Donn Peevy was running for state senator in District 48. The machines said he lost the election. After an investigation revealed that a Republican elections official had kept uncounted ballots in the trunk of his car, officials also admitted that a computerized voting program had miscounted. Peevy insisted on a recount. According to the *Atlanta Journal-Constitution*: "When the count finished around 1 a.m., they [the elections board] walked into a room and shut the door," recalls Peevy. "When they came out, they said, 'Mr. Peevy, you won.' That was it. They never apologized. They never explained." [11]

In a Seminole Nation election held in Oklahoma in August 1997, electronic voting machines gave the election to the wrong candidates twice. The private company hired to handle the election announced results for tribal chief and assistant chief, then decided that its computer had counted the absentee ballots twice. So the company posted a second set of results. Tribal officials then counted the votes by hand,

producing yet a third, and this time official, set of results. A different set of candidates moved on to the runoff election each time. [12]

If you insist on the right to vote for whom you want (and no one's gonna stop you), does it make a difference if misprogramming, rather than a human being, forces you to vote for someone you *don't* want?

News reports often explain miscounts as "software programming errors," with no follow up and certainly no outrage. Yet incorrect programming is more insidious than Mad Myrtle secretly stuffing the ballot box. At least when we vote on paper ballots, hand counted, we can hold someone accountable. We don't even know the names of our voting machine programmers.

A software programming error gave the election to the wrong candidate in November 1999 in Onondaga County, New York. Bob Faulkner, a political newcomer, went to bed on election night confident he had helped complete a Republican sweep of three open council seats. But after Onondaga County Board of Elections staffers rechecked the totals, Faulkner had lost to Democratic incumbent Elaine Lytel. Just a few hours later, election officials discovered that a software programming error had given too many absentee ballot votes to Lytel. Faulkner took the lead. [13]

Akron, Ohio, discovered its votes got scrambled in its December 1997 election. It was announced that Ed Repp had won the election — no, cancel that, a programming error was discovered — Repp actually lost. (Look! Twins!) Another error in the same election resulted in incorrect vote totals for the Portage County Board election. (Make that triplets.) Turns out the bond referendum results were wrong, too. [14]

In a 1998 Salt Lake City election, 1,413 votes never showed up in the total. A programming error caused a batch of ballots not to count, even though they had been run through the machine like all the others. When the 1,413 missing votes were counted, they reversed the election. [15]

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Voting machine vendors claim these things are amazingly accurate. Bob Urosevich, who has headed three different voting machine companies under five different corporate names, said in 1990 that his company's optical-scan machines had an error rate of only "one-thousandth of 1 percent." [16]

At that time, Urosevich was with ES&S (then called American Information Systems). Recently, the same Urosevich (now president of Diebold Election Systems, formerly called Global Election Systems) gave an even more glowing endorsement of his company's touch-screen accuracy.

"Considering the magnitude of these elections, which includes more than 870,000 registered voters within the four Maryland counties, we are very pleased with the results as every single vote was accurately counted," he said. [17]

When Chuck Hagel accepted his position as chairman of American Information Systems, he offered a rousing endorsement: "The AIS system is 99.99 percent accurate," he assured us.[18]

But do these claims hold up?

According to *The Wall Street Journal*, in the 2000 general election an optical-scan machine in Allamakee County, Iowa, was fed 300 ballots and reported 4 million votes. The county auditor tried the machine again but got the same result. Eventually, the machine's manufacturer, ES&S, agreed to have replacement equipment sent. Republicans had hoped that the tiny but heavily Republican county would tip the scales in George W. Bush's favor, but tipping it by almost four million votes attracted national attention.

"We don't have four million voters in the state of Iowa," said Bill Roe Jr., county auditor.

Todd Urosevich of ES&S said "You are going to have some failures." [19]

November, 2003: Boone County officials wanted to know why their MicroVote machines counted 144,000 votes cast when only 5,352 existed.

"I about had a heart attack," said County Clerk Lisa Garofolo, according to the *Indianapolis Star*. "Believe me, there was nobody more shook up than I was." [20]

If you are an elections official, I hope this litany gives you pause. Do you really need this kind of stress?

With computerized voting, the certified and sworn officials step aside and let technicians, and sometimes the county computer guy, tell us the election results. The Boone County information technology director and a few MicroVote techs "fixed the problem." (For voting, I prefer the term "corrected.")

Better than a pregnant chad — these machines can actually give birth.

In the 1996 McLennan County, Texas, Republican primary runoff, one precinct tallied about 800 votes, although only 500 ballots had been ordered. "It's a mystery," declared Elections Administrator Linda Lewis. Like detectives on the Orient Express, officials pointed fingers at one suspected explanation after another. One particular machine may have been the problem, Lewis said. That is, the miscounted votes were scattered throughout the precincts with no one area being miscounted more than another, Lewis also explained. Wait — some ballots may have been counted more than once, almost doubling the number of votes actually cast. Aha! That could explain it. (Er…excuse me, exactly *which* ballots were counted twice?)

"We don't think it's serious enough to throw out the election," said county Republican Party Chairman M.A. Taylor. Error size: 60 percent. [21]

Here's a scorching little 66 percent error rate: Eight hundred and twenty-six votes in one Tucson, Arizona-area precinct simply evaporated, remaining unaccounted for a month after the 1994 general election. No recount appears to have been done, even though two-thirds of voters did not get their votes counted. Election officials said the vanishing votes were the result of a faulty computer program. Apparently, the software programming error and the person who caused it are still at large. [22]

Some voters aren't so sure that *every single vote* was accurately counted during the 2002 general election in Maryland.

According to the *Washington Times*, Kevin West of Upper Marlboro, who voted at the St. Thomas Church in Croom, said, "I pushed a Republican ticket for governor and his name disappeared. Then the Democrat's name got an 'X' put in it." [23]

No one will ever know whether the Maryland machines counted correctly because the new Diebold touch-screen system is unauditable.

Tom Eschberger became a vice president of ES&S not long after he accepted an immunity deal for cooperating with prosecutors in a case against Arkansas Secretary of State Bill McCuen, who pleaded guilty to taking kickbacks and bribes in a scheme related to computerized voting systems. [24]

Eschberger reported that a test conducted on a malfunctioning machine and its software in the 1998 general election in Honolulu, Ha-

waii, showed the machine worked normally. He said the company did not know that the machine wasn't functioning properly until the Supreme Court ordered a recount, when a second test on the same machine detected that it wasn't counting properly.

"But again, in all fairness, there were 7,000 machines in Venezuela and 500 machines in Dallas that did not have problems," he said. [25]

Really?

Dallas, Texas: A software programming error caused Dallas County, Texas's new, $3.8 million high-tech ballot system to miss 41,015 votes during the November 1998 election. The system refused to count votes from 98 precincts, telling itself they had already been counted. Operators and election officials didn't realize they had a problem until after they'd released "final" totals that omitted one in eight votes.

In one of the nonsensical answers that we see so often from vendors, ES&S assured us that votes were never lost, just uncounted.

The company took responsibility and was trying to find two apparently unrelated software bugs, one that mistakenly indicated precinct votes were in when they weren't, and another that forgot to include 8,400 mail-in ballots in the final tally. Democrats were livid and suspicious, but Tom Eschberger said, "What we had was a speed bump along the way." [26]

Caracas, Venezuela: In May 2000, Venezuela's highest court suspended elections because of problems with the vote tabulation for the national election. Venezuela sent an air force jet to Omaha to fetch experts from ES&S in a last-ditch effort to fix the problem. Dozens of protesters chanted, "Gringos get out!" at ES&S technicians. Venezuelan President Hugo Chavez accused ES&S of trying to destabilize the country's electoral process. Chavez asked for help from the U.S. government because, he said, the U.S. had recommended ES&S. [27]

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Some people, when you give them the short but horrifying version of the electronic voting issue, insist on minimizing the problem. You tell them about an election that lost 25 percent of its votes, and they say, "That's just an isolated incident." When you add that another election had a 100 percent error, they call it a "glitch." When you tell them a voting machine was videotaped recording votes for the opposite can-

didate than the one selected, they say, "There are problems in every election."

No. We are not talking about a few minor glitches. These are real miscounts by voting machines, which took place in real elections. Almost all of them were caused by incorrect programming, whether by accident or by design. And if you run into anyone who thinks we are hallucinating these problems, hand them the footnote section, so they can examine sources and look them up themselves.

For the third time in as many elections, Pima County, Arizona, found errors in its tallies. The computers recorded no votes for 24 precincts in the 1998 general election, but voter rolls showed thousands had voted at those polling places. Pima was using Global Election Systems machines, which now are sold under the Diebold company name. [28]

Officials in Broward County, Florida, had said that all the precincts were included in the Nov. 5, 2002, election and that the new, unauditable ES&S touch-screen machines had counted the vote without a major hitch. The next day, the County Elections Office discovered 103,222 votes had not been counted.

Allow me to shed some perspective on this. Do you remember when we got excited about a missing ballot box found in a Dade County, Florida, church daycare center in the 2000 presidential election? [29] One hundred and three thousand uncounted votes represents about 1,000 ballot boxes. Broward Deputy Elections Supervisor Joe Cotter called the mistake "a minor software thing." [30]

If you are a candidate, you know that participating even in a small election means raising or borrowing money, passing out flyers, going door to door and standing in the rain at various events. How do you feel if your vote is not counted accurately?

"I knew something was wrong when I looked up the results in my own precinct and it showed zero votes," said Illinois Democrat Rafael Rivera, according to the *Chicago Tribune*. "I said, 'Wait a minute. I know I voted for myself.'"

The problem cropped up during the Lake County, Illinois, election held April 1, 2003. Clerk Willard Helander blamed the problem on ES&S, the Omaha company in charge of operating Waukegan's optical-scan voting machines. Rivera said he felt as if he were living an episode of *The Twilight Zone*. No votes showed up for him, not even his own.

"It felt like a nightmare," he said. [31]

Is this not alarming? These voting systems have miscounted our votes, flipping elections even when they are not particularly close. Even more alarming: We have no idea how many miscounts go unnoticed.

No legal authority permits privately employed technicians — often temporary workers — who are not sworn and don't work for the elections office, who sometimes are not even residents of the U.S., to determine the results of the election when there are discrepancies. Yet they do.

Ten days after the November 2002 election, Richard Romero, a Bernalillo County, New Mexico, Democrat, noticed that 48,000 people had voted early on unauditable Sequoia touch-screen computers, but only 36,000 votes had been tallied — a 25 percent error. Sequoia vice president Howard Cramer apologized for not mentioning that the same problem had happened before in Clark County, Nevada. A "software patch" was installed (more on that risky procedure later) and Sequoia technicians in Denver *e-mailed* the "correct" results. [32]

Not only did Cramer fail to mention to Bernalillo County that the problem had happened before in Nevada — just four months later, Sequoia salespersons also failed to mention it while making a sales presentation to Santa Clara County, California. A Santa Clara official tried to jog their memory. According to the minutes of this meeting, [33] "Supervisor McHugh asked one of the vendors about a statistic saying there was a 25 percent error rate. ... No one knew where this number came from and Sequoia said it was incorrect."

That meeting was held Feb. 11, 2003. Just 20 days before, in Snohomish County, Washington, at a meeting called because Sequoia optical-scan machines had failed to record 21 percent of the absentee votes,[34] I asked about the 25 percent error in Bernalillo County. The Sequoia representative was well aware of the problem, replying quickly that *that* 25 percent error was caused by something quite different from *this* 21 percent problem. OK. *Nothing to see here — move along.*

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Sequoia's failure to disclose a miscount when asked about it during a sales meeting really got me wondering: How often do voting companies lie about known errors when they are making sales presentations?

Not often, it turns out. They don't have to lie — because our election officials *don't ask*! That's right. When deciding to buy voting machines, our representatives don't ask whether the machines count accurately. And only occasionally does anyone bother to ask whether the machines can be tampered with. Here's what I mean:

Marion County, Indiana Voting Technology Task Force, Meeting Minutes July 30, 1999

ES&S, Global Election Systems, MicroVote. Mr. Cockrum asked a series of questions to each vendor.

How do you recommend instruction of voters to become familiar with your system?

How many machines per voter/precinct?

Could your system handle split precincts?

Could your systems handle school board elections?

Does your system allow for party crossover voting?

What is the recount capability?

Is your system tamper proof?

Can your system be leased or does it need to be purchased?

What is the percentage of availability of spare machines?

What are the advantages?

There being no further business before the Voting Technology Task Force, Chairwoman Grant adjourned the meeting.

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We know the machines have miscounted elections, but could this happen without being discovered?

In Seattle, a malfunction caused voting-machine computers to lose more than 14,000 votes during the November 1990 election. Individual ballots were counted but not the votes contained on them. The computer program didn't catch the problem, nor did any of the election officials. A Democratic candidate happened to notice the discrepancy after the election was over, and he demanded an investigation.

"It was mechanical or electric malfunction with the card reader," said Bob Bruce, then superintendent of elections for King County. "We'd lost the 14,000 votes. We've got them back now. Hallelujah! The prodigal

votes have come back. Now we have to make sure we don't have too many votes." [35]

At least two voting machine miscounts resulted in grand jury investigations. In Polk County, Florida, County Commissioner Marlene Duffy Young lost the election to Bruce Parker in November 1996 but regained the seat after a court-ordered hand recount. After the recount, county commissioners unanimously voted to ask for a grand jury probe. Testifying were Todd Urosevich, a vice president with American Information Systems Inc. (now ES&S), the company that had sold the county its ballot-counting equipment. The machines had given the election to Parker, a Republican, but a hand recount revealed that Young, a Democrat, had won. Todd Urosevich said his machines were not responsible for the miscount. [36]

A grand jury was convened in Stanislaus County, California, to determine what caused computerized voting machines to misreport election results in the November 1998 election. The grand jury concluded that an ES&S computerized counting system miscounted the votes for three propositions. A hand recount of the ballots resulted in Measure A, a state proposition, being reversed: ES&S machines had reported that it had lost badly, but it had won. According to Karen Matthews, county clerk recorder and registrar of voters, the problem occurred because of a programming error. [37]

Who, exactly, must pay lawyers and court costs if errors made by a voting machine result in litigation? Is it the taxpayer?

If an elections official ruins an election — loses votes forever, or mishandles the voting so badly that no one can repair the error — we can fire that person. If an elections *machine* ruins an election, shouldn't we fire that voting system?

In Knoxville, Tennessee, a software programming error caused more than 40,000 votes cast during 15 days of early voting for the 1996 general election to be lumped together, instead of separating the vote tally into city and noncity ballots. Voters considered this programming error to be an outrage because it caused one of the ballot items to fail when it was voted on county-wide. [38]

In the October 16, 2001, Rock Hill, South Carolina city election, voting machines were programmed incorrectly, skipping hundreds of votes cast. In a number of precincts, the ballot-counting software ig-

nored votes for council members when they should have been included, causing omission of 11 percent of the votes cast for these races. In all, voting irregularities were found in seven of the city's 25 precincts. [39]

At its heart, our body of law is on the side of the voter. Our entire governing system is based on the sanctity of the vote. It is not excusable for votes to be counted improperly because of "programming errors." Almost all states have statutes that say something like this:

"If voting machines are to be used, they must count the vote *properly*."

If a system is so complicated that programming errors become "inevitable" or "to be expected," the system must not be used. And yet the problems continue.

In Union County, Florida, a programming error caused machines to read 2,642 Democratic and Republican votes as entirely Republican in the September 2002 election. The vendor, ES&S, accepted responsibility for the programming error and paid for a hand recount. Unlike the new touch-screen systems, which eliminate voter-verified paper ballots, Union County retained a paper ballot. Thus, a recount was possible and Democratic votes could be identified. [40]

In Atlanta, Georgia, a software programming error caused some votes for Sharon Cooper, considered a "liberal Republican candidate," not to register in the July 1998 election. Cooper was running against conservative Republican Richard Daniel. According to news reports, the problem required "on-the-spot reprogramming." [41]

How can computerized vote-counting possibly be considered secure from tampering when "on-the-spot reprogramming" can be used to alter vote totals?

In November 2002, a voting machine was caught double-counting votes in South Dakota. The error was blamed on a "flawed chip." ES&S sent a replacement chip; voters demanded that the original chip be impounded and examined. Who was allowed to examine it? Citizens? (No.) Experts that we choose? (No.) ES&S? (That's it.) [42]

But they are tested and tested and tested again.

This is the official rebuttal when you ask whether machines can miscount. More on this testing later, but for now, suffice it to say that the ultimate invalidation of the testing a voting machine endures would be *a machine that can't count!* Election officials and voting machine

companies can argue 'til they are blue in the face about the excellence of the certification process, but if the testing works, how did this happen: In Volusia County, Florida, during the 2000 presidential election, the Socialist Workers Party candidate received almost 10,000 votes — about half the number he received nationwide. Four thousand erroneous votes appeared for George W. Bush while at the same time, presidential candidate Al Gore received *negative* 16,022 votes. [43]

I think we should pause for a moment to digest this last example. In fact, if an electronic voting system, in this case a Diebold optical-scan system, can register *minus* votes in sufficient quantity to cause a candidate for president of the United States to erroneously concede to his opponent, we should examine the situation in more detail, don't you agree? We'll revisit this episode in a later chapter.

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Sometimes, machines are given a passing grade even when they fail their testing. Dan Spillane, a senior test engineer for the VoteHere touch-screen voting system, says he flagged more than 250 system-integrity errors, some of which were critical and could affect the way votes were counted — yet this system passed every level of certification without a hitch. Spillane claims he brought his concerns up to all levels of VoteHere management but was ignored. Just before the system went through certification testing, Spillane contends, the company fired him to prevent him from flagging the problems during certification. He filed a lawsuit for wrongful termination, [44] which was settled by VoteHere, with details kept confidential. [45]

According to the *Las Vegas Review-Journal*, a member of the Nevada Policy Research Institute's Advisory Council reports the following: "In July 1996, a public test to certify Clark County's Sequoia Pacific machine for early voting was conducted. During the test, a cartridge malfunctioned; also, the examiner had difficulty casting his vote. He had to vote 51 times rather than the designated 50, an option not afforded the voter should the machine malfunction in an actual election. In spite of these malfunctions, the machine was given certification — the equivalent of declaring it accurate, reliable and secure." (Clark County then trotted right out and bought the machines.) [46]

The testing didn't work here either: In Conroe, Texas, congressional candidate Van Brookshire wasn't worried when he looked at the vote

tabulation and saw a zero next to his name for the 2002 primary. After all, he was unopposed in the District 2 primary and he assumed that the Montgomery County Elections Administrator's Office hadn't found it necessary to display his vote. He was surprised to learn the next day that a computer glitch had given all of his votes to U.S. Rep. Kevin Brady, who was unopposed for the nomination for another term in District 8. A retabulation was paid for by ES&S, the company that made the programming mistake. The mistake was undetected despite mandatory testing before and after early voting. [47]

What is supposed to happen in theory doesn't always happen in practice. In Tennessee, a computer snafu in the August 1998 Shelby County election temporarily stopped the vote count after generating wildly inaccurate results and forcing a second count that continued into the morning. State Sen. Roscoe Dixon huddled with other politicos around a single copy of the latest corrected election returns, which quickly became dog-eared and riddled with circles and "X"s.

"This system should have been checked, and it should have been known that the scanner couldn't read the cartridges," Dixon said. [48]

Here's another system they tested right before the election, but it miscounted anyway, flipping the election: Pamela Justice celebrated her re-election to the school board in Dysart, Arizona, in the March 1998 election. But the computer had failed to count 1,019 votes from one precinct. When those votes were added in, Justice lost the election to her opponent, Nancy Harrower.

"We did an accuracy test before election day and the computers worked fine," said Karen Osborne, county elections director. [49]

And if you're not yet convinced that our certification system doesn't work: A computer defect at the Oklahoma County State Election Board left more than a dozen state and county races in limbo during the 1996 general election. A final count was delayed until sometime the next morning while technicians installed new computer hardware.

Despite several trial runs with computers the week prior to the election, the problem didn't surface until 7:05 p.m. — five minutes after the election board attempted to begin its count. "That's what's puzzling about it," County Election Board Secretary Doug Sanderson said. "It's one of those deals where you can test it one minute and it's working fine, and you can test it the next and it's not."

Two hundred and sixty-seven precincts (and two close races) were involved.

"We could count it by hand, but I'm not going to do that," Sanderson said, as reported by the *Daily Oklahoman*. "We're just going to wait here until we can do it electronically, so there will be no question that the election's integrity was upheld." [50] Really.

Sometimes they omit testing key systems: The manufacturer of Baltimore's $6.5 million voting system took responsibility for the computer failures that delayed the November 1999 city election results and vowed to repay the city for overtime and related costs. Phil Foster, regional manager for Sequoia Pacific Voting Equipment Inc., said his company had neglected to update software in a computer that reads the election results. Although it tested some programs, the company did not test that part of the system before the election. Before Sequoia agreed to reimburse the city for the problems — a cost that election officials said could reach $10,000 — Mayor Kurt L. Schmoke had threatened a lawsuit against the company. [51]

After every election, you will hear this happy refrain: "The election went smoothly." More recently, as we have brought concerns to light, this has become: "Though some people expressed concerns about the voting machines, the election went without a hitch."

Here's the hitch: You won't discover miscounts until you do the audit, which does not take place on election night, and errors sometimes aren't identified until several days later, if at all.

Most errors are detected only when voter sign-in sheets are compared with vote tallies. Many of the errors listed in this chapter were found *only* because the number of votes cast did not match the number of voters who had signed in. But suppose 100 votes are cast, 55 for Mary and 45 for John, but the computer says you have 100 votes, 48 for Mary and 52 for John. John wins. How will we know the election was given to the wrong person if no one checks the paper ballots?

The California Institute of Technology and the Massachusetts Institute of Technology mobilized a team of computer scientists, human-factors engineers, mechanical engineers and social scientists to examine voting technology. Here are voting system error rates, as estimated by the Caltech/MIT Voting Technology Project report, issued in July 2001: [52]

Most lost votes — Congressional and gubernatorial races

1. Lever machines **7.6%** — 1.5% for presidential races
2. Touch-screen machines **5.9%** — 2.3% for presidential races
3. Punch card **4.7%** — 2.5% for presidential races
4. Optical scan **3.5%** — 1.5% for presidential races
5. Hand-counting **3.3%** — 1.8% for presidential races

The Caltech/MIT study omits three critical issues: programming errors, tampering and dirty politicking.

If we are going to use computerized systems, we need computer scientists to help us create safe voting systems. Dr. Rebecca Mercuri, now with Harvard University, and Dr. Peter Neumann from SRI International Computer Science Laboratory, are among the best known computer scientists in the elections field and were the first to really investigate electronic voting systems. They were joined by Dr. Doug Jones, a computer scientist from the University of Iowa, who became a member of the Iowa Board of Examiners for Voting Machines in 1994. For many years, these were the voices of reason in the mad dash to electronic voting. New faces have entered the fray within the last two years, but for more than a decade, much of the heavy lifting has been done by these three computer scientists.

They've done a stellar job, but computer scientists usually see this as a programming challenge, rather than an auditing problem or a decision about election procedures, and they tend to concentrate their attentions on touch-screen voting, though some of the most disturbing problems take place on optical-scan systems.

Because we have become over-reliant on input from this one type of expert, we have not adequately evaluated simpler, cheaper solutions, like going back to hand-counted paper ballots (perhaps using a computer as a printer, for legibility and accessibility).

Linda Franz, a voting integrity activist you'll meet later in this book, puts it more tactfully:

"Democracy builds from many pieces. We have an absolute need for accounting expertise, and part of the puzzle is the input of experts on good accounting practices. Computer scientists know the theory of plotting out the need before the design, and in current electronic voting systems, it doesn't look like the vendors have done much of that. How do we convince them that the system needs to be thought out with the input of experts in many fields?"

Current voting systems suffer from a very poor understanding of accounting, and make no mistake about it, counting the vote is a form of accounting. We also need better input from candidates and campaign managers, from historians, from legal and civil rights people, and from the officials who run the elections.

"I often see overgeneralization [believing that expertise in one area translates into wisdom in other domains] with top performers in advanced technical fields," says leadership psychologist Dr. Susan Battley, who troubleshoots for organizations such as JP Morgan Chase and Brookhaven National Laboratory. "In reality, when high achievers overlook fundamental differences in skill requirements, it courts not just failure, but disaster." [53]

We may have such a disaster with current auditing systems. We've been using inappropriate statistical models for auditing, and this model (random spot-checks of a tiny percentage of the ballots) has now become the law in many jurisdictions. This can help catch random error, but a more robust procedure is needed to detect fraud.

November 2002, Comal County, Texas: A Texas-sized anomaly on ES&S machines was discovered when the uncanny coincidence came to light that three winning Republican candidates in a row tallyied exactly 18,181 votes. It was called weird, but apparently no one thought it was weird enough to audit. [54] Comal County's experience shows why a simple, random, spot-check audit is insufficient.

Suppose you are an auditor but you must follow election audit rules. You are only allowed to spot check, and you can only look at 1 percent of the receipts. You see this:

$18,181 - Utilities
$18,181 - Advertising
$18,181 - Payroll

But you can't do anything about it, because according to the law, you can't audit any more. You have already looked at 1 percent of the receipts. If you try to pull the records on the $18,181 anomaly, party hacks object that you want to "audit and re-audit and then audit some more." A real audit allows you to look at any darn thing you want, even on a hunch, and when you spot an anomaly of any kind, you get to pull all the records.

1950s, Louisiana: Ivory tower, meet raw politics. When automated voting machines were brought into the state as a way to reduce election

fraud, then-Gov. Earl Long said, "Gimme five (electoral) commissioners, and I'll make them voting machines sing 'Home Sweet Home.'" [55]

Actually, accountants for Las Vegas casinos have better expertise on fraud-prevention techniques than computer professors. Auditors and forensic accountants are never invited onto voting system task forces or to voting symposiums, nor were they called upon to testify when the Help America Vote Act, which prescribed new voting requirements, was being written. Hint hint. Nudge.

July 1996, Clark County, Nevada: According to a *Las Vegas Review-Journal* article, a technician removed thousands of files from the tabulation sector of the program during the vote count "to speed up the reading of the count." Reconfiguring a computer program that affects the tabulation of votes is prohibited without prior state verification, but they did it anyway. [56] In a real audit, people don't get to remove part of the bookkeeping system, and in the real world, people don't always follow instructions.

November 2002, Miami, Florida: Fuzzy math in Miami? On November 10, the *Miami Herald* listed the following figures for the total votes cast at the Democrat-friendly Broward County Century Village precinct in the general election:

1994: 7,515
1998: 10,947
2002: 4,179

Yet an accountant called Century Village and was told that its occupancy had remained stable (around 13,000 residents) since the complex had hit capacity in 1998. [57]

A spot-check audit, in this case, will achieve nothing. Because there is usually no provision in the law to allow an audit based on anomalies, all a fraudster had to do was figure out a way to delete a block of votes and cook the sign-in books. Impossible, you say? Here's a five-letter method: b-r-i-b-e.

* * * * *

When a human being handles a voting system, you'll see mistakes, but when a computer handles the voting, you'll see some complete boondoggles.

November 1998, Clearwater, Florida: The voting computer crashed on election night. Republicans who lost complained that the crash could have corrupted files, skewed data or lost votes. Tom McKeon, a county commissioner candidate, said "There's no guarantee the votes went to the right candidate." Elections Supervisor Dot Ruggles said it was not the first time such a crash had occurred. [58]

March 2000, Shelby County, Tennessee: Computer problems halted the voting at all 19 of Shelby County's early-voting sites during the 2000 Republican presidential primary, forcing officials to use paper ballots (which were supposed to be provided by the voting machine company as a backup but were unavailable when needed). Election officials had to make voters wait in line or tell them to come back later. Because early voting turnout in this election was six times normal, this snafu affected about 13,000 voters. [59]

November 2000, Glenwood Springs, Colorado: At a special city council meeting held just after the election, Mayor Skramstad announced that the Garfield County Clerk and Recorder asked that he read a press release. It stated, "The Garfield County Clerk and Recorder wishes to inform the public that she is continuing to experience difficulty with the ES&S Inc. software utilized for tabulating election results. I will receive a corrected computer chip this evening. On Friday, November 10th … my office will utilize a new chip to count the ballots for Precinct 20 and re-tabulate the results … I anticipate this process will take most of the day. Thank you for your patience during this process. Signed, Mildred Alsdorf." [60]

Question: Did this new chip go through certification? Nope. The only one who knew what was on this chip was some guy in Omaha. What Mildred didn't realize when she accepted that chip was that she had just opened the door for any candidate to file a lawsuit against the county, ultimately paid for by you, the taxpayer, and guaranteed to produce a great deal of stress for Mildred, the County Clerk and Recorder.

November 2000, Allegheny County, Pennsylvania: City Councilwoman Valerie McDonald reported that machines in Pittsburgh's 12th and 13th wards and other predominantly black neighborhoods malfunctioned on Election Day. They began smoking and spitting out jammed and crumpled paper. Poll workers felt the machines had been inten-

tionally programmed incorrectly and had been sabotaged. Whether or not there was sabotage, the spit-and-polish image so carefully crafted in election company press releases didn't seem to apply to the African-American precincts that day. Poll workers in the 12th and 13th wards waited hours for repairs, and voters who couldn't spend the day at the polling place were rendered politically voiceless. [61]

February 2000, Passaic, New Jersey: About 75 percent of the voting machines in the city of Passaic failed to work when the polls opened on Election Day, forcing an undetermined number of voters to use paper ballots during the morning. Independent consultant V. Thomas Mattia, a Philadelphia voting machine supervisor who later examined the machines, concluded the problem was due to sabotage, which led a Democratic candidate to refer the matter to the FBI.

For no discernable reason, Mattia later reversed himself.

"I believe that it was an oversight, and there was no fraud involved," Mattia stated in a letter.

Freeholder James Gallagher, who had referred the matter to the FBI based on Mattia's previous suspicions, said that he was surprised by the reversal and needed more information about why the expert had changed his mind. [62]

November 2002, Tangipahoa Parish, Louisiana: "I can't say every precinct had a problem, but the vast majority did," Tangipahoa Parish Clerk of Court John Dahmer said. He reported that at least 20 percent of the machines in his parish malfunctioned. "One percent might be acceptable, but we're not even close to that," Dahmer said. He said 15 employees worked to combat the malfunctions. [63]

November 2002, Maryland: Vote Republican (read "Democrat") — In Maryland, a software programming error on Diebold touch-screen machines upset a lot of voters when they saw a banner announcing "Democrat" at the top of their screen, no matter whom they voted for. [64]

November 2002, New Jersey: Forty-four of forty-six machines malfunctioned in Cherry Hill, New Jersey: Election workers had to turn away up to 100 early voters when it was discovered that 96 percent of the voting machines couldn't register votes for mayor, despite the machines' having been pretested and certified for use. [65]

November 2002, New Jersey: "What the hell do I do with this?" A bag full of something that looked like rolls of cash register tapes was handed to the Mays Landing County Clerk. A computer irregularity in a New Jersey vote-counting system caused three of five relay stations to fail, leaving a single county clerk holding the bag for a hand count. [66]

November 2002, Ascension Parish, Louisiana: An elections official gnashed his teeth as more than 200 machine malfunctions were called in. The Parish Clerk said his staff was on the road repairing machines from 5 a.m. to 9 p.m. In one case, a machine wasn't repaired until 12:30 a.m. Wednesday. "A mechanic would fix a machine, and before he could get back to the office, it would shut down again," Bourque said. [67]

November 2002, Ohio: A voting machine malfunctioned with 12 of Crawford County's 67 precincts left to count. A backup vote-counting machine was found, but it also could not read the vote. Election workers piled into a car and headed to another county to tally their votes. [68]

November 2002, Pickens County, South Carolina: Pickens County couldn't get totals from two precincts because of computer problems. [69]

November 2002, Georgia: Fulton County election officials said that memory cards from 67 electronic voting machines had been misplaced, so ballots cast on those machines were left out of previously announced vote totals. Fifty-six cards, containing 2,180 ballots, were located, but 11 memory cards still were missing two days after the election. Bibb County and Glynn County each had one card missing after the initial vote count. When DeKalb County election officials went home early Wednesday morning, they were missing 10 cards. [70]

What is a memory card? It's a ballot box. Electronic ballot boxes for the Diebold machines used in Georgia are about the size of a credit card. With the new electronic voting systems, you can pocket a dozen ballot boxes at once, slip one up your sleeve or tote 67 ballot boxes around in your purse.

An interesting (and suspicious) anomaly appeared with these missing electronic ballot boxes. I interviewed a Georgia computer programmer named Roxanne Jekot for this book. When Jekot quizzed Dr. Brit Williams, official voting machine certifier for the state of Georgia, during an August 22, 2003, public meeting, Williams explained that the memory

cards were not lost, but had inadvertently been left in the machines.

Really? Something appears to be missing in this explanation. The procedure in Georgia for transmitting electronic votes from Diebold touch-screens is as follows: If you have seven voting machines at a polling place, each one has a memory card which stores its votes. You take all seven cards and, one by one, put them into a single machine, which accumulates them and runs a report. When votes from all seven machines are accumulated, they are transmitted to the county tabulator. A printout of the accumulated results is run, and this is placed in an envelope with the memory cards. The envelope is then sealed, signed and delivered to the county.

Jekot raised this excellent question: If the votes are accumulated from all cards before transmitting to the county, this means all the votes would be transmitted as one batch. So why did 2,180 more votes show up when individual cards were "found" inside the machines?

I also have this question: If the procedure is to accumulate, print the report, place it into an envelope with cards, seal the envelope, sign it and then take it to the county, how is it that different people, at different polling places, forgot to do this 67 times in the same county?

Perhaps we should look into the Georgia election a little more.

* * * * *

November 2002, Nebraska — This example shows, I think, just how far we've deviated from the concept of fair and open election procedures. Paul Rosberg, the Nebraska Party candidate for governor, eagerly took advantage of a Nebraska law that lets candidates watch their votes being counted. He first was invited to watch an optical-scan machine, which had no counter on it, and then was taken into the private room, where he was allowed to watch a computer with a blank screen. So much for public counting of votes. [71]

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"Take the rest of the examples out or put them in an appendix — this is just completely overwhelming," said an editor. So I did. All in all, I documented 100 of these examples, and could have continued for another 100 had space allowed, and our ability to tolerate this outrage permitted. See Appendix A for a continuing compendium.