Statistical Proofs of Election Fraud in Arizona: Election 2004

David L. Griscom, Ph.D.
http://www.impactglassresearchinternational.com/
23 January 2008

I. Prologue

This essay explains in layman's terms how some relatively simple mathematical analyses applied to public records can prove fraud in the event that insiders should massively steal our votes. But it is more than dry numbers. This is the story of a Ph.D. and an eighth-grade dropout whose paths crossed for the first time in the run-up to the 2004 General Election. There were easily 100 prospective turn-out-the-vote canvassers milling about the room, all waiting to be indoctrinated by a team of MoveOn organizers. Lost in his thoughts, John Brakey wasn't particularly sociable that morning, but he exuded an aura of a man possessed by great purpose. So the Ph.D. followed him across the room to ask for his coordinates. Neither could imagine in that fleeting moment the incredibly synergistic collaboration they were soon to embark upon ...some history of which you will learn below. But history is always much larger than any two actors on its stage, and indeed many other concerned Arizonans had already joined, or soon would join, in the battle against those who would steal our elections [1].

II. John Brakey, Master Sleuth of Election Fraud

On 2 November 2004, John R. Brakey was Democratic Cluster Captain for four precincts in Arizona Legislative District (LD) 27, a part of the predominately-Hispanic, 80% non-Republican Congressional District 7. LD 27 encompasses a part of Pima Country southwest of the city of Tucson. John was new to the job, but he knew that part of his duties – and his prerogative – was to pick up carbon copies of the hand-printed list of voters who had already cast their ballots. This poll-worker-filled-out form is called the Consecutive Number Register (CNR). Poll workers in three of John's four precincts greeted him with hostility, and in one case they attempted to conceal the existence of several completed CNR pages for which he was requesting copies.

About two hours after the official closing time, he returned to his home polling place, a school located in Precinct 324, to see if he could pick up a final copy of the CNR. To the shock of everyone present, he walked in on the poll workers apparently in the act of altering this document ...which should have been completed at the time of the arrival of the last voter. John also observed the vault of the Diebold optical-scan voting machine to be open, instead of being locked shut as it always should be. When he approached to see what they were doing, the poll workers rose to their feet in unison, cursing him and

telling him to get out [2]. John beat a hasty retreat after the woman he had observed impeding voters all day long (by hobbling around the room as though crippled) began to circle behind him brandishing her club-like cane like a weapon.

The next morning John happened to catch Greg Palast on Democracy Now urging election sleuths to go to their polling places and pick through the trash for possible evidence of chicanery. John did just that. But finding nothing in the trash outside, he wandered into the school library where the voting had taken place and noticed several boxes. One was unsealed and held 924 "Advice to Voter" slips, which he had seen the poll workers working with the night before. He stuffed these into his jacket and left. These slips turned out to be the key to proving what these poll workers had been up to.

From that moment on, figuring out exactly what had just transpired became John's all-consuming passion. He abandoned his bread-winning job and began working 18-hour days gathering and entering into Excel spreadsheets all available public records bearing on the voting at Tucson Precinct 324 on Election Day 2004. I soon joined him in the forensic analysis these records, the results of which I ended up presenting as PowerPoint lectures at the National Election Reform Conference in Nashville, TN, April 9, 2005, the Election Assessment Hearing in Houston, TX, June 29, 2005, the Election Integrity Workshop held at a meeting of the Arizona Democratic Committee, Flagstaff, AZ, August 20, 2005, and a session entitled "Are We a Democracy? Vote Counting in the United States" at the 2007 Annual Meeting of the American Association for the Advancement of Science (AAAS), in San Francisco, February 16, 2007.

So what did we find that was so important to warrant presentation in so many venues? Well, it eventually became clear that the poll workers at Precinct 324 were making, and causing voters to make, great numbers of errors in the "poll books" (public records of Election Day generated or managed by the poll workers, including the Signature Rosters where the voters are supposed to sign in). These were types of errors that experienced poll workers almost never make. It took John and me an aggregate of about 2,000 hours to discern and interpret all of these irregularities. Our story can be found in the abstract for my AAAS Meeting presentation (Appendix) and also in my actual PowerPoint [3].

It turns out that the two head poll workers at Precinct 324 on 2 November 2004, the Reverend Benjamin Khan and his wife, each had at least 10 years experience and certainly knew better than to make such errors. Yet the poll books show that they made seven different kinds of errors *exactly 11 times each.* If those errors had been truly random (for example, if they were due to incompetent bumbling) then mathematicians, physicists, and gamblers would be quick to tell you that the odds of all seven having happened exactly 11 times each are very much less than *one in 20 million*! Therefore, the only possible conclusion is that the Khan team made these errors deliberately. But why? Well, the only reason we could think of was to steal votes by stuffing the ballot box according to a well-practiced system involving (1) creation of one of each kind of poll-book "error" about once every hour and (2) performance of one illegal ballot manipulation corresponding to each of these "errors." Such a system would have had the

advantages of (a) spreading out the ballot manipulations throughout the 12-hour Election Day and (b) leaving behind a record in the poll books believed by the system's originators to be so confusing that even the likes of Sherlock Holms would have had great difficulty reverse-engineering their scheme before their corrupted Presidential Election results became official upon the meeting of the Electoral College.

John and I failed to make that deadline, but we did make another one: the 6 January 2005 Joint Session of Congress. We are pretty sure that our story of poll-worker fraud in Arizona was brought to the attention of Senators McCain, Kerry, Kennedy, and Boxer. So, maybe, just maybe, we were part of the reason why Senator Barbara Boxer (CA) resolved to stand up with Representative Stephanie Tubbs Jones (OH) and other House Democrats at the Joint Session to challenge the 2004 presidential vote in Ohio [4].

Otherwise, John filed a complaint against the Khans with the Pima County Attorney's office ...which was eventually dismissed after the Pima County Elections Director reportedly fired the Khans for "incompetence" – *the one possibility with much less than one chance in 20 million of being true!*

So how many votes might the Khans have gotten away with stealing? My most conservative estimate based on the 2 November 2004 Precinct 324 poll books is **a 6.9% net vote shift based on the assumption that the poll workers utilized no more blank ballots than those officially issued to them**. However, extra ballots would have been easy enough to obtain, because at that time anyone in Pima Country could request up to two replacement Mail-In ballots before the Election *without returning a spoiled one*. (John Brakey's wife actually spoiled hers and was sent another, no questions asked.) In my AAAS PowerPoint [3] I inferred a larger shift of 12.8% – recently corrected [5] to **11.5%. This number derives from documentary evidence implying that the poll workers at Precinct 324 (1) handed out 22 illicitly obtained blank ballots to voters who signed a roster on Election Day but whose names don't appear on the CNR, (2) destroyed these 22 ballots** (presumably for Kerry) **after voters had marked them, and (3) cast 19 illicit ballots** (presumably for Bush) **in the names of voters appearing on the CNR but *who did not sign any roster*.** Furthermore, they admitted on the Official Ballot Report and Certificate of Performance (signed by all seven of them) that **"[It] appears 3 extra ballots – not sure why!"**

Early on, John Brakey realized that election insiders had the motive, means, and opportunity to *hack* the 1.94w memory cards of the Diebold optical scanners and/or the GEMS central tabulators. He thus reasoned that the Khan team must have been stuffing the ballot box against the possibility of an audit being required ...in which case crooked elections officials would be standing by to "randomly" select precincts like #324 as the only ones to audit. *Such a ploy would have created the illusion that the election was honest.* John termed this two-pronged attack the **"Hack and Stack"** [6].

III. Mail-In Ballots: An Invitation to the Perfect Crime

I have been told that only two States in the Union have laws on their books allowing for recounts of Mail-In ballots. Obviously, if Mail-In votes should be stolen, it would be the perfect crime.

So who witnesses or otherwise assures the integrity of the Mail-In ballots we cast? I don't know about other places, but every Election Day for a decade or so prior to 2004, the 8th floor of the Pima County Building, where the Mail-In ballots are stored, was closed by the police bomb squad at the time of their counting. This old Pima County "tradition" is an eerie precedent for what happened in Warren County, Ohio, on Election Night 2004, when county officials locked down the administrative building and prohibited independent observers from watching the vote count, supposedly because an FBI agent had reported a terrorist threat [7].

Table 1 shows the official results of Election-Day-2004 voting for John Brakey's entire Legislative District (LD 27). Note that the ever-vulnerable Mail-In vote exhibits 2.4% *fewer* Bush votes than he received in the At-the-Precinct voting, while Kerry got 2.7% *more*. So, it might seem that the Mail-Ins had actually been stolen on Kerry's behalf.

But things are not always as they seem...

Table 1.

Averages of 63 Precincts of AZ LD 27	Kerry/Dem	Bush/Repub	Other
E2004 At-Precinct Voting	61.9%	37.0%	1.0%
E2004 Early/Mail-In Voting	64.6%	34.6%	0.9%
Party Registration	48.8%	20.6%	30.6%

IV. New Evidence that They Hacked the *At-the-Precinct* Vote in 2004

After nearly two years of assuming I had done all I could by way of exposing election fraud in Pima County, I was inspired to return to the Excel spreadsheets of 2004 Election data compiled by John Brakey *for all 63 precincts* of Arizona LD 27, comprising 81,979 predominately-Hispanic, 80%-non-Republican registered voters ...who somehow seemed to vote 36% for Bush, even with an amazing 74.2% turnout!

My idea was to take a deeper look at the relative presidential vote shares in the three permissible forms of voting on Election Day 2004: (a) Provisional, (b) At-the-Precinct, and (c) Mail-In. My operating hypothesis was that the presidential voting patterns may vary from precinct to precinct, but *within the same precinct* the Kerry (and Bush) vote shares (expressed as percentages of the total) should be virtually identical in each of these three voting forms. Stated in another way, the ratios of the Kerry's (and Bush's) percentage vote share of form (a) to that of form (b) to that of form (c) should be very close to 1.0 to 1.0 to 1.0 for large enough voting units *...provided the election was not Hacked in one or two of these three forms*.

However, I felt the need to test this supposition in some way or other. Here is how I went about it:

First, it seems safe to assume that those Provisional Ballots *actually accepted* by the County Registrar of Voters are virtually 100% honest, since each was sealed in an envelope with a voter signature and printed name and address on an affidavit affixed to the outside. For such a ballot to be accepted, the Recorder must recognize that the signer of the affidavit is a voter registered to vote in that precinct, that he/she appeared at the correct polling place on Election Day to fill out his/her Provisional Ballot, and that he/she did not vote early (or elsewhere on Election Day).

So I hoped it might be possible to use the Provisional Ballots as a benchmark for the way folks truly voted [8]. The first thing I tried was to take the ratios of the presidential vote shares of Provisional ballots to the corresponding same-precinct Mail-In shares. Figure 1 displays the individual-precinct Provisional-Ballot-to-Mail-In ratios of the Bush shares, while Figure 2 shows the corresponding ratios for the Kerry shares.

Next I used the mathematical curve-fitting software that came with my graphing program to obtain the continuous horizontal lines in Figures 1 and 2 as the best fits of these data [9]. Lo, each of these fits agreed with my "null hypothesis" that in an honest election these ratios should equal 1.0 (represented by the horizontal *dashed* line) within the 95% confidence limits concomitantly generated by my software (the pair of curved lines above and below the fitted line). Thus, to my surprise, I was forced to conclude that the vast majority of the Mail-In ballots were probably *not* Hacked.

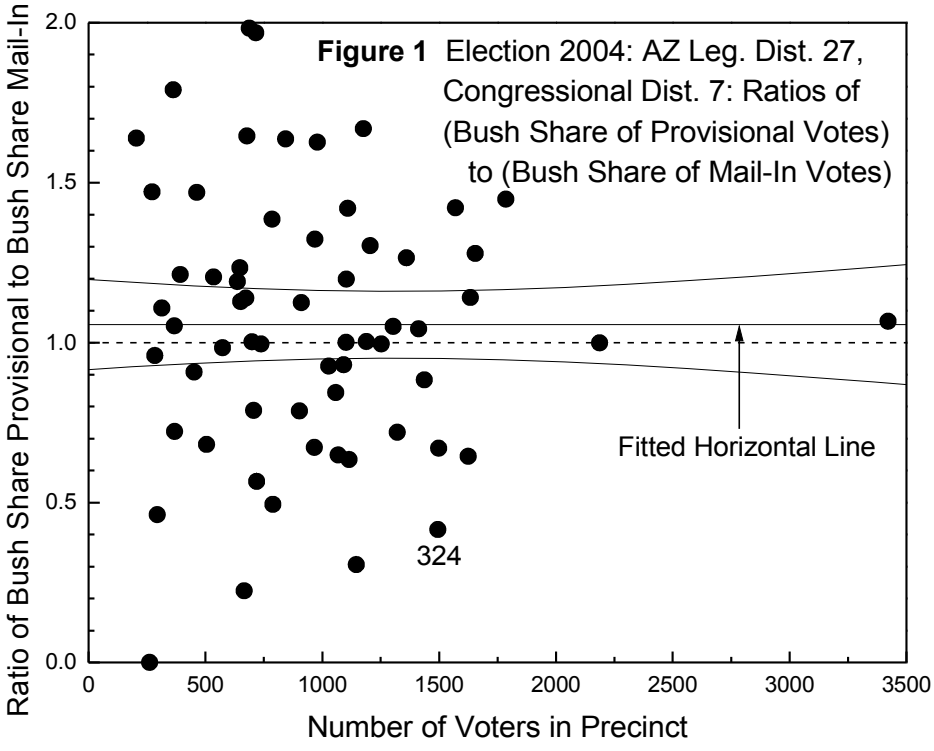


Figure 1 Election 2004: AZ Leg. Dist. 27, Congressional Dist. 7: Ratios of (Bush Share of Provisional Votes) to (Bush Share of Mail-In Votes)

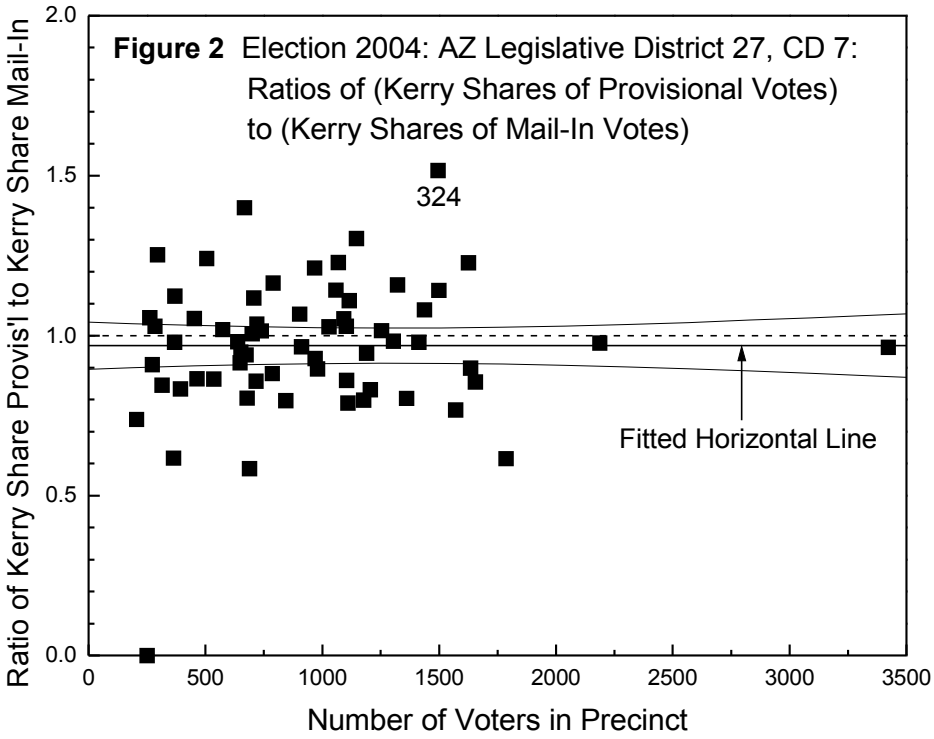


Figure 2 Election 2004: AZ Legislative District 27, CD 7: Ratios of (Kerry Shares of Provisional Votes) to (Kerry Shares of Mail-In Votes)

But I still wanted to look at the ratios of the At-the-Precinct data to the statistically-significant (and now shown to be mostly honest) Mail-In data. And, guess what? We see in Figure 3 that Bush's ratios of his At-the-Precinct vote shares to his (mostly honest) Mail-In shares are shifted on average 11.5% in his favor, and this time the shift is *well outside of the 95% confidence limits* pertaining to the fitted horizontal line!

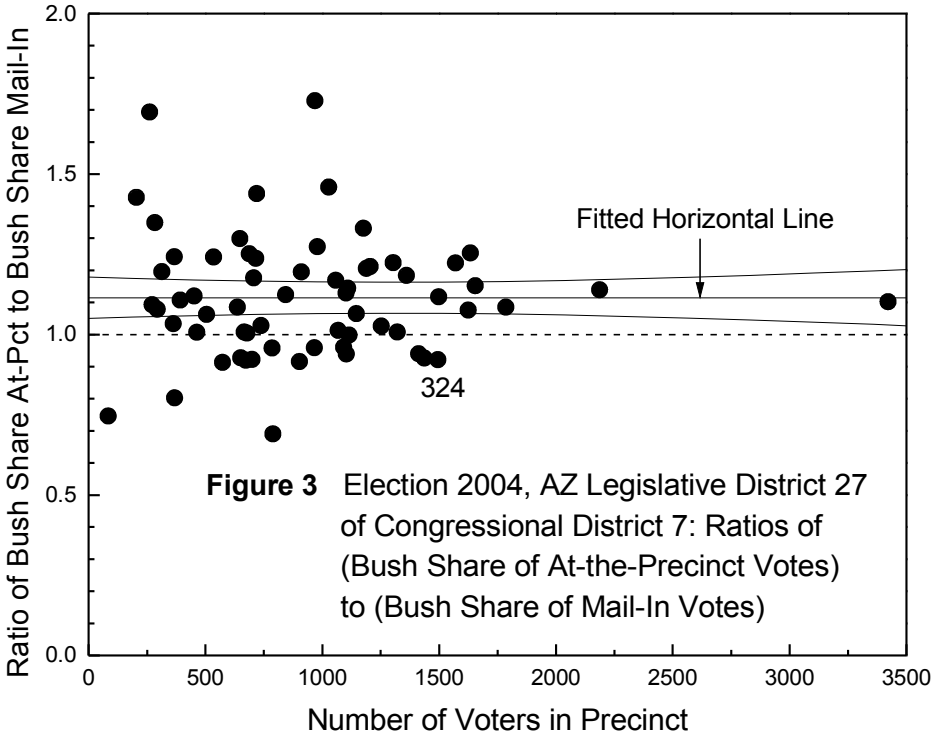
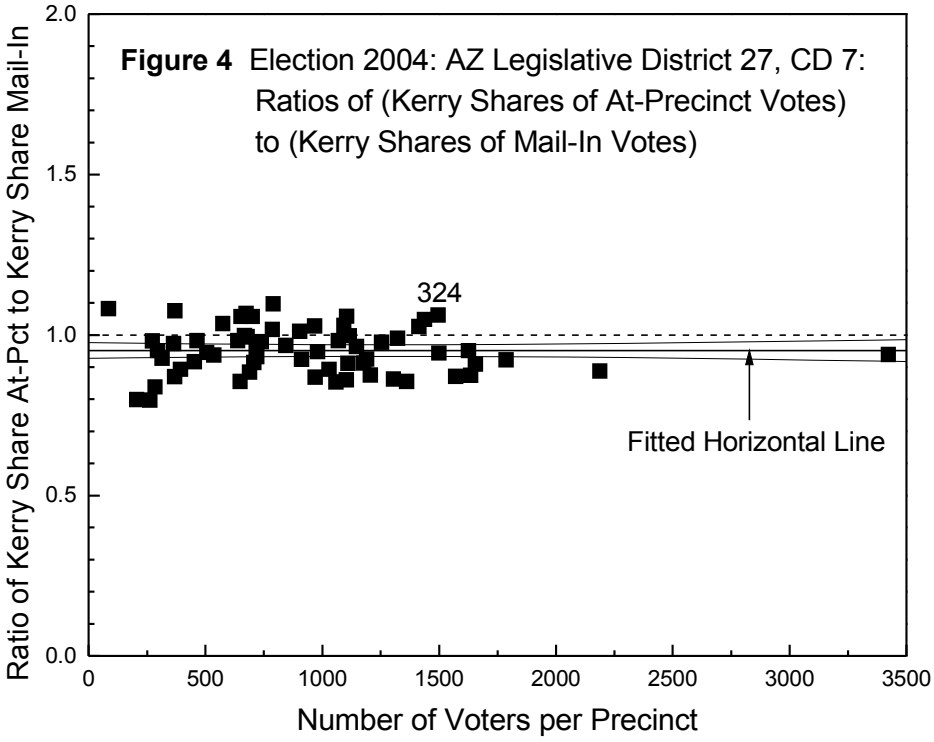


Figure 3 Election 2004, AZ Legislative District 27 of Congressional District 7: Ratios of (Bush Share of At-the-Precinct Votes) to (Bush Share of Mail-In Votes)

In Figure 4 the ratios of Kerry's At-the-Precinct vote shares to his (mostly honest) Mail-In shares are seen to be shifted an average of 5% against him, again *outside the 95% confidence limits*. I believe that the four graphs I have just shown you constitute sufficient proof that the *At-the-Precinct vote* at AZ LD 27 was *Hacked* – that is, stolen for Bush by insider implantation of vote-flipping codes in the 1.94w memory cards of the Diebold optical scanners and/or by alteration of the totals in the Diebold GEMS central tabulators by Pima County election officials.



V. Precinct 324: Doing the Numbers on the Registered Voters Who Expressed No Party Preference

A critical reader might well ask: Couldn't the poll workers at John Brakey's Precinct 324 have been stealing votes on *Kerry's* behalf, given the positions of the Precinct-324 data points labeled in Figures 3 and 4? Well, let's take a closer look at the data. Table 2 breaks out the actual 2004 At-the-Precinct and Mail-In vote shares of Kerry and Bush at Precinct 324.

Table 2.

Precinct 324 of AZ LD 27	Kerry/Dem	Bush/Repub	Other/NOP
E2004 At-Precinct Voting	56.9%	41.6%	1.6%
E2004 Early/Mail-In Voting	53.6%	45.1%	1.3%
Party Registration	47.1%	21.5%	31.5%

Now let's look at what happens when we subtract the LD-wide-average data shown in Table 1 from the corresponding data of Table 2. In Table 3 we see that Kerry did

stunningly *worse* (and Bush correspondingly much better) at Precinct 324 than the *average* for the entire Legislative District 27 – in particular, there was **a net *Mail-In* shift of 19.0% in Bush's favor** (after correction for the lower-than-average Democratic party registration)!

Table 3.

Difference (Pct 324) - (LD-27 Average)	Kerry/Dem	Bush/Repub	Other/NOP
E2004 At-Precinct Voting	-5.0%	4.5%	0.5%
E2004 Early/Mail-In Voting	-11.0%	10.6%	0.4%
Party Registration	-1.7%	0.8%	2.4%

Let me explain this kind of "vote shift" calculation by using the Precinct-324 At-the-Precinct vote shares as the next example. In the first row of Table 3 we see that Kerry has a 5.0% *smaller* (negative) At-the-Precinct vote share than his LD-27-wide average. We also see that Bush has a 4.5% *larger* At-the-Precinct share than his LD-27-wide average. To get the "gross shift" of votes from Kerry to Bush, we subtract the number in the Kerry column from the number on the same row in the Bush column. This yields a **gross *At-the-Precinct* shift of 9.5% in Bush's favor.** (Remember, in Table 3 we are measuring all shifts *relative to the LD-27-wide average*.)

However, if we wish to improve our accuracy, we really ought to correct for the fact that there were 1.7% fewer registered Democrats at Precinct 324 and 0.8% more registered Republicans *than was the case for the average LD-27 precinct* (third row of Table 3). But for purposes of making any "correction" based on party registration we have no choice but to first make a "modest assumption," namely, that all registered Democrats voted for Kerry and all registered Republicans voted for Bush (or the numbers of cross-over voters were exactly equal). Then, to make the proposed correction under this assumption, we take the shift of party registration (in this case in Bush's favor) at Precinct 324 *relative to the LD-wide average* (1.7+0.8 = 2.5%) and subtract it from the gross At-the-Precinct Kerry-to-Bush shift *relative to the LD-27-wide average* (9.5%) to get **the net At-the-Precinct shift that might be the result of fraud (7.0%)**.

In the discussion below I will begin using the jargon "red shift" and the acronym "NOP." By a "red shift" I mean a shift favoring Bush (a Kerry loss plus a Bush gain *adding to a positive number*), and by a "blue shift" I mean one that favors Kerry (a Kerry gain plus a Bush loss adding to a positive number). I will use "NOP" to denote, not only the voters who registered as "No Party Preference," but also those very few registered as third-party voters.

Subject to our "modest assumption," one may calculate the percentages of NOP voters who cast their votes for each candidate. Consider Bush's Precinct-324 At-the-Precinct share of 41.6% in Table 2. If we subtract from this the Republican-Party registration of 21.5%, we get a number, 20.1%, which (under our assumption) is the percentage of all voters at Precinct 324 on Election Day 2004 who voted for Bush but were neither Republicans nor Democrats. Therefore, this percentage must have been drawn from the pool of voters that I lump together as "NOP." So, let's take the ratio of this number to the percentage of *all voters* (no matter who they voted for) who were

registered NOP (or third party), seen from Table 2 to be 31.5%. Expressed as a percentage, 20.1% divided by 31.5% is 64% – an unexpectedly large percentage of NOPs voting for Bush …in my view.

Still, the devil's advocate (and Karl Rove) would argue that all red shifts resulted from NOP voters at Precinct 324 – *and* LD-wide – who simply decided to vote for Bush in large numbers. Their reasons for this might have been as trivial as having watched a "Swift Boat" attack on Kerry or as visceral as a deep fear that Kerry would defend them less well against "the terrorists" than Bush did on 9/11/01 (if that were possible).

So, *were* the NOPs in John Brakey's predominately-Hispanic precinct rabidly pro-Bush in that moment? Not according to the canvasses that John and I carried out just a few days before the Election. I recall encountering very few Bush voters among those NOPs and infrequently-voting "turnout" Dems that I canvassed. Unfortunately, however, our canvass sheets were lost before we could total them up. So we have no objective pre-polling numbers for that part of Tucson.

Nevertheless, I did retain the results of my own canvass (for MoveOn) of several more-affluent, less-Hispanic, and more-Republican neighborhoods of Arizona Congressional District 8, in the Catalina foothills 18 miles to the northeast of Precinct 324. Of the 115 individual NOPs and "turnout" Democrats I interviewed, 95 were certain of, or leaning toward, voting for Kerry, while only 6 had any intentions of voting for Bush!

Now let me put these numbers in perspective. I conducted what might be regarded as a statistically significant poll of a predominately-WASP upper-middle-class Tucson neighborhood and found that ***83%* of the NOPs and turnout Dems intended to vote for *Kerry* and only 5% planned to vote for Bush!**

So if you should persist in believing that 64% of the At-the-Precinct and 75% of the Mail-In NOP voters in predominately-Hispanic, less-affluent Precinct 324 really voted for *Bush*, I'll sell you the Brooklyn Bridge!

VI. Were Other Precincts Affected in the Same Way as Precinct 324?

On the basis of the above evidence, I concluded that **the *Mail-In* votes *for Precinct 324* were *Hacked*.** So, the next question becomes: In how many other precincts can the Mail-In vote have been Hacked? It cannot have been too many, given that Figures 1 and 2 show that the LD-wide *average* Bush and Kerry shares of the Provisional Ballots (presumed honest) are equal to their corresponding average shares of the Mail-In ballots within 95% statistical confidence.

I decided that two of the prime candidates for investigation were the other two precincts (numbers 271 and 235), where John Brakey encountered poll workers behaving peculiarly and/or reacting hostilely to his legitimate presence on Election Day 2004.

Tables 4 and 5 show the official results for Precincts 271 and 235, respectively, *presented in terms of their differences from the LD-wide averages* (exactly analogous to Table 3).

Table 4.

Difference (Pct 271) - (LD-27 Average)	Kerry/Dem	Bush/Repub	Other/NOP
E2004 At-Precinct Voting	1.9%	-1.2%	-0.7%
E2004 Early/Mail-In Voting	-2.6%	2.8%	-0.2%
Party Registration	5.0%	-2.7%	-0.8%

We see in Table 4 a 3.1% gross "*blue* shift" in the At-the-Precinct voting and 5.4% gross red shift in the Mail-Ins. But when we take into account the net 7.7% party registration advantage enjoyed by the Democrats over the Republicans of Precinct 271, we arrive at the following corrected numbers relative to the average for LD 27: a 4.6% net At-the-Precinct *red* shift (no longer blue) and a hefty **13.1% net red shift in the Mail-Ins**.

Now let's look at Precinct 235. In Table 5 we see a 2.3% net red shift in the At-the-Precinct voting and whopping **13.8% net red shift in the Mail-Ins** (both taking into account the tiny 0.2% correction for party registration).

Table 5.

Difference (Pct 235) - (LD-27 Average)	Kerry/Dem	Bush/Repub	Other/NOP
E2004 At-Precinct Voting	-1.5%	0.6%	0.9%
E2004 Early/Mail-In Voting	-7.5%	6.1%	1.4%
Party Registration	0.0%	-0.2%	1.7%

Remember that in Section V we found a **19.1% net red shift in the Mail-Ins** at Precinct 324.

Clearly, Pima County officials were Hacking the *Mail-In* votes at all three of the precincts where we know (# 324) or suspect (#s 271 and 235) that poll workers were Stacking (stuffing) the ballot box.

So, let's try to guess the name of their program. How about...**"No Precinct Left Un-Hacked"**

VII. Summing Up Election Day 2004 in Arizona Legislative District 27

Here is my summation of what apparently went down in LD 27 on Election Day 2004. It's a kind of scenario that election integrity activists refer to as **"wholesale election fraud"** to distinguish it from insignificant mom-and-pop **retail "voter fraud"** (for which nine Federal Attorneys were fired for refusing to prosecute in the run-up to the 2004 Election):

There was a conspiracy comprising (1) **insiders** with digital access to the 1.94w memory cards in the Diebold AccuVote OS optical scanners and/or to the GEMS central

tabulators, and (2) **a cadre of colluding poll-workers**, including the crew headed by Rev. Khan at Precinct 324. Their overall plan was to Hack the *At-the-Precinct* vote at all precincts *except* the ones manned by poll workers whose job it was to Stack (stuff) the ballot boxes at those polling places. (We saw above that for some reason they decided to Hack the *Mail-In* vote in the Stacked precincts.)

With regard to *Precinct 324*, recall from Section V that the net red shift in the At-the-Precinct votes was "just" 7.0 %, that is, less than John Brakey's and my *maximum* prediction (Section II). But bear in mind that (1) all of the red shifts discussed in Sections V and VI are *with respect to the LD-27-wide average*, (2) the LD-wide average At-the-Precinct vote is itself 5.1% red shifted with respect to the LD-wide average Mail-In vote (Table 1), and (3) the Mail-In vote was shown in Section IV to have been (largely) uncorrupted. So, it is logical to arithmetically add (a) the 5.1% red shift of the LD-wide At-the-Precinct vote with respect to the putatively-honest LD-wide Mail-In vote to (b) the 7.0% net red shift in the Precinct-324 At-the-Precinct vote with respect to the LD-wide average At-the-Precinct vote to obtain (c) a **"*total* Precinct-324 At-the-Precinct red shift."** This result, 12.1%, is close to the value of 11.5% [5] *independently estimated from John's and my study of the Precinct-324 poll books* as the amount of vote flipping the Khan team could have accomplished assuming they had at their disposal 44 illicitly-obtained blank ballots, utilized 41 of them, and then faked innocent puzzlement over the fact that they had 3 extras left over (Section II).

In other words, *my totally independent "outside-in" calculation of At-the-Precinct election theft at Precinct 324 gives the same answer* (within standard statistical error [10]!) *as does John's and my "inside-out" deduction of the maximum vote shift the Khan team could have contrived by running their system* – **a system that we reverse-engineered in detail by forensic analyses of their own poll books!**

QED [11]!

VIII. A New Way to Spot the Frauds in a Forest of Data

One of the things that I've learned in my 41 years as a research physicist is that the meaning of one's data is best understood – and communicated to others – by finding the most revealing ways to graph them. So I tried out many different possibilities for plotting the 2004 Presidential-Election data for the 63 precincts of Arizona Legislative District 27. Most of these attempts failed to "speak to me." But then one day I came up with the winner! This type of graph represents the same information as is contained in Figures 3 and 4 but all in a single plot – *one that spotlights vote-flipping fraud.*

In Figure 5, I've plotted Kerry's At-the-Precinct vote shares *minus his Mail-In shares* – each expressed as a percentage of the total Kerry-plus-Bush vote shares in the respective voting form – on the vertical (y) axis versus the corresponding subtraction of data for Bush's shares on the horizontal (x) axis. Thus, each solid black square represents

the **At-the-Precinct-minus-Mail-In *differences* of *both* candidates' vote shares for one entire precinct**.

To help interpret Figure 5, I've added a straight line of slope of -1.00 passing through the origin (x=0, y=0). Although not a mathematical fit, this line appears to describe the data pretty well. But what does it mean? In principal, it's a *vote flipping curve*. This means that if a data point at the origin were to represent a completely honest election, then, for example, flipping some At-the-Precinct votes from Kerry to Bush would move that point down the straight line of slope -1.00 into the lower-right quadrant of Figure 5 – *very much like the data points we actually see there*.

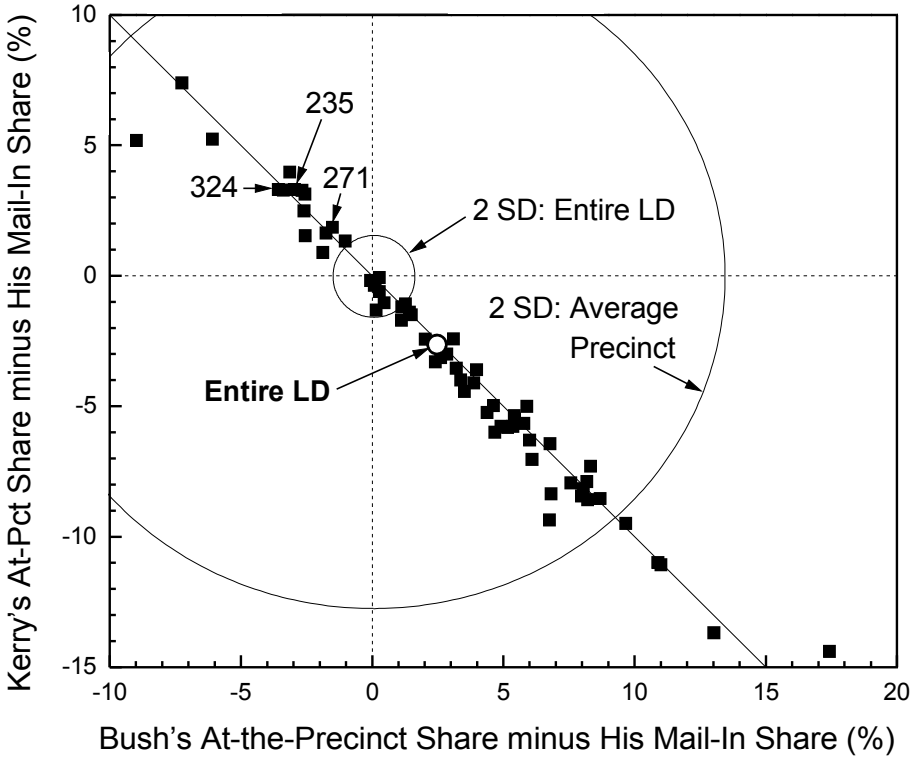
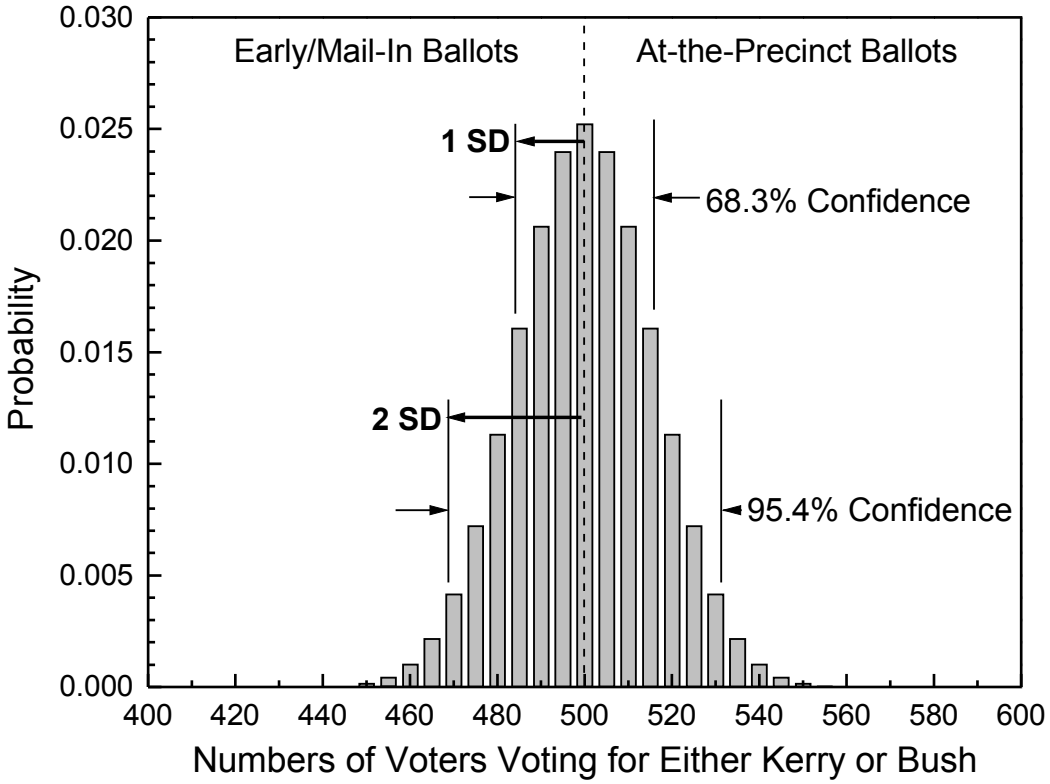


Figure 5. (see caption p. 22)

Still, fraud cannot be proven before calculations are done to determine the extent to which the positions of these data points might possibly have resulted from statistical effects. It turns out that the Binomial Distribution Function [12] is perfect for this job. It treats random systems with only two possible outcomes, such as "heads or tails," "Kerry or Bush," or "Mail-In or At-the-Precinct." However, *people do not make random decisions regarding who to vote for as president!* So with "Kerry or Bush" thus ruled out, we deduce that *"Mail-In or At-the-Precinct" is the one and only source of whatever randomness may be manifested in the data of Figure 5*.

Accordingly, I generated the Binomial Distribution of Figure 6 with the aid of a handy web-based calculator [12]. This "bell curve" gives the probabilities of x number voters at a hypothetical 1,000-voter precinct casting their ballots by Mail-In and 1,000-x

Figure 6. Predicted Statistical Variations of Kerry and Bush Vote Shares between Mail-In and At-the-Precinct Balloting



voting At-the-Precinct, assuming the average individual to have a 50% probability of selecting the one mode or the other [13] and that Provisional balloting is not an option.

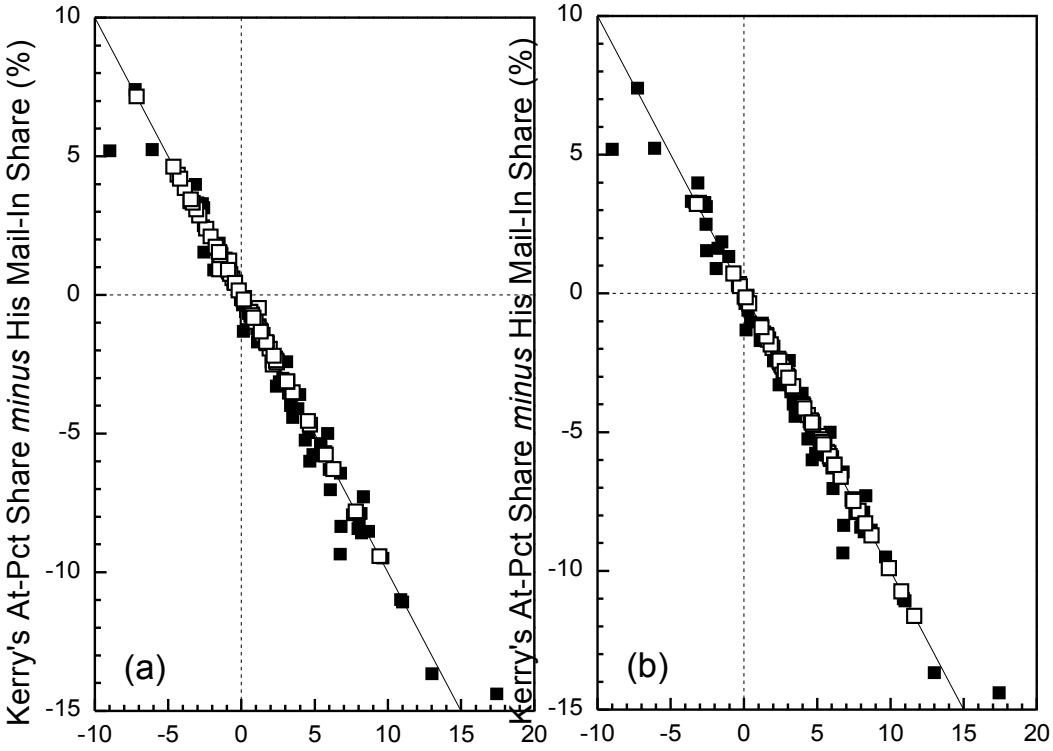
For most practical purposes it is seldom necessary to calculate the entire bell curve; rather, the so-called Standard Deviation (SD) is often all that is needed. It is well established that there is a 0.683 probability that any real-life outcome will fall between ±1 SD and a 0.954 probability that any real-life outcome will fall between ±2 SD. Thus, as indicated in Figure 6, the range ±2 SD defines the "95% confidence limit."

But my final objective was to use this type of bell curve for a subtly different purpose. That is, I wanted to determine the expected *no-fraud* statistical variances between Kerry's and Bush's Mail-In vote shares and their respective At-the-Precinct vote shares by treating the total number of Mail-In-plus-At-the-Precinct ballots as a fixed *historical number* and the ratio of the Mail-Ins to this total to be an *historical probability* [13]. This enabled me to overlay the two "95% confidence" circles on Figure 5 [14].

However, to be sure that I understood the implications of Figure 5, I wanted to simulate some elections. To do this, I first searched the web for a Binomial Random Number Generator [15]. Then I used the historical Election-Day-2004 data for Arizona LD 27 to define the total numbers of Bush and Kerry ballots actually cast (n_{0B} and n_{0K}, respectively) and the probability (p_0) of anyone casting a Mail-In ballot *for each of the 63 precincts* [13, 16]. Next, I generated a single Binomial-Distribution-based random

variation in the difference between the Mail-In and At-the-Precinct shares for Kerry and a single one for Bush, separately for each precinct. And, finally, I used each precinct-specific pair of Kerry and Bush numbers to generate a single synthetic "data point" on the same type of graph as Figure 5. I give the full details of these probability-based "Monte Carlo" calculations in footnote [17].

The hollow squares in Figure 7(a) represent a simulated honest election in LD 27 [18, 19]. The black squares are the same 2004 LD-27 individual-precinct historical tallies as shown in Figure 5. To get the simulated results of Figures 7(b), I began with the fair election of Figure 7(a) but then flipped 5% of Kerry's *At-the-Precinct* votes to Bush [20]. This is exactly the kind of operation that appears to have been executed by the operator of the Pima County election computer operator on 2 November 2004, according



to all of the evidence that I have reviewed and analyzed in this chapter. Indeed, the simulated flipped-vote data of Figure 7(b) appear to match the actual data better than the honest-election simulation.
Figure 7. (see caption on page 22)

However, as of this writing, I have done only one Monte Carlo calculation of each type. So it is safe to say that research using the system I describe here is still in its infancy and that its future exploitation will likely draw out stronger conclusions than the ones I reach below.

So what can be said about my present cursory results? Well, first, I've determined that the *median* precinct data point of the honest election simulation of Figure 7(a) lies 0.63% into the lower-right quadrant along the line of slope -1.00. This shift is about 1/10 of the calculated Standard Deviation for the At-the-Precinct-minus-Mail-In differences of the *average* LD-27 precinct (6.64%) and is therefore not significantly different from zero. So my honest-election simulation indeed came out looking honest (always assuming the Mail-Ins to honest).

The median precinct data point for my 5% flipped election of Figure 7(b) turns out to lie at x=4.58%, y=-4.58%, on the vote-flipping line. Thus, my Monte Carlo calculated data differ by -0.42% from the actual amount of flipping I did. This error size is similar in absolute magnitude to the +0.63% of my honest election. No surprise here.

Back in the real world, the median data point for *the actual 2004 LD-27 Election* is shifted to the lower right of the origin by 3.38%. To the extent that this median is representative of the entire LD, these historical data indicate about 3.4% vote-flipping fraud At-the-Precinct (given the evidence of Section IV that the Mail-Ins were mostly honest).

While my precinct-by-precinct analyses are still in need of further development and more Monte Carlo simulations to make them fully as quantitative, there is one exceedingly strong conclusion that can be drawn already. The smallest circle centered on the origin in Figure 5 defines the 95% confidence limits (2 SD) for the *entire Legislative District 27*. The actual data point for the whole of LD 27 (the large hollow circle) turns out to be more than 4 SD to the lower right of the origin. By consulting standard Confidence Interval tables [21], one can easily translate this discrepancy into odds of just **one chance in 15,773 that the LD-wide At-the-Precinct vote was *not* hacked**! The actual degree of this hacking, assuming the LD-wide Mail-Ins to be honest (which they weren't entirely [22]), amounts to 1,508 ±191 votes stolen from Kerry and 1,412 ±143 votes manufactured for Bush. Here the "plus-or-minus" numbers are the calculated Standard Deviations [14].

XI. The Author's Thoughts about All of This

For the most part, in this chapter I have been clinically dispassionate ...as though I were writing just another scientific paper. On occasion I've attempted a bit of black humor, but this has been just an artifice to hold the reader's attention. In the end, as I reread what I've written, I keep returning to the thought of the 60,000 Americans from various walks of life and ethnic heritages belonging to Arizona Legislative District 27 who turned out in remarkably large numbers on Election Day 2004 to exercise their constitutional right to "throw the bum out." What happened to these Tucsonans that day is quite likely a microcosm of what was simultaneously happening to Americans all across our country. I reflect on the facts that not only were these good folks' wills – and their inalienable rights – subverted, but they haven't been given a clue by the mainstream media as to what was done to them. So those who have not informed themselves by other means are left with no choice but to blame their neighbors for "the bum" still being at the helm ...still driving Titanic America toward the not-too-distant icebergs, full speed ahead. And all the while, the evil ones who contrived this heinous crime against our republic go about consolidating their power and wealth and pursuing their illegal wars at the expense of the good American people they so furtively disenfranchise.

The words that best describe my feelings leap from the title of Alan Paton's novel:

"Cry, the Beloved Country."

Appendix

The following is a version of my abstract for the 2007 Annual Meeting of the American Association for the Advancement of Science, slightly modified from the original by adding 50 more words for increased reader clarity. Everything else remains the same, including the error: The 8% vote shift shown below (and in the original) is erroneous; the correct value should be 6.9% [5].

« As Cluster Captain on 2 November 2004, John Brakey returned to one of his assigned Tucson polling stations an hour after the polls had closed, surprising poll workers apparently altering the poll books. Brakey began an audit of this precinct (#324) based on copies of all public records: (1) a list of all voters registered in precinct, (2) all Signature Rosters (SRs), (3) the Consecutive Number Register (CNR) with 884 poll-worker-printed voter names, (4) the Official Ballot Report and Certificate of Performance signed by all 7 poll workers, and (5) a list voters who signed affidavits on the envelopes conveying Provisional Ballots (PBs) to the county Recorder. Brakey recovered from the morning-after trash (6) the poll-worker-annotated "Advice to Voter" slips. Records (2) and (6) indicated which voters were required to vote on PBs (which are only accepted by the Recorder if she ascertains that the voter is registered and had not mailed in an Early Ballot). Record (4) could not be reproduced by from the public data without assuming 39 PBs were illegally fed into the optical-scan ballot box on Election Day. The CNR contained 11 fewer unique names than the number of ballots in the ballot box according to (4), implying 11 felony double votes. The poll workers issued 11 extra ballots as alleged spoil replacements, possibly to cover up (but failing to disprove) these double votes. There were also exactly 11 voters who signed a "regular" SR but whose names are not listed on the CNR, 11 voters who signed the PB SR but are not on the CNR, 11 voters who signed both the "regular" and PB SRs, 11 registered voters listed on CNR who failed to sign any roster at all, and 11 phantom voter names appearing on 11 of the signed envelopes of PBs received by the Recorder that do not match any signature on any SR – nor any entry on the CNR! The probability of any one of these irregularities occurring 11 times is much less than 1/11. The odds of all 7 occurring exactly 11 times as independent random accidents (e.g., due to incompetence) are much, much less than one chance in 11 raised to the 7^{th} power = 19.5 million. Three voters had their names inscribed a second time on the CNR exactly 100 places after the first, with one-chance-in-131-million probability. Despite their complete control of the CNR, the poll workers wouldn't have been able to contrive such statistical rarities without a "system." Indeed, (6) revealed a non-standard hand-numbering scheme which would have fit the purpose. We conclude that 22 valid Kerry votes could have been discarded (as 11 allegedly spoiled ballots and the 11 PBs rejected by the Recorder, likely because of 11 forged signatures) and 61 Bush votes could have been forged (as 39 PBs illegally fed into the ballot box on Election Day, 11 double votes, and 11 alleged spoil replacements) – a shift of 8%. Still, the inferred "system" would have deposited paper ballots in the ballot box exactly matching the number claimed in (4), and voter choices on these ballots would match the official tally, thus appearing honest in the event of a hand recount – and thereby covering up demonstrably possible hacking the 1.94w memory cards in optical-scanner precincts where the poll workers were honest. »

References

[1] David L. Griscom, "A Concise History of Election-Integrity Investigations, Litigations, and Legislation in Arizona: September 2004 through November 2007," http://impactglassman.blogspot.com/2007/12/concise-history-of-election-integrity.html

[2] Mark Crispin Miller, "Fooled Again – The *Real* Case for Election Reform," *Basic Books*, New York, 2007, p 132.

[3] David L. Griscom and John R. Brakey, "Forensic Statistical Mechanics Applied to Public Documents Prove Poll-Worker Fraud," presentation by Griscom to the 2007 Annual Meeting of the *American Association for the Advancement of Science*, 2/16/07; http://www.drivehq.com/file/df.aspx/publish/dlgriscom/Election Fraud Research/Griscom_AAAS 2007 Annual Mtg.ppt

[4] Amy Goodman, "History in the Making: Dems Force Debate on Ohio Voting Irregularities," *Democracy Now!*, 7/7/05; http://www.democracynow.org/article.pl?sid=05/01/07/1621240

[5] In Slide #11 of my AAAS PowerPoint [3] I now realize that the row in the table labeled "Poll Workers Issue Themselves 11 New Ballots to Replace Ballots Recycled as Ersatz Spoils" is synonymous with the row labeled "Double Votes." Thus, the "Total Swing" must be reduced by 11, from 113 to 102. This same mistake led to an error in my AAAS abstract, where I claimed a shift of 8% under the conservative assumption that the poll workers did *not* use 41 extra blank ballots. In reality, this number should have been 6.9%.

[6] David L. Griscom, Ph.D., "Sleuthing Stolen Election 2004: John Brakey and the "Hack and Stack," *OpEdNews*, 3/17/07; http://www.opednews.com/articles/opedne_michael__070313_the_long_road_to_dem.htm

[7] Erica Solvig, "Warren's vote tally walled off – Alone in Ohio, officials cited homeland security," *The Enquirer*, 11/5/2004; http://www.enquirer.com/editions/2004/11/05/loc_warrenvote05.html

[8] Forensic analyses involving Provisional-Ballot data are subject to larger statistically uncertainties than the other two forms of voting, owing to the smaller sample sizes: average of only 36 Provisional ballots *officially accepted* per precinct in Arizona LD 27, compared with averages of 502 At-the-Precinct ballots and 411 Mail-Ins. Nevertheless, the results of Figures 1 and 2 acquit my use of the Provisional-Ballot data to prove that the Mail-In tallies were (mostly) uncorrupted.

[9] All four fitted straight lines of Figures 1 through 4 were forced to be horizontal because there is no a priori reason to expect any systematic influence of precinct size on these data. Ideally, though, each data point should have been assigned a weighting factor proportional to the size of the precinct it represents, whereas this was not an option on my fitting software. Nevertheless, each of the four fitted horizontal lines pass through the data point for the largest precinct, as expected for a correctly weighted fit.

[10] All of the party-registration-corrected "net" red shifts of At-the-Precinct vote shares *with respect to the LD-wide At-the-Precinct* ***average*** vote shares are based on immutable numbers taken from the public record and are thus not subject to statistical uncertainty. However, the 5.1% red shift of the LD-wide At-the-Precinct average *with respect to the LD-wide Mail-In average* is at least partially due to the random reasons that cause some people vote at the precinct and others vote by mail. Therefore, summing those two red shifts to get the "*total* At-the-Precinct red shifts" for individual precincts requires taking into account this statistical uncertainty. In fact, the "*total* At-the-Precinct red shift" for Precinct 324 on Election Day 2004 calculated in this way (7.0% + 5.1% = 12.1%) agrees with our forensically-deduced number of votes that could have been fraudulently shifted by the Khan team (11.5%) within 1-SD statistical error (0.84%) calculated for LD 27 by the method described in footnote [14].

[11] Q.E.D. stands for the Latin words *quod erat demonstrandum*, meaning "which was to be demonstrated." Mathematicians, physicists, and philosophers append these initials at the end of their mathematical or logical proofs to proclaim "Eureka, I've proved it!"

[12] Binomial Distribution Function (explanation and calculator): *Department of Physics and Astronomy, Georgia State University*; http://hyperphysics.phy-astr.gsu.edu/hbase/math/disfcn.html#c2

[13] Each vertical bar in Figure 6 represents the middle probability of a block of 5 voters given by the Binomial Distribution Function for a total of n=1,000 voters who had only two options: voting At-the-Precinct or by Mail-In. Using the same symbolic notations (n, x, and p) as the calculator of footnote [12], the position of the peak is given by a number $x_{peak} = n \times p$. Here, p is a number (always between 0 and 1) that specifies the most probable outcome. For simplicity, in Figure 6 I have chosen to use p = 0.5. Elsewhere, I use x_0 to mean the historical value for the number of Mail-In votes and n_0-x_0 to be the historical number of At-the-Precinct votes – *based on publicly available data for the 2004 Arizona LD-27 Presidential Election* obtained by FOIA request by John Brakey. Thus, in this scheme n_0 is the total historical number of votes cast by one or the other of these two voting modes. There is no way to know the value of p before the fact. However, when historical data exist, an *historical probability* of $p_0 = x_0/n_0$ can be assigned to each precinct.

[14] Figure 6 gives the combined (Kerry-plus-Bush) probability of there being more (or less) ballots cast by Mail-In with correspondingly fewer (or more) ballots cast At-the-Precinct, *irrespective of who the voters vote for*. This graph is useful mainly for illustrative purposes. However, because the officially-reported numbers of Kerry (and Bush) voters who voted by Mail-In and At-the-Precinct are known historical numbers, independent Binomial Distributions can be calculated for Kerry and Bush voters by taking n_{0K} and n_{0B} to be the *historical* total numbers of Kerry and Bush voters respectively voting by one or the other of these two methods and letting x_{0K} and x_{0B} be the *historical* numbers of Kerry and Bush voters who respectively voted by Mail-In. In Figure 6, I approximated the "historical" number of Mail-In voters to equal the number of At-the-Precinct voters. Thus, in Table 6 below I take $x_0 = n_0/2$ (implying p_0 = 0.5) to approximate the actual historical value of p_0 = 0.452, and I used the calculator of ref. [12] to calculate separately (1) the SD of all Bush *and* Kerry voters *combined* (virtually

identical to the case for Figure 6), (2) the SD for the Kerry voters alone assuming the 64% LD-wide average advantage he is *officially* credited with, and (3) the SD pertaining to the 36% of all voters officially "credited" with having voted for Bush. However, in order to transfer these SDs into Figure 5, the following must be done: (a) All three calculated SD's must be expressed as percentages of the *total* number of Kerry-*plus*-Bush voters casting their ballots by each respective voting method (that is, the value of x_0 in the *first* row of Table 6) [17], (b) these percentages should be multiplied by 2 to obtain the "2 SD" 95% confidence limits shown in the table, and (c) they should be multiplied by 2 again to obtain 95% confidence limits for *the* ***differences*** *between the Mail-In and the At-the-Precinct shares* – since the statistical variations of these two modes of voting are necessarily equal in magnitude but opposite in algebraic sign.

Table 6

Arizona LD-27 E2004: Average Precinct	$n0$ (total voters)	$x0$ (Mail-In voters)	SD (voters)	2 SD (% of 452)
All Bush and Kerry Voters	904	452	15	6.64%
64% Voting for Kerry	579	289	12	5.31%
36% Voting for Bush	325	163	9	3.98%

I also developed a table analogous to Table 6 for the entire LD. I used these two tables to determine the "95% confidence" circles that I have placed in Figure 5. In each case, the radius of the circle is twice the 2-SD value of the first row (which is itself equal to the square root of the sum of the squares of the 2-SD values of the second and third rows).

[15] Smart Monte Carlo Excel Add-In and Random Number Generator tool (free trial download), http://www.excely.com/excel/random-number-generator/

[16] For all of my Monte Carlo calculations I used the actually inferred historical values of p_0 (equal to the historical number of Mail-In votes divided by the sum of the historical Mail-Ins plus the At-the-Precinct votes *at each precinct* [13]) instead of the "p = 0.5 approximation" of Figure 6 and footnote [14].

[17] All of my Binomial-Distribution data points were calculated from the following pair of equations:

$$\text{Bush's At-the-Precinct Vote Share minus His Mail-In Share} = \frac{n_{0B} - x_B}{n_{0tot} - x_{tot}} - \frac{x_B}{x_{tot}} \qquad (1)$$

$$\text{Kerry's At-the-Precinct Vote Share minus His Mail-In Share} = \frac{n_{0K} - x_K}{n_{0tot} - x_{tot}} - \frac{x_K}{x_{tot}} \qquad (2)$$

Here, n_{0K}, n_{0B}, x_{0K}, and x_{0B} are historical numbers [13, 14] and x_K, and x_B represent presently calculated (and mostly very probable) *independent statistical variations* of the Kerry and Bush *Mail-In* vote shares, respectively. That is, any symbol n, x, or p, having a subscript "0" stands for an historical number. Note that $n_{0tot} \equiv n_{0K} + n_{0B}$ is an historical number comprising the sum of two other historical numbers representing total Bush (n_{0B}) and total Kerry (n_{0K}) votes cast by both voting methods combined. (Here, the symbol "≡" means "defined equal to.") On the other hand, and $x_{tot} \equiv x_K + x_B$ is the sum of *two separately generated random numbers* (using the appropriate historical numbers in the

Binomial number generator), because Kerry and Bush voters make *statistically independent* random choices regarding whether to vote At-the-Precinct or by Mail-In. Nevertheless, the appearance of x_{tot} in *both* Equations (1) and (2) means that what the Kerry voters do in this regard has an imprint on "Bush's At-the-Precinct Share minus His Mail-In Share," and vice versa. This is the reason why this kind of data tends to follow a straight line, rather than appear as a circularly symmetric cloud in Figures 5 and 7. In fact, *every data point* (whether experimental or statistically calculated) *is located at coordinates x and y given by Equations (1) and (2), respectively.*

[18] To simulate an honest election, it seemed imprudent to begin with historical election returns which my analyses of Sections IV, V, and VI had already shown to be tainted. Therefore, I decided to assign to Kerry "hypothetical-historical" values of n_{0K} equal to the sum of all Democratic voters plus 90% of the NOP voters (defined in Section V) *separately calculated from public data for each precinct*, and I gave Bush an n_{0B} value comprising the sum of all Republican voters plus 10% of the NOPs at each precinct. Nevertheless, I retained the *true historical values* of $p_0 = x_{0tot}/n_{0tot}$, and I applied these p_0 values precinct-by-precinct equally to both the Kerry and the Bush voters. I show these results in Figure 7(a). In any event, a partitioning of NOP votes more favorable to Bush is unlikely to affect the conclusions drawn from Figure 7.

[19] Some "truth in advertising" details: The random number generator that I used [15] "gagged" (timed out) on four of the largest LD-27 precincts (with 3,284, 2,126, 1,463, and 1,529 Kerry-plus-Bush voters), so I was prevented from creating these four Monte-Carlo data points in Figure 7. However, because of the large sizes of these precincts, these four points surely would have fallen somewhere close to the origin.

[20] Calculation of the hollow squares of Figure 7(b) began with the identical "honest election" Binomial calculations as Figure 7(a). However, here I replaced n_{0K} and n_{0B} in Equations (2) and (1) respectively by values $n'_{0K} = 0.95n_{0K}$ and $n'_{0B} = n_{0B} + 0.5n_{0K}$. That is, 5% of the Kerry votes of Figure 7(a) were flipped to Bush. Note that, unlike what I've proved to have actually happened in Sections V and VI, *100% of my artificial flips affected the At-the-Precinct votes only* (leaving the Mail-Ins absolutely untouched.)

[21] For example, http://mathworld.wolfram.com/StandardDeviation.html

[22] We know from Sections V and VI that the *Mail-In* votes in Precincts 324, 271, and 235 were red shifted 19.1, 13.1 and 13.8%, respectively, vis-à-vis the LD-wide average – certainly due to Hacking of the Mail-In tallies. Therefore, it is possible to correct Figure 5 (which is nominally understood by assuming all Mail-Ins to be honest) accordingly. I do not show the results here, but they are simply described as a shift of the three data points representing Precincts 324, 271, and 235 from their present "Mail-Ins-assumed-honest" positions in the upper left-hand quadrant of Figure 5 to new positions in the lower-right-hand quadrant. In fact, the corrected points for Precincts 235, 324, and 271 fall respectively 1.0, 1.8, and 2.7 times deeper into the lower-right quadrant than the corresponding uncorrected point in the upper-left quadrant. Therefore, a version of Figure 5 corrected in this manner would manifest an even more lopsided preference of the data points for the lower-right-hand quadrant (always to Bush's advantage if the Mail-Ins are either honestly counted or have been corrected for insider manipulations).

FIGURE CAPTIONS

Figure 1. Election-2004 data for 63 precincts of Arizona Legislative District 27: Ratio of Bush's share of the (accepted) Provisional ballots to Bush's official share of the Mail-In ballots for each precinct.

Figure 2. Election-2004 data for 63 precincts of Arizona Legislative District 27: Ratio of Kerry's share of the (accepted) Provisional ballots to Kerry's official share of the Mail-In ballots for each precinct.

Figure 3. Election-2004 data for 63 precincts of Arizona Legislative District 27: Ratio of Bush's official share of At-the-Precinct ballots to Bush's official share of the Mail-In ballots for each precinct.

Figure 4. Election-2004 data for 63 precincts of Arizona Legislative District 27: Ratio of Kerry's official share of At-the-Precinct ballots to Kerry's official share of the Mail-In ballots for each precinct.

Figure 5. Election-2004 data for 63 precincts of Arizona Legislative District 27: Official vote share *differences*: At-the-Precinct vote share *minus* Mail-In vote share. Each solid square represents one precinct, with the Bush difference determining the x coordinate and the Kerry difference determining the y coordinate. Meanings of the large concentric circles are explained in footnote [14].

Figure 6. Binomial Distribution Function revealing the probabilities of random variations between the Mail-In and At-the-Precinct modes of voting. In this example, there are a total of 1,000 voters and the peak in the bell curve corresponds to the assumption of $p = 0.5$ [13].

Figure 7. Election-2004 data for 63 precincts of Arizona Legislative District 27: Comparisons of Monte Carlo simulations (hollow squares [19]) with historical data for all 63 precincts (solid squares in both graphs). (a) A simulated "honest" election supposing a Kerry-versus-Bush outcome modeled on historical party registration data by assuming that Kerry receives 9 out of every 10 votes cast by voters registered as "No Party Preference" (NOP) [18]. (b) Same as (a) but with 5% of Kerry's *At-the-Precinct* votes flipped to Bush [20].