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2d Session }

HOUSE OF REPRESENTATIVES

{ REPORT
No. 96-991

STUDY AND ANALYSIS OF THE VOTING ANOMALIES
IN THE HOUSE OF REPRESENTATIVES ON MAY 14
AND JULY 30, 1979

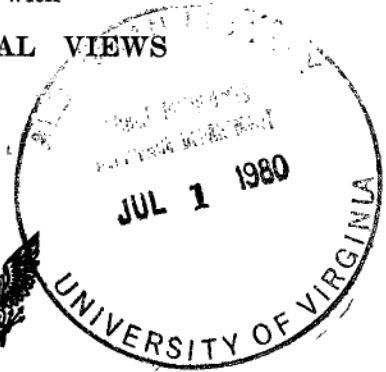
REPORT

OF THE

COMMITTEE ON STANDARDS OF OFFICIAL CONDUCT
HOUSE OF REPRESENTATIVES

together with

SUPPLEMENTAL VIEWS



MAY 15, 1980.—Referred to the House Calendar and ordered to be printed

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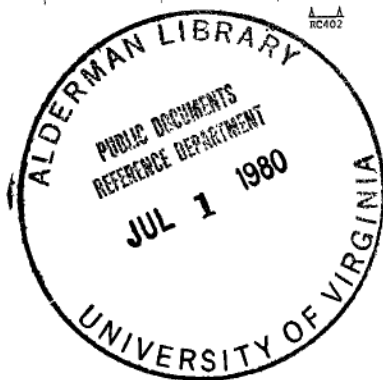
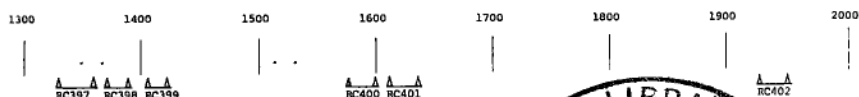
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ERRATA

Page 9, insert missing chart after Figure 1., as follows:



14395

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SUMMARY

This is a report of the Committee on Standards of Official Conduct into the circumstances surrounding two recent voting anomalies in the House of Representatives. On one occasion six votes (Roll Calls 397-402) were recorded on Monday, July 30, 1979, in the name of Representative Morgan Murphy of Illinois. On that date, Representative Murphy was excused from attendance for an official leave of absence and was conducting public hearings in Chicago on other legislative business. The other occasion was on Monday, May 14, 1979, when Representative Tennyson Guyer was recorded on three votes (Roll Calls 146-148) while he was in Ohio. The investigation conducted by the Committee determined that neither of the circumstances came about as a result of a failure in the electronic voting system. This conclusion supported earlier findings of inquiries by the General Accounting Office and House Information Systems.

In considering proxy voting as an offense the Committee was presented with a situation in which the applicable rules are ambiguous. The Committee has decided not to file formal charges against any Member arising out of these incidents. In arriving at this conclusion, the Committee does not do so from a belief that proxy voting should be permitted on the House floor. Rather it does so because the Rules of the House are not sufficiently specific and further, the purely statistical evidence adduced during the study is not sufficient without corroboration to support formal charges.

As a result the Committee has decided to move to prevent further occurrences of a similar nature. Accordingly, the Committee recommends a) the adoption of an addition to Rule VIII clearly prohibiting proxy voting, b) that the television cameras covering the proceedings on the House floor (supplemented by additional equipment if necessary) videotape (NOT for broadcast) all recorded votes.

These two recommendations, if adopted, would provide the irrefutable evidence necessary to support formal action in any future case that may occur. All Members, officers, employees of the House should know that this Committee will consider a violation to be such a serious offense that it would, if proved, probably result in the Committee recommending severe disciplinary action.

INTRODUCTION

This report of the Committee on Standards of Official Conduct (hereinafter Committee) is divided into four parts. Part I summarizes the facts that brought the voting anomalies to the Committee's attention. Part II outlines relevant House and Committee rules and Committee jurisdiction. Part III of this report consists of the Committee's analysis of the voting anomalies, and Part IV is comprised of the conclusions the Committee drew from the investigation. Appendix A contains probability calculations relevant to Part III, and Appendix B is a proposed rule change prohibiting proxy voting in House Floor proceedings.

PART I—BACKGROUND OF THE INVESTIGATION

Since 1973, the House of Representatives has employed an electronic system of recording votes. Each Member is issued a plastic voting card (similar in size to a credit card) which is individually coded. On recorded votes and quorum calls, the Member inserts the card into one of 44 voting stations on the House Floor and votes by pressing a button at the station marked "yes", "no" or "present." Generally there is a fifteen minute time limit in which a Member may record his vote.

In the July 31, 1979, Congressional Record (H-6974), a personal explanation was inserted by Representative Morgan Murphy of the 2nd District of Illinois stating that he had been in Chicago on July 30, pursuant to an excused leave of absence conducting public hearings of a subcommittee of the Select Committee on Narcotics Abuse and Control. In his absence he was recorded as having voted on six recorded votes (roll calls 397-402). Representative Murphy's statement further requested that the Committee on Standards of Official Conduct look into the matter.

Separate studies of the electronic voting system, one by House Information Systems and one by the General Accounting Office, were conducted and the results reported to the Committee on House Administration. Both concluded that the voting anomalies on July 30 were not the result of mechanical or electronic failure in the system. Those reports were accepted by the Committee on House Administration on September 6, 1979, and forwarded to the Speaker on September 10, who in turn provided them to the Committee on Standards of Official Conduct.

At its September 20, 1979, meeting the Chairman designated Representatives John Murtha and William Thomas to serve as a subcommittee that would, with the assistance of the Committee staff, review the issue. Additionally, the Chairman announced that the Committee would retain Mr. James P. Anderson of Fort Washington, Pennsylvania, a noted expert in the field of computer security, to assist the Committee in the study. The subcommittee was directed to report back to the Committee with a recommendation as to the need for the Committee to initiate a formal preliminary inquiry.

In January, 1980, subsequent to the actions noted above, another voting anomaly was brought to the Committee's attention, involving three votes cast in the name of Representative Tennyson Guyer on May 14, 1979, while Representative Guyer was in Ohio. The Committee added the consideration of these votes to its ongoing study.

PART II—VOTING, HOUSE RULES AND COMMITTEE JURISDICTION

No Rule of the House of Representatives flatly prohibits proxy voting on the House Floor, although in an interpretation of Rule VIII in a 1930 ruling by Speaker Nicholas Longworth on the validity of a proxy signature on a discharge petition, it was held that there is no provision in rules authorizing Members to vote by proxy. The ruling states, "There is no rule that the Chair knows of in the House of Representatives for any sort of proxy. No man can transfer his vote or permit another Member to vote for him. . . . A Member must vote in person." (Cannon's Precedents VII, 1014). Such rulings are instructive only to the extent that they are actually known; and the Committee believes that the rules should be amended to apprise all Members clearly of the unavailability of proxy voting in House floor proceedings. Rule XI, clause 2 (f) prohibits proxy voting in Committee unless the committee's rules permit such votes and restricts them to the circumstances outlined in Rule XI.

Rule XV, clause 5, which provides for the recording of votes by electronic means refers to "Members voting or present," and requires that votes be reported in the Congressional Record "as if their names had been called in the manner provided for under such preceding provisions." The preceding provisions govern rollcall votes in which Members personally answer by stating their vote.

Clause 1 of The Code of Official Conduct (Rule XLIII) requires Members, officers and employees of the House to conduct themselves in a manner which reflects creditably on the House of Representatives. In the opinion of this Committee, that provision could cover abuses of the electronic voting system if more specificity existed in the Rules with regard to proxy voting.

House Rule X, clause 4(e)(2)(B) and Committee Rule 13 permit the Committee, on its own initiative, to investigate possible violations of House Rules. Sufficient evidence of a violation can result in a preliminary inquiry under Committee Rule 11. In initiating an investigation into the July 30 voting anomalies, the Chairman noted that the investigation being undertaken was to determine if sufficient evidence could be developed to proceed to a formal preliminary inquiry.

PART III--ANALYSIS OF VOTING ANOMALIES

INTRODUCTION

The voting anomalies observed on May 14 and July 30, 1979 were not due to a malfunction or failure of any mechanical or electrical part of the Electronic Voting System. While this point was adequately demonstrated by the Committee on House Administration, it is believed worth reiterating. In support of this conclusion, the contract investigator for the House Committee on Standards of Official Conduct reviewed the work of the General Accounting Office and the House Information Systems and in his professional opinion believes that the conclusions reached by the GAO and House Information Systems correctly state the condition of the Electronic Voting System in the House of Representatives. This point is reiterated because there are a number of people who sincerely believe that any electronic system is highly prone to error. That view, coupled with a natural reluctance to think ill of, or accuse others of wrong doing, is sufficient in their minds to place the incident in the realm of hardware or electronic malfunction. It should be noted that the analysis contained in Part III B is based chiefly on the study and analysis done by the computer security consultant employed in this case by the Committee. Relevant probability calculations are contained in Appendix A.

A. INTERVIEW AND LABORATORY TEST RESULTS

The analysis began with the hope that the financial data system that supports reimbursements for Members' travel and other expenses could be used to provide reliable data on Member travel against which the records of the Electronic Voting System could be compared to identify other cases similar to that which precipitated this study. On examination, it was learned that the electronic records supporting the Members' financial system were only minimally useful because the original data provided by the Members is frequently in error, spans a multiple number of trips and in general could not be relied upon. Because of the form in which the data is actually presented to the system, it would be necessary to launch a massive manual effort to obtain travel records of those Members for whom such records exist, correlate them with votes, and to find substantiating evidence of any absence from Washington. The size of this effort without any substantial evidence that the practices were widespread did not appear to be worth the effort. It would appear that in order to explore fully that avenue for all Members without exception would require approximately 120-180 man months at an estimated cost of \$500,000.

Both Messrs. Murphy and Guyer were interviewed informally by Committee staff, and later under oath during an executive session of the Committee. They could provide no explanation for the occurrences. Both emphatically denied any wrongdoing. In addition, Committee investigators interviewed nine current or former staff employees of both Members and again were able to develop no information relevant to the voting study objective.

On one occasion, Representative Guyer, though he was not sure of the date, recalled leaving his card at a voting station after voting. An

employee in the Doorkeeper's office interviewed by Committee investigators recalled an instance when Representative Guyer's card was found on the House Floor and the employee kept it over night before it could be returned to the Member. But again, the employee could not recall the date with any certainty. The employee's interview indicated that it is not uncommon for a Member to leave his card at a voting station after voting, with it being returned to the Member when it is found.

Because a number of employees of the House of Representatives have access to the House Floor and in fact may routinely be found on the Floor while the House is in session, the Committee staff prepared a comprehensive set of written interrogatories that were sent to thirty majority and minority employees with Floor access. The interrogatories required responses with regard to the voting anomalies known at the time and general questions that would cover any knowledge of absentee voting. Responses (which were signed under the perjury provisions of 28 U.S.C.A. Section 1746) were returned promptly to the Committee and with one exception, reflected no knowledge of any improper conduct. The one exception was followed up, and proved to be the result of confusion about the operation of the Electronic Voting System and thus of no significance.

From time to time Members have indicated by various means (usually by putting personal explanations in the Congressional Record) that the Electronic Voting System failed to record, or improperly recorded their vote. In an effort to determine the precise nature of problems these Members experienced with the system, Committee staff interviewed seventeen Members (and one former Member) who said they had experienced voting problems. Most confessed the possibility of human error, although a number were positive that they had in fact voted and either been recorded improperly or not recorded at all.

Twenty-six Members whose votes on July 30, 1979 were near in time and voting station to the votes recorded by Representative Morgan Murphy's card were interviewed in an effort to determine if any were aware of any suspicious activities. None of these interviews produced information pertinent to the inquiry. Because eight months had elapsed between the date of the May 14 votes recorded for Representative Guyer and the discovery of the anomaly, similar interviews were not pursued for the May 14 votes.

Finally, Representative Morgan Murphy's voting card, which was withdrawn from use on the day the anomaly was discovered (July 31, 1979), was sent to the Federal Bureau of Investigation Laboratory for examination. The F.B.I. found no evidence that the card had been copied, altered or subjected to other than normal use. Nor were there any latent fingerprints recovered from the card.

B. COMPUTER ANALYSIS

1. Objectives of Computer Analysis

The computer security expert retained by the Committee, Mr. James P. Anderson of Fort Washington, Pennsylvania undertook a thorough

study of the Electronic Voting System and set-out four objectives for his study. Those objectives were:

(a) To establish definitively whether or not the present Electronic Voting System has sufficient security and integrity to warrant continued confidence in its use;

(b) To identify technical tests that could shed light upon whether the voting incidents were isolated or part of a pattern, and to develop circumstantial or direct evidence to support the conclusion;

(c) To identify additional tests or tasks to determine whether other voting anomalies have occurred and the circumstances surrounding those possible incidents;

(d) To establish if there is a need for additional safeguards to be applied to the Electronic Voting System.

2. Summary of Tests and Analyses

In hope of identifying the individuals who cast the votes in the name of Representatives Morgan Murphy and Tennyson Guyer, or to determine whether the anomalous votes were examples of frequent occurrences, a number of tests and analyses were performed on the data recorded by the Electronic Voting System. These various tests include:

Same vote,
Two minute windows,
Minimum time exclusions,
Signature analysis.

These four tests were devised to analyze the July 30 votes recorded for Representative Morgan Murphy. After those tests were completed, the May 14th votes recorded for Representative Guyer came to the Committee's attention. The Guyer votes were subjected to the same tests as will be explained in subsection "e".

(a) *Same vote.*—This analysis tests a very simple but plausible hypothesis that the person or persons who may have caused the votes to occur in a Member's absence would not have voted the absentee's card differently from his own. It is further hypothesized that those votes were being cast by a single individual rather than by several individuals. In the case of Representative Morgan Murphy, the result of this test was a list of 77 individuals who voted the same way as Representative Murphy of Illinois voted on the 6 votes on July 30. This test, even assuming the premise valid, yields too large a result to be useful.

(b) *Two minute windows.*—The six votes occurring on July 30, 1979 were analyzed to test the hypothesis that the surrogate voter, if such exists, would most likely vote his card and the absentee's card, not necessarily sequentially, but within a relatively short period of time of each other, rather than do one vote at the beginning of a voting period and wait till near the end of the voting period to cast the other vote.

The two-minute window test was applied to the six votes using Representative Murphy (IL) as the reference point, to create lists of Members who voted within the two minutes before Representative Murphy's vote, and within the two minutes after Representative Murphy voted. The lists thus created were merged, keeping only those Members who appeared on all lists. Upon completion, only one name appeared within the specified interval.

When the voting records are subjected to the window analyses previously described, and one or more names are found to be in association with the Member used as a reference point, the question arises as to how significant the finding can be. This section attempts to provide an answer to that question and show the basis for the reason. What is needed is a way to determine whether an association is a rare or a common event over a particular set of votes. One way of analyzing the data, and the way that has been used for the purpose of establishing significance, is to assume that there is *no* correlation between individual votes. That is, each vote by each Member is independent of all others, in a statistical sense.

If the votes recorded are grouped by the time of occurrence from the start of a roll call, one could begin to ask the question how many Members vote in the second minute after the beginning of a roll call or how many Members vote in the sixth minute after the beginning of a roll call? Because the number of Members actually voting varies from one roll call to another, it is more useful to convert the votes actually recorded into percentage of the total vote.

Assuming the independence of votes to be correct, then the *percentages* of the total votes shown for each minute after the beginning of a roll call can be used as the measure of the probability of any given vote occurring in that period.

Of course, using the single roll call as a basis for statistical generalization is not appropriate. However, it is possible to combine the data on roll calls for the period in question and provide a high degree of confidence in the statistics that are derived.

Rather than just combining all data into a single distribution, a higher degree of refinement can be obtained by observing the fact that there are basically two different patterns of the voting that are a function of the length of time since the preceding vote took place. The time factor is merely a recognition of the fact that when votes are scheduled back to back, many Members arrange to vote at the end of one roll call and then stay on or near the Floor to vote at the beginning of the next roll call in order to have the maximum amount of time available for other activities.

The six votes on July 30 in fact had three of each kind as can be seen by the diagram in Figure 1. Roll calls 397, 400 and 402 occur a relatively long time after the preceding vote. They are characterized by approximately 50 percent of the vote occurring in the last five minutes of the roll call. Roll calls 398, 399 and 401 occur a short time after the preceding vote, and are characterized by having approximately 50 percent of the vote occur within the first five minutes of the roll call.

In order to assess the significance of any associations that occur, one has to understand the premise that the votes of any Member are independent of votes of any other Member. Under that premise, the percentages shown in the two patterns in Figure 2 can be taken as an approximation that any given Member will vote in that particular period of time. To further simplify the analysis, and to match the intervals discussed in the first two paragraphs of this section, we will group the two patterns into four-minute intervals as shown in Figure 3.

Using Pattern A as an example, the figure .167 is the probability that any single vote distribution occurred in the first four-minute interval of that vote. The probability that any one individual would vote in that same period, assuming that the voting pattern is independent, is the product of the probabilities, $.167 \times .167 = .0278$. There are about three chances in 100 that two specific individuals voted in that interval.

This mathematical reasoning can be extended over the entire set of six votes for the 30th of July and the independence of the votes of any two Members tested by computing the probability that the temporal proximity of their votes could have occurred by chance alone. The assumptions used: (a) there are two voting patterns characterized by the distribution of probabilities over four intervals of four minutes each (see Figure 3); (b) two individual voters will decide when to vote independently of each other in a random fashion according to the approximate distributions.

Given that there are three votes of Pattern A (Roll Call 397, 400, 402) and three votes of Pattern B (Roll Call 398, 399, 401), the probability that two specific Members will vote by chance all six times within *some* same interval as each other is .006 (approximately 6 in 10,000).

Given one Member's vote in a specific sequence of patterns and intervals (for example using Representative Murphy as a reference point in the two-minute window analysis described on page 6, the sequence of patterns and intervals is A4, B1, B1, B4, A1) the probability that *any* other Member would vote in precisely the same sequence of patterns and intervals is .0003 (approximately 3 in 10,000).

To review:

A two-minute window hypothesis obtained names on each of the six votes of July 30, 1979.

A single name was voted near Representative Murphy's vote for all six votes on that date.

The significance of this pattern is such that the probability that the particular two Members voted in precisely the same identical sequence of patterns and intervals *by chance* is approximately 3 in 10 thousand.

This is not to say that such pairings or associations cannot occur naturally. It is repeated again that the statistical meaning of such pairings is based on the assumption that the voting pattern is independent. This independence may not be present for a variety of reasons. The Members may naturally work together on the issues involved in the votes for that particular day or period and would have a tendency to be on the Floor at the same time, or the Members may just naturally congregate in social patterns that have nothing to do with the issues and the associations could result from such social gatherings. However, on July 30th, the association occurred at a time when it is known for a fact that the reference point, Representative Morgan Murphy, was not present in the House.

The Member whose voting on July 30 appeared in association with the votes cast by Representative Morgan Murphy's card denied under oath in an executive session of the Committee any connection whatever with the absentee voting.

FIGURE 1.—Times of rollcall votes 397 to 402.

Figure 2.—Voting Pattern Distributions Based on Length of Time Between Succeeding Votes

PATTERN A	Rollcall 397 (Start: 13:19: 38, end: 13: 39:00)	Rollcall 400 (Start: 15:47: 02, end: 16: 04:20)	Rollcall 402 (Start: 19:14: 14, end: 19: 30:14)	Total	Percent
Minute after start of rollcall:					
1.....	29	24	45	98	8.8
2.....	6	3	17	26	2.4
3.....	5	17	11	33	3.0
4.....	6	9	14	29	2.6
5.....	12	8	14	34	3.1
6.....	18	14	18	50	4.5
7.....	28	14	44	86	7.8
8.....	17	13	27	57	5.2
9.....	28	31	26	85	7.7
10.....	22	32	38	92	8.3
11.....	26	32	23	81	7.3
12.....	40	39	28	107	9.7
13.....	39	48	27	114	10.3
14.....	32	38	15	85	7.7
15.....	33	39	10	82	7.4
16.....	11	30	15	56	5.0
Total.....	352	391	372	1,115	

PATTERN B	Rollcall 398 (start: 13:40:37, end: 13:56:45)	Rollcall 399 (start: 14:01:42, end: 14:18:49)	Rollcall 401 (start: 16:08:58, end: 16:25:13)	Total	Percent
Minute after start of rollcall:					
1.....	57	83	128	268	23.4
2.....	57	27	31	115	10.0
3.....	34	20	19	73	6.4
4.....	27	16	21	64	5.6
5.....	27	21	25	73	6.4
6.....	26	16	19	61	5.3
7.....	23	12	16	51	4.5
8.....	20	18	18	56	4.9
9.....	28	19	11	58	5.1
10.....	11	18	13	42	4.4
11.....	19	23	15	57	5.0
12.....	13	21	11	45	3.9
13.....	18	34	14	66	5.8
14.....	10	16	11	37	3.2
15.....	19	22	14	55	4.8
16.....	2	13	3	18	1.6
Total.....	391	379	369	1,139	

Figure 3.—Grouped Voting Patterns

[In percent]

	Pattern A	Pattern B
Interval minutes:		
1. 1 to 4.....	16.7	45.6
2. 5 to 8.....	20.3	21.2
3. 9 to 12.....	32.8	17.6
4. 13 to 16.....	30.2	15.3

(c) *Minimum time exclusions.*—In another attempt to identify any individual who may have voted Representative Murphy's card on July 30, stop watch measurements were taken of the time required to go from the voting stations at which the anomalous votes were recorded to all other voting stations in the chamber. The voting data for the six votes was then examined and all Members were excluded who could NOT have voted Representative Murphy's card because it would have been physically impossible to move from the station where they were recorded as having voted to or from the station where Representative Murphy was recorded as having voted within the time which is known to take to go between the two stations. Under the assumption of a single individual involved in the anomaly, this procedure was only able to reduce the number of people who could have performed the improper voting to approximately 250.

(d) *Signature analysis.*—As part of the investigation as to the scope of the problem, all voting data for Representative Murphy for 1978 and 1979 was assembled from the Electronic Voting System computer records. The data shows that Representative Murphy votes in a characteristic manner. Overall, Representative Murphy votes using verification approximately 52 percent of the time. More importantly, he typically verifies at least one vote within the first two or three votes of a legislative day (e.g., he verifies on the first vote of the day 47 percent of the time; he verifies his vote on the first, second or third vote of a day 75 percent of the time).

Investigating allegations of "buddy system" voting, the electronic voting records of the entire Illinois delegation were assembled under the assumption that a "buddy system", if one existed, would most likely be contained within a single delegation. The records for the entire delegation were examined to see if there was any indication of unusual voting patterns or any other indication of the possibility of the existence of the "buddy system". Of the Members examined, only Representative Murphy showed any characteristic "signature" to his votes.

Operating under the hypothesis that a "buddy system", if it existed, would be to preserve a voting record, particular attention was paid to voting patterns occurring on the first day of a legislative week. There were five first days through July in 1979 in which the individual voting pattern for Representative Murphy of Illinois appeared, from inspection, to vary from his normal voting patterns. Detailed travel records for these days were examined to determine whether Representative Murphy was present and if not present, whether there was a possibility of identifying who might be casting the votes recorded in his name.

Investigation of the travel records for the dates selected by the signature analysis revealed the date April 24, 1979 as a day upon which there is evidence that three votes were recorded for Representative Murphy occurring while he was still traveling between Chicago and Washington. Representative Murphy (IL) had no specific recollection of his return flight to Washington on April 24, and denied under oath any improper conduct with regard to votes that may have been cast for him that day in his absence.

A two minute window analysis of those three votes did not produce an association similar to the July 30 voting.

(e) *Tests and Analyses of May 14, 1979 Votes Recorded for Representative Guyer.*—After the completion of the computer data analysis performed by the Committee's computer security consultant, press reports in January, 1980 brought to the Committee's attention the Monday, May 14, 1979 votes recorded for Representative Tennyson Guyer. On that date, Representative Guyer was in Ohio. The tests developed to analyze the earlier anomaly were similarly applied to the circumstances of the May 14 votes. There were seven recorded votes that day, with votes recorded for Representative Guyer on the last three votes of the day (roll calls 146, 147, 148). On Thursday, May 10 (the last legislative day before the May 14 votes) Representative Guyer left Washington on a flight that departed Washington National Airport at 7:22 p.m. Representative Guyer's card was used to record a vote on roll call 141 at 7:18:49 p.m., thus adding the last vote of May 10 to those of May 14 for a total of four absentee votes.

"Same vote," "window," and "minimum time exclusions" analyses were unable to isolate a single name in association with the absentee votes. Additionally, Representative Guyer has no characteristic voting "signature" that could be used to examine past voting for indications of absentee voting.

3. Review of additional security systems

(a) As part of the overall study of the voting anomalies, the present system design was reviewed to determine whether it would be possible to make changes that would prevent proxy voting in the future. A number of alternative methods of Member identification were briefly considered. These include use of magnetic striped cards in lieu of the present identification card, the use of physical measurement devices such as fingerprint readers or hand geometry readers in lieu of the card and similar schemes. This review was not a full engineering evaluation, but more in the nature of a feasibility examination to see whether the technology would permit improved identification less susceptible to misuse than the present scheme.

1. Magnetic striped cards

The substitution of magnetic striped cards for the present cards offers little improvement over the present situation in that it is still possible for cards to be exchanged or shared among cooperating Members. The only potential advantage the magnetic striped card has over the card presently used by the Electronic Voting System is that it would make more difficult the forgery of a card. (It must be

recognized that the present card is very susceptible to duplication and only slightly more resistant to outright forgery.) The magnetic striped card, while having greater resistance to duplication or forgery, has the disadvantage of generally requiring a motorized reader in order to provide uniform motion of the magnetic stripe past the read head. The magnetic stripe is susceptible to distortion or destruction by placing the card in (fairly close) proximity to a magnetic field. In addition, the cost of providing some 40 reader stations for the extremely marginal improvement in "security" of the system or card does not appear to provide any incentive for further consideration of this option.

2. Physical measurements

The second alternative is using a fingerprint or other physical characteristic reader. This has a number of systems advantages not enjoyed by other methods. These are principally the inability, for all practical purposes, to duplicate or forge the characteristics involved.

An informal survey was made of research in the area of measurements of physical characteristics such as fingerprints, signatures and the like. As a result it is concluded that the false alarm rate, that is the rate at which legitimate identifications will be rejected as not being recognized by the equipment, is too high for consideration in use in the House. Even a one or two percent reject rate, which is not uncommon with such equipment, would mean that in a particular vote, typically four Members, would not be successfully recognized. It is believed that this rate is too high for the business of the House of Representatives.

Although the principle focus was on fingerprint readers, the same group of researchers were familiar with work in the area of hand geometry, signature analysis and similar measurements. None of these techniques appear to have sufficient usefulness to be given serious consideration as a replacement for the present system.

(b) *Proposed changes.*—It is concluded that the present method of identifying Members to the voting system is probably the most cost effective available. The question arises as to whether any measures are available to prevent or discourage the type of activity resulting in Representative Murphy's and Representative Guyer's votes being recorded in their absence.

Partly as a result of the analyses that took place as part of this study, it appears feasible to implement a non-intrusive, non-judgmental form of surveillance of voting activity. The basic scheme would be to use the television cameras that currently record Floor debate to record also the actual voting as well. The portion of the activity representing the votes would not be made public, but would be preserved to be made available for retrospective analysis of any anomalies being discovered. The length of time such records should be retained has not been determined.

The use of the television already in place in the House chamber merely enforces accountability. Further refinement to the surveillance technique could be added by incorporating several of the analysis programs written for this study into a system that would respond to re-

quests for analysis to determine whether a voting anomaly has taken place, and if it has, with whom. With the videotape record of each vote and the individual records available through the computer based Electronic Voting System, it would be possible to pinpoint any wrong doing.

PART IV—CONCLUSION AND RECOMMENDATIONS

The Committee now declines to bring formal charges against any person involved in either of the two incidents. This results not from any view that willful and knowing abuse of the Electronic Voting System is not serious misconduct, but rather from ambiguities in the present rules when taken together with the need to rely solely on statistical data; based on assumptions and unaided by other direct evidence of wrongdoing. The insufficiency of such unassisted statistical evidence is addressed in the case of *People v. Collins*, 68 Cal. 2d 319, 439 p.2d 33 (1968).

The result of the study done from the data stored in the voting system's computer established, in one instance, a strong statistical association based on probability, between the votes recorded for Representative Morgan Murphy and another Member's voting on July 30. However, nothing of a non-statistical nature exists in the way of corroborating evidence, and the Member whose voting was associated denied under oath any improper conduct.

The Committee is aware that the Electronic Voting System has, since its adoption, provided the opportunity for abuse, and that the House, in changing its rules to accommodate the new system, took no additional action by way of rule changes to guard against proxy voting. The House apparently depended upon existing ambiguous rules and upon a fairly common understanding that Members should be present to cast their vote. Current rules and common understanding obviously have not served adequately to protect the integrity of the Electronic Voting System.

The Committee recommends that the House adopt a rule specifically prohibiting proxy voting on the House Floor.

The Committee further recommends that the television cameras covering the proceedings on the House Floor videotape (not for broadcast) the activity on the Floor during recorded votes. Pictures, combined with the analysis computer programs developed during the voting anomaly study should provide irrefutable evidence of any future proxy voting.

This Committee views any willful abuse of the Electronic Voting System as a most serious matter. The integrity of the House, and indeed, of the legislative process, has been called into question. Ambiguity in the rules with respect to voting and insufficient evidence have combined to deter the Committee from filing charges, but following action on this Committee's recommendations, no one should be under any misapprehension of the Committee's determination to pursue abuses of the system. Formal charges will be filed against alleged violators, and if the charges are proved, appropriate disciplinary action will be recommended to the House.

STATEMENT PURSUANT TO RULE XI, CLAUSE 2(1)(3)(A)

The Committee makes no special oversight findings in this report. This report was approved by the Committee on Standards of Official Conduct on May 7, 1980, by a vote of 7 yeas; 0 nays; 2 voting present.

SUPPLEMENTAL VIEWS OF CONGRESSMEN F. JAMES SENSENBRENNER, JR., AND WILLIAM THOMAS

The Committee's report glosses over the seriousness of allegations of "ghost voting" on the floor of the House. For that reason, we could not vote in favor of it. Because we agree with the recommended resolution specifically prohibiting one Member from authorizing another from voting on the floor, we both voted "present" on the adoption of this report.

Rule VIII of the House of Representatives governs voting. This rule reads as follows:

"1. Every Member shall be present within the Hall of the House during its sittings, unless excused or necessarily prevented; and shall vote on each question put, unless he has a direct personal or pecuniary interest in the event of such question."

The Committee argues that a failure of Rule VIII to specifically prohibit proxy voting on the floor is ambiguous. We disagree with that conclusion, particularly in light of the fact that House Rule XI, clause 2, relating to proxy voting in Committee, specifically requires a written rule of the Committee to authorize proxy voting and in the absence of such a rule, proxies are not allowed. Section XLI of *Jefferson's Manual*, which reads: ". . . nor is anyone to be told in the division who was not in (the House) when the question was put." appears to reach the same conclusion. There is no logic to assume that the absence of a House rule prohibiting proxies authorizes them, especially when House Rule XI makes specific requirements for them to be used in Committee.

Turning to the evidence uncovered by the Committee during the course of its investigation, we find that two separate studies, one by the House Information Systems and the other by the General Accounting Office, clearly showed that the voting anomalies involving Representatives Morgan Murphy and Tennyson Guyer were *not* the result of either mechanical or electronic failure of the electronic voting system. From these studies, the presumption arises that the voting cards of these Members were used on the House floor at a time when they were not in Washington.

The statistical evidence prepared by Mr. Anderson relating to the anomaly involving Representative Morgan Murphy on July 30, 1979, showed that the probability that two specific Members will vote by chance in all six votes which occurred that day within the interval assumed was approximately 6 in 10,000. Put another way, the chance that another Member did *not* vote Morgan Murphy's card was 6 in 10,000.

In reviewing Representative Morgan Murphy's votes during 1979, the Committee received evidence that three votes were recorded in his name on April 24, 1979, at a time when he was still traveling between

Chicago and Washington. Mr. Anderson's analytical technique isolated several names, one in particular, but there were an insufficient number of votes to isolate with the same degree of probability as the July 30, 1979 voting anomaly.

In the case of Representative Guyer, Mr. Anderson was not able to isolate a single name for the anomalies which occurred on May 10 and 14, 1979.

Hence, in the two cases involving Representative Morgan Murphy, there is extremely strong statistical evidence that another Member voted his card.

The law is settled that statistical evidence standing alone without corroboration is insufficient to sustain any charge of wrongdoing. We agree that there is not one shred of corroboration and thus neither Representative Morgan Murphy nor Representative Tennyson Guyer should be charged by this Committee.

Both Representatives Morgan Murphy and Guyer swore on oath at an executive session of the Committee that they had never given their voting cards or authorized their use by another. Similar depositions were taken of those Members whom Mr. Anderson's study indicated may have cast votes for the absent Members, with similar results. Statements were executed under the penalties of perjury by all floor personnel who might have had access to any information relative to a Member's card being voted by another.

Simply stated, the statistical evidence shows that there is a great probability that someone else voted Morgan Murphy's card, but there is not the corroboration necessary to allow the Committee to prove wrongdoing by Mr. Murphy by the standard of clear and convincing evidence required by the Committee's rules.

Therefore, we reluctantly concur with the Committee's conclusion not to formally charge either Representative. We fully support the Committee's recommendation that each voting station on the House floor be videotaped during roll calls. That way, if a similar incident happens again, there will be the clear corroborative evidence required for this Committee to bring charges against the offending Members.

F. JAMES SENSENBRENNER, Jr.
WILLIAM M. THOMAS.

APPENDIX A

PROBABILITY CALCULATIONS

INTRODUCTION

This appendix gives the probability calculations cited in Section III. The data used for the calculations are that in Figure 3, Grouped Voting Patterns. The table is reproduced here for convenience of the reader.

[In percent]

	Pattern A	Pattern B
Interval minutes:		
1. 1 to 4.....	16.7	45.6
2. 5 to 8.....	20.3	21.2
3. 9 to 12.....	32.8	17.6
4. 13 to 16.....	30.2	15.3

CASE 1

Given that there are 3 votes of Pattern A and 3 of Pattern B, the probability that two specific voters will vote all six times within the same interval as each other is given by:

$$\begin{aligned}
 {}^x A &= (.167)^2 + (.203)^2 + (.328)^2 + (.302)^2 = .268 \\
 {}^x B &= (.456)^2 + (.212)^2 + (.176)^2 + (.153)^2 = .307 \\
 P &= (.268)^3 (.307)^3 = .0005569 \approx .0006
 \end{aligned}$$

CASE 2

Accepting as given, one Member's votes (A4, B1, B1, A1, B4, A1), the probability that *any* other specific Member would vote in precisely the same pattern and intervals over the six votes is given by:

$$\begin{aligned}
 P &= (.302) \times (.456) \times (.456) \times (.167) \times (.153) \times (.167) \\
 &= .0002679 \approx .0003
 \end{aligned}$$

(17)

APPENDIX B

RESOLUTION

To amend rule VIII of the Rules of the House of Representatives to prohibit a Member from casting any other Member's vote or recording any other Member's presence, and for other purposes.

Resolved, That rule VIII of the Rules of the House of Representatives is amended by inserting at the end thereof the following new clause:

"3. (a) A Member may not authorize any other individual to cast his vote or record his presence in the House or Committee of the Whole.

"(b) No individual other than a Member may cast a vote or record a Member's presence in the House or Committee of the Whole.

"(c) A Member may not cast a vote for any other Member or record another Member's presence in the House or Committee of the Whole."