

place tighter regulations on campaign contributions and expenditures; the House Administration Committee is holding hearings on the issue, but its controversial committee chairman, Wayne Hays (D-Ohio) is not known as an ardent reformer.

Asking Congress to reconstruct itself at a time when it is coping with the impeachment crisis and a heavy docket of urgent legislation puts maxi-

mum stress on the institutional nervous system. There is a normal congressional rhythm which assumes that perhaps one or two major issues, such as tax or trade legislation, are handled in each session, with preparations for action often taking several years. The energy shortage alone, with all its ramifications, would push Congress to its limits in a normal year. An added difficulty this year, according to

Nixon critics, is that the Administration is suffering a post-Watergate paraplegia which prevents it from taking the actions which permit Congress and the Executive to interact effectively. Hill leaders have so far shown no signs of seizing the tiller so that, under the circumstances, it is difficult to foresee whether, after all, this will be the session for a showdown or simply a slowdown.—JOHN WALSH

Watergate Tapes: Critics Question Main Conclusion of Expert Panel

Nothing in the last month has damaged President Nixon more than the conclusions reported by the panel of experts suggesting that the 18½-minute gap on the 20 June tape was erased deliberately. Conversely, few things would have helped Nixon more than if the panel had come in with a report that the erasure and buzz might have been caused accidentally. As it happens, all the data the panel has revealed so far can be accounted for by an explanation which the panel apparently failed to consider, but which implies that the erasure was accidental and not deliberate.

This alternative explanation has received surprisingly little attention, maybe because the panel's conclusions fitted so well with people's expectations. It has been mentioned in passing by Charles S. Rhyne, the attorney for Miss Rose Mary Woods, but his remarks have been reported skeptically in the press. Rhyne himself has not had the report proposing the explanation checked out by technical experts, and delayed a week before passing it on to Judge John J. Sirica on 6 February.

The report is the work of a small electronics firm, Dektor Counterintelligence and Security Inc., located in Springfield, Virginia. The Dektor people argue that the sounds and magnetic marks discovered by the panel on the 18½-minute segment could all have been caused, in a single continuous operation, by the sputtering on and off of the tape recorder's internal power supply. The Uher 5000 used by Miss

Woods is known to have a defective rectifier circuit, which in fact burned out while the recorder was in the panel's hands. The panel of experts, on the other hand, based their conclusion—that there must have been at least five separate manual erasures—on their belief that the magnetic marks could only be imprinted by hand operation of the button controls.

Two electronics experts consulted by *Science* say that the Dektor hypothesis is technically feasible and is as compatible as is the panel's version with what little data is given in the panel's summary report. The panel's testimony before Sirica's court, which runs to more than 300 pages of transcript, contains nothing to suggest that the panel considered the Dektor hypothesis, and, in fact, there are positive indications that the panel did not.

Citing an order by Sirica not to talk to the press, members of the panel refused last week to say whether they had considered the Dektor explanation before releasing their summary report, or whether they have since performed tests to rule out the explanation. According to Barry Blesser, an assistant professor of electrical engineering at MIT, who advised on the selection and work program of the panel (*Science*, 14 December, p. 1108), the data in the summary report do not allow a decision to be made between the two hypotheses. But he finds the panel's more believable because the magnetic marks on the 18½-minute gap fall into the classic pattern made by some in-

experienced with recorders trying to erase a tape.

Blesser adds that he cannot imagine people of the panel's caliber failing to perform the obvious tests that would rule out the Dektor theory. On the other hand, Allan D. Bell, president of Dektor, observes that the panel members are experts in acoustics and computer processing—sensible fields to choose before one knew what the problem was—but not particularly familiar with the workaday problems of tapes and tape recorders.

Bell's company, headquartered above a cookie factory just beyond the Washington beltway, has a staff of 30 professionals, most of whom have backgrounds in the intelligence community. The company develops equipment for use in counterintelligence and security—two recent products are a psychological stress evaluator and an instrument for testing whether a telephone has been converted into a listening device. The company put about 100 man-hours into its analysis, which was based on the data in the panel's summary report and tape recorder tests conducted in Dektor's laboratories. The analysis was done for the "fun of working out a logic problem," Bell says, and because of an intuitive feeling that the experts' report was incomplete. Dektor is receiving no fee from Rhyne, nor is Bell interested in anything beyond the technical issues, such as how the gap could have lasted 18½ minutes. "I'm limiting my entry into this mess," he says.

The explanation developed by Bell and his colleagues goes as follows. A malfunction started in the tape recorder circuitry (maybe in its filter capacitor) which rectifies the alternating current from the mains into direct current. Because of the malfunction, there occurred a series of intermittent voltage drops in the d-c supplied to the bias oscillator, which energizes the erase and record heads. (The voltage

drops would not necessarily affect the forward movement of the tape because the tape capstans are driven directly from the a-c mains supply.)

Whenever the voltage fell below a certain threshold value, the oscillator would cease to oscillate, and the erase and record heads would be deenergized, leaving their characteristic magnetic signatures on the tape—a quartet of lines for the E-shaped erase head of the Uher 5000 and a doublet for the U-shaped record head. Momentary deactivation of the heads would also produce the brief snatches of speech and other phenomena on the erased section. The malfunctioning rectifier could also cause the predominant buzzing sound on the erased section.

The Dektor conclusion is that “it appears at least feasible that the entire scenario described in the report [of the panel of experts] and the graph and in the ensuing testimony could result from an intermittently defective power supply with the recorder in forward continuous transport, without stops or reversals, for the entire buzz section.” Bell and his colleagues add that they cannot say that the defective power supply was the cause, nor that the panel’s conclusions could not have been the cause—“We can say only that the power supply problems provide an apparently equally feasible alternative.”

In addition, the Dektor study contradicts the panel’s report on two points of fact. First, the panel states in its report and testimony that only by manual operation of the recorder’s control buttons can the erase head be deenergized and the quartet signature imprinted on the tape. Dektor’s tests with a Uher 5000 show that anything that causes a voltage drop will deenergize the erase head—in fact this is exactly how the erase head is normally activated and deactivated. A less important oversight is the panel’s statement that the record head leaves a single mark on deactivation; had the panel employed the more refined method of developing magnetic marks used by tape experts they would have picked up the fainter, second line of the record head doublet, Bell suggests.

As Blesser observes, it is extremely hard to believe that the panel did not consider and exclude the Dektor hypothesis before presenting its own. Yet various statements made by the panel in court indicate fairly certainly that it had not considered salient points of the Dektor argument (court transcript 17 January 1974, pages 2688–2690):



The panel of experts poses outside the U.S. District Court in Washington, D.C. From left to right are Richard H. Bolt, John G. McKnight, Franklin Cooper, James L. Flanagan, Mark R. Weiss, and Thomas G. Stockham. At the right is a U.S. marshal described in the agency caption as attempting to break up the picture session. Panel members were appointed by Judge Sirica on the joint recommendation of the White House and the Special Prosecutor.

MR. ST. CLAIR [attorney for President Nixon]: If there was such an interruption [of the power supply], would it not de-energize the head?

MR. WEISS [panel member]: It would also de-energize the motor.

MR. ST. CLAIR: I wonder if you would respond to my question and then make an explanation.

MR. WEISS: Yes, it would de-energize the head.

MR. ST. CLAIR: And if it de-energized the head, it would make this series of character marks, wouldn't it?

MR. WEISS: No.

MR. ST. CLAIR: I thought it had been given here [that] if the erase head is de-energized it makes a characteristic mark consisting of a quad.

MR. WEISS: I would like Mr. McKnight to respond to that.

MR. ST. CLAIR: Certainly. [McKnight explains that tests made on a Sony recorder show the power cut does not cause a mark, but the test has not been performed on the Uher 5000.]

MR. ST. CLAIR: So if there were a series of power cut interruptions, you are not now prepared to tell us whether or not it would make these characteristic marks on the tape?

MR. MCKNIGHT: We can only give an opinion; right. . . .

St. Clair then puts a crucial question:

MR. ST. CLAIR: Perhaps if you don't know this, maybe we could refer it, but supposing these was an interruption in the power supply of the machine, rather than the power supply to the machine [italics added].—You get the differentiation?

MR. MCKNIGHT: Yes.

MR. ST. CLAIR: . . . [Y]ou are not now prepared to tell what result if any would result on the tape, if that were to be the situation? You knew there was a . . .

MR. BEN-VENISTE [attorney for the Special Prosecutor force]: We don't have an answer to that question.

MR. MCKNIGHT: I am sorry. No, I don't believe we can definitely answer that question.

A test that could fairly decisively rule out the Dektor hypothesis and corroborate the panel's conclusions would be to look for any discontinuities in the 60-cycle-per-second tone and harmonics thereof that make up the buzz. There are several places in the testimony in which it would be quite natural to cite this test—if it had been done—and indeed the panel did look for a phase discontinuity at the point where the buzz suddenly becomes softer, but none was found. Moreover, if the panel members had suspected that the failing rectifier might have had anything to do with the marks on the buzz section they would presumably not have performed tests on Miss Woods' recorder until it failed and then thought only of fixing it. A diode bridge was replaced, and, according to Weiss, “We, of necessity, had to open up the interior . . . and tighten down several screws and, quite conceivably, for example, may have tightened a ground connection to a point where it was making more firm

contact than previously." After these adjustments the Uher 5000 would not buzz any more. The panel's action made it vulnerable to a scathing accusation by Miss Woods' attorney that it had destroyed vital evidence. To Rhyne's question, "So in effect you obliterated the evidence which anyone else would need to test your conclusions, did you not?" Weiss had to reply, "Yes, in large part."

Why then did the panel of experts apparently fail to consider the possibilities raised by Bell and his colleagues at Dektor? The logic of the panel's thought processes emerges fairly clearly from its voluminous testimony before Judge Sirica. The "key and guts" of their report, panel chairman Richard H. Bolt agreed in answer to a question from Ben-Veniste, was the quartet signature left by deenergizing the Uher erase head. The panel repeatedly states that only the control buttons can deenergize the erase heads, so the argument presumably went, "Erase quartet means deenergization means hand operations of the buttons." Panel chairman Bolt stated explicitly, "We asked the question: What operations on the key board would produce that internal function such as, for example, turning power from the erase head. These are the only questions we looked at." All facts were explained to fit this framework and those that didn't, such as the occurrence of the buzz, tended to be ignored. "In our view, the presence or absence of buzz and the exact source of buzz is essentially irrelevant to the issue that we are looking at technically," Bolt told Sirica.

If the panel had decided that the buzz was relevant, it might have been led to consider the effect of the failing rectifier circuit. In fact the panel put considerable effort into determining the source of the buzz and decided, after discovering a correlation between the loudness of the buzz and variations in the noise on the mains power supply, that the latter was the source of the buzz. Weiss even went to the White House with a tape recorder to record the power output of the plug in Miss Woods' office. (No noise variations were detected, the reason being, the panel later decided, that the President and his staff were away at the time and power drains in the White House were different from usual.) "After all of the concentration on the buzz," Rhyne asks concentration on the buzz," Rhyne asks at one point in the hearing, "then you in effect throw it out of the window.

Why?" "We believe that the most solid and basic evidence that we have developed is the direct magnetic evidence on the tape," Bolt answers.

Why did the panel present the court and the public with a summary of its conclusions (which, as it happens, was consciously written in the form of a press release) before it was ready with the technical details on which the conclusions were based? It seems that Sirica asked for a summary to be delivered as soon as possible and the panel was sufficiently confident to give it. Despite the unwelcome nature of their summary to the White House, the panel was so surprised to be treated as hostile witnesses by St. Clair and Rhyne that they asked for a special hearing before Sirica to complain. "We cannot function properly if we are in some minor way set off our stride, or disturbed," panelist Thomas G. Stockham told the judge.

Even if the panel had not considered the Dektor hypothesis at the time of last month's hearings, it will by now have checked it out. It is quite likely that the hypothesis has been disproved, if only because the panel would presumably have publicly admitted by now if its conclusions were ambiguous or even incorrect. Even should the Dektor explanation be true, some important problems remain for those wishing to base a full scenario on it. It is probably necessary to assume that Miss Woods talked for 18½ minutes on the telephone instead of the 5 she estimates. (Argument here would hinge on how common it is to make such an underestimate of time.) Barring a malfunction in the Uher's controls, for which there is no evidence, she must have pressed the record button instead of the stop, as she has related in court, and also have kept her foot on the foot pedal throughout the 18½ minutes. Next is the question of why she cannot remember whom she was talking to. (Rhyne says she receives some 90 calls a day, too many to keep a log of. He adds that he doesn't think there was anything on the tape anyway—Nixon and Haldeman had four meetings the day before, on 19 June, one of them on an airplane, where sensitive aspects of the break-in 2 days earlier were more likely to have been discussed.)

President Nixon has been reported as saying that he doesn't know how the 18½-minute erasure was made, but that he feels sure it was accidental. If the Dektor hypothesis should be proved correct, there is a chance he may be right.—NICHOLAS WADE

APPOINTMENTS

Byron K. Trippet, president, International College Funds of America, to president, University of Americas. . . . **Gerald B. Robins**, professor of higher education, University of Georgia, to president, Texas A&I University. . . . **N. Edd Miller**, president, University of Nevada, to president, University of Maine, Portland-Gorham. . . . **Sammie W. Cosper**, dean, College of Liberal Arts, University of Southwestern Louisiana, to vice president for academic affairs at the university. . . . **Halsey Royden**, professor of mathematics, Stanford University, to dean, School of Humanities and Sciences at the university. . . . **William U. Gardner**, president, International Union Against Cancer, scientific director, Council for Tobacco Research-U.S.A., Inc. . . . **Robert G. Loewy**, dean, College of Engineering and Applied Sciences, University of Rochester, to vice president, Rensselaer Polytechnic Institute. . . . **Robert T. Conley**, dean, College of Science and Engineering, Wright State University, to vice president of the university. . . . **Theodore M. Schad**, executive director, National Water Commission, to executive secretary, Environmental Studies Board, National Research Council. . . . **David Prammer**, director of biological sciences, Rutgers University, to director of university research at the university. . . . **Paul W. McDaniel**, former director, research division, Atomic Energy Commission, to president, Argonne Universities Association. . . . **Andrew M. Sessler**, theoretical physicist, Lawrence Berkeley Laboratory, University of California, to director of the laboratory. . . . **Paul Dreizen**, professor of biophysics and medicine, Downstate Medical Center, State University of New York, Brooklyn, to dean, School of Graduate Studies at the center. . . . **Stanley van den Noort**, acting dean, College of Medicine, University of California, Irvine, to dean of the college. . . . **Francis P. Brether-ton**, professor of earth and planetary sciences, Johns Hopkins University, to president, University Corporation for Atmospheric Research. . . . **George C. Shelton**, associate dean, School of Veterinary Medicine, University of Missouri, to dean, College of Veterinary Medicine, Texas A&M University. . . . **Lawrence G. Crowley**, associate dean, Medical School, Stanford University, to dean, Medical School, University of

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