Polygraph

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AN EDITORIAL NOTE ON THE ABZUG REPORT

By

Norman Ansley

In printing the entire report of the Subcommittee chaired by Congresswoman Bella S. Abzug, we wish to point out that the American Polygraph Association does not endorse it. However, everyone connected with the polygraph profession should be aware of its contents and how the report came about.

None of those who were involved in the preparation of this report were present at the 1974 Hearings held by the Subcommittee. Yet the 1974 Hearings are said to be the basis for this report. Although this report recommends that the use of the polygraph be discontinued by all Government agencies for all purposes, not a single witness, not even the ACLU, made such a sweeping recommendation.

Congresswoman Abzug would go even farther than banning the Federal use of the polygraph. In a press release she stated: "I believe that they ought not to be used by private industry or by local or state authorities. We may need legislation to accomplish this goal if the use of these things doesn't decline."

In a dissenting view by the Honorable Frank Horton, supported by twelve other Congressmen, he asked: "What of the individual under investigation in a doubtful case who asks that he be tested in order to try to prove his innocence? Is this privilege one which our government should deny him? We think not."

Most of the Members of the committee did not participate in the vote which made this report official. They were deceived. The vote was taken at the end of a meeting held for the purpose of marking up a bill on the National Women's Conference, and the meeting was attended only by those interested in that bill. Thus two groups wrote dissenting reports after the report was passed. One, by nine members, sets forth six recommendations which differ from those in the report. Another, by thirteen Congressmen, opens with the statement: "We disagree strongly."

We too, disagree strongly.

Polygraph 1975, 05(1)

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94th Congress 2d Session

HOUSE OF REPRESENTATIVES

THE USE OF POLYGRAPHS AND SIMILAR DEVICES BY FEDERAL AGENCIES

January 28, 1976. - Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

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THIRTEENTH REPORT

Together with

Separate and Dissenting Views

Based on a Study by the Government Information and Individual Rights Subcommittee.

On January 22, 1976, the Committee on Government Operations approved and adopted a report entitled "The Use of Polygraphs and Similar Devices by Federal Agencies." The chairman was directed to transmit a copy to the Speaker of the House.

I. INTRODUCTION

In 1964, the Foreign Operations and Government Information Subcommittee made its initial study of the Federal Government's use of polygraphs as "lie detectors." Over the years, such use of polygraphs had become an increasingly controversial topic. As a consequence, both public officials and private citizens were raising serious questions regarding the propriety of their use, as well as the validity and reliability of such devices. Consultation with the Library of Congress disclosed that no study of the Federal Government's use of polygraphs had ever been made by the Congress, by any agency of the executive branch, or by private researchers.

On the basis of hearings conducted in 1964, a reported entitled "Use of Polygraphs as 'Lie Detectors' by the Federal Government" was issued by the Committee on Government Operations in March 1965. It concluded that:

There is no "lie detector," neither machine nor human. People have been deceived by a myth that a metal box in the hands of an investigator can detect truth or falsehood.¹

The committee expressed its concern that this myth was being encouraged by substantial Federal Government expenditures for polygraph machines and on salaries for hundreds of Federal investigators who were conducting thousands of polygraph examinations. To correct the obvious defects and to protect employees from abuse in connection with polygraph examinations, the

¹H. Rept. 89-198, p. 1.

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committee recommended that the Federal Government:

Initiate comprehensive research to determine the validity and reliability of polygraph examinations.

Prohibit the use of polygraphs in all but the most serious national security and criminal cases.

Improve the training and qualifications of Federal polygraph operators.

Restrict the use of two-way mirrors and recording devices during polygraph examinations.

Guarantee that polygraph examinations be, in fact, voluntary.

Insure that refusal to take a polygraph examination will not constitute prejudice or be made a part of an individual's records except in the most serious national security cases.²

The committee also recommended that the President immediately establish an interagency committee to study problems posed by the Federal Government's use of polygraphs and to work out solutions to those problems.

Four months after that report by the committee, the Department of Defense issued a comprehensive directive to regulate the conduct of polygraph examinations and to improve the selection, training, and supervision of its polygraph operators.

A subsequent report by the committee dated September 26, 1966,³ commented both on the directive issued by the Department of Defense and on the establishment of an Interagency Polygraph Committee by President Lyndon B. Johnson in November 1965. The directive was recognized in the report as the first step taken by any Federal agency to curtail the widespread use of so-called "lie detectors." Its provisions for stricter controls and for research were considered to be in harmony with most of the recommendations previously made by the committee. The Department of Defense directive, however, did not prohibit the use of polygraphs in all but the most serious national security and criminal cases.

The interagency group's detailed study of the overall utilization of polygraph machines throughout the executive branch was then still in process, and the final report was not available to the committee for evaluation. This committee did, however, include the following recommendations in its own September 1966, report:

1. The Department of Defense polygraph directive is a good first step forward. But now a second should be taken. The Department should immediately reconsider the permissive use of the device for pre-employment screening with the view of fulfilling the committee's recommendation to prohibit the use of polygraphs in all cases but those clearly involving the Nation's security.

²Ibid., p. 2.

³"Use of Polygraphs as 'Lie Detectors' by the Federal Government" (pt. 2), H. Rept. 89-2081. 2. Qualified physicians and psychiatrists should be included among the appropriate supervisory officials designated to review polygraph examination records.

3. All Government agencies should be placed under a uniform administrative system which will enforce maximum controls on the use of polygraphs, and which will establish regulations to prevent their proliferation and misuse.⁴

In June of 1974, the Foreign Operations and Government Information Subcommittee held hearings to update its information on this subject.⁵ Not only had nearly a decade passed since the previous hearings but new technology and techniques have been developed.

The subcommittee used a questionnaire⁶ in addition to public hearings, as it did in its earlier inquiry, to develop the data and views included in this report.

II. BACKGROUND

History is full of instances where different cultures and societies have attempted to detect lies and verify truth. Some of the ancient tests reflected a primitive understanding of psychology or physiology, but they were hardly reliable or scientific. They had in common a significant dependence on brutality, deception, or chance as the determinant of guilt or innocence.

At various times, and in different places, there evolved such tests as the ordeal of boiling water, the ordeal of the red hot iron, and the ordeal of the red hot stones. In one such ordeal, a suspected wrongdoer was required to thrust his hand into a fire. If the hand was unsinged when removed, the individual was declared innocent; if the hand was burned, that was positive proof of guilt. In other circumstances, truth or lack of truth might be determined by the pattern assumed by a handful of tossed pebbles. A test used by the early Chinese required suspects to chew rice powder while being questioned. If the rice powder was dry when spit out, the man was condemned, on the premise that the tension of guilt supposedly dried up his salivary glands.

Modern criminology is more sophisticated, and utilizes a wide variety of devices and methods which have been developed to assist in apprehending suspected criminals and establishing their guilt or innocence. Among those generally acceptable to the courts as admissible evidence are the results of tests relating to fingerprinting, ballistics, and handwriting. Others, such as the results of polygraph tests, have not yet merited that "general acceptance."

⁴Ibid., p. 4. ⁵"The Use of Polygraphs and Similar Devices by Federal Agencies." Hearings before the subcommittee of the Committee on Government Operations, House of Representatives, June 4 and 5, 1974. Appendix A.

⁷In <u>Frye</u> v. <u>United States</u> (293 F. 1013 [D.C.Cir. 1923]) the court made the following observation relative to the general acceptance test of admissibility: "Just when a scientific principle or discovery crosses the line between the experimental and demonstrable stages is difficult to define.

Polygraph

The polygraph concept presumes that an identifiable physical reaction can be attributed to a specific emotional stimulus. Erasistratus, a Greek physician and anatomist of the third century B.C., reported that emotion caused a quickening of the pulse, but the first attempt to use a scientific instrument as an aid in detecting lies dates back to 1895 when Cesare Lombroso, an Italian criminologist, claimed success in determining the guilt or innocence of suspected criminals by noting whether their blood pressure or pulse changed during interrogation.

In a book entitled "On the Witness Stand" published in 1908, Harvard psychology professor Hugo Munsterberg discussed possibilities of detecting lies by recording physiological changes. Changes in breathing rates were linked to attempts at deception by another Italian criminologist, Vittorio Benussi, in 1914. The following year William Moulton Marston, a criminal lawyer and student of Munsterberg, began systematic research at the Harvard Psychological Laboratory into the correlation between lying and changes in blood pressure.

During World War I, Marston headed a committee of psychologists formed by the National Research Council to look into the known deception tests and report on their possible usefulness in counter-intelligence activities. Using a sphygmomanometer, the device physicians use to measure a patient's blood pressure, Marston conducted experiments by taking intermittent readings of blood pressure during interrogation periods. After performing a number of experiments, the committee of psychologists concluded that the Marston blood pressure test was 97 percent reliable. It recommended that Marston be appointed Special Assistant to the Secretary of War with authority to use his method in spy cases. War Secretary Newton D. Baker took no action on the recommendation, but the committee's work aroused the interest of a young psychologist, John A. Larson, who was connected with the Berkeley, Calif., police force.

In 1921 Larson devised an instrument capable of simultaneously recording blood pressure, pulse rates, and respiratory changes, the forerunner of today's polygraph. Working under Berkeley Police Chief August Vollmer, sometimes called the father of scientific police work in this country, Larson used his device with reported success on hundreds of criminal suspects. Presently he was joined on the Berkeley force by a young man named Leonarde Keeler.

Keeler, a Stanford University psychology major, was destined to become the best known expert in the field. In 1926, he developed an improvement of Larson's apparatus. Keeler continued refining his device, which he named the Keeler polygraph, and incorporated into it the feature of measuring changes in the skin's resistance, commonly known as "galvanic

Somewhere in this twilight zone the evidential force of the principle must be recognized and while courts will go a long way in admitting expert testimony deduced from a well-recognized scientific principle or discovery, the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which it belongs."

skin response." He also developed polygraph interrogation techniques while at the scientific crime detection laboratory at Northwestern University from 1930 until 1938, when he entered private business.

The term polygraph refers, most precisely, to the multiple-pen subsystem which records the instrumental responses on a roll of paper; through usage, it has come to represent the entire lie detection equipment. Contemporary polygraph equipment measures simultaneously three physiological responses:

Physiological response	Device	Method of sensing
Breathing pattern	Pneumograph	Corrugated rubber tube
Blood pressure and pulse	Cardio-sphygmomano- meter	Pneumatic pressure cuff around upper arm (or around wrist and fore- arm to minimize dis- comfort)
Skin resistance to external current	Psycho-galvanometer	Finger or palmar sur- face electrodes.

Psychological Stress Evaluator

The psychological stress evaluator (PSE-1) was developed by two retired Army intelligence personnel and has been marketed by them through Dektor Counterintelligence & Security, Inc., of Springfield, Va., since 1970. The instrument capitalizes on the principle of involuntary physiological changes that are related to psychological stress. It is designed to measure and to graphically display certain stress-related components of the human voice's two modulations-the audible and the inaudible.

According to the developers of the PSE-1, there are inaudible frequency modulations in speech that are superimposed on those audible modulations of the voice that are heard. They further represent that the internal stresses which are reflected in those inaudible variations of the voice are not totally controlled by the brain or thought processes, and that these variations can be detected and recorded by their PSE-1 device.

Two significant advantages are claimed for the PSE-1 over other types of "lie detector" devices. First is its simplicity, in that it has relatively few moving parts and it is relatively easy to learn to operate. Second, the PSE-1 does not have to be used at the time of the interview or interrogation. A tape recorder is used to make a permanent record of the interview, and the tape is later fed into the PSE-1 and the voice reactions recorded on a chart. Users of the device frequently make tape recordings for clients over the telephone, run the tape on the PSE-1, and report the test results to their clients.

Voice Analyzer

Research on the capability of a speech parameter to differentiate truthful from deceitful responses, by measurement of the energy changes in the lower and mid-range speech frequencies, begun in 1963 by Mr. Fred Fuller, culminated in 1970 in the development of the voice stress analyzer. The acknowledged shortcomings of that instrument by its developer led to further research of those rapid variations in the tremolo or vibrato amplitude of speech. In 1972, a second device known as the Mark II voice analyzer was introduced by this same individual. That device electronically extracts a numerical value of those rapid variations in the tremolo or vibrato amplitude of speech, which the developer represents varies with changes in emotional stress.

The Mark II voice analyzer and the Dektor psychological stress evaluator both use the analysis of speech as a basis for inferring truth or deception. They are, however, two completely different instruments and the features extracted from speech for measurement by these instruments are entirely different. The developer of the Mark II voice analyzer claims that because it shows an instantaneous numerical value reading, it provides the most rapid means of detecting deception and the most precise indication of emotional reaction of any instrument.

Other Devices and Techniques

A 1962 report by the Institute for Defense Analysis, cited in the subcommittee's earlier hearings,⁸ notes that suggestions have been made that other physiological responses, such as face temperature, electrocardiograph and electro-encephalogran should be included in lie detection work but virtually no research had been done to learn whether the addition of these indicators would increase the accuracy of lie detection.

Dr. Frederick Davidson, a professor at Kent State University in Ohio, claims to have discovered a lie detection technique that works on a subject who never opens his mouth.⁹ Dr. Davidson reports that he merely examines change in retina color, plus change in pupil size and in eye focus, to determine emotional response to stimuli-like questioning. Thus, he says, the conventional retinoscope can become a lie detector. It allegedly works, too, on an intoxicated or drugged individual because it measures responses in the eye's retine to questions or comments. The method was used temporarily to screen applicants for campus police jobs at Kent State University.

The Weizmann Institute of Rehovot, Israel, recently reported development of a "microwave respiration monitor" to determine truthfulness remotely and without the knowledge of the subject.¹⁰ This device, presently being used in addition to the polygraph by the Israeli police, measures the palpitations of the stomach by use of a microwave. The theory is that lying

⁸Hearings, subcommittee of the Committee on Government Operations, House of Representatives, 88th Cong., 2d sess., Apr. 29 and 30, 1964. "Use of Polygraphs as 'Lie Detectors' by the Federal Government - Panel Discussion with Scientists," (pt. 3), pp. 425-463.

⁹Hearings, pp. 113-120. See footnote 5. ¹⁰Hearings, pp. 121-140. See footnote 5.

produces an increased rate of respiration which can be detected by increased movement of the stomach. The device offers the possibility of widespread, random, remote and surreptitious "truth verification" at border crossings, airports, and police lineups. The developers hope to market the device in the United States shortly.

III. RESEARCH AND THE FALLIBILITY OF "LIE DETECTOR" DEVICES

No body of empirical scientific data existed 10 years ago to demonstrate that the polygraph was either valid or reliable, or both, when used as an instrument for lie detection. The subcommittee found that Federal investigators had given thousands upon thousands of polygraph tests, but that there had been no attempt to determine the validity of the procedure and no attempt to find out whether the polygraph operator really could detect falsehoods. No statistical proof had been compiled, despite thousands of cases; no scientific proof had been produced, despite thousands of opportunities.

The need for and importance of research were highlighted to the subcommittee by the views expressed by many expert witnesses that lie detection tests could be rendered nearly or completely invalid. This could occur if the physical or mental makeup of the individuals being tested involved extreme nervousness, physiological abnormalities, mental abnormalities; if there was a lack of or managed emotional response; and if bodily movements were undetected. These and other factors make it possible for an individual to mislead examiners. Moreover, in the view of those experts, polygraph examiners had neither the training nor ability to recognize obscure mental or emotional abnormalities.

For that reason, the committee's first recommendation in its earlier report was that:

The Federal Government initiate comprehensive research to determine the validity of polygraph examinations.

Federally Funded Research — Polygraphs

A DOD joint services group on polygraph research, established shortly thereafter to act on that recommendation, developed a research program which contemplated six studies:

a. Evaluation of basic instrumentation now employed in polygraph examinations for the assessment of the reliability and adequacy of measurement of the physiological changes assumed to be significant. The test standards and methods for this purpose will be established by an unbiased agency, the National Bureau of Standards.

b. An extensive field test of the reliability of polygraph field instrumentation in use.

c. A study of the reliability of examiners in polygraph chart interpretation.

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d. An attempt to establish external criteria in criminal cases which will make it possible to perform studies of the validity of each aspect of the polygraph examination.

e. An examination of the possibilities inherent in modern instrumentation and computer data processing in the assessment of physiological changes.

f. Collection and analysis of descriptive statistics on polygraph operations.

The Air Force provided \$200,000 in October 1966 to support this program, designated as Project 4356, at Rome Air Development Center. Earlier, the Air Force transferred \$16,500 to the Navy for a contract to the National Bureau of Standards to evaluate the response characteristics of two standard polygraph instruments. A total of \$111,516 was actually spent, with \$104,984 reserved for studies awaiting approval. Although a continuing program of research was contemplated, no funds were provided in fiscal year 1968.

The major reason for research planned and undertaken on the polygraph was to determine its validity, more commonly called accuracy. Validity is defined as a measure of the agreement between the results of a polygraph examination in the absence of any other information and some independent and acceptable way of establishing a person's true guilt or innocence. Validity should be distinguished from reliability. Reliability is simply a measure of agreement between two or more examiners on the same case (or between two tests by the same examiner); i.e., it is a measure of consistency.

Unfortunately, it is possible to be both consistent and wrong. On the other hand, high accuracy is not possible if reliability is low. Validity, i.e., agreement of a polygraph examination with "the truth" (as measured in a test program) is, obviously, the central issue concerning the value of the polygraph as a test of deception in routine use.

The joint services group recognized that it is relatively easy to measure the validity of the polygraph in a laboratory because steps can be taken to insure precise knowledge of the subject's "guilt" or "innocence" and to insure independent judgments by the polygraph examiners. As an example, a subject is told to select a particular card from a deck and to respond with the word "no" to all questions about it or any other card. The experimenter can keep the card while the polygraph examiner's task is to determine the subject's choice solely on the basis of the polygraph test.

A more complicated laboratory test of validity is to contrive the subject's participation in some simulated crime, like acting as if he stole a book from a college bookstore, or perhaps even to steal a book (while arrangements have been made for the bookstore manager to look the other way). Experiments of this sort are not regarded as conclusive because, it can be said, the subject does not have a real motive to deceive the examiner, or does not exhibit the same emotions as that of a guilty person in an actual crime. Thus, even though the "laboratory" experiment offers precise control and knowledge of events, some observers do not accept the results of such experiments. The joint services group was able to accomplish only part of its assignment. It developed a research and development program which, if carried out, was believed capable of establishing the reliability and validity of the polygraph as a means of judging deception. However, that group was not able to undertake its proposed validation studies because of concern with the possibility of severe adverse reaction on the part of Congress, the press, and the public to that program.¹¹ Moreover, its proposed TV study of the complete polygraph interrogation could not be undertaken because too few polygraph examinations were being conducted at the time to permit the collection of the required research data in a reasonable amount of time.

The joint services group summarized the results of its curtailed research efforts in an internal report dated August 28, 1968, entitled, "Present Status of DOD Research on the Polygraph."¹² That report states that the joint services group was able to formulate but not to carry out a research program to determine the reliability and validity of a polygraph examination, observing that the conceptual problems of devising a research strategy were less formidable than the practical ones.

Notwithstanding the problems encountered, and the fact that its research program was not completed, the joint services group did reach some conclusions. Paramount was its conclusion that the polygraph remains in use although no steps were being taken to establish its validity. In addition, it concluded that the standard polygraph device is not a precision instrument, and that the response characteristics of the two standard polygraph instruments—Keeler and Stoelting—differ. Moreover, it found that some polygraphs in routine use in the Department of Defense did not perform in accordance with pertinent specifications. The joint services group also noted that, although rather easy to carry out, surprisingly few studies had been accomplished on the reliability of an entire polygraph examination or of any of its parts such as the pre-interrogation interview, type and sequence of questions used in the examination and chart reading.

The Department of Justice witness, commenting on the matter of the fallibility of polygraph test results, enumerated many reasons¹³ for that Department's decision to view such examinations with caution and to oppose their introduction into evidence at trial. Among them was the statement that:

* * * the results of polygraph examinations cannot be viewed with the same equanimity as the results of forensic tests such as fingerprints, ballistics, and blood tests because * * * .

followed by an enumeration of nine reasons for that view. (See Justice Department Position on Admissibility for additional detail.)

Federally Funded Research - Voice Analyzers

With the passage of time, polygraph proponents appear to have accepted

¹¹Hearings, pp. 630-631. See footnote 5. ¹²Retained in subcommittee files. ¹³Hearings, p. 414. See footnote 5.

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without serious question the validity of their device as an instrument for differentiating between truth and deception. They are now increasingly addressing their efforts to demonstrating the reliability of polygraph test results (i.e., consistency in reaching an identical conclusion). Moreover, they no longer give as much emphasis to the term "lie detection" as they used to; instead, they speak of their testing processes as a means of identifying and measuring changes in stress which are indications of the truth or deception of the answers being given.

The primary strategy and efforts of the proponents of the psychological stress evaluator and the voice analyzers are devoted to demonstrating that, in similar circumstances, their devices are at least as, if not more, reliable than are polygraphs.

In the most recently reported pertinent research, "Comparison of Voice Analysis and Polygraph as Lie Detection Procedures,"¹⁴ the researcher's finding was that there existed a clear inferiority of voice analysis, in its present state of development, not only to the polygraph, but also to judgments made on the basis of simply observing subject's behavior. In view of this, the study concluded that neither of the presently existing voice analysis instruments (i.e., psychological stress evaluator or the voice stress analyzer) warranted acceptance as valid "lie detectors" within the constraint of an experimental paradigm. The CIA, which has been interested in voice analysis for several years does not believe that research to date has been either exhaustive or conclusive, and has plans for research of its own.

Proposed Federally Funded Research - Polygraphs

The subcommittee was advised in May 1974,¹⁵ that the Law Enforcement Assistance Administration (LEAA), of the Department of Justice, had under consideration funding an 18-month study, for approximately \$100,000, entitled "Validity and Reliability of Detection of Deception," to consider the following five areas:

 The basic validity and reliability of polygraph examinations in detecting truth and deception with criminal suspects;
The relative effectiveness of various physiological measures, including the currently used standard measures (respiration, skin resistance, cardiovascular activity) and other promising measures which require additional laboratory research;
A general evaluation of present practices among field examiners in private practice and in law enforcement settings;
The extent to which subject variables such as psychopathy and personality factors influence the effectiveness of the polygraph technique; and

5. The sources of errors in polygraph examinations.

The study is expected to result in reports written for two different audiences. First, a comprehensive and detailed report of the overall

¹⁴Technical Report No. LWL-CR-03B70, by Joseph F. Kubis, Fordham University, to U.S. Army Land Warfare Laboratory, Aberdeen Proving Ground, Md., 20015 ---(Final Report Contract No. DAAD05-72-C-0217). ¹⁵Letter dated May 29, 1974, retained in subcommittee files.

research, methodology, results, and conclusions will be prepared, along with individual reports covering each of the five research areas stated above, for those with a scientific and professional interest in the polygraph technique. Secondly, a summary report will be prepared for the criminal justice practitioner who is interested in the problems of application of the polygraph technique.

American Polygraph Association Research

The level of research directly funded or sponsored by the American Polygraph Association can best be described by that organization's own language—"minimal."¹⁶ Only nominal funds have been allotted to the APA Research and Instrumentation Committee for in-house volunteer efforts concerned mostly with instrumentation and refinement of techniques. These projects receive advance approval by the APA president.

The APA spokesmen were queried, also, concerning the degree to which the organization had itself conducted tests comparing the accuracy and validity of polygraphs and those newer devices which depend primarily on voice analysis. Such a test was reported to have been underway for about a year, conducted by the APA Research and Instrumentation Committee, but no report thereon was expected before August 1974. On March 19, 1975, the subcommittee was advised that the test was suspended, without preparation and issuance of a final report, because of indicated unreliabilities of the PSE equipment being used in the research project.¹⁷

Continued Need for Definitive Research

When the committee earlier identified the need for and recommended research, it was hopeful that with the passage of some reasonable period of time, some of its doubts and reservations about the validity and reliability of polygraphs might be allayed by the result of that research. However, the nature of research undertaken, both federally and privately funded, and the results therefrom have done little to persuade the committee that polygraphs, psychological stress evaluators, or voice stress analyzers have demonstrated either their validity or reliability in differentiating between truth and deception, other than possibly in a laboratory situation. It is not alone in this view.

The Law Enforcement Assistance Administration of the Department of Justice responded to the subcommittee's request for evaluative information relating to past and recent research on the validity and reliability of polygraphs as follows:

It has been established that psycho-physiological recordings can be effective in differentiating between truth and deception in mock crime situations in the laboratory, and that the accuracy rate of detection can be manipulated by controlling such variables as age, relevance of the question, degree of motivation of

¹⁶Hearings, p. 160. See footnote 5.

¹⁷Memorandum retained in subcommittee files.

the subject, the number and type of physiological measures being monitored, the number of times the questions are asked, etc.

However, the effectiveness of the lie detection technique when it is used on criminal suspects outside of the laboratory has never been adequately resolved; there is, therefore, a conspicuous lack of reliable data on this point. Polygraph examiners have consistently claimed an error rate of less than one or two percent. Unfortunately, their claims are unsubstantiated, and their statistics were based upon total cases rather than confirmed cases. Several scientists have examined criminal suspects, and they have unanimously reported accuracies of essentially 100%. However, they did not publish many details to support their claims.¹⁸

The Department of Justice was also queried about the justification for underwriting, at a cost of \$100,000, the unsolicited research proposal from Dr. David C. Raskin of the University of Utah, in light of the earlier substantial Federal funding of several Department of Defense research projects.

The response to that question again emphasized the significant difference between test results obtained in a laboratory situation and those obtained in a "real life" situation:

During the last 50 years there have been over 75 laboratory experiments which have indicated that psycho-physiological measurements can greatly increase the probability of determining whether a subject is lying or not. Unfortunately, there are numerous differences between the detection of deception in a laboratory environment and lie detection with criminal suspects. Some of these differences, such as the degree of emotional involvement which the subject has in the outcome of the examination, are obvious and compelling; other differences are more subtle. Some of these differences favor accuracy with criminal suspects. The qualifications, experience and testing techniques of the scientists were not at all representative of lie detection as it is being practiced today. Perhaps the major reason for this is that very few scientists have been trained in current lie detection practices.

Since polygraphs are being used more frequently in the judicial process and are used by the Federal Government, as well as most major law enforcement agencies at State and local levels, it is extremely important that adequate information be available regarding the basic reliability and validity of the techniques. In addition, information is needed about the ways in which the techniques can be improved and the extent to which available techniques are properly employed in present practice. It is the basic purpose of the proposed research by the University of Utah

18_{Hearings}, pp. 638-639. See footnote 5.

to fill some of the gaps in knowledge concerning those fundamental problems.19

The Central Intelligence Agency made similar observations in its testimony before the subcommittee:

Reliability, defined as consistency of interpretation of polygraph charts, has been looked at by means of examiner agreement studies. Agreement figures from our studies are comparable to figures from similar studies of other groups interpreting data germane to their specialties.

On the other hand, validity—or the degree to which polygraph charts measure what they purport to measure—has been a more difficult issue to evaluate. Satisfactory independent criteria for validating real life conditions are scarce, and the differences in polygraph subject attitudes between real life and laboratory conditions have prevented much headway through laboratory experiments. The data so far available have not been disappointing, but they are limited, and we still lack an appropriate scientific base for any conclusions.²⁰

IV. LEGAL AND MORAL CONSIDERATIONS

The subcommittee heard considerable testimony that the examination of individuals by polygraph or other "lie-detection" instruments infringes on essential individual liberties and protections guaranteed by the Constitution.

"Lie Detectors" and Constitutional Safeguards

The American Civil Liberties Union witness stated that no individual should be required, by moral or legal compulsion, to submit to a "Lie Detector" test and argued that a number of the Bill of Rights amendments to the Constitution are violated by such a testing procedure. He called further attention to the fact that some European countries have long rejected the polygraph as an impermissible police technique, not so much because of its possibilities for error, but because it was deemed to violate the essential dignity of the human personality and the individuality of a citizen.²¹

The spokesman for the American Federation of Government Employees (AFGE), an organization representing 650,000 Federal employees in exclusive recognition units, expressed similar strong objections for much the same reasons. The AFGE recognized with only limited satisfaction the inclusion in the Federal Personnel Manual of the partial bars to the use of polygraphs in screening applicants and appointees to competitive service positions, following subcommittee hearings of a decade ago. It expressed particular concern about that significant part of the Federal work force which is in the

¹⁹Hearings, p. 639. See footnote 5. ²⁰Hearings, pp. 646-647. See footnote 5.

²¹Hearings, pp. 38-49. See footnote 5.

excepted service and which does not enjoy the same protection afforded competitive service employees.²²

The AFGE proposed, therefore, that the use of polygraphs be controlled by legislation and that such legislation contain an absolute bar against the conduct of polygraph examinations of Federal employees, except in narrowly defined national security cases. The pressures placed upon certain elements of the intelligence and security apparatus of the Government were conceded to warrant the limited and selected use of polygraphs and other technological devices, in the public interest. However, it is the stated belief of the AFGE that the outer limits of that use and very strict procedural safeguards should be established under congressional standards, if proliferation of use and abuse in application is to be avoided.

The conditions which call forth the use of polygraphs on Federal employees are often highly charged investigations involving security breaches or leaks of classified information which initially at least are conducted under partial or total secrecy, according to the AFGE. In such circumstances, the compulsion upon the employee to consent is believed to be overpowering. There is the assumption present—which the AFGE finds unwarranted—that the polygraph will somehow sort out the innocent from the guilty and that if an employee refuses to submit, he is hiding his guilt.

While the polygraph examination is not a surreptitious surveillance of the individual, like bugging or wiretapping or the use of two-way mirrors, the union believes that the use to which the results may be put can have the same deleterious effect, unless strictly controlled. Accordingly, assuming that polygraph examinations are warranted in narrowly justified circumstances, the AFGE proposed that they be conditioned unequivocally by law to require consent of the individual examined and to guarantee to him the right to have an attorney, a doctor, or both, or another representative of his choice present at all times during the examination.

The AFGE further proposed that absolutely no inference adverse to the employee should be drawn from the refusal to submit to the polygraph examination, that the use of the result of a polygraph examination be restricted to the specified purpose for which it was taken and to which the employee has consented, and that the use or distribution of such test results for any other purpose be prohibited.

"The Right To Prove One's Innocence"

Supporters of the use of the polygraph, psychological stress evaluator, and voice analyzer as "lie-detectors," who appeared before the subcommittee as witnesses, uniformly represented that their examination results were valid and reliable when their instruments were operated by competent examiners who adhered to proper examining techniques. They rejected the charge that use of these instruments violates an individual's constitutional rights and protections, supporting the view with the statement that the job applicant or employee has the option to refuse to take such an examination.

²²Hearings, pp. 384-385. See footnote 5.

Again, uniformly, they offered the view that the opportunity to take the polygraph or similar test should be welcomed by an individual, because, to quote the American Polygraph Association, "* * * all intelligent people endorse the right of the innocent to prove their innocence * * * ."23

This latter view is a novel restatement of a major tenet of our system of jurisprudence that an individual is presumed to be innocent of charges brought against him and that his guilt must be proven.

A number of witnesses disagreed with this restatement of law. Mr. Henry S. Dogin, Deputy Assistant Attorney General, Criminal Division, Department of Justice, for example, was queried as follows:

Mr. Cornish. One of the concerns that I raised here yesterday was sort of a theme running throughout the testimony of the polygraph proponents. And the theme was that there was a way a person can prove himself to be innocent of things. I just wondered, Mr. Dogin, do you know of any court in the United States where a defendant is required to prove his innocence?

Mr. Dogin. No. The State, the people or the Government has to prove him guilty beyond a reasonable doubt.

* * * *

Mr. Cornish. Also one of the witnesses yesterday said he thought it was a bizarre twist of the Constitution if someone were to regard the first amendment as giving the right to remain silent. Mr. Dogin, do you find that bizarre?

Mr. Dogin. Not at all.24

Proponents of the polygraph instrument stated during their testimony that, increasingly, courts have begun to admit test results as evidence. In response to the subcommittee's request, a summary of information bearing on that point was prepared and furnished by the American Polygraph Association (APA).²⁵

Admissibility In Evidence

In substance, that submission discloses that a number of State courts have been considering more closely the subject of admissibility of polygraph test results as evidence. Examination by the subcommittee staff of the cases identified by the APA shows that the strongest of the cases have been in support of the defense; have dealt with situations where test results, although admitted through stipulation by both parties, were not admitted as prime evidentiary material; and none of the cited cases appears to have addressed those primary issues involving the violation of individuals' constitutional guarantees against self-incrimination.

²³Hearings, p. 191. See footnote 5.
²⁴Hearings, pp. 631-632. See footnote 5.
²⁵Hearings, pp. 147-153. See footnote 5.

Justice Department Position on Admissibility

The responsibility of the Criminal Division at the Department of Justice is to enforce all Federal criminal laws except those specifically assigned to the Department's Antitrust, Civil Rights, and Tax Divisions. U.S. attorneys are concerned with criminal matters and litigation arising under approximately 900 Federal statutes, including statutes relating to bank robbers, kidnapping, extortion, labor racketeering, fraud against the Government, conflict of interest, bribery of public officials, perjury, corruption of justice, and theft and larceny of public property. In light of these major responsibilities, the position of the Justice Department with respect to the use of results of polygraph examinations is deemed particularly noteworthy.

Because it views the results of those examinations with caution, it opposes their introduction into evidence at trial. To this end, U.S. attorneys are instructed not to seek the admission in evidence of polygraph examinations and to oppose all attempts by defense counsel to seek the admission of such examinations. This position of the Department of Justice is concurred in both by the eight U.S. courts of appeals which have considered the question of the advisability of polygraph results as evidence, and by the vast majority of State courts.

The Department of Justice witnesses, who appeared before this subcommittee, marshaled the following list of reasons supporting this policy:

First, while proponents of the polygraph claim 80 to 90 percent or even higher accuracy for the technique, their statistics are open to challenge because of the great difficulty in obtaining independent corroboration of the results of the vast majority of examinations--especially those examinations indicating the subject was not trying to deceive the examiner.

Second, the results of polygraph examinations cannot be viewed with the same equanimity as the results of forensic tests such as fingerprints, ballistics, and blood tests because: (1) There is no specific physiological reaction indicative of deception, and even the same person may have inconsistent physiological reactions associated with deceptive responses; (2) apparent indications of deception may be caused by other psychological factors; (3) the moral attitude toward lying by the subject may affect his reactivity; (4) the subject may be able to "manufacture" physiological responses, such as intensifying his reactions to control questions, thereby effectively masking his reactions to relevant questions; (5) mental instability or aberration may affect the reactivity of a subject; (6) the taking of depressant drugs may affect a subject's reactivity; (7) the physical circumstances incident to an examination may affect a subject's physiological reactions; (8) the complexity and nature of the matters being inquired into may affect a subject's reactions (for example, a subject may be able to rationalize his answers in matters involving his state of mind, such as questions relating to

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intent of knowledge, but would be less likely to be able to rationalize his answers to simple direct questions such as "Did you shoot John Jones?"); and (9) other objective factors such as a subject's involvement in other similar acts, excessive interrogation prior to the polygraph examination, and excessive test length may also affect the accuracy of polygraph results.

In addition to these objective factors affecting the validity and reliability of polygraph results, subjective factors, such as the polygraph examiner's observation of the subject's behavior during the test procedure, the effect of the interaction of the polygraph examiner and the subject, and the subjective bias of the polygraph examiner, may all affect the validity and reliability of any examination.

Third, and possibly most important, because of the undue reliance juries are likely to place on the apparent mechanistic accuracy of polygraph results, we believe that the introduction in evidence of polygraph results would virtually vitiate juries' historical fact-finding responsibilities. As Judge Irving Kaufman eloquently stated fifteen years ago:

The most important function served by a jury is in bringing its accumulated experience to bear upon witnesses testifying before it, in order to distinguish truth from falsity. Such a process is of enormous complexity, and involves an almost infinite number of variable factors. It is the basic premise of the jury system that twelve men and women can harmonize those variables and decide, with the aid of examination and cross-examination, the truthfulness of a witness. * * * I am not prepared to rule that the jury system is outmoded. * * * I still prefer the collective judgment of twelve men and women who have sat through * * * a trial and heard all the evidence on the guilt or innocence of a defendant.

Indeed, unless there is a constitutional amendment which substitutes trial by polygraph for trial by jury, the Criminal Division will oppose the introduction in evidence of polygraph results.

Fourth, under the common law rules of evidence and proposed Rule 704 of the Rules of Evidence for United States Courts and Magistrates, polygraph results, which one Court of Appeals has preceptively referred to as little more than "electrical oathhelpers," would not be the proper subject of expert testimony.

Fifth, the admission of polygraph results would greatly attenuate the length of trials and lead to a potentially serious confusion of the issues. Our experience with hearings on defense attempts to introduce polygraph results in evidence is that these hearings take more of the court's time than 75 percent of all criminal trials. It readily can be seen that such hearings not only would more than double the length of most trials, but also would lead to serious confusion of the issues involved in a case because at least as much of the court's time would be spent "trying" the polygraph examination as the issues involved in the case. Moreover, if courts admit polygraph results of defendants, should they not also admit polygraph results for key witnesses or even all witnesses?

Additionally, if the use of the polygraph becomes prevalent, jurors may come to believe that any defendant who does not submit polygraph results indicating his innocence is presumably guilty.

Sixth, it is our belief that there is no proper evidentiary purpose served by polygraph results which would justify their admissibility in evidence under either common law rules of evidence or the proposed Federal Rules of Evidence. Polygraph results are not properly classifiable as substantive evidence, evidence of character trait or credibility, or rehabilitative evidence as an exception to the prior consistent statement rule.

Finally, if the Government were to seek the introduction of polygraph results of defendants in cases in which defendants failed to testify, serious Fifth Amendment problems would arise. If defendants were to successfully introduce polygraph results in cases in which they did not intend to testify, serious questions would arise as to whether they did not thereby waive their Fifth Amendment rights and could be required to take the stand.²⁶

V. POLICY AND STANDARDS ESTABLISHED BY THE CIVIL SERVICE COMMISSION

The current provisions of the Federal Personnel Manual relating to the use of polygraphs are an outgrowth of the interagency study made following the issuance by this committee of its reports in 1965 and 1966.

The first report recommended that the President establish an Interagency Committee To Study Problems Posed by the Federal Government's Use of Polygraphs and to work out solutions. The second report recommended that all Federal Government agencies be placed under a uniform administrative system which would enforce maximum controls on the use of polygraphs and would establish regulations to prevent their proliferation and misuse.

The study, under the direction of John W. Macy, Jr., then Chairman of the Civil Service Commission (CSC), developed a set of guidelines and instructions which, in substance, were incorporated by the Commission into a Federal Personnel Manual system letter issued October 25, 1968, and subsequently, into the Federal Personnel Manual, chapter 736, appendix D.

²⁶Hearings, pp. 413-417. See footnote 5.

The current regulations, which include minor modifications made in 1973,²⁷ contain the following essential provisions:

(1) An executive agency which has a highly sensitive intelligence or counterintelligence mission directly affecting the national security may use the polygraph for employment screening and personnel investigations of applicants for and appointees to competitive service positions only after receiving written approval from the Chairman of the Civil Service Commission.

(2) The executive agency must submit to the Chairman of the Civil Service Commission a statement of the nature of its mission and a copy of its regulations and directives governing the use of the polygraph.

(3) The Chairman determines whether the agency has an intelligence or counterintelligence mission directly affecting the national security and whether the regulations and directives meet the approval requirements.

Approval to use the polygraph is granted only for 1 year, and an agency given approval by the CSC to use the polygraph for competitive service positions is required to recertify annually that the conditions which led to the original certification still exist in the agency. All other uses of a polygraph to screen applicants for and appointees to competitive service positions are forbidden. This prohibitions applies to the use of the results of polygraph examinations given previously by that agency, by another Federal agency, or by a private source.

The head of each department and agency of the Federal Government is responsible for establishing and maintaining an effective program to insure that the employment and retention in employment of any civilian officer or employee is clearly consistent with the interests of national security. The employment of each such civilian officer or employee is subject to investigation. The investigation of persons entering or employed in the competitive service is primarily the responsibility of the Civil Service Commission. Exceptions to that rule may be made where agency heads assume that responsibility pursuant to law or by agreement with the Commission. The investigation of persons other than those in the competitive service is primarily the responsibility of the employing department or agency.

Of the 2.6 million Federal civilian employees, 85 to 90 percent are estimated by the Civil Service Commission to be competitive service employees. The remaining 10 to 15 percent—or between 250,000 to 375,000 individuals—are excepted service employees. The use of polygraphs in personnel investigations of such excepted service employees, either for pre-employment screening or as a condition of continued employment, is not prohibited by the provisions of the Federal Personnel Manual.

²⁷Inst. 196, dated July 9, 1973, to Federal Personnel Manual, retained in subcommittee files.

Included in the category of excepted service employment are employees of the Tennessee Valley Authority, the employees of the Foreign Service in the Department of State, all—some 10,000—attorneys in the Federal Government (schedule A); cooks, chaplains and other persons for whom the Commission lacks either the capacity or opportunity to examine as to qualifications (schedule B); and those noncareer executive assignments frequently referred to as "political jobs" (schedule C).

The Civil Service Commission itself does not possess any devices such as the polygraph or a psychological stress evaluator, nor does it make use of those so-called lie detectors in its own internal operations or in discharging its responsibilities relating to Government-wide investigative activities. Its Bureau of Personnel Investigations, through the Office of Security Appraisal, conducts continuing studies of personnel security programs of Federal departments and agencies for the purpose of determining:

(1) Deficiencies in security programs established under the order which are inconsistent with the interests of, or directly or indirectly weaken, the national security.

(2) Tendencies in these programs to deny to individual employees fair, impartial, and equitable treatment at the hands of the Government, or rights under the Constitution and laws of the United States or Executive Order 10450.

Each study made at a department or agency includes examination of pertinent files and regulations, and looks into whether it is used only for approved purposes. An agency is required to take necessary steps to correct any material weakness or deficiency disclosed during the appraisal and to notify the Commission of the changes made. This requirement would be applied to any unapproved use of the polygraph, or any similar device.

Commission's Assessment of Agency Polygraph Use

The Commission's experience, since the issuance of its instructions in 1968, leads it to conclude that little use has been made of the polygraph, in relation to competitive civil service employment. Only one agency, the Department of Defense, has submitted a request for approval of the use of the polygraph. The initial request dated June 20, 1969, was not approved by the Commission. By letter of July 8, 1969, Commission Chairman Hampton advised the Department of Defense that DOD Directive 5210.48, issued July 13, 1965, which governed the use of the polygraph throughout that department, needed to be updated and clarified so that it more specifically met the criteria set forth in the Federal Personnel Manual.

A second Department of Defense request, dated March 14, 1973, resulted in the Chairman of the Civil Service Commission granting authority to use polygraph examinations for certain limited categories of employees.²⁸ A request for renewal of this approval was under consideration by the Commission at the time of the subcommittee's hearings in June 1974.

²⁸Hearings, p. 412. See foot note 5.

The Civil Service Commission advised the subcommittee in March 1975²⁹ that the Department of Defense had submitted its proposed regulations and directives on the use of polygraphs for review during the fall of 1974. The Commission returned that submission to the DOD, with suggestions for changes. During October 1974 DOD agreed to make the suggested changes and to have revised guidelines approved by the Secretary of Defense. The Commission also advised that it was its understanding that after the guidelines had been approved and signed by the Secretary of Defense, DOD would apply to the Commission for permission to use the polygraph for a 1-year period under the amended guidelines. However, as of this latest advice from the Commission, the guidelines have yet to be signed and approved by the Secretary of Defense.

Security appraisals performed by the Civil Service Commission have disclosed no misuse of the polygraph by agencies. Its recent appraisal at the National Aeronautics and Space Administration (NASA) did disclose, however, that that agency had regulations setting forth a policy regarding polygraph examinations which did not conform to the provisions of the Federal Personnel Manual. The Commission's security appraisal of that agency was closed out on May 17, 1974, at which time NASA agreed to revoke its policy.³⁰ The Commission also was assured by NASA that the policy had not been used in violation of the provisions of the Federal Personnel Manual.

The committee notes with satisfaction that the Federal Personnel Manual now includes a statement of Government-wide policy with respect to the use of polygraphs by Federal agencies, where none existed at the time of its earlier hearings, 10 years ago. Additional evidence of concern by the executive branch is the continuing review by the Civil Service Commission of agencies' security programs, including consideration of their policies and practices concerning the use of polygraphs.

The committee is convinced, notwithstanding, that additional opportunity exists throughout the Federal Government to improve and strengthen both policy and practices. The Federal Personnel Manual appears to be overly concerned with what agencies must do to obtain approval from the Civil Service Commission to administer polygraph examinations to their employees. It is the committee's belief that, in an area of such sensitivity with respect to individual's rights, the pertinent paragraphs of its manual should state clearly those few specific conditions in which applicants for and appointees to competitive service positions may be required to take polygraph examinations. It also should state what effect the polygraph examination, or the refusal to take that examination, has on eligibility for employment or continued employment. Such an introduction would more appropriately preface the current explanatory material in appendix D of chapter 736 of the Federal Personnel Manual.

The testimony by the Civil Service Commission witness disclosed that only the Department of Defense has submitted a request for approval of its statement of policy and procedures applicable to use of polygraph tests to examine a few Defense Intelligence Agency employees in competitive service

²⁹Letter retained in subcommittee's files.

³⁰Hearings, p. 412. See footnote 5.

positions who were detailed to work with the National Security Agency. The subcommittee, by circularizing a questionnaire among 53 Federal agencies, learned that not only the Department of Defense but other agencies, including some with employees in competitive service positions, administered or had administered for them a number of polygraph tests during 1973.

The Department of Justice letter of November 26, 1973,³¹ reports that its Drug Enforcement Administration utilizes the polygraph to evaluate employee integrity, when allegations concerning the employee are made, or to judge the credibility of informants who volunteer unusual information of an important nature. That letter further states the the Drug Enforcement Administration contracts with members of the American Polygraph Association for polygraph examinations, but that no costs were incurred for this purpose in fiscal year 1973.

The Board of Governors of the Federal Reserve System responded on November 12, 1973,³² stating that on four specific occasions in fiscal year 1973 polygraphs were utilized, through the retention of outside agencies, as aids in the investigations of suspected improper conduct of duties by Reserve bank employees.

The November 14, 1973,³³ response from the United States Postal Service reports that polygraph examinations are used in criminal investigations of employees' activities and that 485 polygraph examinations were made by the Postal Service during fiscal year 1973.

The Defense Communications Agency responded to the questionnaire on November 2, 1973,³⁴ stating that it did not possess any polygraph machines, but that at the request of the Office of the Special Assistant to the Secretary of Defense, it had arranged for the U.S. Army 902d Military Intelligence Group to conduct one polygraph examination during fiscal year 1973.

None of the above agencies included in their responses to the questionnaire any disclaimer that the tests were given to individuals other than employees in the competitive service category. The committee was unable to ascertain from the limited information furnished whether or not the polygraph tests reported to it by these four agencies were given to competitive service personnel. Information subsequently obtained confirmed that those provisions of the Federal Personnel Manual relating to the use of polygraphs are applicable neither to the employees of the Federal Reserve System nor the Postal Service, because those employees do not hold competitive service positions.

No procedures currently exists imposing the requirement that all agencies which have any competitive service employees and which do administer polygraph examinations report to a control agency in the executive branch, certifying that polygraph tests were not administered in connection either

³¹Letter retained in subcommittee files.

³²Letter retained in subcommittee files.

³³Letter retained in subcommittee files.

³⁴Letter retained in subcommittee files.

with pre-employment, appointment, or continuance of employment of such individuals. The committee is persuaded that, absent such a reporting requirement, the Civil Service Commission can only assume that no agency other than the Department of Defense is giving polygraph tests or has had polygraph tests given to its competitive service employees.

The committee is further persuaded that such periodic reporting is desirable at intervals not less frequent than annually. Such reporting should provide for the disclosure of the volume of polygraph testing, Government-wide, for both those agencies having highly sensitive intelligence or counterintelligence missions directly affecting the national security and for those agencies not members of that intelligence community. Those reports should cite the Civil Service Commission document containing approval of the agency's pertinent regulations and directives and should furnish data on the number of polygraph instruments; the number of tests administered both by and for the agency, categorized by purpose of the test (as contemplated by paragraph D-3(1) of appendix D); and the numbers of excepted employees and competitive service employees tested.

VI. OWNERSHIP AND USE OF "LIE DETECTORS" BY FEDERAL AGENCIES

Only a relatively few agencies in the Federal Government currently own and use polygraphs, and that same condition pertained when the committee made its report in 1965. The overall pattern of ownership and usage has changed only slightly in the intervening decade. Generally, polygraphs are being used in screening applicants for employment by the Central Intelligence Agency (CIA) and the National Security Agency (NSA); by these and several other agencies, in connection with security and personnel investigations of employees; and by two agencies in connection with scientific research not related to the subject of lie-detection.

Financial and Statistical Data

In 1965, agencies reported to the subcommittee ownership of 512 polygraphs which were acquired at a cost of \$428,066, and which were used for 19,796 tests during fiscal year 1963. The subcommittee's recent canvass of agencies showed a reported ownership of 458 polygraph devices with an acquisition cost of \$493,368, and that 6,889 tests were performed during fiscal year 1973. This decline in the volume of tests performed is particularly noteworthy, because the 19,796 tests given 10 years ago do not include those tests given by both the CIA and NSA, whereas the 6,889 total currently reported does include more than 3,000 tests performed by NSA. It is quite obvious that those other agencies (primarily the military departments in the Department of Defense) which own polygraphs also have sharply curtailed their use.

Some of the more significant data furnished to the subcommittee relating to the number and cost of polygraphs owned, and the frequency with which they were used during fiscal year 1973, follow:

	Instruments owned	Acquisition cost	Annual maintenance and other expenses ¹	Tests performed in fiscal year 1973
Investigation and personnel sci	reening:			
Department of Defense:				
Army	285	\$219 , 171	\$59,289	2,028
Navy	21	30,500	26,181	665
Marines	12	24,000	500	62
Air Force	58	53,872	47,410	482
Defense Investigative Serv	rice 0	0	·0	5~
Defense Communications Age	ency 0	0	0	1~
National Security Agency	14	24,645	11,866	3,081
Defense Intelligence Ageno	ey O	0	0	1~
Chairman, Joint Chiefs of	Staff 0	0	0	0
Defense Telephone Service	0	0	0	0
Total, Defense	390	350,189	145,246	6,325
Investigation and personnel scr Department of Justice: Feder	eening: al			
Bureau of Investigation Department of the Treasury:	26	25,847	500	79
Secret Service	10	13,215	0	₅₀ 3
Customs Service	1	1,368	200	7
Total, Treasury	.ل.بل 	14, 583	200	57
U.S. Postal Service: Postal Inspection Service Central Intelligence Agenc	10 (4)	14,813 (⁴)	23 , 028 (4)	485 (4)
Total, investigation and personnel screening	437	405,432	168 , 974	6 , 946
Scientific and medical research:				
Health, Education & Welfare Environmental Protection Agen	19 cy 2	74,990 12,948	0 0	0 0
Total, scientific and medical research	21	87,938	0	0
Total, all applications	458	493,370	168,974	6,946

USE OF POLYGRAPHS BY AGENCIES OF THE UNITED STATES GOVERNMENT

¹Exclusive of operators' salary cost. ²Tests administered in connection with, respectively, personnel security, per-screening, & security clearance. ³Response stated: "Less than 50 polygraph tests

were conducted by the Secret Service in fiscal 1973." ⁴Agency states such information is classified & its disclosure restricted under 50 U.S.C.403(g).

The committee cautions that the data furnished by the Federal agencies reporting ownership and use of polygraphs have not been validated by audit or any other means, and that some evidence is at hand which raises questions about the accuracy of some of that reported data. The single largest user listed above is the Department of Defense, which furnished statistical data, first during November 1973, and subsequently during the public hearings in June 1974. There were some sharp disparities in those data, particularly as they related to the total number of polygraphs owned and in use by the Army and in the number of polygraph examiners in the various components of the Department of Defense.

DEPARTMENT	OF	DEFENSE	COMPILATIONS	OF	DATA	RELATING	TO	POLYGRAPHS	AND	POLYGRAPH
EXAMINERS										

	Pc	lygraphs Own	Polygraph Examiners				
	Operable	Inoperable	Inoperable Total		- Primary Duty		
Army:							
June 30, 1973 Mar. 31, 1974	141 276	144 ¹ 140	285 416	70 61	9 32		
Navy:							
June 30, 1973 Mar. 31, 1974	21 21		21 21	10 9	10 9		
Marine Corps:							
June 30, 1973 Mar. 31, 1974	12 12		12 12	11 17	0 0		
Air Force:							
June 30, 1973 Mar. 31, 1974	58 58		58 58	33 27	0 1		
NSA:							
June 30, 1973 Mar. 31, 1974	14 16		14 16	12 20	7 7		
That all •							
June 30, 1973 Mar. 31, 1974	246 383	144 140	390 523	136 134	26 49		

¹Shown as inoperable, on basis of DOD statement that many of the 144 units in the Army Material Command stock are obsolete.

The Department of Defense, at the request of the subcommittee, has undertaken to resolve those differences. That Department has furnished responses to the subcommittee's inquiries concerning (1) the need for the relatively large number of polygraphs (58) owned by the Air Force, in view of the relatively few tests (482) given by the DOD component in fiscal year 1973, and (2) the need for so many certified examiners in the Air Force, with all the attendant costs for qualifying them, inasmuch as only one person had that function as a primary duty. On the first point, the Department of Defense, stated that the Air Force's initial acquisition of the instruments was based on their distribution to each regional operating location, so that examiners did not have to carry an instrument with them at all times. In 1970, the Air Force changed its system to require individuals to carry their own individually assigned instruments. Excess instruments were maintained as backups for repair parts for the ones in use in the field. Plans to eliminate excess instruments in the Air Force inventory were being put into effect.

On the second point, the subcommittee was advised that, up until July 12, 1974, the Air Force had assigned polygraph duties as an additional duty, believing that this policy permitted timely administration of examinations. Due to programmed revisions in the DOD Directive, the Air Force was planning to go strictly to primary duty polygraph examiners and would assign individuals with primary duties in that field.

This change was expected to result in a future cut of over 50 percent of the presently certified polygraph examiners in the Air Force's Office of Special Investigations (OSI), as well as a 50- to 75-percent cut in equipment requirements. The subcommittee subsequently was advised that the number of OSI polygraph examiners is being reduced from 34 to 17. DOD sources have estimated that, at the \$20,000 average annual payroll cost for such individuals, total annual savings of a recurring nature would approximate onethird of a million dollars. This would be reduced, in some small measure, by increased travel costs incurred by the remaining examiners.

Significant additional savings are anticipated by the Department of Defense as a result of reductions in future years' requirements for training of examiners and for procurement of polygraph equipment.

Use of Psychological Stress Evaluator

The psychological stress evaluator (PSE), marketed by Dektor Counterintelligence & Security, Inc., is a comparatively new entry in the field of lie detector devices. Relatively few have been acquired by Federal agencies, with the Department of Defense being the principal purchaser. The following data on sales to Federal agencies were furnished by Dektor.³⁵

Agency	Date of Sale	Number of items	Serial No.	Number of operators trained
NASA Ames Research Center, Moffett Field, Calif.	June 22, 1974	1	1560	2
Patuxent Air Test Center, Patuxent, Md.	May 24, 1974	1	1572	2
Human Engineering Labs, Aberdeen Proving Grounds, Md.	Nov. 14, 1973	1	1493	l
Sharpe Army Depot, * Lathrop, Calif. VA Hospital, Danville, Ill.	July 1973 Apr. 19, 1973	1 1	326 233	*2 1
Drug Rehabilitation Center,* U.S. Naval Air Station, Yukon, Fla.	July 5, 1972	l	63	*2

³⁵Letter retained in subcommittee files.

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Agency (cont.)	Date	of	Sale	Number of items	Serial No.	Number of operators trained
United States Army Mobility Equip- ment Research and Development Center, Combat Development						
Command, Fort Belvoir, Va. United States Air Force, Office of Special Investigations.*	Jan.	24 ,	1972	2	31 , 32	1
Washington, D.C.	May		1972	l	51	* 1
Md.	May		1972	l	10	0
Md.		do		l	6	0
Total				11.		12

Dektor also advised that the individuals it trained as PSE operators for the agencies marked () on the above list asked that the purchases by their sponsoring agencies be kept confidential.

When the agencies responded to questionnaires released at the subcommittee's request, their information was somewhat at variance with the above. The Veterans' Administration confirmed the acquisition of one PSE unit which was being used at a VA hospital in the treatment of psychiatric patients. An initial response from the Department of Defense reported the purchase of six PSE units through fiscal year 1973 by major DOD components. However, an amended DOD submission on May 9, 1974, reported that those components owned only five PSE's and that a voice stress analyzer purchased by one of its components, the National Security Agency, had previously been reported erroneously as a PSE. These five PSE's were procured at an average cost of \$2,150 each for the purpose of determining their validity and possible usefulness.

The Department of the Army, which purchased three of the devices, contracted for a test and evaluation project by Fordham University at a cost of \$27,492. The Fordham tests, summaried in an August 1973 report, found that the PSE produced valid results in less than one-third of the tests administered and that its reliability was less than pure chance. As a result, the Army dismantled two of the equipments and transferred the other to the Air Force for tests in an application not related to "lie detecting," personnel security, or investigations.

The Air Force Office of Special Investigations procured one PSE (in addition to that mentioned above obtained from the Army) for validation testing. The Air Force evaluation, encompassing approximately 60 tests during fiscal year 1973, although tentative, resulted in a conclusion that the device was not useful. This device was to be transferred to a Research and Development Office of the Air Force Research Laboratory, at Hanscom Field, Mass.

The National Security Agency obtained one PSE and also a voice stress analyzer for research purposes. Both devices were found to be insufficiently reliable. Both were declared surplus and made available for other research use unrelated to detection of deception.

Some discrepancies still remain between the number of PSE's reported as purchased by DOD, and the number reported by Dektor as having been sold to DOD. Moreover, preliminary discussions with DOD personnel indicate that the purchases of at least two additional PSE instruments in fiscal year 1974 did not conform to prescribed procurement procedures. The subcommittee is also seeking some explanation from DOD why, on the one hand, PSE's are being dismantled and disposed of by one of its components because of their lack of reliability, and, on the other hand, subordinate organizations in the military components continue to contract for and acquire the same type of instruments.

Use of Voice Analyzers

In addition to the voice stress analyzer purchased by the National Security Agency, the subcommittee was advised that a Mark II voice analyzer, a conceptually different equipment item marketed by Technical Development, Inc., was purchased by the Central Intelligence Agency in May 1974, at a cost of \$3,500. The CIA is evaluating that device, prior to making a firm decision as to whether to engage in any serious research.

Intelligence Agency Practices Differ

A number of Federal agencies having highly classified security missions, require their civilian employees to be polygraphed as a part of the preemployment screening process.

The CIA routinely uses the polygraph as an aid to investigation for determining the security eligibility of persons for employment by or assignment to the Agency; security clearance by the Agency; staff-like access to sensitive Agency installations, utilization in operational situations; or continued access to certain classified information. All CIA employees, except the Director and Deputy Director who are Presidential appointees, are required to take polygraph tests prior to appointment.

The National Security Agency (NSA), which is a separately organized agency within the Department of Defense, performs highly specialized technical functions in support of intelligence activities of the United States as one of its two primary missions. NSA's policy³⁶ is to use the polygraph examination as an investigative aid in determining the eligibility of persons for employment and/or for access to sensitive cryptologic information or for access to certain areas. It also uses the polygraph in the conduct of counterintelligence and personnel security investigations which cannot be completed through normal investigative means.

36National Security Agency Regulation 122-3, dated Jan. 7, 1966, retained in subcommittee file.

All civilian employees of the National Security Agency, including Presidential appointees, are required by that Agency's regulations to be polygraphed as part of the pre-employment screening process. As a general rule, NSA's military personnel whose clearances are controlled by their parent service are not polygraphed.

The President's Foreign Intelligence Advisory Board, consisting of 12 individuals, advises the President concerning the various activities making up the overall national intelligence effort. It conducts a continuing review and assessment of foreign intelligence and related activities in which the Central Intelligence Agency and other Government departments and agencies are engaged and reports its findings, appraisals and recommendations to the President. The Executive order³⁷ establishing the Board provides that:

The Director of Central Intelligence and the heads of all other departments and agencies shall make available to the Board all information with respect to foreign intelligence and related matters which the Board may require for the purpose of carrying out its responsibilities to the President.

When queried by the subcommittee,³⁸ the Board stated that neither appointment as a member of the Board, nor as the Board's Executive Secretary, nor as an employee on the Executive Secretary's staff was contingent on taking and passing a polygraph test.³⁹

The State Department, the Federal Bureau of Investigation in the Department of Justice, and several major components of the Department of Defense have a considerable degree of involvement with the intelligence communities and deal in highly classified and very sensitive material, much of it relating to national security matters. These agencies see no need for routinely polygraphing their employees in connection with pre-employment screening interviews, and do not require such testing.

Testimony by the Department of Defense witness included the statement that in October 1972, the Department barred the use of the polygraph as a screening or selection device or as a condition of employment for all civilian employees—competitive service or excepted service—aside from those few individuals assigned to the National Security Agency. More recently, the Department advises that a proposed revision to its DOD Directive 5210.48 dealing with polygraph examination, when approved and issued, will make its provisions applicable to military personnel as well as civilian employees. This is another commendable action on the part of the Department of Defense, which earlier was commended for having taken the first step by any Federal agency to curtail the then-existing widespread use of these so-called lie detectors.

³⁷Executive Order 11460, dated Mar. 20, 1969.

³⁸ Appendix B.

³⁹Appendix C.

Does the Intelligence Community Rely Too Heavily on Polygraph Testing?

Dr. Stefan T. Possony of Stanford University's Hoover Institution on War, Revolution and Peace, who was not able to appear personally before the committee as a witness, did furnish a statement. In it he recognized the potential of the polygraph as a pioneering technological development which could contribute to achieving a better understanding of the interrelationships between psychological states and physiological. However, he criticized in strong terms the present uses of polygraphs as "lie detectors," particularly in the intelligence and military communities, which are the principal users in the Federal Government.

The opening paragraphs of Dr. Possony's statement⁴⁰ include the following:

I am not opposed, on principle, to the use of the polygraph in security investigations. I have no quarrel with the contention that from time to time, the polygraph has helped to uncover information which but for the use of the instrument might have remained hidden. But it is imperative that the polygraph be used in a manner that is scientifically and legally appropriate.

I am not opposed to, or even particularly critical of, the system through which the United States Government seeks to prevent infiltration by hostile agents and, more generally, to protect its internal security. American investigators and security agencies have a difficult and thankless job to perform, and their freedom of action has been unduly narrowed by legal and political constraints. They do need all the technical support they can get, and it is not surprising that they are infatuated with a gadget which promises easy answers.

I should add that the American internal security setup differs most significantly from the despotic and inhumane police systems of the totalitarian states. But it does not live up to the standards this nation has chosen to observe and represent.

It is surprising, and disturbing, that the government has never yet taken a firm stand against the "lie detection" hocus-pocus. Like any technology which we incorporate in airplanes, ships or tanks, or any medical technique which we allow our physicians to use, or any drug which is released to the drugstore, the polygraph must be approached on the basis of scientific objectivity, technical excellence, statistical validation, investigative probity, administrative integrity, and legal acceptability.

⁴⁰Hearings, pp. 667-774. See footnote 5.

The inadequacies and shortcomings of the polygraphs examination in meeting reasonable criteria in each of the above areas are discussed in some detail in Dr. Possony's statement. In his judgment, the polygraph has been oversold as an instrument of personnel selection and counterespionage as well as an instrument of intelligence collection. It has also been oversold as the key to psychodiagnostics. In concluding his statement, Dr. Possony expressed himself as follows:

To be viable, internal security programs must be kept within the confines delineated by the U.S. Constitution, including the Bill of Rights.

VII. POLYGRAPH OPERATORS AND THE QUEST FOR PROFESSIONALISM

The operator of the polygraph is generally conceded to be the most important component of the "lie detection" technique. He should have proper training and adequate experience to understand the theory of which the polygraph instrument is based, and should be aware of the device's limitations. Because of this, polygraph operators should be individuals of high moral character and sound emotional temperament, be selected carefully, trained properly, and supervised effectively.

On the basis of agency-furnished information showing variances among agencies on the points of minimum age, educational requirements, grade or rank, and investigative experience, the committee concluded in its prior report:

* * * there are no uniform criteria for selecting Government polygraph operators, and training procedures are even more inconsistent. Both are completely inadequate since the operator is by far the most important factor in the polygraph technique.⁴¹

The consensus of witnesses at that time was that ideal minimum requirements for a polygraph examiner should include:

- 1. At least 25 years of age.
- 2. College graduate from an accredited school.

3. At least 5 years of investigative experience.

4. A complete background investigation, satisfactory completion of psychological tests, and a psychiatric review.

5. High moral character and sound emotional temperament.

Current Criteria for Selection of Examiners

Provisions of the Civil Service Commission's Federal Personnel Manual (FPM) pertinent to the use of polygraphs currently do include a requirement that agencies subject to the provisions of the FPM establish adequate

⁴¹H. Rept. 89-198, p. 15.

standards for the selection and training of examiners, but do not prescribe such standards. Accordingly, an agency using polygraphs may, and still does, establish its own standards for qualifying individuals as polygraph examiners. It should come as no surprise that substantial differences still exist in the specific criteria that agencies have imposed upon themselves.

There is general acceptance by the components of the Department of Defense of the 25-year minimum age as one criterion as well as a requirement that the examiner be a citizen. Another agency gives its age criterion as a preference for "maturity consistent with about 30 years of age"; still another states that examiners should be between 25 and 40 years of age. In neither of these latter two instances is citizenship a stated requirement. The criteria for polygraph examiners furnished by two additional agencies are silent on the points of both minimum age or citizenship.

Various combinations of formal education and experience-involving type, level, and duration-are acceptable to different agencies to meet their minimum requirements for selection as polygraph examiners. Some agencies are silent in their statement of requirements on whether and how an individual will be judged as having high moral character and sound emotional temperament. At least one prescribes that polygraph examiner-designees themselves be subjected to a polygraph examination and a psychological assessment. Minimum grades and rank held by polygraph examiners still differ among the agencies.

From the foregoing, it is apparent that the standards for selection of individuals to be trained as polygraph examiners still are not uniform. However, the committee does discern some little movement by Federal agencies in that direction, and commends such efforts.

Polygraph Examiner Training

A substantial number of the polygraph examiners employed by Federal agencies have been trained at the Army's special training facility at the U.S. Army Military Police School, Fort Gordon, Ga. That training program, which was established in July 1951, originally was 8 weeks in duration; however, in July 1965, the course was extended to 12 weeks and then in August 1970, lengthened to 14 weeks. In addition to the 14-week formal training phase, each examiner-trainee must serve an internship prior to certification as a polygraph examiner.

The facility at Fort Gordon trains polygraph examiners not only for the Army, but also for the Air Force, Navy, and Marines, and for the Department of the Treasury and the U.S. Postal Service. The Army has also trained polygraph examiners for the U.S. Coast Guard; the National Security Agency; U.S. civilian police agencies under the sponsorship of the Law Enforcement Assistance Administration; Canadian Defense Forces; Philippine Army; Republic of Korea Army; Pakistani Army; Republic of Nationalist China Army; and the Venezuelan Army.

Since this training program was established in 1951, there have been 1,251 individuals graduated from the basic course; advanced, refresher, or personnel security training has been given to 270 students.

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Department of Defense Training

The prerequisites for attendance at the Army school by all DOD personnel include—U.S. citizen, at least 25 years of age, baccalaureate degree from an accredited college, plus 2 years experience as an investigator with a recognized government agency; or the equivalent of 2 years of college, plus 5 years of investigative experience. Personnel attending the course from other Federal agencies must meet prerequisites as determined by their respective agencies.

There are 506 academic hours in the polygraph examiner (basic) course, which includes 13 hours of polygraph theory and administration, 19 hours of polygraph maintenance management, 84 hours of polygraph examination procedures, 34 hours of training regarding evaluation of mental and physical fitness of examinee, 331 hours of comprehensive practical exercises, and 25 hours of examinations. There are also 54 hours of nonacademic (administrative) time included in this course, with a total course time of 560 hours or 14 weeks. Based on fiscal year 1974 funding, the cost per student for this basic course is approximately \$6,300.

The polygraph examiner refresher course, a 3-week or 120-hour course, affords advanced or refresher training for the practicing polygraph examiner and the requalification and certifications of previously trained personnel who have not been active as polygraph examiners. This course provides refresher training in all facets of polygraph examination procedures and polygraph instrumentation, as well as subjects related to the conduct of polygraph examinations.

DOD encourages its polygraph examiners to receive advanced or refresher training each 2 years at either the U.S. Army Training Facility or at other training seminars or workshops.

The internship prior to certification within the military departments of DOD is 6 months to 1 year in length, following the formal phase of polygraph training. During this period, each examiner conducts polygraph examinations in support of criminal or security investigations wherein polygraph charts are generated. All examinations conducted by intern examiners are directly supervised by a certified examiner.

The Department of Defense witness referred specifically, in recent testimony, to the concern previously expressed about the qualifications of polygraph examiners of that agency. The committee's prior report recognized that the DOD Directive 5210.48 established relatively high qualifications but then noted that it contained a grandfather clause which permitted examiners on the rolls in 1965 to continue on their jobs even if they did not have the training and education required under the agency's revised 1965 standards. The witness stated that the problem appears to have been resolved by the passage of time, in that there was only one such polygraph examiner remaining of Defense rolls. Moreover, that one individual had received refresher training as recently as December 1973. The other 134 examiners reportedly met fully the qualification standards of the DOD directive. Other Agency Training of Examiners

Currently, the National Security Agency examiners receive their polygraph training at the Keeler Polygraph Institute in Chicago, Ill. Following this training of 6 weeks duration, National Security Agency examiners serve an internship of 6 months or conduct 100 polygraph examinations under the direct supervision of a certified National Security Agency examiner.

The Central Intelligence Agency, under its centrally controlled program, also trains its own polygraph examiners. The training courses average 6 to 7 weeks in duration and include coverage of interviewing and interrogation, test construction, chart interpretation, instrument maintenance and repair, physiology, psychology, and professional ethics. On completion of this course of instruction, the trainee serves an internship of from 6 to 8 months, during which he is assigned cases of gradually increasing complexity under the guidance and monitoring of senior examiners.

The Federal Bureau of Investigation, too, conducts its own training program for polygraph operators. Agents selected for that training are provided an intensive 2-week academic program, followed by a 1 year period of on-the-job training, during which all their polygraph examinations are under supervision of the FBI Laboratory. The FBI does not send any of its agents to outside agencies or schools, public or private, for polygraph training.

The scope of training offered by the U.S. Army's school at Fort Gordon appears to be substantially more comprehensive and presumably more costly than that adopted by these other agencies for their own use. If its length and content can be justified as being minimally essential, then the adequacy of the courses by the CIA and FBI, and possibly NSA, is brought into question. If the shorter term courses of these latter agencies are adequate, then the Army's course which is twice the length of any of the others, may be unjustifably lengthy and costly. Certainly, on either the point of effectiveness or economy, the committee believes that this matter warrants attention.

Efforts Toward Professionalism

The American Polygraph Association was formed in August of 1966 by a merger of three predecessor organizations—the Academy for Scientific Interrogation, the American Academy of Polygraph Examiners, and the National Board of Polygraph Examiners.

The 376 members in good standing of these predecessor organizations were accepted as charter members of the new organization. Those individuals then actively serving as polygraph examiners who did not meet the normal membership requirements prescribed by the APA constitution were permitted full membership status, by a provision for waiver of certain requirements. That waiver procedure was in effect for approximately four years after the APA was established. Membership in the APA totaled 1,004 by May 1974, and of this number, 645 were full members with the right to vote.

The APA constitution contains the following statement of objectives:
The objectives of the American Polygraph Association shall be to advance the use of the polygraph as a profession as a means of promoting social welfare by the encouragement of the use of the polygraph in its broadest and most liberal manner: by promotion of research into instrumentation and techniques; by the improvement of the qualifications of polygraph examiners through high standards of professional ethics, conduct, education and achievement; to unify polygraph examiners throughout the world and rekindle their interest in the use of the polygraph and in the APA, by the increase and diffusion of polygraph technology through meetings, professional contacts, reports, papers, discussions and publications; thereby to advance scientific, professional and public acceptance of the contributions of polygraph techniques to the promotion of the public welfare and to keep the APA informed of member sentiment and urge the membership's active participation in civic and community affairs where the polygraph is concerned; and to publicize the name and prestige of the APA.42

In furtherance of those objectives, the APA has, among other things, developed for its membership a code of ethics, standards, and principles of practice; publishes a quarterly journal and monthly newsletter; and expends considerable effort supporting licensing or regulation of polygraph examiners by the individual States.

In conjunction with this latter activity, it has drafted a model licensing bill which would regulate persons who purport to be able to detect deception or to verify truth of statements through the use of instrumentation as lie detectors, polygraphs, deceptographs, and/or similar or related devices and instruments.

The APA's board of directors adopted a resolution in August 1973, disapproving the use of the Dektor psychological stress evaluator as the sole source of or a major contribution to a determination of truth or deception in a meaningful testing situation for determining either truth or deception.⁴³ It also authorized its officers, directors and members to state the following as the official position of the APA, with reference to the Dektor PSE-l psychological stress evaluator:

1. That the PSE-1 is not a polygraph and does not meet minimum standards for polygraph instruments; neither does it meet minimum instrument standards for those States which have established such standards by legislation.

2. That the published standards for the selection and training of PSE-1 examiners do not in any way meet APA requirements.

3. That the published capability of the instrument for surreptitious use constitutes a potential violation of the constitutional rights of the person being examined.

4. That the PSE-1 should not be used in a meaningful testing situation without verification by a trained examiner using an acceptable polygraph instrument.

⁴²Hearings, p. 192. See footnote 5.

43 Hearings, pp. 218-219. See footnote 5.

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There are, according to APA's recent testimony, 17 States which either license or regulate the activities of polygraph examiners.⁴⁴ In the remaining 33 States, any individual who either owns or has access to a polygraph device may offer his services as a polygraph examiner, for a fee, without meeting any prescribed minimum requirements of education, training, experience, or moral, and financial responsibility. No States have yet enacted licensing or regulatory statutes for users of the PSE device, and only the State of Florida has held public hearings on the proposition.

The APA also has a program for accrediting schools which train polygraph examiners. Its most recent listing of such schools shows 10 in the United States, including the Army's Military Police School and Texas A & M College, College Station, Tex.; the Israeli Polygraph School in Tel Aviv, Israel; and 2 accreditation actions pending.

Efforts by polygraph examiners to obtain acceptance of their activities as a profession and of themselves as professionals are wholly understandable. Raising the requirements for education, training, work experience and personal qualifications of those individuals whom the APA certifies as polygraph examiners is a goal that the committee finds laudable. The committee, however, retains much of its earlier reservation about whether the broadly stated APA requirement of a baccalaureate degree, irrespective of the discipline involved, is a reasonable criterion for properly qualifying an individual as a polygraph examiner. The committee would deem it more appropriate, absent special professional-level medical training of individuals, that polygraph examiners have at the very least a substantial educational background in psychology, physiology, and human behavior.

The relatively minor role accorded such subjects in those polygraph training course curriculums furnished to the subcommittee falls short of what it feels is acceptable preparation. The committee's position, in its 1965 report, was that qualified physicians and psychiatrists should be among the appropriate officials designated to review polygraph examination records. Little evidence was offered or representations made by agency spokesmen during the recent hearings that this recommendation has either been adopted or given serious consideration. The following commentary, offered by Dr. Possony, appears to have particular relevance:

If we compare the polygraph with a medical speciality, we can say that the polygraph is a quasi-medical specialty which was taken over by the nurses. The doctors are not admitted to practice in this field, the scientific backup is woefully inadequate, and the current expectations on performance are too high. If the general philosophy which the U.S. Government is applying to public health were adhered to with respect to the polygraph, this machine would be restricted to specialists with high rather than low qualifications. Furthermore, the utilization of polygraphs in private industry would be forbidden.

⁴⁴Hearings, p. 146. See footnote 5.

To find methods permitting the effective diagnosis of psychological and mental states has been one of the most challenging tasks throughout history. This task, which was not solved even by torture and which remains unsolved, is continuing but it cannot possibly be entrusted to individuals with perfunctory preparation. In the United States, to pull a tooth, one must have a dental degree. To handle a mild neurosis, one needs a degree in clinical psychology. To perform surgical operations, one must be a highly qualified and certified surgeon. Of course, medical doctors cannot function without nurses and nurses aides. Similarly, in the polygraph field, some tasks can be performed by the "operators." But it is entirely inappropriate to use such operators as diagnosticians and to allow them to work without professional supervision.⁴⁵

VIII. THE POLYGRAPH TEST AND SAFEGUARDS FOR THE INDIVIDUAL

In one of its early studies⁴⁶ the Foreign Operations and Government Information Subcommittee cataloged the reasons given by Federal agencies for the use of polygraph examinations in carrying out Government business. These included the investigations of security matters, infractions of criminal laws, and employee misconduct, as well as pre-employment screening, medical measurements, and medical and scientific research. Regardless of the stated use, those agencies assured the subcommittee that the rights of individuals who were given polygraph tests were adequately safeguarded. Presumably those assurances relied heavily on the corollary representations that individuals voluntarily agreed to submit to such tests.

Another, clearly less defensible reason for using polygraphs recently was disclosed in the record of transcription of Presidential tapes released by the House Judiciary Committee in 1974. The following statement reportedly was made by President Nixon in an Oval Office conversation on July 24, 1971, because of his concern and frustration with repeated leaks to the press about his secret foreign policy positions:

Listen, I don't know anything about polygraphs and I don't know how accurate they are but I know they'll scare the hell out of people.47

The President reportedly proposed giving lie detector tests to as many as 1,500 people with "top secret" security clearance in the National Security Council, State Department, Central Intelligence Agency, and the Department of Defense, but was persuaded by his aides not to do so, at least as an initial step.

⁴⁵Hearings, pp. 710-712. See footnote 5.

^{46&}quot;Use of Polygraphs by the Federal Government (Preliminary Study)," committee print, April 1964, 88th Cong., 2d sess.

⁴⁷Washington Post, July 10, 1974.

As previously stated, the circumstances under which many polygraph tests are given are potentially if not actually coercive, from the individual's viewpoint. For that reason, the committee has had and continues to have considerable concern about the safeguards for the individuals. Accordingly, agencies were asked for information about the organizational level at which approval to give a polygraph test must be obtained, whether an individual's physical and mental condition are considered, whether the use of polygraphs is subject to review, what relative weight is accorded polygraph test results or refusals to be tested, whether test results are made known to the individual, whether an avenue of appeal exists, and what controls exist to insure the confidentiality of those test results.

A number of these high-interest areas are matters that must be covered in the agency regulations and objectives that the Civil Service Commission requires to be submitted to it, when agencies elect to use the polygraph in personnel investigations of competitive service employees and applicants to competitive service positions. Examination of the regulations and directives and questioning of witnesses during the subcommittee's hearings disclosed a number of significant differences among agencies in their implementation actions.

Who Authorizes Tests?

In most instances, agencies now are requiring that polygraph tests not be given until written approval has been obtained from a relatively high level official authorizing the action. Only in a few instances are such approvals authorized at a field level, without requiring prior approval at the headquarters level in Washington.

The Director of the Central Intelligence Agency has delegated to his Director of Security authority to conduct the polygraph program for that Agency. The Director of the National Security Agency has delegated a general authority to that Agency's Director of Security to polygraph applicants for employment; employees of contractors requiring access to the Agency's spaces, classified information, or classified operations; and persons assigned to unusually sensitive projects. Specific written approval of the Director of Security or a higher authority is required in each case when polygraph examinations involving counterintelligence or personnel security investigations are proposed.

Requests for polygraph examinations in the Federal Bureau of Investigation are referred through channels to supervisory review levels at the agency's headquarters, and final approval authority is vested in Assistant Directors. The U.S. Postal Service, which uses polygraph examinations in those criminal cases which are under investigation by its Inspection Service, has established two levels at which approval may be authorized. The Regional Chief Postal Inspector has authority to authorize the use of the polygraph in the field; in certain exceptional cases, the Postal Service's Chief Postal Inspector may personally authorize use of the polygraph. Two organizational elements in the Department of Treasury use polygraphs—the Customs Service and Secret Service. Both the Office of Investigation and Office of Security and Audit in the Customs Service must obtain prior approval from the Assistant Commissioner (Security and Audit). In the Secret Service, polygraph testing may be authorized by the Special Agent in Charge of a Field Office, or, on request of that Special Agent in Charge, the matter may be referred to approval by the Assistant Director at headquarters in Washington.

The State Department, although it does not own polygraph devices, reports that on rare occasions in the past it has used the polygraph examination as one of a number of investigative techniques to resolve discrepant testimony by employees suspected of activities prejudicial to national security interest. On such occasions, these services were obtained by contracting out. Final approval authorizing a polygraph examination must be made by the Department's Deputy Assistant Secretary for Security, of a case supervisor responsible for a particular investigation recommendes that course of action.

Consideration of Physical and Mental Condition

The polygraph is one of many instruments used for measuring the physiological changes that frequently accompany changes in an individual's feelings. Gaging an individual's physical or mental condition and determining whether or not that state of health is "normal," is, in the committee's opinion, a matter for medical professionals. That was one of the bases for its earlier recommendation that qualified physicians and psychiatrists should be included among the appropriate supervisory officials designated to review polygraph examination records.

Information furnished to the subcommittee shows that the Central Intelligence Agency, alone, among those agencies frequently using polygraphs, routinely requires that (a) examinees be interviewed by representatives of the Office of Personnel and the Office of Medical Services and (b) those Offices advise the Director of Security of anything known to them that might preclude the advisability of conducting a polygraph interview.

At the other end of the spectrum, the U.S. Postal Service appears to depend on the qualifications of its polygraph operators to make those medical-type determinations. That agency responded to the subcommittee's inquiry as follows:

The physical and mental condition of the person to be tested is evaluated by the Postal Inspector who conducts the polygraph examination. Written instructions regarding such an evaluation are not made; however, evaluation of the subject's mental and physical condition as a prerequisite to the test is a part of the formal training each Polygraph Examiner receives in polygraph school. Questions regarding the physical and mental condition of each subject are asked by the Examiner before the examination is commenced, and a record is made of the responses to such questions. The responses of other agencies fall somewhere between these extremes. Two agencies, stating that the physical and mental condition of the person to be tested is considered—"carefully considered" by the Department of Justice and "always considered" by the Department of State—did not disclose whether the consideration and conclusion was by polygraph operators or by qualified medical professionals. After further inquiries, these two agencies advised that an individual for whom a polygraph test is being contemplated may be referred to a medical professional for interview or examination, if a question or doubt about the individual's physical or mental state of health arises.

The Department of Justice requires that the request for approval of polygraph testing that is transmitted to Washington be accompanied by an identification of any known physical or mental disabilities, abstracted from the background file on the individual. On the basis of that data, the approving official may recommend that the examinee be advised to consult with his personal physician before the test. The polygraph examining procedure used by its Federal Bureau of Investigation in the pretest interview also includes as a further measure of assurance inquiries by the polygraph examiner concerning the examinee's state of health.

The Department of State also considers any pertinent health and medical information available in the employee's personnel file, and solicits the views of the investigative case supervisor and the polygraph examiner in deciding whether an individual should be polygraphed or should be referred for a professional medical examination before being given the polygraph test.

In the case of the National Security Agency, if its polygraph operators have any question or doubt as to the physical or mental fitness of any examinee, they may refer the matter to the Director of the Medical Center for appropriate action. From the information provided to the subcommittee by the Department of Treasury, it appears that investigative personnel in its Bureau of Customs and Secret Service make the determination of condition of health without any prior advice or consultation with medical personnel.

Weight Accorded Polygraph Tests

The stated policies of agencies using polygraphs appear relatively consistent on this point. In substance it is best exemplified by the Departments of Justice and State, where the polygraph examination is held to be a useful adjunct to the normal interview and interrogation process, and may provide direction for additional investigative effort. Information developed during such examinations reportedly is given the same weight as substantive information developed from any other source.

The CIA and NSA both require applicants for employment to be polygraphed, as one aspect of their security screening processes. Both agencies represented to the subcommittee that, while refusal to take a polygraph test would effectively bar an individual from further consideration for employment, the result of the test is but one element of the total investigative record and that security action is not taken on the basis of the polygraph test results alone. The U.S. Postal Service uses polygraph tests most frequently where large numbers of persons have had access to registered mail which has been lost, and an effort is being made to narrow the number of suspects. The use of the polygraph in such circumstances is justified by the Postal Service as an expedient means of saving many investigative hours and of providing definite suspects on whom the investigative energy can be concentrated.

In the Treasury Department, the two organizations which use polygraphs state their policy somewhat differently. The Secret Service claims to use polygraph tests only after other factors have been determined which indicate that this technique may be of further assistance. It is not considered to be anything other than an aid in a criminal investigation. It is not used as a substitute for personnel investigation or interrogation of a suspected person.

The Customs Service advised the subcommittee that the polygraph is used only when tangible and concrete investigative leads have been exhausted, but also stated that the results of such examinations are used as investigative aids rather than as evidence. Most commonly these tests are used to determine an individual's involvement or noninvolvement in cargo theft cases or cases of personnel dereliction areas. In a number of cases, polygraph examination results are credited with having determined involvement and complete confessions and the identification of coconspirators followed.

Effect of Refusals to be Polygraphed

Agencies responding to the subcommittee's current inquiry were consistent on several pertinent points. Polygraphs are given only with the voluntary consent of the individual to be tested. Refusal of an individual to agree to take a polygraph test is not recorded or reflected in that individual's official personnel file.

A fairly representative statement on this point is the instruction of the U.S. Postal Service, which reads as follows:

Refusal to Take an Examination

44.17 The polygraph examination is voluntary in nature and no person can be forced to take an examination. The examination requires the full and complete cooperation of the Examinee. A Postal employee who declines to take an examination shall not be considered as failing to cooperate in an investigation. No stigma is attached to such a refusal, and adverse action shall not be taken against a person for unwillingness to volunteer to take a polygraph examination. Information concerning a person's refusal to submit to a polygraph examination shall not be recorded in any of his personnel files.⁴⁸

4⁸U.S. Postal Service CIPI Reprint No. 128-72; retained in subcommittee files.

The very nature of the polygraph equipment and the examining procedures used in a test is such as to preclude giving the test unless the individual's "cooperation" is obtained. Whether or not such cooperation is indeed evidence of "voluntary" consent has been noted previously in this report. The inherently coercive pressures to submit to an examination, both for those who are asked to do so in connection with employment screening programs of the CIA and NSA, or for those other Federal employees who may believe that continuance in their positions would somehow be compromised if they did not submit, are relatively self-evident.

The CIA witness offered the following commentary on that Agency's cyclical reinvestigation program, in connection with which employees may be asked to take another polygraph examination:

Mr. Phalen. We have a reinvestigation program which is cyclical, and it is based as closely as we can make it on a 5-year cycle. In the course of that 5-year cycle we send out another questionnaire to the individual and ask him to update his data. We also conduct a field investigation updating what we have in our security files. When all this is put together there is a determination whether or not this is something that would require a clarifying interview.

Now, this clarifying interview could be just a straight interview, just asking him, or it could be that we might think that a polygraph would be helpful, and also the individual occasionally thinks that a polygraph might be helpful, particularly where the information comes from an area where we can't reach by our investigative processes.

For example, some overseas areas where people do spend much of their lives.

This is getting to your question. We polygraph, I would say, no more than one to five people a year under that arrangement. So my short answer to your question is, we do not polygraph people as part of our reinvestigation program, that is, periodically. It is only at the time that something comes up in the course of reinvestigation which we feel requires clarification, or it would be helpful if we could clarify it. The number is almost minimal.

And second, I think we should stress that it is completely voluntary. We do have people who have said, I do not wish to take a reinvestigation polygraph. We have accepted this. We have asked them why. And they are all still employed, and there is no record of this in their personnel files or in their security files.

* * * * * * * * * * * * Mr. Phalen. One of the reasons is--and it fits many of them--is that their career has been outstanding, and their life is relatively an open book. And, of course, in our

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relatively closed society of the intelligence community it is quite a bit of an open book. And on that basis they would prefer not to go through it. Of course, some of this is a hangover from questions that have been asked in the past which were a little too broad. Frankly, our earlier approaches to screening might have been a little too broad, and evoked responses in rather personal areas which we don't go into any more.

And this possibly is a feeling from that earlier time.

We have refined our questions down-and I can go into some examples there if we wish where we do not do that any more-this would be an example, that a person says he would rather not go through it. Occasionally they have touched on their own personal philosophy, the integrity of themselves. They would prefer not to subject themselves to this.⁴⁹

Availability of Results to Individuals Tested

Individuals who are polygraphed by the CIA and NSA are not told of the findings and conclusions of the examiners. The State Department reports that only the general nature of the polygraph test findings are made known to the individuals undergoing that type examination. The other four agencies which reported using this testing procedure in connection with criminal investigations gave answers slightly different, one from the other, and covered a fairly broad spectrum of practice.

In the Treasury Department, the Secret Service responded that:

The findings of all such polygraph examinations would most definitely be made available to the subjects of such tests. Since this is a fundamental procedure in conducting the examination we can think of no single situation where this would not be done.

The U.S. Customs Bureau response was a simple "yes" to the same question. The U.S. Postal Service generally makes the examination's findings available to the individual being polygraphed. This is not required by its regulations, but this "policy" has, over a period of time, been communicated verbally to its polygraph examiners. The Justice Department does not disclose to the individual either the results of the polygraph tests or the examiner's final opinion based on test findings.

Reassurance that refusal to submit to the polygraph test will not result in stigma attaching to that individual, and that no record is made of that refusal in his official personnel file are comforting, in some degree. However, information provided the subcommittee by the Department of Treasury's U.S. Secret Service discloses that:

⁴⁹Hearings, pp. 654-655. See footnote 5.

* * * his or her refusal would merely be reflected as a comment in the criminal investigative file and not in any individual personnel record.⁵⁰

Ten years earlier, when queried on this point, all Federal agencies responding reported that refusals by employees to take polygraph tests were not noted in their personnel records, although such matters might be mentioned in investigative reports. The information furnished on the administrative controls over the confidentiality of test results strongly indicates that the condition still persists.

Assurance of Confidentiality of Test Results

As previously indicated, polygraph test results are normally incorporated into substantive investigative files which are separate and apart from an individual's official personnel file. No agency incorporates the results of the polygraph tests into a computerized data bank nor is such data normally interchanged among Federal agencies. Where two or more agencies cooperate in a criminal investigation, particularly where the U.S. Postal Service and the Treasury Department are involved, there can be a sharing of information which includes polygraph test results. In most other reported circumstances, polygraph test results are not made known to other Federal agencies.

Both the U.S. Postal Service and the National Security Agency instructions make provision for release of this type of information to outside agencies, with the approval of the Chief Postal Inspector on the one hand, and the NSA Director or Deputy Director, on the other.

Appeals of Polygraph Test Results

Policies and practices applicable to the appeal of polygraph test results have not changed substantially since the committee last reported on this subject. Several agencies reported that no administrative or criminal action is taken predicated solely on the basis of these examinations and that provision for appeal from adverse polygraph test results is therefore unnecessary. However, the agencies taking that position further noted that any adverse administrative action resulting from an inquiry or investigation would be subject to appeal under the agencies' normal adverse action appeals program.

Special Test Facilities

Three agencies reported that special examining rooms or other facilities are maintained for administering polygraph tests. The Treasury Department's Secret Service reports that its examining rooms have two-way mirror and that some are equipped with recording devices. Examinees normally are told of the existence of both items. The special test rooms maintained by the CIA generally are not equipped with two-way mirrors, but do have a capability to

⁵⁰Letter dated Nov. 2, 1973, retained in subcommittee files.

monitor and record the audible portion of the test. The examinee is told whether the interview is being monitored or recorded, if he asks about it. The NSA special facilities for polygraph testing are equipped with two-way mirrors, and monitoring and/or recording devices. Agency instructions require that the examinee be told about these special characteristics of the test room prior to the examination.

IX. RECOMMENDATIONS

It is the recommendation of the committee that the use of polygraphs and similar devices be discontinued by all Government agencies for all purposes.

While recognizing that there has been substantial compliance with the committee recommendations of 1965 calling for increased uniformity of administration of the polygraph and comprehensive research into their validity and reliability, the clear import of the hearings upon which this report is based leads to the same conclusion as was reached in 1965. The conclusion at that time was that:

There is no "lie detector," neither machine nor human. People have been deceived by a myth that a metal box in the hands of an investigator can detect truth or falsehood.

The Department of Justice continues to maintain the position that the results of polygraph examinations would not be admitted as evidence in the Federal courts. The committee adopts this position and further affirms that since such examinations are considered invalid for evidentiary purposes, there is absolutely no reason for continuing the use of such examina-tions for investigatory purposes.

Although there is indication that efforts are being made to upgrade the training and educational requirements of polygraph operators, the committee finds that unproven technical validity of the polygraph devices themselves makes such efforts a meaningless exercise.

Even if the committee adopted the positions of some agencies that the polygraph is useful solely as a secondary investigative technique and that the results of a polygraph examination alone are never considered conclusive, the committee finds that the inherent chilling affect upon individuals subjected to such examinations clearly outweighs any purported benefit to the investigative function of the agency.

The committee additionally recommends that the use and/or acquisition of other so-called "lie detectors" such as the PSE or the voice analyzer be discontinued. Evidence presented in the hearings upon which this report is based demonstrates that such devices have even less scientific validity than the polygraph. Although no agency of the Federal Government is using such other devices at this time as a substitute for polygraph examinations, the committee recommends that additional federally-funded research into such devices be discontinued.

APPENDIXES

Appendix A. — Questionnaire on Polygraphs and Psychological Stress Evaluators

1. Does your agency possess or make use of polygraphs or psychological stress evaluator detection devices? (If major subordinate organizations within your agency engage in such activity, please list all those organizations.

2. How many polygraphs and psychological stress evaluator detection devices are the property of your agency? Your response should show separate data for each of these two categories of devices, if available.

(a) Please list the total acquisition cost of all such devices.

(b) Please estimate the total annual maintenance costs of such devices and indicate whether maintenance is performed by agency personnel or by outside sources.

(c) If your agency leases such devices, or contracts with other public or private agencies to perform such tests, please provide the total costs for such activity during fiscal 1973.

(d) Please estimate all additional expenses attributable to such testing, such as travel expenses for examiners to and from location of tests, internal and external training programs, and all other costs for fiscal 1973.

(è) Do you have on loan to or loan from other Federal agencies or any other sources any polygraphs or psychological stress evaluator detection devices? If yes, give the number of such devices and identify the agencies or sources involved.

3. Please provide two copies each of all intra-agency directives, administrative orders, rules, regulations, and/or instructions governing the use of such devices within your agency.

4. Briefly explain your agency's general procedures governing the use of both categories of devices and answer the following specific questions. (Please explain procedures and indicate if they are covered by regulation in connection with each question. If more than one major subordinate organization within the agency is affected, provide separate responses for each.)

(a) For what specific purposes are these devices used (i.e., employment interviews, security clearance processing, suspected improper conduct of duties, medical measurements, or other purposes. List in order of most frequent use.)

(b) Are the devises used in every instance involving those purposes listed in answer to (a) above?

(c) What weight is given to the data resulting from tests by these devices, or refusals to take such tests in relation to other types of investigative information?

(d) Who makes the initial determination to use such devices, and is this initial determination subject to review by higher authority in each case?

(e) Is the physical and mental condition of each person to be tested considered to determine suitability to take such a test?

(f) What disposition is made of data derived from such tests given to persons connected with your agency (i.e., retained in affected individuals' personnel files, retained separately, entered into a computerized information system data bank, made available to other Government agencies, etc.).
(g) Are the findings of such tests made available to the subjects of such tests?

(h) Is there a right of appeal in cases of adverse findings?
(i) Is access to such data restricted and, if so, what classification or other designation is applied to the data?
(j) If a person connected with your agency refuses to take such a test, is that refusal in any way whatsoever in the individual's personnel records?

(k) Does your agency maintain special facilities, such as specially designed rooms, for the performance of such tests? Briefly describe such facilities and how they are equipped, stating particularly if they have two-way mirrors and recording devices. Furnish photographs, if available.

Appendix B. -- Correspondence from Former Chairman Moorhead to the Executive Secretary of the President's Foreign Intelligence Advisory Board

June 7, 1974.

EXECUTIVE SECRETARY

President's Foreign Intelligence Advisory Board, Executive Office Building, Washington, D.C.

Dear Sir: This subcommittee has a long-standing and continuing concern with the subject of polygraph testing by Federal Government agencies of individuals being considered for employment. This practice of polygraph testing, as a prerequisite to employment, is one reserved to the agencies having highly sensitive intelligence or counterintelligence missions directly affecting the national security.

It would appear that the President's Foreign Intelligence Advisory Board would have such a mission. Accordingly, we would be interested in answers to the following questions:

1. Is appointment as a member of the Board contingent upon the designee taking and passing a polygraph test?

2. Is employment as the Executive Secretary or as staff to that individual contingent, in each case, upon the taking and passing of a polygraph test?

3. If the answer to either 1 or 2 above is affirmative, what organization gives the test, and to whom are the test results reported?

4. If the requirement does exist, have all members currently serving on the Board or administratively supporting the Board passed such a test in the past five years?

With best regards,

Sincerely,

William S. Moorhead, Chairman.

Appendix C. — Correspondence from the Executive Secretary of the President's Foreign Intelligence Advisory Board to Former Chairman Moorhead

The White House Washington, D.C., June 12, 1974.

HON. WILLIAM S. MOORHEAD,

Chairman, Foreign Operations and Government Information Subcommittee of the Committee on Government Operations, Rayburn House Office Building, Washington, D.C.

Dear Congressman Moorhead: Following are answers to the questions raised in your letter of June 7:

1. Appointment as a member of the President's Foreign Intelligence Advisory Board (PFIAB) is not contingent upon passing a polygraph test.

2. Appointment as the Executive Secretary or employment on the PFIAB staff is not contingent upon passing a polygraph test.

Should you have any further questions, please do not hesitate to contact me.

With kindest regards,

Wheaton B. Byers, Executive Secretary

SEPARATE VIEWS OF HON. SAM STEIGER (CONCURRED IN BY HON. FRANK HORTON, HON. JOHN N. ERLENBORN, HON. JOHN W. WYDLER, HON. CLARENCE J. BROWN, HON. GARRY BROWN, HON. CHARLES THONE, HON. EDWIN B. FORSYTHE, AND HON. ELLIOTT H. LEVITAS)

The recommendations contained in this report for an absolute ban on the use of polygraphs and similar devices are contrary to the testimony presented at the hearings on which this report is based. It is our opinion that the testimony and discussions contained in this report support the original recommendations agreed upon earlier by the Subcommittee on Government Information and Individual Rights. We think they should be made a part of this report with particular reference to recommendation No. 2.

Recommendations

No. 1

The committee has not changed its basic views about the benefits of and the need for research relative to polygraphs, and it has similar views relative to psychological stress evaluators, voice analyzers, and other types of stress-measuring instruments. Testimony developed during recent hearings showed that a number of Federal agencies are either conducting in-house research or are funding such research through contracts.

The committee recommends, because the applicable technology and the related scientific disciplines are so specialized, that insofar as Federal agencies fund further research in this area, a more formal and organized approach be developed for any such research, so that the different projects complement one another. This could preclude or minimize the possibility of duplicative or concurrent research, provide an effective mechanism for sharing research findings and conclusions having common applicability, and better recognize any given agency's unique requirements.

No. 2

The committee strongly reaffirms its earlier position with respect to the use of polygraphs, and recommends that the use of polygraphs and other stress evaluator devices by Federal agencies be prohibited in all cases but (1) those clearly involving the Nation's security and (2) those in which agencies can demonstrate in compelling terms their need for use of such devices for their law enforcement purposes, and that such uses would not violate the fifth amendment or any other provision of the Constitution.

No. 3

The committee recommends that the pertinent sections of the CSC's Federal Personnel Manual be revised to give visibility and emphasis to an individual's rights and alternatives when he is requested to submit to a polygraph test. The Commission's regulations should address themselves specifically not only to the approval uses of polygraph tests to preemployment screening situations but also to those situations in which the question of the continuance of an individual's employment in a competitive service position is under consideration or at issue because questions may have arisen about his honesty or the propriety of his conduct.

The committee also sees a need for and recommends to the Civil Service Commission that it require agencies each year to report the number of polygraph tests given to competitive service and to excepted employees, the reasons for those tests, and the uses made of the results of the tests.

No. 4

The committee recommends that the Department of Defense give additional consideration to a cross-service arrangement among its many components for polygraph testing, so that the overall requirements for devices and for training polygraph examiners might be reduced, with resulting savings to the Government.

The committee hesitates to recommend that some Government-wide central monitoring and control point be established for the purchase and test evaluation of PSE's and voice analyzers solely on the basis of their acquisition cost. However, the ancillary costs involved in uncoordinated, multi-organization contracting for or in-house performance of evaluation tests can easily become significant, as is evidenced by what is happening in the Department of Defense. For that reason, the committee does recommend that the Department of Defense establish a single point of management for those devices and other newly developed similar devices represented as being useful as lie detectors to satisfy that agency's stated needs.

No. 5

Discerning between "truth" and "deception" is the stated objective of the polygraph operator; therefore, his ability to do so should not be dependent in any way upon the special mission responsibilities of his employing agency. It follows then that all polygraph examiners should be equally well-trained and qualified. The committee accordingly recommends that a common set of qualifications (educational training, experience and personal) be established for polygraph examiners of all Federal agencies. Both in education and training, the committee recommends that the requirements for a baccalaureate-level education and special training as a polygraph examiner give greater emphasis to the fields of psychology, physiology, and behavioral sciences.

The marked variations in the duration of the special formal training given by different agencies to polygraph examiners needs further consideration. The committee particularly recommends that the Department of Defense critically reassess its earlier justifications for expanding its formal training course from the original period of 8 weeks to the present 14 weeks training course. Such an evaluation should, at the very least, examine and compare the content of the Army school's syllabus with the training syllabuses of those agencies which give their formal training in periods of 6 to 7 weeks. If those other training course curriculums are found to be adequate, then DOD should take the necessary steps to shorten its polygraph training courses.

The advantages of uniformity and economy that normally would accrue if all Federal agency polygraph examiners were given their highly specialized basic training at a single, adequately equipped facility appear self-evident to the committee. It therefore recommends to those other Federal agencies which contract for or operate such in-house training programs that they begin discussions with DOD about having their employees trained at the Army's Military Police School, Fort Gordon, Ga., on a cost-reimbursable basis.

No. 6

It is the belief of the committee that attitudinal changes in recent years are evidenced in the greater concern shown by Federal agencies about the manner and conditions under which polygraph tests are given and about the confidentiality accorded and the uses being made of the polygraph test results.

The organizational levels at which requests for polygraph testing must be approved, on a case-by-case basis, are gratifyingly high. Assurances that the test results, by themselves, are only another matter for consideration, rather than the sine qua non upon which personnel decisions are made by agencies, also are gratifying. On the other hand, the fact that refusal to submit to polygraph testing remains a bar to initial employment by CIA and NSA is hardly justifiable, in the committee's view, merely because of the "national security" claim advanced by these two agencies. A number of other agencies also have sensitive missions but do not require pre-employment polygraphing.

There still are a number of marked differences in the Federal agencies' practices that relate to equipping special test rooms and disclosing to the examinee the results of the polygraph tests.

The committee remains persuaded that determining whether or not an individual's state of mental and physical health is acceptable, before he undergoes a polygraph test, is a decision that should be made by properly trained medical professionals rather than by polygraph examiners.

The committee's recommendation of a decade ago, that all Government agencies be placed under a uniform administrative system which would enforce maximum controls on the use of polygraphs and which would establish regulations to prevent their proliferation and misuse, appears to have been accepted and acted upon, to a considerable degree. There is, however, substantial opportunity to make more uniform a number of the agency practices referred to above. To accomplish this, the committee recommends that the President reestablish an interagency committee to consider these matters, to act as a clearinghouse of agencies' research activities involving polygraph and other stress analysis devices, and to coordinate the periodic reporting recommended earlier in this report.

Sam Steiger.

We concur in the foregoing views:

Frank Horton. John H. Erlenborn. John W. Wydler. Clarence J. Brown. Garry Brown. Charles Thone. Edwin B. Forsythe. Elliott H. Levitas.

DISSENTING VIEWS OF HON. FRANK HORTON, HON. CLARENCE J. BROWN, HON. PAUL N. MCCLOSKEY, JR., HON. JOEL PRITCHARD, HON. JOHN N. ERLENBORN, HON. CHARLES THONE, HON. GARRY BROWN, HON. EDWIN B. FORSYTHE, HON. ALAN STEELMAN, HON. ROBERT W. KASTEN, JR., HON. SAM STEIGER, HON. JOHN W. WYDLER, AND HON. WILLIS D. GRADISON, JR.

We disagree strongly with the recommendation made at the conclusion of this Report, that the use of polygraphs and similar devices be discontinued by all government agencies for all purposes.

The factual information and opinions referred to in the Report relate solely to hearings held in June, 1974, <u>during an entirely different</u> <u>Congress</u>, and participated in by an entirely different group of Members. There were two days of hearings in 1974. On June 4, the Hearing Record discloses that five Members were present: then-Chairman William Moorhead, Bill Alexander and James Stanton, Democrats, and John Erlenborn and Ralph Regula, Republicans. The following day, June 5th, only Mr. Moorhead and Mr. Erlenborn were in attendance. None of these members serve on the Subcommittee in this, the 94th Congress, which proposed this Report. None who do serve at the present time on the Subcommittee were present or participated in the 1974 hearings. The testimony and subsequent statements received for inclusion in the 1974 record take up 790 pages and represent a wide diversion of views and suggestions. <u>No</u> witness, however, urged prohibition of the polygraph for all purposes as the Committee majority now recommends.

Even the ACLU and the American Federation of Government Employees did not go this far. Former Senator Sam Ervin submitted perhaps the most persuasive argument, that no American be compelled to submit to polygraph testing as a condition of obtaining or retaining federal employment.

A majority of us who join in these dissenting views agree with Senator Ervin. But this is a far cry from recommending that the government be prohibited from use of the polygraph for all purposes. What of the individual under investigation in a doubtful case who asks that he be tested in order to try to prove his innocence? Is this privilege one which our government should deny him? We think not.

While we have grave reservations about the use of the polygraph in 1973 by DOD and the CIA as disclosed in the 1974 testimony, there is absolutely nothing in the hearing record to justify the recommendation made by the Committee majority.

How, then, did the Committee reach such recommendation?

The answer provides an interesting commentary on congressional procedures. First, it should be noted that an earlier draft report was prepared in March, 1975, to reflect the record of the 1974 hearings. That report, prepared for submission to the full Committee at its April meeting, included at page 20, the specific recommendation that polygraph tests should be . . .

prohibited in all cases, but (1) those clearly involving the National Security and (2) those in which agencies can demonstrate in compelling terms their need for use of such devices for their law enforcement purposes and that such uses would not violate the fifth amendment or any other provision of the Constitution.

There were five other specific recommendations as to the use of polygraphs, but none which suggested that they be prohibited absolutely.

The recommendations of the draft report were approved by the Subcommittee in March 1975 (with four Members, Chairwoman Abzug, Ranking Minority Member, Sam Steiger, Andrew Maguire, and Paul McCloskey participating in the meeting) and ordered reported to the full Committee on Government Operations on March 25, 1975.

Six recommendations were thus approved. They were based on a careful review of the testimony at the 1974 hearings, and both the Chairwoman and two of the three Republicans on the Subcommittee concurred in these recommendations.

Thereafter, however, the two Subcommittee staff members who prepared the report, James Kronfeld and Nancy Wenzel, were replaced by the Chairwoman with five new staff members, <u>none</u> of whom had participated in the 1974 hearings or in the preparation of the March draft report.

The Chairwoman thereafter did not comply with the March 25 vote of her Subcommittee and did not submit the draft report to the full Committee. Instead, she waited until September 25, six months later, at which time she circulated a memorandum to the Subcommittee on another subject, (the National Women's Conference bill) and adding a single sentence to the end that there would also be consideration of a revised recommendation on the polygraph Report.

No arguments were submitted in support of this change of recommendations and at a hurried meeting on September 30, 1975, attended by six Members of the Majority, but with no Minority Members present and <u>without either dis-</u> <u>cussion or debate</u>, the new recommendation was adopted in a 6 to 0 vote by Subcommittee Members, <u>none of whom</u> had participated in the 1974 hearings or the preparation of the earlier draft Report approved by the Subcommittee in March, 1975.

It seems to us that this procedure is both demeaning to the House as well as indicative of a certain lack of validity in the recommendation.

Our own recommendations remain the original recommendations of the March 25, 1975 draft Report which follows:

1. The committee has not changed its basic view about the benefits of and the need for research relative to polygraphs, and it has similar views relative to psychological stress evaluators, voice analyzers, and other types of stress-measuring instruments. Testimony developed during recent hearings showed that a number of Federal agencies are either conducting in-house research or are funding such research through contracts.

The committee recommends, because the applicable technology and the related scientific disciplines are so specialized, that insofar as Federal agencies fund further research in this area, a more formal and organized approach be developed for any such research, so that the different projects complement one another. This could preclude or minimize the possibility of duplicative or concurrent research, provide an effective mechanism for sharing research findings and conclusions having common applicability, and better recognize any given agency's unique requirements.

2. The committee strongly reaffirms its earlier position with respect to the use of polygraphs, and recommends that the use of polygraphs and other stress evaluator devices by Federal agencies be prohibited in all cases but (1) those clearly involving the Nation's security and (2) those in which agencies can demonstrate in compelling terms their need for use of such devices for their law enforcement purposes, and that such uses would not violate the fifth amendment or any other provision of the Constitution.

3. The committee recommends that the pertinent sections of the CSC's Federal Personnel Manual be revised to give visibility and emphasis to an individual's rights and alternatives when he is requested to submit to a polygraph test. The Commission's regulations should address themselves specifically not only to the approved uses of polygraph tests to preemployment screening situations but also to those situations in which the question of the continuance of an individual's employment in a competitive service position is under consideration or at issue because questions may have arisen about his honesty or the propriety of his conduct.

The committee also sees a need for and recommends to the Civil Service Commission that it require agencies each year to report the number of polygraph tests given to competitive service and to excepted employees, the reasons for those tests, and the uses made of the results of the tests.

4. The committee recommends that the Department of Defense give additional consideration to a cross-service arrangement among its many components for polygraph testing, so that the overall requirements for devices and for training polygraph examiners might be reduced, with resultant savings to the Government.

The committee hesitates to recommend that some Governmentwide central monitoring and control point be established for the purchase and test evaluation of PSE's and voice analyzers solely on the basis of their acquisition cost. However, the ancillary costs involved in uncoordinated, multi-organizational contracting for or in-house performance of evaluation tests can easily become significant, as is evidenced by what is happening in the Department of Defense. For that reason, the committee does recommend that the Department of Defense establish a single point of management for those devices and other newly developed similar devices represented as being useful as lie detectors to satisfy that agency's stated needs.

5. Discerning between "truth" and "deception" is the stated objective of the polygraph operator; therefore, his ability to do so should not be dependent in any way upon the special mission responsibility of his employing agency. It follows then that all polygraph examiners should be equally welltrained and qualified. The committee accordingly recommends that a common set of qualifications (educational training, experience and personal) be established for polygraph examiners of all Federal agencies. Both in education and training, the committee recommends that the requirement for a baccalaureate-level education and special training as a polygraph examiner give greater emphasis to the fields of psychology, physiology, and behavioral sciences. The marked variations in the duration of the special formal training given by different agencies to polygraph examiners needs further consideration. The committee particularly recommends that the Department of Defense critically reassess its earlier justifications for expanding its formal training course from the original period of 8 weeks to the present 14 weeks training course. Such an evaluation should, at the very least, examine and compare the content of the Army school's syllabus with the training syllabuses of those agencies which give their formal training in periods of 6 to 7 weeks. If those other training course curriculums are found to be adequate, then DOD should take the necessary steps to shorten its polygraph training course.

The advantages of uniformity and economy that normally would accrue if all Federal agency polygraph examiners were given their highly specialized basic training at a single, adequately equipped facility appear self-evident to the committee. It therefore recommends to those other Federal agencies which contract for or operate such in-house training programs that they begin discussions with DOD about having their employees trained at the Army's Military Police School, Fort Gordon, Ga., on a cost-reimburseable basis.

6. It is the belief of the committee that attitudinal changes in recent years are evidence in the greater concern shown by Federal agencies about the manner and conditions under which polygraph tests are given and about the confidentiality accorded and the uses being made of the polygraph test results.

The organizational levels at which requests for polygraph testing must be approved, on a case-by-case basis, are gratifyingly high. Assurances that the test results, by themselves, are only another matter for consideration, rather than the sine qua non upon which personnel decisions are made by agencies, also are gratifying. On the other hand, the fact that refusal to submit to polygraph testing remains a bar to initial employment by CIA and NSA is hardly justifiable, in the committee's view, merely because of the "national security" claim advanced by these two agencies. A number of other agencies also have sensitive missions but do not require pre-employment polygraphing.

There still are a number of marked differences in the Federal agencies' practices that relate to equipping special test rooms and disclosing to the examinee the results of the polygraph tests.

The committee remains persuaded that determining whether or not an individual's state of mental and physical health is acceptable, before he undergoes a polygraph test, is a decision that should be made by properly trained medical professionals rather than by polygraph examiners. The committee's recommendation of a decade ago, that all Government agencies be placed under a uniform administrative system which would enforce maximum controls on the use of polygraphs and which would establish regulations to prevent their proliferation and misuse, appears to have been accepted and acted upon, to a considerable degree. There is, however, substantial opportunity to make more uniform a number of the agency practices referred to above. To accomplish this, the committee recommends that the President reestablish an interagency committee to consider these matters, to act as a clearinghouse of agencies' research activities involving polygraph and other stress analysis devices, and to coordinate the periodic reporting recommended earlier in this report.

To show how the Committee reached a contrary view, we attach as Appendix A Chairwoman's memorandum of September 25, 1975.

Appendix A

U.S. House of Representatives Government Information and Individual Rights Subcommittee, Committee on Government Operations Washington, D.C., September 25, 1975. TO: Members of the Government Information and Individual Rights Subcommittee. FROM: Bella S. Abzub, Chairwoman.

Subject: Hearing on National Women's Conference Bill - Correction

Because of the Democratic Caucus called for 9:00 a.m. next Tuesday, September 30, the legislative hearing scheduled to consider H.R. 8903 (a bill to organize and convene a 1976 National Women's Conference) will be moved to 10:00 a.m., or shortly thereafter, and will start immediately following the conclusion of the Democratic Caucus.

The hearing will be held in the same room as scheduled, Room 2247 of the Rayburn House Office Building. Vote and mark-up of the bill will take place immediately after witness presentations at the hearing. If for any reason a quorum is not present at that time, mark-up will take place on Wednesday, October 1, at 2:00 p.m. in Room H-310, The Capitol.

Also to be voted on at the Tuesday hearing is the enclosed committee report on the use of polygraphs by federal agencies, and the revised recommendation.

Enclosures.

Polygraph Report: Errata Sheet

1. Pages 14, 20, 25, 33, 40, 48 and 49: strike out all portions headed "RECOMMENDATION" OR "RECOMMENDATIONS".

2. Page 49, after end of all text: insert the following new section:

IX. Recommendations

It is the recommendation of the committee that the use of polygraphs and similar devices be discontinued by all government agencies for all purposes.

While recognizing that there has been substantial compliance with the committee recommendations of 1965 calling for increased uniformity of administration of the polygraph and comprehensive research into the validity and reliability, the clear import of the hearings upon which this report is based leads to the same conclusion as was reached in 1965. The conclusion at that time was that:

There is no "lie detector," neither machine nor human. People have been deceived by a myth that a metal box in the hands of an investigator can detect truth or falsehood.

The Department of Justice continues to maintain the position that the results of polygraph examinations would not be admitted as evidence in the Federal courts. The committee adopts this position and further affirms that since such examinations are considered invalid for evidentiary purposes, there is absolutely no reason for continuing the use of such examinations for investigatory purposes.

Although there is indication that efforts are being made to upgrade the training and education requirements of polygraph operators, the committee finds that unproven technical validity of the polygraph devices themselves makes such efforts a meaningless exercise.

Even if the committee adopted the position of some agencies that the polygraph is useful as a secondary investigative technique and that the results of a polygraph examination alone are never considered conclusive, the committee finds that the inherent chilling affect upon individuals subjected to such examinations clearly outweighs any purported benefit to the investigative function of the agency.

The committee additionally recommends that the use and/or acquisition of other so-called "lie detectors" such as the PSE or the Voice Analyzer be discontinued. Evidence presented in the hearings upon which this report is based demonstrates that such devices have even less validity than the polygraph. Although no agency of the Federal government is using such other devices at this time as a substitute for polygraph examinations, the committee recommends that additional federally-funded research into such devices be discontinued.

Frank Horton.Alan Steelman.Clarence J. Brown.Robert W. Kasten, JrPaul N. McCloskey, Jr.Sam Steiger.Joel Pritchard.John W. Wydler.John N. Erlenborn.Willis D. Gradison,Charles Thone.Garry Brown.Edwin B. Forsythe.Image Steiger

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By

Norman Ansley

Polygraphic testing of persons afflicted by certain handicaps often presents difficulties with respect to modifying procedural matters and equipment. For this reason, examiners tend to avoid testing in such situations, often needlessly so. It is the purpose of this paper to discuss procedures which can be used successfully to overcome difficulties encountered when testing persons who stutter, are deaf and dumb, or are blind.

Stutterers

Stuttering is a relatively common affliction, over a million Americans, probably closer to a million and a half, stutter somewhat. It appears to be essentially psychological in nature and may, in fact, be a cultural phenomenon, since it is known that there are cultures in which stuttering is non-existent. But, what is stuttering? Stuttering can be defined as a defect in speech which is characterized by a stumbling and spasmodic repetition of syllables resulting from the difficulty in pronouncing initial consonants, presumably caused by spasms in the lingual and paletal muscles. Another definition of stuttering is that it is a disturbance of the smooth flow of speech due to tonic and clonic spasms involving the functions of respiration, phonation, and articulation. The tics and spasms may or may not be near to the speech mechanism. A tonic spasm is a persistent, involuntary, and even a violent muscular contraction. A clonic spasm is one that is marked by the muscular contraction immediately followed by relaxation. Although the two spasms differ, the result is the same. stuttering.

It is said that the stutterer stutters because, first of all, he expects to stutter. And second, he dreads it. He then becomes tense anticipating the stutter and he tries to avoid it, so he stutters. The stutter, then, stutters because he trys not to.

It is important to note that stammering differs from stuttering in that stammering is purely a performance phenomenon, not an emotional one. Stammering is only a defect in articulation; it is hesitant, faltering speech, characterized by mispronounciations and transpositions of words and letters. The subject who stammers can be helped some by avoiding the words that he stammers. This does not always hold true for a subject who stutters.

There is, by the way, no deformity of organs or disease of the nervous system related to stuttering. There is no difference in the general blood pressure, heart rate or metabolism. However, among children there is often a slower development of motor skills. Psychiatrists report that stutterers have an outstanding degree of primary anxiety. In other words, this anxiety is not a result of stuttering. Such primary anxiety is complicated by the secondary anxiety of stuttering. Many stutters are said to have neurotic traits, being timid and obsessive-compulsive in nature and having repressed hostility. The presence of such traits may be a factor in the case; and may create problems during the testing.

Women may take comfort in the fact that some four to eight times as many men stutter as women; and among the adult population, it may be eight to one men or more. Because people stutter more when they are frightened, a disproportionate number may be encountered during polygraph testing.

Stuttering may involve three types, situational, ritual and traumatic. Situational stuttering occurs when the stutterer is influenced by the presence of certain persons or situations. For example, a child may stutter only in the presence of his parents, or only in school but never at home. Another example is the man who may stutter only in front of his boss, or only when he gives a speech.

Ritual stuttering refers not really to stuttering but rather to the manner in which it is controlled; that it, a ritual must be performed to prevent stuttering. This is very common among adults. To control or overcome their stuttering, they find some comfortable physical position or something they do mechanically that will prevent them from stuttering. For instance, they may hold their ear, put their hand on their head, or put a hand in a pocket. If anything is done to prevent them from going through this ceremony, they will stutter. When this kind of stutterer undergoes a polygraph examination, the placing of attachments may make it impossible for him to go through his ritual; hence, he may stutter during the testing, but not during the pre-test.

The third kind of stuttering, one many examiners are probably familiar with, is called traumatic. Such stuttering occurs immediately after a traumatic experience, such as a serious auto accident, and may last for a moment, a few moments, for days, or, rarely, for a lifetime. The V.A. hospitals are still treating a few people who are stuttering as a result of their experiences in the Korean War. Generally, however, traumatic stuttering lends itself to treatment better than other types of stuttering.

Traumatic stuttering may occur because of the immediate tension of the polygraph testing situation. You may come across a subject who has not stuttered before but who does stutter when in the examination room. Joyce Hanson, for instance, tells of one case where the subject stuttered only during the test, and then only when answering the relevant questions. In this case, the stuttering was a reaction, a meaningful deception reaction, later verified by admissions.

The average stutterer does not stutter all the time. He only stutters about 10 per cent of his words. Also, some people will not stutter in the morning but only in the afternoon when fatigue sets in. Moreover, some people may botch up one word for a while and then, when that word can be pronounced clearly, have trouble with others, thus, their stuttering is not necessarily consistent.

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There are two interesting things about most stutterers of all classes, except the traumatic. They can whisper without stuttering, and they can sing without stuttering. You may not get them to sing a response, but consider the other approach if you have a quiet room.

Many stutters can answer "yes" and "no" without stuttering. Hence, even if a stutterer is difficult to interview it is worthwhile to attempt routine polygraph testing. However, be aware of the occasional situation where a person is malingering; he is hoping that you will not test him because you will think he is unfit for testing. Also be aware that some people stop stuttering under tension. So a man may say, "You know, I usually stutter, but today I don't seem to have any problem." If observations indicate that a person is a stutterer make note of his ability to answer "yes" or "no". If such responses are normal, proceed with polygraph testing. But when "yes" or "no" responses cause problems, consider one of these alternate techniques.

I am indebted to Walter Atwood for the following example. While testing a stutterer. Atwood observed that the first chart was a mess; reactions in the pneumo, cardio, GSR were not systematic. They were simply irregular, and could not be analyzed. Noting this irregularity, Atwood switched to a form of a "no-answer" test, similar to the silent answer test developed by Horvath and Reid (1972). This test is used in conjunction with the Reid Control Question Technique, which requires answers on the first chart and other charts. Although, it is a very fine test, it cannot be used just the way it is for the stutterer. In Horvath's approach the subject is told that he will be asked the same questions as in other tests, but in the silent answer test he is not to give an oral answer, merely to silently and truthfully answer questions. Thus, in this situation, the subject who has been answering truthfully orally doesn't have to change his answers. But if he has been lying orally and he is now told to answer truthfully to himself he must either tell the truth, which means he changes his answer, or he must lie again and disobey the instructions. It creates a dilemma for the liar.

Although Atwood's test differs somewhat from Horvath's, the same dilemma is apparent. Atwood's modification involves instructing the subject to answer silently, to himself, exactly the way he answered the questions during the pretest interview; warning him not to change his answers. Hence, the subject will be either deliberately disobedient if he decides to "beat the test" by changing his silent answers, or will be faced with the act of lying if he answers the questions as instructed. For full effectiveness the pre-test instructions must be made clear to the subject. That is, the subject must know that if he changes answers during the test, when he is answering silently, this is going to create a problem for him, that he will react because of his disobedience. Failure to properly instruct a subject will probably lessen chances of detecting deception. Indeed, this is apparent from the research reported by Gustafsen and Orne (1965) where they demonstrated the value of the direct verbal answers, noting that those who said "no" to questions were more frequently detected than those who were told to say nothing.

Gustafsen used relevant-irrelevant tests in a laboratory situation and was able to detect 19 of 25 people when they answered "no". But only 14 of 24 persons could be picked out when they remained silent. By employing a peak of tension test, using numbers in a known sequence, he was able to pick 20 of 27 correctly when they said "no" but could only pick 13 of 26 from those who remained silent. These statistics suggest that it is important to create a specific dilemma for the subject if you are going to use a silent answer test. And a silent answer test is one of the approaches in handling a stutterer.

Since a stutterer often can whisper without stuttering, if the examination room is quiet, it may be appropriate to tell the subject to whisper his answers; perhaps conducting a trial run to determine if this approach is practicable. I have also been told of cases where the stutterer has been instructed to answer with a very slight nod.

Some subjects engage in false stuttering, which, by the way, is fairly hard to do. In such cases, it may be evident that the stutterer does not sound right. If testing is actually conducted in such instances, the charts may not look right as the stuttering won't be at the end of the inspiration cycle, where it usually occurs. Tom Moore of the Metropolitan Police Department in Washington, D.C. reported a case of fake stutterer who was told by his attorney to stutter only on the pertinent questions. Moore noted that the pneumo pattern was wrong; the stuttering wasn't at the end of the inspiration cycle. He was right, and the subject confessed.

Deaf and Dumb Subjects

Deaf and dumb subjects present problems different from those of stutterers. The deaf person is not as much of a problem as the person who is both deaf and dumb. When dealing with these subjects the first thing to do is to make extensive preparation. After such preparation, practice the test on someone before you actually conduct it. Then you must be able to answer some questions about the particular subject. First, how deaf is this Subject? If he can hear a little or not at all? Can he read lips? Paul F. Rohde had a case where the subject was able to read lips but he refused to cooperate. Incidentially, the reason he did not want to cooperate was that he thought that if he created a problem, the test would not be conducted. With deaf subjects you will spend a lot of time passing notes back and forth. Since you have to do this, bring the subject alongside, like you were playing the piano together. It is easier for the subject to read the pre-test instructions you have written for him, and to write his answers right on them. If you each use a pen of a different color you can later attribute the notes to the right person, but be sure to write on the same pad, taking turns.

You must agree on the questions as you do with anyone else, but if you can stay with your originally planned questions, this is easier as you can then use prepared transparancies or cards, without altering them. We once tried 35 mm slides but gave up on them because there is no way to alter the photograph of the question to agree with the Subject's objections or changes. You may use any one of three techniques: a transparancy

projector, an opaque projector, or a 5 x 8 card technique. The card technique is simple, but there is one point to note. The appearance of the card causes an initial response. So first you make a dry run with the subject, which also gets your timing down while you mark the chart and handle the cards. When you put the question out in front of the subject, put the blank or the backside out first. Turn the question card over, let him read the question, turn it back to the blank side, and take it away. The first time I did this I had it timed perfectly. I put the card out in front of the subject with the blank side facing him, I turned it over and there was the question-upside down. It really is necessary to practice this technique.

With a projector you may need a second person in the room. If your subject can hear a little, then signal the person to use the projector rather than say, "Ask the question"; or you will have a stimulus in front of your question. This technique also needs practice, with someone in your own office acting as the subject, and another as your assistant.

Many deaf people can answer "yes" or "no", and if so have them to do so during testing. But, if it is quite an effort for them to speak, and it takes quite a while to work up to an answer, then I suggest you not have him speak. A slight nod will do. You may also use the Atwood pretest and a silent answer test.

Raymond D. Inglin of the Los Angeles Police Department had a case where the person was not deaf or dumb, but refused to answer questions. He agreed to take a polygraph test but he refused to answer questions during the tests. Inglin conducted a peak of tension test on the calibre of the weapon and the location in which the victim had been shot. The subject reacted perfectly to the right items in this test. He also reacted to the relevant questions during a zone comparison test. He was later found guilty of murdering his girlfriend. But the situation here, where there is no answer, is different from those laboratory studies conducted by Gustafsen and Orne. There was little pressure or stress in the laboratory where subjects were simply picking numbers. In Inglin's case, however, the man had very much to lose and even though he acted like a mute, he was examined with good results. It is, however, an isolated case.

There was a case in Vermont where a deaf mute, who was also illiterate, was successfully tested. He was 23 years old but still living with his mother, incapable of being employed. To explain why he was away all night he alleged that a certain man, whom he identified, had dragged him into a hotel room and forced him to commit indecent acts all night. The mother came to the police and explained the story to them.

The Vermont State Police decided to test the victim first. Now they were presented with something of a problem. This man was deaf, mute, and could not read. They asked the Principal of the nearby school for the deaf to come in and act as an interpreter. In this case, the Principal sat in front of the subject's chair and used sign language for questions that the examiner pointed to. The subject nodded very slightly for answers, "yes" and "no". After the first chart he decided he wanted to change his story and he admitted that he was not forced into the hotel room, but he was lured in on the promise of something to drink and eat. After the third chart he changed his story again. He said he hadn't been lured in, that he had gone willingly, and had enjoyed the whole evening, but he had to explain to his mother why he was out all night. The part of the story as to what they did, however, was true. A difficult test to conduct, but the Vermont State Police took adequate time for preparation, obtained assistance, and completed the examination and interrogation.

If a deaf-dumb subject is able to read lips, this fact may also be a problem. If the subject faces you during the test to read your lips, he will also be reading your reactions to the chart and to his replies. Because the deaf are generally very good at reading facial expressions, I would suggest that you do not conduct the examination with the subject facing you. Rather, use a third person to act as an "interpreter." If the subject reads the facial expressions of the "interpreter", he will not be aware of your reactions to his polygraph charts.

Blind Subjects

When testing blind people you have problems which differ from those presented by other handicapped persons. For instance, you will have to read the release to them; guide their signature, or at least get their hand in the right place; and, perhaps, adjust the room.

When testing blind persons you will want to know if they have been blind from birth or as a result of a recent occurrence, because it affects the way blind people describe things. In addition, you will want to know whether they are totally blind, or can see some light, or are merely legally blind. Some legally blind people have quite a bit of vision. When you put the attachments on a blind person, let them feel them first. Let them feel the blood pressure cuff, the electrodes and the pneumo tubes, and tell them what each one does. Remember, they cannot see that attachment and they don't know what it looks like. They will be so sensitive to sound and touch that they will notice vibrations you are not aware of. They will note subtle inflections of your voice. They will be aware of your turning your head away while speaking.

In one particular case the subject was not only blind, but was wearing a pacemaker. Despite these handicaps, the test was successful. Although there were no changes in heart rate, blood-pressure changes were evident.

One of the toughest cases known involving a handicapped person was conducted by Mr. Paul F. Rhode, in which there was a tremendous response. There was a GSR response beyond belief, there was a spectacular blood pressure rise, an acceleration of pulse rate, and a huge pneumo reaction. Unfortunately none of this was recorded on the chart. What happened was that Paul Rohde was putting the attachments on a blind man when the seeingeye dog suddenly made viscious growl and jumped at the examiner's throat. The reaction was Paul Rohde's. Be sure that is is all right with the dog when you put those attachments on. A word from the dog's master is a wise precaution.

Miscellaneous Problems

Subjects with palsy create a problem with their constant movement and speech defects. The movement may prevent the use of regular cardio units. but a plethysmograph taped to the subject works very well. The speech is often slow and difficult, even a "yes" or "no" answer may take time. Palsy is common with Parkinson's disease, cerebral tumors and lesions, and sometimes with multiple sclerosis. Subjects who have missing or deformed arms or legs can be tested without trouble. If the arms are deformed, use a blood pressure cuff on the ankle or calf. Elevating the leg on a chair or the use of a reclining chair will improve the pattern. Dwarfs, who are defined as being between two feet and four feet-ten inches, are a problem only in that they have a tendency to slide out of an ordinary chair; and require a smaller blood pressure cuff. Use an infant or child cuff. A reclining chair will solve the movement problem. Hemophiliacs should not be tested with a blood pressure cuff at all because of the possibility of vascular or veinous damage. The use of a photoelectric plethysmograph or a cardio activity monitor is recommended as these attachments are passive. If the subject is in a body cast, the pneumograph recording may be difficult to obtain. In one case, the pneumograph tube was placed over one shoulder with the chain under the opposite arm. The polygraph instrument had an amplified pneumograph section which produced a satisfactory pattern. Both the Lafayette model 76164 and the Stoelting Polyscribe have this feature. In another case the body cast did not extend much below the rib cage, and a satisfactory pattern was obtained from a low abdominal position. Although some retarded subjects may be tested; it is not always possible. Research on institutionalized retardates (Abrams and Weinstein, 1974) indicated that they were not fit subjects.

Equipment

Most testing of the physically handicapped requires only some imagination and practice. The use of a polygraph instrument with either the plethysmograph or cardio activity monitor is often useful. So are amplifiers on the pneumograph channels. The use of the highly adjustable polygraph chairs produced by Stoelting or Lafayette, or a commercial model reclining chair which permits tilting the subject back, have advantages with handicapped subjects. The former reduces arm movement and is adjustable to the subject's size. The recliner reduces movement, is more comfortable, and permits the best examiner observation. The use of an overhead projector or opaque projector is useful in handling deaf subjects. The use of the low pressure cardiosphygmographs is also useful in reducing discomfort.

Conclusion

The successful examination of handicapped subjects depends upon careful preparation of questions and adaptation of techniques. Rehearsal with an assistant is strongly recommended before working with deaf, dumb, and blind subjects. Stutterers may be able to whisper their answers, or a "silent answer" test may be employed. The examiner will need extra time for preparation and conduct of these cases, but there is no reason to avoid them.

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ANSWER KEY TO POLYGRAPH REVIEW ON PHYSIOLOGY:

b.
 d.
 a.
 c.
 b.
 True.
 True.
 False.
 False.

10. True.

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THE DEFENSE MECHANISM OF REPRESSION:

A PSYCHOLOGICAL AND PHYSIOLOGICAL APPROACH

By

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and

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An important goal of psychotherapy is to bring about an integration in personality by strengthening the ego. In therapy, defense mechanisms are major stumbling blocks that tend to impede this achievement. In order to appreciate the most powerful of the defense mechanisms, that of repression, one must consider not only its psychological aspects, but also its physiological aspects; the former to understand the development of repression, and the latter as a possible aid to the therapist in the discovery of the patient's repressed experiences.

The term "defense mechanism" was first introduced by Sigmund Freud in 1894 in his study, "The Defense Neuro-Psychoses" to "describe the ego's struggle against painful or unendurable ideas or affects."¹ Although Freud mentioned and defined defense mechanisms in a number of his various works, he credited Anna Freud with giving "a first insight into their multiplicity and many sided significance."²

According to psychoanalytic theory, defense mechanisms evolve in accordance with the formulation of the psychic apparatus.

On their way to gratification the id-impulses must pass through the territory of the ego and here they are in an alien atmosphere. In the id the so-called 'primary process' prevails; there is no synthesis of ideas, affects are liable to displacement, opposites are not mutually exclusive and may even coincide. . . The sovereign principle which governs the psychic processes is that of obtaining pleasure. In the ego the association of ideas is subject to strict conditions, to which we apply the comprehensive term 'secondary process'; further, the instinctual impulses . . are required to respect the demands of reality and . . to conform to ethical and moral laws by which the super-ego seeks to control the behavior of the ego.²

Anna Freud paints this scene as a picture of war where "peaceful relations between the neighboring powers are at an end."⁴ She states that

Case Facts: The subject, Richard Tope, and a friend were on a drinking spree in Ohio. While driving back to Indiana, they noticed a 19 year-old girl riding a bicycle. They forced her to stop and forced her to get in their truck where they both raped her. The subject then killed her because he would be too easily described. Tope was 5'9", 305 lbs., and had red hair. Tope stabbed the girl 96 times, then went to a car wash and walked through trying to get the blood off. He has been convicted and sentenced to life imprisonment. the ego "invades the id. . . . by means of appropriate defensive measures, designed to secure its own boundaries."⁵

Ten mechanisms of defense are listed by Anna Freud. They include: regression, repression, reaction-formation, isolation, undoing, projection, introjection, turning against the self, reversal, and sublimation. According to her, the most unique defense mechanism, and the one most potentially harmful to personality integration, is that of repression.

"Repression is an unconscious exclusion from consciousness of objectionable impulses, memories, and ideas."⁶ The repressed material theoretically becomes a special part of the id, and "the repressing force or censorship derives from the unconscious part of the ego."⁷

Whenever a repressed wish or idea comes close to the surface and attempts to re-enter the conscious, the ego's chief defense mechanism is activated to push the undesireable wish down, back into the unconscious. Powerful anti-cathexes are the forces that caused repression, and they keep the repressed material under close guard. The action of the ego that prevents the unconscious from becoming conscious is called 'resistance.'⁸

If the armor of resistance was penetrated, "... the repressed memory almost never came to consciousness 'cold' and that if it did, no therapeutic result occurred. ... Thus it was expected that the patient would emote — in more technical language, abreact."⁹ It was felt that this "catharthis" was a necessary component for psychoanalysis.

Resistance can manifest itself in various manners.¹⁰ In the case of repression, however, resistance is connected with a failure of memory.¹¹ What could be so painful to an individual to cause a failure of memory?

A traumatic experience is one that, within a very short period of time, subjects the mind to such an intense degree of stimulation that assimilation or elaboration of it cannot be effected by normal means, and lasting disturbances in the distribution of the available mental energy result.¹²

A logical way to observe the physiological manifestations of repression that might occur after a traumatic experience is through the use of a polygraph testing procedure.

A polygraph instrument records some of the physiological activities that are affected by the autonomic nervous system. The autonomic nervous system is partitioned into two components: the sympathetic division and the parasympathetic division. The latter controls basic bodily functions that a person normally does not have to think about, such as breathing, heart rate, digestion, etc., in a passive, regulatory way. The sympathetic division, on the other hand, prepares the body for emergency "fight or flight" situations. Though a subject does not literally flee from the testing room during a polygraph examination, sympathetic stimulation will occur when a subject attempts to lie to questions that are asked of him.

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Sympathetic nervous system stimulation causes changes in heart rate, blood pressure, respiration, and galvanic skin response activities, all of which can be recorded by a polygraph instrument.

A dramatic exhibit of repression can, at times, be observed in people who have been involved in criminal activities. Theoretically, if a subject is truly amnesic and genuinely believes that he did not participate in an event, he should not react deceptively on the polygraph when he denies participation in the event.

The person who has committed the crime testifies that he 'blacked out' that is, has no recollection of doing what he is accused of doing. Obviously, this amnesia is protective. What happens in such cases is apparently that the person finds his situation intolerable and the need to escape becomes overwhelming. Running away would be one solution, but not a wholly satisfactory one, since the person would carry with him his memories and the anxieties they create. Forgetting everything is the most complete escape, except for death.¹³

A true case example is here offered to illustrate the power of the defense mechanism of repression in operation.

A male white subject, twenty-one years of age, was accused with another man of the kidnap, rape, and murder of a young woman after a drinking spree. Although the subject could remember being with the accomplice on the night in question, he denied any personal involvement in the crime. The subject had a ninth grade education, and had been arrested numerous times as a juvenile for charges ranging from assault and battery to burglary and car theft. Being under six feet tall and weighing over 300 pounds, the subject attributed his obesity to overeating and drinking. After a psychiatric evaluation, the subject was classified as a chronic alcoholic and psychopathic personality type.¹⁴

After being incarcerated for approximately one year while waiting for trial, this subject was asked to volunteer for a polygraph examination on a stipulated agreement. The subject consented and was tested by an expert polygraph examiner who specializes in criminal cases. During the pre-test interview of the polygraph examination, the subject denied any involvement in the crime. He suggested that his alleged accomplice along with another man might have been responsible. The subject was given two tests. His polygrams contained specific reactions, indicative of deception to the following relevant questions:

(See Figures 1 - 2)

Q. Do you plan to try to lie to me during this test? A. No.

Q. Did you tell the police the truth about this incident? A. Yes. Q. Have you told me the truth to the best of your ability?

- A. Yes I have.
- Q. Were you there when the girl was stabbed to death? A. No.

Galvanograph reactions were noted to the questions:

Q. Do you know who killed this girl? A. No.

Q. Were you involved in this kidnapping and rape?

A. No.

Q. Did you force this girl to have sex with you? A. No.

No specific reactions were noted to the questions:

- Q. Did you ever kill anyone? A. No.
- Q. Did you ever stab anyone with a knife?
- A. No.

During further questioning, the subject was shown pictures of the deceased, who had been stabbed over ninety times. After studying the pictures the subject stated, "I couldn't have done nothing like that." The subject also made another statement, one of the sort that Anna Freud defined as "parapraxes." : "I've been over it a million times in my hand - - in my head - - you know. I don't remember ever seeing the girl before."

From time to time we obtain further glimpses of the unconscious in another way, in those eruptions of the id which are known as parapraxes. As we know, these eruptions are not confined to the analytic situation. They may occur at any time when in some special circumstances, the vigilance of the ego is relaxed or diverted. ... Such parapraxes, especially in the forms of slips of the tongue ... illuminate as with a flash of lightening some part of the unconscious. ...¹⁵

Before the examination was concluded, the subject had verified many of the statements of the other accused party in the case, however, he denied seeing the victim. The opinion of the polygraph examiner, based on the charts, was that the subject was being deceptive when he stated he was not present when the girl was stabbed to death. Further, the polygraph examiner stated that in his opinion the subject had repressed the act of stabbing the victim and could not allow himself to believe that he had committed the act.

Approximately two weeks later, the subject was given another polygraph examination. At this time his trial had been in progress for three days.
The subject's polygram on this occasion contained specific reactions, indicative of deception, to the following questions:

(See Figure 3) Q. Did you kill _____? A. No.

Q. Did you have sexual relations with _____?

During this second polygraph examination the subject gave a detailed confession of his participation in the offense. The assumption that evidence produced in the early days of the trial enabled the subject to remember the incident is a reasonable conclusion.

This case is important for several reasons. Some psychologists believe that because of the lack of proper super-ego development, a psychopathic personality type will not react on a polygraph. This assumption is, in our opinion, disproven. A comparison of those charts from before the trial with those made after the trial began illustrates the strength of the defense mechanism of repression. Finally, the psychiatric report on this subject stated that if he were involved in the crime, he had repressed the incident. The independent opinion of the polygraph examiner, based upon the physiological recordings was more specific, and was subsequently verified by new evidence.

Lawrence O'Kelly (Mowrer, 1953) devotes an entire chapter to the possibility of integrating the polygraph technique and psychotherapy. First, O'Kelly compares the techniques and notes their differences:

In lie-detection the operator is concerned with a very restricted part of the life history of his subject, and he has (usually) abundant knowledge of the facts of deed and motive; his major problem is fitting these known facts to one of a number of suspects . . . the process of psychotherapy is a good deal more complex. We do not have a single 'crime' and a number of subjects potentially responsible. We have, rather, a complex social situation in which a distressed person, aided, in ways that are still obscure, by a therapist, goes through a lengthy learning process, terminated (ideally) only when the patient has become free of his complaints.¹⁶

As O'Kelly acknowledges, many laboratory studies concentrating on the physiological aspects of emotion have not produced dependable results:

But in the interrogation of suspected criminals or in the psychotherapy of an emotionally troubled patient, the emotional situation is, for the subject, genuine, and realistic. This very possibly has a great deal to do with the difference between the inconclusive correlations of emotions with autonomic disturbance in the laboratory and the relatively great practical success of the lie-detector technique in the life situation.¹⁷ With a sound appreciation of polygraph technique, O'Kelly recognizes that the total evidence accumulated throughout the polygraph interview must be evaluated:

The process of judgement in this situation is dependent upon many factors, a host of which are probably derivable from aspects of the situation other than polygraphically recorded physiological variables. However, without the contribution of the tracings of autonomic function, in the case of liedetection, successful judgement is considerably lower than when the physiological variables are available (Burtt, 1948). A guess might be hazarded that the judgements of therapists about the specific nature of the patients' reactions during therapeutic interviews might likewise be improved if similar physiological data could be made available.¹⁸

O'Kelly is aware of the patient's possible adverse reaction to having recording attachments applied during the therapy session, but does not feel that this would present an unsurmountable problem. He suggests that it would be necessary for an assistant to manage the instrumental recordings, and "become a part of the therapeutic process."¹⁹ He notes "that it is possible for a patient to accept the notion that professional confidence can be extended by two as well as by one."²⁰

O'Kelly discussed the possible directions that physiological research in psychotherapy could take. Ruth Monroe in discussing the recognition of emotional concomitants in psychoanalytic technique states: "the correlations between the topic under 'analytic' discussion and the bodily reaction has been amply demonstrated, ... and it may be that eventually some mechanical device will supplement the analytic observations."²¹

After a void of twenty years, Barbara Brown discusses the possibility of using the polygraph in a therapeutic setting to shorten the "lengthy psychologic procedure that coaxes out emotional problems from the battle between consciousness and subconsciousness." She further suggests that "the therapeutic use of the lie-detector is on or near the horizon."²²

Obviously, "the process whereby a psychotherapy patient becomes aware of and eventually verbalizes repressed material is a matter of both theoretical and practical interest to the therapist."²³ Still, these writers know of no certified polygraph examiner involved in psychotherapy research. As an aid to the therapist, and to his patient, this avenue of research holds great potential and merits further study.

Footnotes

¹Anna Freud, <u>The ego and the mechanisms of defense</u> (New York: 1946) p. 45.
²Hans Sjoback, <u>The psychoanalytic theory of defensive processes</u> (New York: 1973) p. 185.
³Translation 7

⁹Freud, p. 7. ⁴Ibid.

⁵Freud, p. 8. ⁶Benjamin B. Wolman, The unconscious mind (Englewood Cliffs, N.J., 1968) p. 144. ⁷Raymond E. Fancher, Psychoanalytic psychology (New York, 1973) p. 203. ⁸Wolman, p. 144. ⁹Ruth Monroe, Schools of psychoanalytic thought (New York, 1955) p. 316. ¹⁰For a more complete discussion of resistances, see Wolman, pp. 182-189. 11A. A. Brill (Ed.) The basic writings of Sigmund Freud (New York, 1938) p. 939. ¹²Wolman, p. 24. ¹³James D. Weinland, <u>How to improve your memory</u> (New York, 1957) p. 36. 14 Classification from psychiatric report and personal communication. ¹⁵Freud, p. 17. 16. Lawrence O'Kelly "Physiological changes during psychotherapy." (In Mowrer) (New York, 1953) p. 646. ¹⁷Ibid. p. 645. 18_{Ibid}. p. 646. ¹⁹Ibid. p. 655. ²¹Munroe, p. 304. ²²Barbara Brown, <u>New mind</u>, <u>new body</u>: <u>biofeedback</u>: <u>new directions for the</u> mind (New York, 1974). ²³J. Gorden, et. al. "G.S.R.'s during repression, suppression, and verbalization in psychotherapeutic interviews" (In Stollak et. al.) (Chicago, 1966) p. 420. References Cited Brill, A. A. (Ed.) The basic writings of Sigmund Freud. New York: Random House, 1938. Brown, B. <u>New mind</u>, <u>new body</u>: <u>biofeedback</u>: <u>new directions for the mind</u>. New York: Harper & Row, 1974. Fancher, R. E. Psychoanalytic psychology. New York: W.W. Norton & Co., 1973. Freud, A. The ego and the mechanisms of defense. New York: Universities Press, 1946. Gorden, J., Martin, B. and Lundy, R. "G.S.R.'s during repression, suppression, and verbalization in psychotherapeutic interviews" (IN) Stollak, G., et. al.(Eds.) Psychotherapy research. Chicago: Rand McNally, 1966. Harrelson, L. Keeler Polygraph Institute training guide. Chicago, Illinois, 1964.

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Figure 1. Folygraph chart for Test I

- LEGEND FOR QUESTIONS: #1. Have you had anything to eat today? #2. Do you drink coffee? #3. Do you plan to try to lie to me on this matter?
- #4. Do you smoke?

5 Ø 1860,06 Ó + 1 Y 1 #3. Ø #1. #2.

Did you tell the police the complete truth about this matter? **#5**.

- Do you know who killed this girl? Are you married? #6.
- #7.
- #8.
- Did you ever kill anyone? Were: you involved in this kidnapping and rape? #9.



Figure 2. Polygraph chart for Test II LEGEND FOR QUESTIONS

- #1. #2. #3. #4.
- ND FOR QUESTIONS Are you twenty-one years old? Do you love your daughter? Do you believe in God? Have you told me the truth to the best of your ability? Do you know who stabbed this girl wit the knife? #5.



#6. Do you smoke?
#7. Did you ever stab anyone with a knife?
#8. Did you force this girl to have sex with you?
#9. Were you born in the month of June?
#10. Were you there when the girl was stabbed to death?

- #11. Do you remember more about this case than what you told me?









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CALIBRATING THE POLYGRAPH, A PROGRAMMED TEXT

The Kymograph Component (Part IV)

By

Clark J. Tebbs

This linear program of instruction will be used to teach you how to calibrate the systems within the polygraph instrument, particularly Stoelting AN/USS-2d and 2F.

- 1. <u>Read each page carefully</u>. Do not skim over the reading material with the goal of finishing quickly, for this may cause you to miss vital information.
- 2. Be alert for <u>prompts</u> and <u>cues</u> which will assist you in answering questions or statements in the program. Prompts are key words which are underlined or CAPITALIZED. Cues are hints to help you select right answers.
- 3. After reading each step, write your answer in the blank space or spaces provided. The correct answer will be found on the next page. If you answer correctly, go to the following page and follow the same procedure. If your answer to any step is different from the correct one on the next page, reread the step and write the correct answer; then go to the next page.

Turn to the next page and begin the program with Step 1.

This program of instruction was prepared by WOl Clark J. Tebbs, Instructor, DALET, Polygraph Committee, U.S. Army Military Police School, Fort Gordon, Ga., for the polygraph student as an aid to improve his ability to properly calibrate all components within the AN/USS-2D and 2F polygraph instruments.

KYMOGRAPH COMPONENT

This portion of the programmed instruction will develop your skill in performing the <u>kymograph calibration</u> procedure in the AN/USS-2D and 2F polygraph instruments. Using the polygraph instrument and this program of instruction, you will calibrate the kymograph system to the satisfaction of a certified polygraph examiner within 5 minutes.

Prior to beginning the calibration, insure that all controls on the polygraph instrument are in the NEUTRAL position. This is necessary because the instrument can be damaged if the controls are not properly set before placing it into operation.

1. Prior to performing a calibration check of any component within the polygraph instrument, you should first ______ all of the controls. The controls for the KYMOGRAPH component are the <u>AC power switch</u> and the <u>chart drive switch</u> which should both be in the <u>OFF</u> position prior to starting the calibration check.

Compare your response to the correct one on the next page.

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Answer to 1:

NEUTRALIZE

2. Prior to calibrating the KYMOGRAPH component, you must first insure that sufficient CHART PAPER is in the paper well and that it travels freely across the writing table, through the paper guide rails, and around the paper roller assembly.

The primary job of the kymograph component is to transport the ______ _____ under the recording pens at

a uniform constant speed.

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Answer to 2:

CHART PAPER

3. The kymograph contains the chart drive mechanism that is responsible for driving the chart paper at a constant <u>rate of 6 inches per minute</u>. The chart drive motor is an 8-pole synchronous motor that, through a series of gears, will cause the chart paper to

drive at a rate of _____ inches per

Answer to 3:

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<u>SIX</u> (6)

Minute

4. To determine if the chart drive motor is driving at the proper speed, a timing device such as a <u>stop watch</u> is required because the paper driving rate must be timed for <u>one minute</u>. The period of time measured to insure the proper rate of the chart drive motor is ______. Answer to 4:

ONE MINUTE

5. Turn on the <u>AC power switch</u> and the <u>chart drive switch</u>. This will cause the chart paper to move under the recording pens. While observing a timing device (stop watch or accurate second hand on a wrist watch) place a "vertical" mark on the chart paper at some reference point on the instrument. Exactly one minute later, place another "vertical" mark on the chart paper opposite the same reference point on the instrument. The distance between the two "vertical" marks should be SIX inches.

In order to check the rate of the chart drive motor, the motor is timed for a period of _____ minute to determine if the chart paper travels a proper distance of _____ inches.

Answer to 5:

ONE(1)

<u>SIX</u> (6)

The KYMOGRAPH component is calibrated and functioning properly if the chart paper drives at a uniform speed of six inches per minute and does not bind or drag in any way.

Notify your instructor at this time that you are ready to demonstrate the calibration procedure of the kymograph component. He will monitor your ability to properly calibrate the kymograph component by observing that you insure that the chart paper travels at a constant rate of six inches per minute.

This completes the calibration of the KYMOGRAPH component. NEUTRALIZE all controls on the instrument. Place the AC power switch and the Chart drive switch in the <u>OFF</u> position.

ATTITUDES TOWARD THE USE OF THE POLYGRAPH: THEIR ASSESSMENT

AND SENSITIVITY TO CHANGE

By

J. R. Gerow, Ph.D.

And

N. K. Scrogham

PURPOSE

This study was conducted for two purposes: (1) to get quantitative assessments of the attitudes of "naive" subjects toward various aspects of polygraphy, and (2) to determine the extent to which these attitudes might be subject to change after exposure to written "factual" material on the polygraph and its use. The subjects (\underline{Ss}) in the project were 134 students at Indiana University-Purdue University at Fort Wayne who were enrolled in an introductory psychology course. None of the subjects had ever been tested on the polygraph, nor did any ever have training in polygraph technique.

METHOD

An eleven-item scale was constructed that included three factual questions and eight opinion items dealing with polygraphy. After responding to the questionnaire anonymously the <u>Ss</u> read a representative sample of five short paragraphs about the polygraph, or "lie detector", taken from a population of fifteen such paragraphs gleaned from introductory psychology textbooks. The paragraphs were identified by source and the <u>Ss</u> were told that they were written by psychologists. After they had read the paragraphs, the <u>Ss</u> were given another copy of the same questionnaire to complete. Results were analyzed in terms of the percentage of <u>Ss</u> responding for the Pre-Test and the Post-Test.

RESULTS

The two most striking aspects of the results were the overall negativity of the students' attitudes, and how significantly more negative these attitudes became after reading just one page of supposedly factual, straight-forward information. Items from the scale, the summarized results, and our comments are listed below:

| ITEM (1): | Does a polygraph examiner have to | PRE: | 34•33% Yes |
|-----------|---|------------------------|-------------------------------------|
| | have a degree in psychology or | POST: | 40•30% Yes |
| | psychiatry? | diff: | +5•97% |
| ITEM (2): | Do polygraph examiners have to be licensed? | PRE:
POST:
diff: | 67.18% Yes
54.62% Yes
-12.56% |

<u>COMMENT</u>: The (relatively small) change in the Pre- and Post-test responses to Item #1 is difficult to interpret because none of the paragraphs read

by the <u>Ss</u> between administrations of the questionnaire made any reference to psychology or psychiatry. The fact that the readings were identified as coming from psychology textbooks might very well have produced this change. Similarly, no mention at all was made of licensing of polygraph examiners in the paragraphs.

| ITEM (3): | Are the results of a polygraph | PRE: | 48.51% Yes |
|-----------|--------------------------------|-------|------------|
| • • | examination admissible as evi- | POST: | 20.90% Yes |
| | dence in courts of law? | diff: | -27.61% |

COMMENT: Responses to Item #3 showed the largest percentage change of any item. The paragraphs that the student read obviously convinced a majority of them that polygraph results are not admissible as evidence.

| ITEM | (4): | How often do you think that a | PRE: | 63.62% of the time |
|--------|------|----------------------------------|-------|--------------------|
| | | well-administered polygraph test | POST: | 45.63% of the time |
| | | is successful in detecting de- | diff: | -17.99% |
| | | ception (a lie)? | | _ |
| ITEM (| (5): | How often do you think that | PRE: | 34.05% of the time |
| | | polygraph examiners make | POST: | 45.67% of the time |
| | | mistakes? | diff: | +11.62% |

<u>COMMENT</u>: Although the attitudes here do not start off being very favorable in the first place, it is apparent that they are much more unfavorable at the Post-Test. These <u>Ss</u> believe that a polygraph test "works" less than half the time and that examiners are rather prone to making mistakes.

| ITEM (6): | Do you think that the results of a | PRE: | 36.57% Yes |
|-----------|-------------------------------------|-------|------------|
| | polygraph examination should be | POST: | 12.69% Yes |
| | admissible as evidence in courts of | diff: | -23.88% |
| | law? | | • |

<u>COMMENT</u>: This item was asked in conjunction with item #3, and it is clear that if these subjects had their way, polygraph results would not see the light of day in the court room.

| ITEM (7): | With reference to criminal matters: | PRE: | 75.19% Yes |
|-----------|-------------------------------------|-------|------------|
| • • | would you agree to take a polygraph | POST: | 49.62% Yes |
| | test if you knew you were innocent | diff: | -25.57% |
| | of the charges being investigated? | | |

<u>COMMENT</u>: Of the approximately fifty percent of the subjects who would <u>not</u> take a test under these circumstances, many responded that they would have nothing to gain by so doing, however, many expressed a fear of a mistake being made against their own welfare and that the risk of this mistake was too great to take.

| ITEM (8): | With reference to criminal matters: | PRE: | 34.33% Yes |
|-----------|-------------------------------------|-------|------------|
| | would you agree to take a polygraph | POST: | 38.85% Yes |
| | test if you knew you were guilty of | diff: | +5.52% |
| | the charges being investigated? | | |

<u>COMMENT</u>: This is a significant item. Notice that after reading the material there was an increase in the number who would take the test knowing that they were guilty. Comments by the <u>Ss</u> in response to this item suggest that subjects who responded "Yes" thought that they would have nothing to lose and that maybe they could beat the instrument or the examiner. (See item #9 below.)

| ITEM (9): | Do you think that you could | PRE: | 28.24% Yes |
|-----------|---------------------------------|-------|------------|
| | beat a polygraph test by lying? | POST: | 49.62% Yes |
| | | diff: | +21.38% |

<u>COMMENT</u>: Consistent with other responses, fifty percent of the <u>Ss</u> thought the techniques of polygraphy error-prone enough to allow them to agree with this item. Again, note the very large percentage increase.

| ITEM (10): | 10): Would you tend to think of a
suspect in a criminal investi-
gation who refuses to take a
polygraph test as probably
guilty? | | 53.44% Yes
29.32% Yes
-24.12% |
|------------|--|------|-------------------------------------|
| ITEM (11): | Do you feel that a person should | PRE: | 42.86% Yes |

| Do you reer that a person should | PRE: | 42.80% les |
|----------------------------------|-------|------------|
| be requested to take a polygraph | POST: | 21.21% Yes |
| test before being hired for a | diff: | -21.65% |
| security-sensitive job? | | |

COMMENT: Other than pointing out the consistency of these responses with regard to the other items, and the marked differences between the Pre-Test and Post-Test results, no comment is necessary.

SUMMARY

As stated above, two aspects of this study are noteworthy. First, over-all attitudes towards polygraphy are not very favorable — even less favorable than we thought they might be. Secondly, given that the measured attitudes were not favorable to begin with, and that the material intervening between the Pre- and Post-Tests was generally minimal, the uniform decease in attitude is most impressive. People develop their attitudes from many sources; one of which is material written by recognized authorities. There seems to be little doubt that much of the extant literature available to students in introductory psychology classes if often misleading, or at best is misleading. The disemination of more, unbiased, factual information is badly needed.

* * * * * *

By

Norman Ansley

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* * * * * *

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POLYGRAPH REVIEW By Bobby J. Daily And Steven K. Bartlett

How would you score on a licensing examination? Are you sufficiently up-to-date about such subjects as psychology, physiology, instrumentation, test question construction, chart interpretation, interview techniques, etc.? Are you prepared to undergo direct and cross-examination on polygraph subjects in court? A score of 9 or 10 is excellent, 7 or 8 is good, and below 7 may indicate some review is warranted. The review in this issue is on physiology and was prepared by Steven K. Bartlett of Salt Lake City, Utah. (Answers are on page 67.)

- 1. Respiration involves the exchange of gases at two sites. The exchange across the respiratory membrane of the lungs with the blood in the capillaries of the pulmonary circulation is known as ______ respiration.
 - a. bilateral
 - b. external
 - c. lateral
 - d. internal
- 2. Diffusion of gases between the blood of systemic capillaries and cells of the body is respiration.
 - a. medial
 - b. external
 - c. lateral
 - d. internal
- 3. The connections between neurons are:
 - a. synapses
 - b. axons
 - c. ganglion
 - d. myelin sheath
- 4. The dicrotic notch seen on a polygram is the closure of the semilunar valve in the aorta. This "notch" occurs during:
 - a. electrical conduction
 - b. contraction of the heart
 - c. relaxation of the heart
 - d. the interval between cardiac cycles

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- 5. The upward excursion of the GSR pen on a polygram is the _____ of electrodermal resistance.
 - a. increase
 - b. decrease
- 6. (T) (F) The arithmetic difference between systolic and diastolic pressures is called "pulse pressure".
- 7. (T) (F) The simple average between systolic and diastolic pressures under continuous pressure is the mean arterial pressure.
- 8. (T) (F) The velocity of blood flow increased when the cross section area of the vessels increase.
- 9. (T) (F) Motor nerves carry impulses to the brain which are then directed through the sensory nerves to effector organs that bring about a response.
- 10. (T) (F) The velocity of a nerve impulse is quite independent of the strength of the stimulus and is determined only by the size, type and physiological condition of the nerve fiber.

* * * * * *

VOICEPRINTING

Block, Eugene B. New York: McKay Company, 1975, 244 pages.

A REVIEW

By

Clarence H. A. Romig

As a more than casual observer of the advances made in scientific crime detection since the turn of the century, Eugene Block has written <u>Voice-</u> <u>printing</u> to describe to the public the newest of all innovative investigative techniques. This book should be of particular interest to polygraphists, not only because the psychological stress evaluator and the polygraph techniques are mentioned, but also because of the erratic reception of this scientific technique by the courts. This is the most complete, yet non-technical description of the voiceprint technique that has been made public in a book format.

Eugene Block is a professional writer whose attention was drawn to this subject by several sketchy newspaper accounts of the earliest uses of voiceprints. Although he has written this book from a neutral and objective stance, he very ably depicted the sharply drawn lines between the supporters and serious critics of voiceprints. As with the detractors of the polygraph, the critics contend that the voiceprint method did not have the approval of the general scientific community, that it was far from reliable and was subject to human error. And to all this civil libertarians have added that the use of voiceprint comparison would be a violation of individual privacy. This book is a description of the most salient features of the majority of the voiceprint cases that have reached the courts in the latter 1960's and the early 1970's.

The voiceprint technique has been used to establish evidence for all types of criminal cases, ranging from fraud to murder. And not always was there a record of a voice prepared at the time of the crime. One case in particular used the voiceprint technique as an investigative tool many months after a murder was committed and discovered. Armed with a legal warrant to wiretap a suspect's telephone, investigators recorded conversations between the suspect and his grandmother. Upon hearing the grandmother assure the suspect that she had concealed his guns, search warrants were issued and the murder weapon was discovered. The voiceprints were used to impeach the old woman's court testimony, when she denied the conversations acquired by the wiretap.

The Psychological Stress Evaluator was described in the book as a modernization of the conventional lie detector and in practical use in

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over 150 law enforcement agencies throughout the country. The detection of lies by the PSE is purported to be more reliable and effective than with the polygraph. Several typical cases in which the PSE played a part in resolving the guilt or innocence of suspects were outlined. It was also reported that due to the unfair and inaccurate results of polygraph tests, caused by the suspect's nervousness and tenseness due to the necessary attachments, a simpler method for testing for lies was sought, and the PSE was developed.

There was also reported some traditional background information concerning the history of detection of lies and the development of the modern polygraph. Actually the use of the polygraph was cited very positively as an investigative tool throughout several chapters of the text. The most important point to glean from this book is the fact that voiceprint and polygraph examinations share the dubious distinction of on again - off again acceptance in the courts of this country. This incongruous situation is caused by two factors. The first is the general failure of the voiceprint and polygraph communities to undertake and publish adequate scientific and systematic experimentation with their techniques. The second factor involves the vagaries of the adversary system that allows the courts unlimited discretion to accept, reject or prostitute legal precedents.

In sum, <u>Voiceprinting</u> is a well-written book about a very fascinating subject that should be of interest to every investigator. Furthermore, in view of the incorporation of information about the PSE and the polygraph this book should be mandatory reading for the professional polygrapher.

* * * * * *

ABSTRACTS

Psychopaths

Raskin, D. C. (University of Utah) Psychopathy & detection of deception in prisoners. To investigate the widespread belief that psychopaths can "beat the lie detector," 48 prison inmates were exposed to a mock theft of \$20 and then administered a control-question polygraph examination. Half of the subjects were diagnosed psychopaths, and half were not psychopathic. Within each group, 12 subjects were "guilty" of taking the money, and 12 were "innocent" but informed about the theft. All subjects were instructed to deny having taken the money when examined by a polygrapher who was blind with regard to treatment and groups. Subjects who produced truthful polygraph charts received a \$20 bonus. Measures of respiration, electrodermal and cardiovascular activity were evaluated using on-the-spot field techniques and subsequent quantitative analyses. Field methods yielded 88% correct, 4% incorrect, and 8% inconclusive results. Excluding inconclusives, decisions were 95% correct, and both errors were false positives. There were no dif-ferences in accuracy for psychopaths and nonpsychopaths. Detailed analyses indicated that measures of respiration amplitude and rate, skin conductance and potential, and finger volume and pulse amplitude all produced significant

over 150 law enforcement agencies throughout the country. The detection of lies by the PSE is purported to be more reliable and effective than with the polygraph. Several typical cases in which the PSE played a part in resolving the guilt or innocence of suspects were outlined. It was also reported that due to the unfair and inaccurate results of polygraph tests, caused by the suspect's nervousness and tenseness due to the necessary attachments, a simpler method for testing for lies was sought, and the PSE was developed.

There was also reported some traditional background information concerning the history of detection of lies and the development of the modern polygraph. Actually the use of the polygraph was cited very positively as an investigative tool throughout several chapters of the text. The most important point to glean from this book is the fact that voiceprint and polygraph examinations share the dubious distinction of on again - off again acceptance in the courts of this country. This incongruous situation is caused by two factors. The first is the general failure of the voiceprint and polygraph communities to undertake and publish adequate scientific and systematic experimentation with their techniques. The second factor involves the vagaries of the adversary system that allows the courts unlimited discretion to accept, reject or prostitute legal precedents.

In sum, <u>Voiceprinting</u> is a well-written book about a very fascinating subject that should be of interest to every investigator. Furthermore, in view of the incorporation of information about the PSE and the polygraph this book should be mandatory reading for the professional polygrapher.

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ABSTRACTS

Psychopaths

Raskin, D. C. (University of Utah) Psychopathy & detection of deception in prisoners. To investigate the widespread belief that psychopaths can "beat the lie detector," 48 prison inmates were exposed to a mock theft of \$20 and then administered a control-question polygraph examination. Half of the subjects were diagnosed psychopaths, and half were not psychopathic. Within each group, 12 subjects were "guilty" of taking the money, and 12 were "innocent" but informed about the theft. All subjects were instructed to deny having taken the money when examined by a polygrapher who was blind with regard to treatment and groups. Subjects who produced truthful polygraph charts received a \$20 bonus. Measures of respiration, electrodermal and cardiovascular activity were evaluated using on-the-spot field techniques and subsequent quantitative analyses. Field methods yielded 88% correct, 4% incorrect, and 8% inconclusive results. Excluding inconclusives, decisions were 95% correct, and both errors were false positives. There were no differences in accuracy for psychopaths and nonpsychopaths. Detailed analyses indicated that measures of respiration amplitude and rate, skin conductance and potential, and finger volume and pulse amplitude all produced significant

differentiation of "guilty" and "innocent" subjects. Contrary to inferences from psychophysiological studies of psychopaths, psychopaths were readily detectable and not hyporesponsive. In fact, they showed heightened positive skin potential responses to crime-relevant questions. Furthermore, no subject in either group was able to "beat the lie detector." The results indicate the effectiveness of field techniques in detecting deception in psychopaths and convicted criminals. "Abstracts of Papers Presented at the 15th Annual Meeting of The Society for Psychophysiological Research," Psychophysiology, Volume 13, No. 2 (March 1976): 162.

Imagining Scenes

Weerts, T. C., & Roberts R. (University of Iowa). The physiological effects of imagining anger-provoking and fear-provoking scenes. This study was undertaken to determine if visualization of anger- and fear-provoking scenes would produce differential physiological patterns similar to those produced by the in vivo manipulations used by Ax (1953) and Schachter (1957), i.e., similar increases in heart rate (HR) and systolic blood pressure (SBP) for both anger and fear and a relatively larger diastolic blood pressure(DBP) associated with anger. Sixteen normotensive college students were selected on the basis of their responses to newly developed Anger and Fear/Anxiety Inventories and for their judged ability to visualize arousing scenes during a screening interview. In a 2 x 2 design (intensity x emotion), four scenes (Lo Anger, Hi Anger, Lo Fear, and Hi Fear) were constructed individually for each subject at the initial interview. At a second session, all subjects received an 8-min rest period and visualized two neutral scenes in random order while HR, SBP, DBP, and respiration were monitored. Subjects rated each scene for fear, anger, and vividness. All data were analyzed in terms of change scores from resting levels immediately preceding each scene. As predicted, analyses of HR and SBP data revealed significant increases on both measures when Hi Intensity scenes were compared with Lo Intensity scenes. DBP was significantly higher for Hi Anger scenes than for Hi Fear scenes, in agreement with Ax's and Schachter's findings and interpretation of these results in relation to epinephrine- and norepinephrine-like patterns. Cardiovascular measures did not co-vary with verbal report of emotion or vividness, consistent with Lang's (1968) formulation of imperfectly coupled response systems in emotion. "Abstracts of Papers Presented at the 15th Annual Meeting of The Society for Psychophysiological Research," Psychophysiology, Volume 31, No. 2 (March 1976): 174.

Cardiovascular - Behavioral Interaction

Obrist, Paul A. "Presidential Address, 1975: The Cardiovascular-Behavioral Interaction — As It Appears Today." <u>Psychophysiology</u>, Volume 13, No. 2 (March 1976): 95-107.

Research is reviewed concerning the interrelationships among cardiodynamics, blood pressure control mechanisms, somatic activity, and the stimulus parameter of active vs passive coping. Emerging evidence suggests that with passive coping such as classical aversive conditioning, the heart is more under vagal control which is directionally linked with somatic activity, while blood pressure is more dominated by vascular processes. With active coping such as shock avoidance, the heart is under greater sympathtic control which is directionally independent of concomitant somatic activity, while cardiac influences on blood pressure become more dominant. Several current psychophysiological issues are discussed including the possible significance of these effects for cardiovascular disease processes. [Author abstract.]

Jevning, R., Smith, R., Wilson, A. F., & Morton, M. E. (University of California, Irvine). <u>Alterations in blood flow during transcendental</u> <u>meditation</u>. Cardiac output (CO), and renal and hepatic blood flows have been measured in clinically normal young adults during the practice of transcendental meditation (TM), a well investigated mental technique (<u>American Journal of Physiology</u>, 1971, 221, 795). Two and one half hrs after placement of venous and arterial catheters in the arm, the Stewart-Hamilton dye dilution technique was used to measure the CO twice in each of 3 consecutive 40-min periods, consisting of baseline, experimental, and post-experimental periods. Relative renal and liver blood flows were also measured in each period utilizing 131I-hippuran and 99mTc-sulfur colloid. Measurements were made on a control group (n=6), who were instructed to relax with eyes closed, and a meditation group (n=6), who were instructed to close their eyes and meditate.

A significant (paired t-test) increase (15%) in CO coupled with a significant decline (20%) in liver blood flow occurred during meditation; renal blood flow decreased (20%). In the control group, CO and liver blood flow did not change during relaxation but renal blood flow declined sig-nificantly.

The data seem to indicate that the physiology of TM is fundamentally different from simple relaxation or sleep (in which CO declines). Decreased skin and muscle flow is suggested by other (indirect) data. It is clear that during TM a redistribution of blood flow occurs. Since CO increased and all measured organ blood flows decrease, we hypothesize that cerebral perfusion increases markedly during TM, perhaps accounting for some of the EEG and other changes reported with this technique. "Abstracts of Papers Presented at the 15th Annual Meeting of The Society for Psychophysiological Research," <u>Psychophysiology</u>, Volume 13, No. 2 (March 1976): 168.

Cardiovascular - Pulse wave velocity

Gribbin, Brian, Steptoe, Andrew, and Peter Sleight. "Pulse Wave Velocity as a Measure of Blood Pressure Change," <u>Psychophysiology</u>, Volume 13, number 1, (January 1976): 86-90.

The use of arterial pulse wave velocity (PWV) as a continuous measure of blood pressure changes is outlined. Theoretical considerations indicate that changes in PWV reflect changes in blood pressure, and an experiment was carried out to assess this relationship. PWV along an arm artery was monitored in 26 subjects at a time when the arterial distending pressure of the limb was altered over a wide range by means of externally applied positive and negative pressures. The results show that changes in PWV reliably follow changes in blood pressure. This method can be considered suitable for studies requiring changes rather than absolute values of blood pressure. [Authors abstract.]

Cardiovascular - Plethysmograph

Varni, J. G. & Weber, F. (Walter Reed Army Institute of Research). <u>The separation of arterial and venous components of the peripheral vascular</u> <u>waveform using impedance plethysmography</u>. While using an impedance plethysmograph to study vascular changes in human subjects, we observed what appeared to be aberrant pulse waveforms. Each wavelet possessed three reliable peaks whose relative amplitudes varied from beat to beat.

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Investigating the role of electrode spacing, we found that the waveform could be manipulated by changing the inter-electrode distances. In particular, we found that the "aberrant waveform" was actually a superposition of two distinct components, which could be separated with an optimized tetrapolar electrode configuration.

The amplitude of the second component was seen to vary with the respiratory cycle while the amplitude of the first component remained fixed. Further studies involving controlled venous occlusion, breath-holding, and Val-Salva maneuver, showed that other operations designed to modify a retrograde venous pulse affected only the second component.

We have concluded from our results that the first component represents the arterial pulse wave while the second component represents the retrograde venous pulse wave. The ability to separate peripheral venous and arterial events should provide a valuable research tool for psychophysiologists. "Abstracts of Papers Presented at the 15th Annual Meeting of The Society for Psychophysiological Research," <u>Psychophysiology</u>, Volume 13, No. 2 (March 1976): 163.

Bloom, Larry J. and B. Kent Houston, and Thomas G. Burish. "An Evaluation of Finger Pulse Volume as a Psychophysiological Measure of Anxiety," <u>Psychophysiology</u>, Volume 13, No. 1 (January 1976): 40-42.

The present experiment explored the utility of finger pulse volume (FPV) as a measure of anxiety. Subjects were exposed to either a threatening or nonthreatening situation, and indices of physiological arousal (pulse rate [PR] and FPV) and self-report of anxiety (Affect Adjective Checklist [AACL]) were collected. Results indicated that FPV was responsive to changes in experimentally induced anxiety and significantly correlated with PR and AACL, although the strength of these relationships was not substantial. Relevance for psychophysiological theory and the clinical observation of anxiety is discussed. [Authors abstract.]

Tahmoush, A. J., Jennings, J. R., Camp, S., Lee, A. L. & Weber, F. (Walter Reed Army Institute of Research). <u>Photoplethysmography: A</u> <u>quantitative approach</u>. Photoplethysmography is a simple technique for the measurement of relative changes in peripheral circulation. The transformation of this technique to provide quantitative measures of "blood volume" and "blood volume pulse" requires: (1) a transducer which is linear and whose output is related solely to light intensity, (2) an application procedure which is reproducible and produces minimal distortion at the measurement site, (3) a calibration system, and (4) an optical model of the skin relating light intensity to blood content. Significant achievements have been made during the last year in areas 1, 2, and 3.

The LED-transistor photoplethysmograph has been shown to have a linear output in response to the range of light intensities generally obtained in photoplethysmography. The output is stable over time and relatively independent of temperature and prior light exposure. A light-weight finger holder has been designed which permits reproducible application of the plethysmograph with minimal pressure on the recording site. A mechanical calibration system has been constructed which permits the quantitative comparison of plethysmographs. The calibration is based on the inverse square relationship between light intensity and distance from a point source. The plethysmograph signals obtained with this system can be related directly to a known light intensity. This information in combination with a mathematical model of the skin can be used to relate the amount of light energy scattered by the irradiated area to the distribution and density of red cells in that area. "Abstracts of Papers Presented at the 15th Annual Meeting of The Society for Psychophysiological Research," Psychophysiology, Volume 13, No. 2 (March 1976): 163.

Orienting-Defensive Responses

Cornelius, R. R. & Berg, W. K. (University of Florida). <u>Orienting</u> and defensive responses in spider-fearful and non-spider-fearful subjects. Hare's research suggests that adult females who report an intense fear of spiders ("phobics") respond with heart rate acceleration to pictures of spiders, whereas non-phobics respond to spider photos with deceleration.

The present research sought to verify and extend these findings by attempting to determine, among other things, if the accelerative and decelerative responses differentially habituate, as would be expected if they represented defensive and orienting responses.

Twenty female undergraduates, half spider "phobics" and half nonphobics, received 10 presentations, each 10 sec long, of either a color slide of a spider or a landscape (neutral) scene, followed by a set of 10 whose content was opposite to that of the first. Initial content was counterbalanced across subjects. Instructions precluded the subjects from predicting the content of the initial set of slides but enabled them to predict the content of the second set. Trend analysis of variance of sec-by-sec heart rate revealed that, contrary to Hare's results, phobic subjects responded to the first slide in the initial set with significant acceleratory responses, regardless of whether they were spider or neutral. Non-phobics decelerated to these same slides, and both groups decelerated to the initial slide in the second set, also regardless of content. However, with repetition of the neutral slides, the phobic subjects rapidly shifted to deceleration whereas repeated spider slides elicited continued acceleration. "Abstracts of Papers Presented at the 15th Annual Meeting of The Society for Psychophysiological Research," Psychophysiology, Volume 13, No. 2 (March 1976): 170.

Electrodermal

Stephenson, David and David A. T. Siddle. "Effects of "Below-Zero" Habituation on the Electrodermal Orienting Response to a Test Stimulus," Psychophysiology, Volume 13, No. 1 (January 1976): 10-15. Two experiments were designed to investigate the effect of belowzero habituation training on skin conductance response (SCR) amplitude to a change in auditory stimulus frequency. In both experiments, subjects were trained with a 1000 Hz tone until zero responding and then received 5, 10, or 15 further training trials. In Experiment 1 (N=45), subjects then received 1 presentation of a test stimulus of 1400 Hz, while in Experiment 2 (N=45), the test stimulus was a tone of 670 Hz. On the basis of dual-process theory, it was hypothesized that response amplitude to the test stimulus would be inversely related to amount of below-zero training. However, the results of both experiments indicate that SCR amplitude was positively related to amount of below-zero training. These results suggest that in situations of extended habituation training, an expectancy or subjective probability of stimulus occurrence gradient is important in determining response amplitude to a test stimulus. [Authors abstract.]

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