Polygraph

JOURNAL OF THE AMERICAN POLYGRAPH ASSOCIATION

Volume 5 September 1976 Number 3

Contents

PUBLISHED QUARTERLY

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P.O. Box 74, Linthicum Heights, Maryland 21090

SOME PRINCIPLES OF QUESTION SELECTION AND SEQUENCING FOR RELEVANT-IRRELEVANT TESTING

By

Raymond J. Weir, Jr.

In a paper I wrote several years ago I made the point that a reaction becomes Deception Indicated (DI) only after the examination is so carefully structured that this is the only logical conclusion a reasonable man would reach under the circumstances. At the Delta College Workshop this Spring, a distinguished panel emphasized that the courts may be expected to scrutinize carefully the structure of the examination about which the polygraph expert wishes to testify. Research psychologists are increasingly beginning to be concerned about the structure of the pretest interview, the motivation of the examinee, and so on — matters which the practicing professional has long realized are essential to successful polygraph examinations.

One problem with Relevant-Irrelevant (RI) Testing is that the structure of the examination is not so immediately apparent to the non-initiate as is the structure of any of the several varieties of Control Question Techniques. It would be relatively simple for attorneys, judges, and interested laymen to ascertain from publications the recommended structure for the type of Control Question Examination which the examiner claims to have used, and to determine if the examiner took impermissible liberties with the technique.

Relatively little has been published in the way of the detailed structure, including question selection and sequencing, for RI tests. Some people, apparently including many who use other techniques as their primary method of testing, take the lack of rigid structure for RI examinations to mean no structure at all. Thus, they may administer examinations which violate the very precepts of psychology and physiology upon which polygraphy is based. Since almost every screening examination is of necessity an RI examination, there are few examiners nowadays who do not spend a respectable percentage of their time running RI tests. Applicant testing and similar screening examinations are often the bread and butter of some commercial laboratories. Even police examiners find themselves obliged to screen police applicants or to give tests in complex, multiple-issue crimes which do not lend themselves readily to other techniques.

I hope to set forth for you some of the principles of question selection and sequencing for RI polygraph tests, without, however, any claim that the principles I enunciate are authoritative to the exclusion of the techniques of other successful practitioners of RI testing. I do believe that my suggestions can be defended against hostile cross examination, since they are based solidly upon accepted psychophysiological foundations. I believe strongly that everything which is said and done from the moment the examinee walks into the laboratory should be utterly and implacably purposeful. Reason and purpose beget structure, and it is the structure which validates the DI or NDI conclusion.

Let us define an RI test for the purposes of this paper: "An RI examination consists of a varying series of relevant questions, interspersed with irrelevant questions and one or more controls." This would also be the definition of almost any other technique in popular usage if it were not for that word "varying." Most other systems in widespread use today recommend a relatively fixed question and chart sequence, using "chart" in the meaning of one segment of a polygraph examination. That word "varying," however implies the changing question sequence and the flexibility that is at once the advantage and the complicating factor of the RI examination. I have been told that RI testing may stretch the state of the art a little further than is desirable, and that incompetent examiners might obtain misleading results. The first may be true, but an incompetent examiner is apt to be incompetent, regardless of the technique he may be bungling.

The first general concept we must bear in mind in the construction of our RI examination is that the entire process is predicated upon destroying in advance any reasonable defense on the part of the Subject. He and apologists for him are going to offer every excuse in the world except his evasiveness as being the reason for his DI charts. It is up to us to design our test so that such rationalizations become absurd. The examiner is destroying in advance the defenses of the Subject, while at the same time laying the ground work for any necessary interrogation.

In this regard, it may be noted in passing that RI tests may be expected to require interrogation to a far greater degree than the specific-issue tests for which Control Question techniques are frequently used. In specifics DI charts mean the Subject is guilty of the matter under investigation, and it may be safe to render a DI conclusion based solely on the chart analysis without any corroborating admissions. In the screening situation, however, it is not enough to render a DI conclusion solely because the Subject is reacting, say, to a question concerning the use of narcotics. We need to know what narcotics, the recency of use, the extent of use, involvement in dealing, and a host of other data which can be obtained best through effective interrogation. Our test should prepare for this interrogation process.

Our test design must include taking such steps as are possible to eliminate error and to reduce the level of inconclusive examinations to a minimum. The psychological fraternity delights in sounding ominous warnings about the horrendous impact of "false positives" and "false negatives" upon the accuracy of polygraph examinations. Without for a moment conceding that these exist in real life in such numbers as to present any major problem, we must still structure our examination in such a way as to knock down these straw men to the satisfaction of the psychologists who created them.

Finally, we need to organize our examination in such a way as to provide reasonably effective counter-countermeasures against deliberate efforts to foul up the tests. The underground press and the criminal grapevine have long circulated tips on how to prevent a successful polygraph examination from being administered. Our examination should effectively combat and negate these polygraph countermeasures.

The first specific principle I wish to discuss is that of PATTERN AVOIDANCE. The examiner should avoid any repetitive pattern which may be anticipated by the Subject, and which could create reactions, mask reactions,

or be used by the Subject as an excuse for reactions. This is nowhere so important in RI testing as in the decision as to the relevant-irrelevant question mix. Although a 3:1 mix is recommended by many RI experts, this should not be interpreted as a rigid procedure which requires the insertion of an irrelevant question after each three relevant questions. Instead, the mix should be 3:1, 2:1, 4:2, or 4:1, ending up with a 3:1 average, but never permitting the Subject to be completely certain whether the next question would be relevant or irrelevant.

Pattern avoidance should be applied in other ways during the test. We all know that the Subject is apt to react to the first question on the test and again to the first relevant question on the test. For this reason we generally open each chart with two or three irrelevant questions, allowing the Subject's pattern to become stabilized. After the first chart, we should vary the number of these initial irrelevant questions from one to three, so that the Subject will not be able to be certain that he can relax on three null questions before one of the hot questions appears. Similarly, a different relevant question should be used as the first relevant question on each chart in order to assure that it is the subject matter of the question and not its position on the test which creates any reactions. Similar precautions should be taken to avoid always asking the same relevant questions next to each other during the test. This can create problems because anticipation of the question to follow can make the Subject react to the first question. It can also cause a reaction to the second question to be masked by a continuing reaction to the first question. Even where questions form a logical progression as in, "Do you know who ...?" and "Did you ...?", they should not always be asked next to each other or in the same sequence.

The second general principle which I wish to set forth has been implicit in much of the foregoing discussion. The principle is that of QUESTION REPETITION, and it states very simply that <u>every</u> relevant question in an RI examination should be asked a minimum of <u>three times</u> during any complete examination. This is the only satisfactory answer to critics who worry for fear a stray emotional thought might create a decision that the Subject was lying to the relevant question which was being asked at the moment. As a corollary it is also highly desirable whenever possible that each relevant question should be asked twice during the first chart. [See Figure I.] This permits the examiner to arrive at a preliminary decision, either that he has no apparent problem, or if he does, which question or questions appear to be the source of the problem. Where there are too many relevant questions to permit asking each twice during the first chart, the examiner should at least make an effort to repeat those which exhibit any apparent sensitivity while the chart is being run. It is especially effective to repeat the most sensitive of the relevant questions just in front of the overall truth question which is recommended at the close of each RI chart.

In connection with question repetition, it may be noted that Dr. David Lykken, a well-known psychophysiologist who could hardly be considered a friend of commercial polygraph examiners, has recently published data about what he calls a "guilty knowledge test." This test appears to be almost identical with a Known Solution Peak of Tension Test, and it is rather ironic that Lykken gives it the same name which Keeler used back in 1937. Talk about rediscovering the wheel! In any event, Lykken asserts that one of the strengths of his test is that it lends itself to probability analysis ofthe

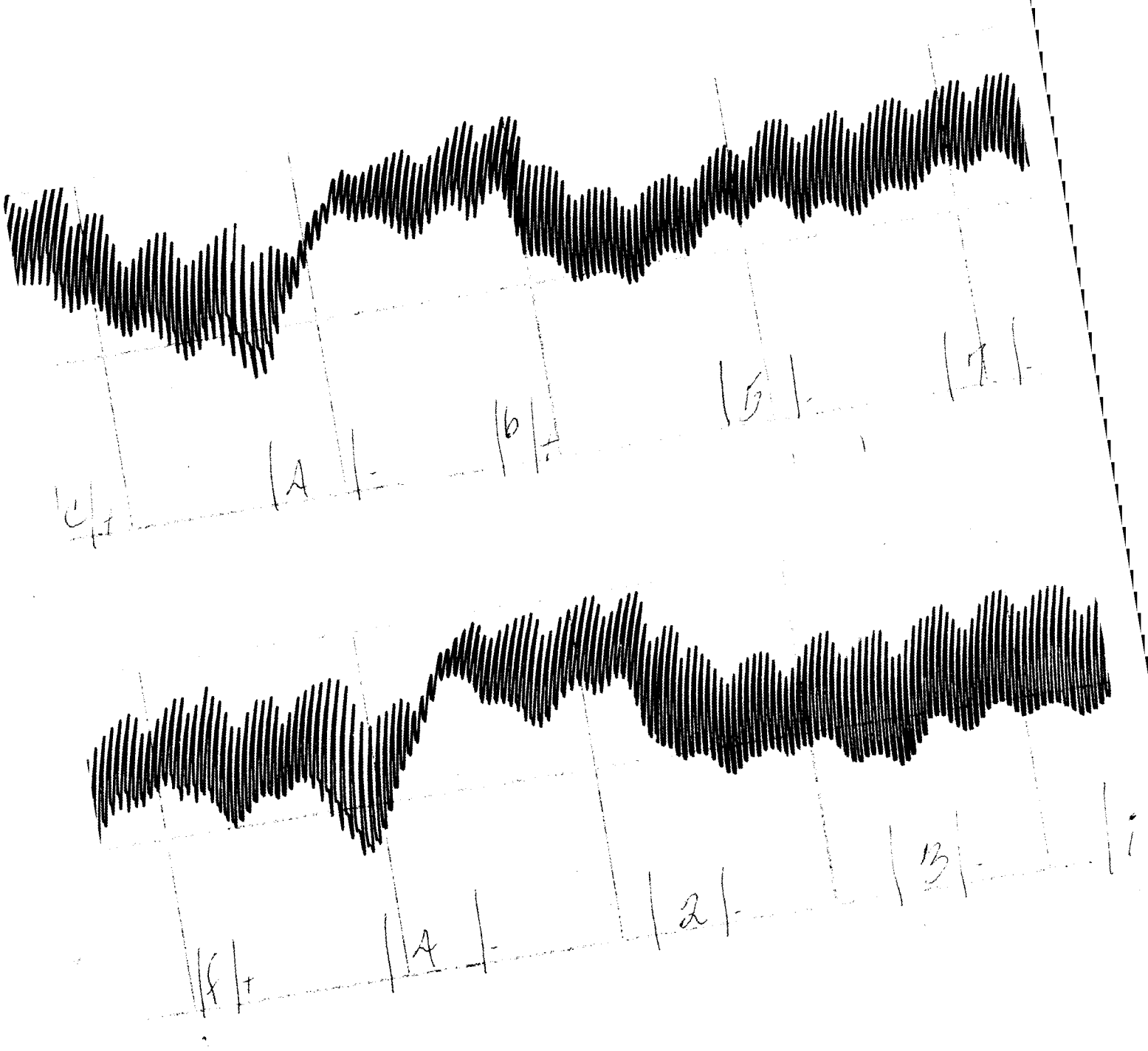

Figure I

TOP: Reaction to Q4, 1st time, 1st chart
BOTTOM: Reaction to Q4, 2nd time, 1st chart

charts, and it becomes fairly simple to demonstrate mathematically the odds against a reaction to the hot item in each series solely by chance. Although I doubt that Dr. Lykken would agree, it seems to me that the same considerations apply if the relevant questions in an examination have been asked frequently enough to permit the application of probability theory to the charts. While a minimum of three times is recommended for each relevant question in our examination, it is quite probably that any question which is giving trouble will be asked at least six times during the course of the examination. The odds against a consistent reaction solely by chance in such a case are not six to one, but factorial six to one or actually 720 to one. From this discussion it becomes obvious that proper question repetition will assure that any reaction, or lack of reaction, for that matter, is meaningful as far as the purpose of the test is concerned.

This requirement for question repetition may come as a shocker to people who are administering what they believe to be RI tests with little or no question repetition. It should also prompt a long-overdue decrease in the number of relevant issues which the examiner attempts to cover during a screening examination. I cannot honestly conceive of how an examiner can hope to cover adequately more than ten relevant issues during an examination. It would require seven minutes of chart time merely to ask the relevant questions three times with at least fifteen-second question intervals. This would not include the additional chart time for irrelevant questions, overall truth questions, and controls. There is no way for the examiner to cover the thirty or forty issues I have seen recommended on some applicant examinations without skimping badly on reasonable safeguards to assure an accurate test.

The examiner should review critically each question which is considered for use during the examination, not only from the point of view of whether it is an effective polygraph question, but also from the consideration as to whether it could be eliminated entirely without decreasing the effectiveness of the test. Each question asked during an applicant screening test should be so important that it would be an absolute bar to hire if it were true of the Subject. Each question should be so important on its face that the Subject will be utterly convinced that the result of being caught in a lie will be very unpleasant for him. After all, this is what makes the polygraph work.

The examiner, then, should exert every effort to cut the test down to size. Five truly relevant questions would be better than ten. More than ten should be attempted only by expert examiners with long experience with RI tests. Maybe some of the commercial clients with an inordinate desire for information about their applicants and employees might scream, but I wonder how they would feel if they knew they were reducing the accuracy of the process by overloading the test. Maybe we should add a surcharge of $50 per question for each question over ten on the examination. At any rate, the examiner cannot permit the client to dictate to him test procedures which could result in an inaccurate product. Our ethical standards demand that our first responsibility is to the person being tested.

The last principle of question selection and sequencing has to do with planning matters so that we obtain charts which can be analyzed, charts where reactions or the lack of reactions are meaningful as far as the purpose of the examination is concerned. It has to do with a word we coined called,

"CON-SPEC-NIFICANT". The word is a mnemonic device to assist young examiners to remember three critical aspects of analyzing reactions during relevant-irrelevant examinations:

The reaction must be CONSISTENT.

The reaction must be SPECIFIC.

The reaction must be SIGNIFICANT.

We establish consistency by repeating the question, by varying the order in which the questions are asked, and by changing the wording of the question. When the Subject reacts consistently to the question, no matter how it is phrased or in what order it is asked, we know the Subject has a problem. We require further that the reaction be specific, that it occur at or immediately following the stimulus. [Figures 2 and 3] We distrust reactions which occur ten or fifteen seconds later, unless we have established during pretest interview that the Subject is so dullwitted that it takes fifteen seconds for perception to take place.

Physiologically, the sympathetic branch of the autonomic nervous system is triggered in a matter of seconds after danger to the organism is perceived. The complete chain fires as one unit, and we should expect our chart reactions at about the same time, immediately after the stimulus. We recommend that the examiner place a stimulus mark at the beginning and at the end of each question so that the period where the verbal stimulus was being applied is clearly indicated on the chart. Perception will take place between or immediately following these marks, and we should expect a reaction which was properly specific to take place during this period. A reaction occurring outside of this time frame might be consistent but would not pass the test of being specific, particularly if other reactions during the examination showed up promptly with the stimulus.

The matter of significance is determined readily easily by anyone who can read charts. If a reaction occurs specifically with a stimulus; if it occurs each time the stimulus is applied; and if its intensity definitely exceeds the "background noise level" of the Subject's general reaction pattern, it is a significant reaction. Thus, even charts where the Subject is exhibiting high levels of GNT, extra systoles, or a vagus pattern can often be read. These things become the norm, and the examiner merely analyzes the charts for significant deviations from this norm.

On the two tables which follow I have attempted to set forth a sample question sequence for two charts of an RI examination. The sequence is intended only as a sample and not as a rigid format with which all RI tests should comply. The recommended question interval is a flat fifteen seconds for all questions, so that the Subject cannot draw any inferences from the interval between the questions. The test assumes that there are six relevant issues, identified by Arabic numerals 1 through 6. Irrelevant questions are identified by small letters. Peaks are identified by the number of the basic question, followed by a capital letter, as "5A, 5B, 5C, etc." Overall Truth questions are identified by a capital T followed by a number, as "T1, T2, etc." Questions which have been modified carry the number of the basicquestion, followed by capital letters indicating the nature of the

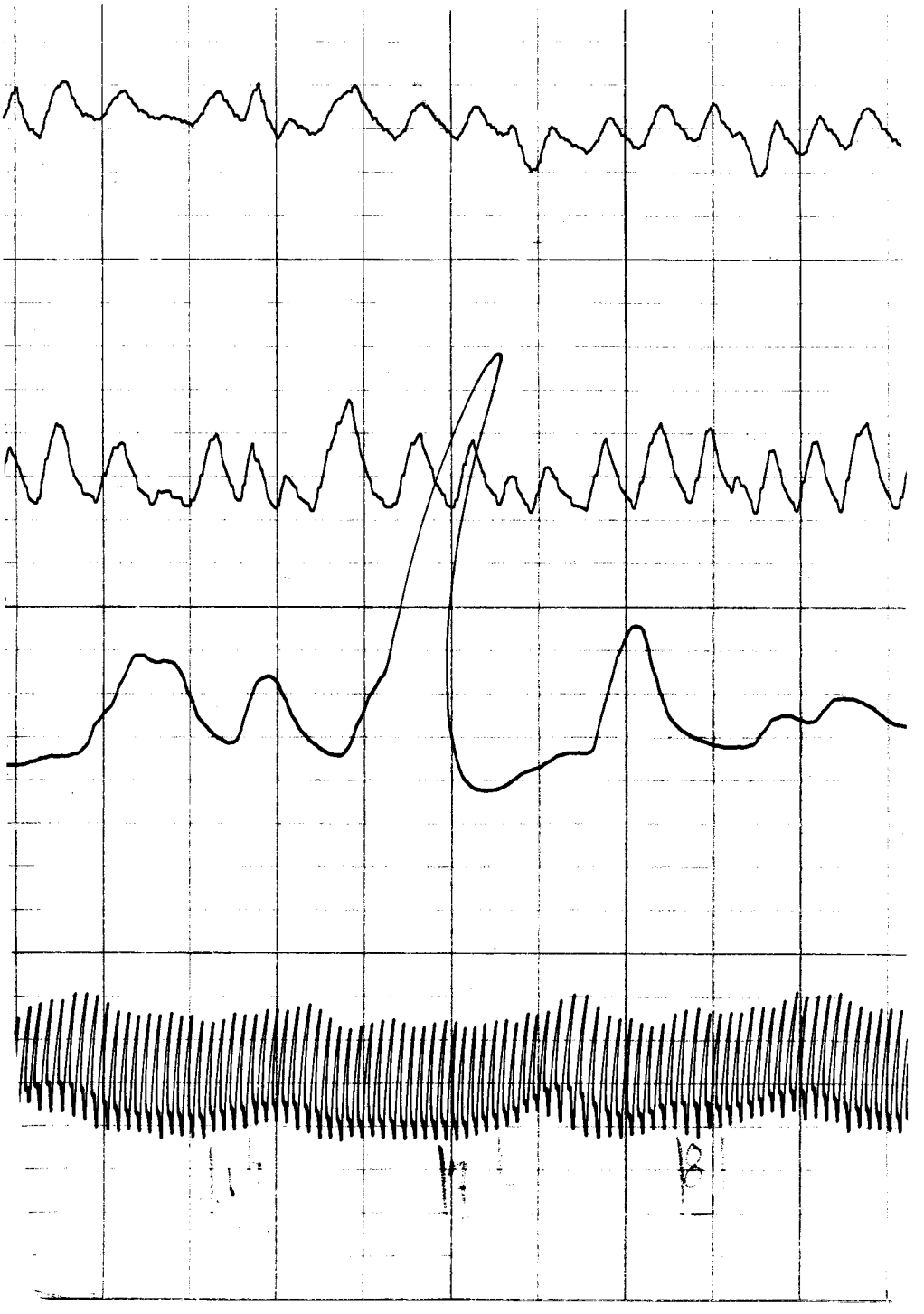

Figure 2

Reaction to Q7, 1st time, 1st chart
(GSR pen 6 seconds longer than cardio and pneumo pens)

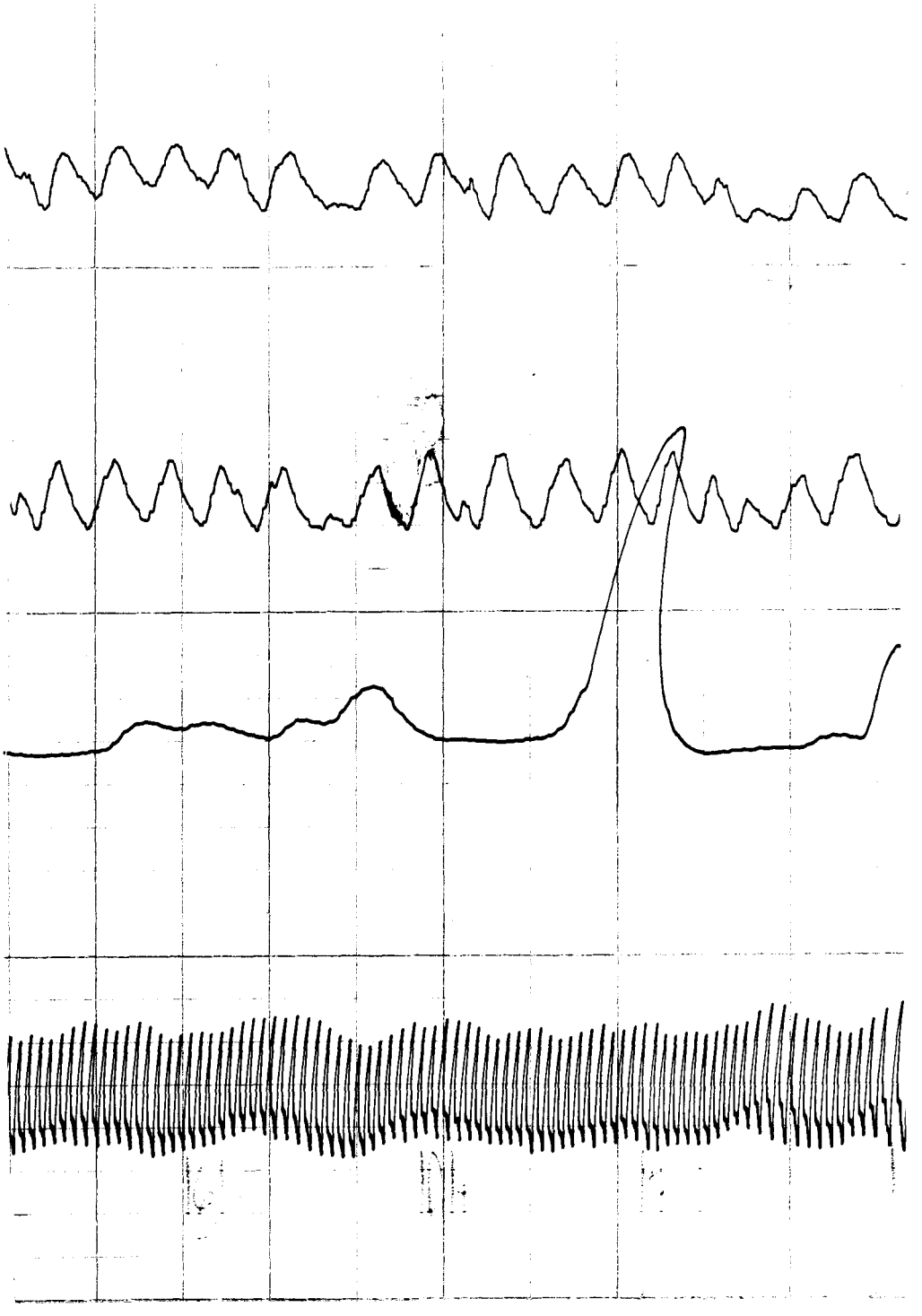

Figure 3

Reaction to Q7, 2nd time, 1st chart

modification, as "FT" (full truth) "TBK" (to the best of your knowledge), etc.

Table 1

X	(Announcement of Test Beginning).
a b c	(Three irrelevants to open First Chart).
1	
2	
3	
d	(Only one norm needed now.)
4	(We break the pattern of three relevants).
5**	(Possible reaction noted).
a	(First repeated question should be a norm).
6	(We vary the sequence in this group).
3	(First repeated relevant; was OK the first time).
1	
e	(We vary the pattern with two straight norms).
f	
2	(Now we get the other relevants in twice).
4	
6	
5**	(We put the problem question in front of T1).
T1**	(Tends to show reactions to 5 are not accidental).
XX	(Announcement of test ending).

Table 2

X	
a & c	(We combine two norms: first reworded question).
4	
1 TBK	(First reworded relevant; was OK before).
6	
g	
5 TBK*	(Still giving problems).
5A	(We go immediately into a searching peak).
5B	
5C	
5D	
Again	(Subject told Q's will be repeated in same order).
5A	
5B	
5C	
5D	
b	
2	
3	
5 W/H*	(We still have troubles).
T2	
T3	
XX	

In the circumstances of this sample test, the examiner is now ready to interrogate concerning the source of the difficulty with question 5. The questions included in the searching peak in Chart #2 would be discussed with the Subject during pretest interview, along with similar breakdowns of the other relevant questions, and the Subject would have been advised that they might be asked directly during the examination. Assuming that the examiner is successful in obtaining admissions, Chart #3 would be used to verify the completeness of the confession. It would be impossible to list a question sequence for Chart #3, since this would depend entirely upon the circumstances. We need not include the relevant questions to which no reaction took place the first three times, except for variety. We would continue to apply the principles of pattern avoidance, repetition, and conspecnificance, in order to get the best possible charts. [Figures 4 through 7]

You will note that no control questions were asked during the first two charts, and none would be used as long as the Subject reacted to any of the relevant questions. If the Subject had shown no reactions to the relevant questions in the sample test, we would have asked one or more controls after the overall truth question on Chart #2. If the Subject reacted to the control, we would give an NDI conclusion. When the Subject stops reacting to the relevant questions, we close that chart out with a control. If the Subject reacts to the control, we render an NDI conclusion. If the specific reactions persist through five charts (the recommended maximum), we render a DI conclusion. If no control can be obtained on the final chart, or if the charts cannot be read, we call the case inconclusive and set the case up for a retest.

The repetition and the flexibility of a well-designed RI test provides strong defenses against countermeasures. One group of these countermeasures is built up around drugs or mental exercises to achieve some sort of Yoga state. The necessity for listening closely as the questions are repeated and paraphrased will tend to break up the concentration necessary to maintain such a mental state. Another popular countermeasure advocates surreptitious pressure or pain stimuli on controls or irrelevant questions in order to offset any reactions which might be taking place on the relevant questions. Here the repetition and the variable question order would make this very difficult to accomplish. The examinee would not know the question order and would find it difficult to prepare in advance for the physical activities to create his phony reactions. If these reactions took place too long after the stimulus, they would not pass the test of being specific, and the examiner would be alerted that the test was being sabotaged.

The foregoing discussion is a highly-condensed treatment of a very complex subject. I hope to have presented the following principles for your consideration:

1. RI polygraph examinations must be carefully and thoughtfully organized for maximum effectiveness.

2. The examiner should avoid repetitive patterns which may be anticipated by the Subject.

3. The examiner should vary the wording of questions and repeat each relevant questions at least three times during the examination.

4. The examiner should maintain control of the scope of his examination, and should use a maximum of ten relevant questions.

5. Reactions observed during RI testing should be consistent, specific, and consistent prior to any DI conclusion.

6. Good RI examinations frequently require interrogation, but are effective against commonly-attempted countermeasures.

Figure 4

Reaction to Q7a, 1st chart

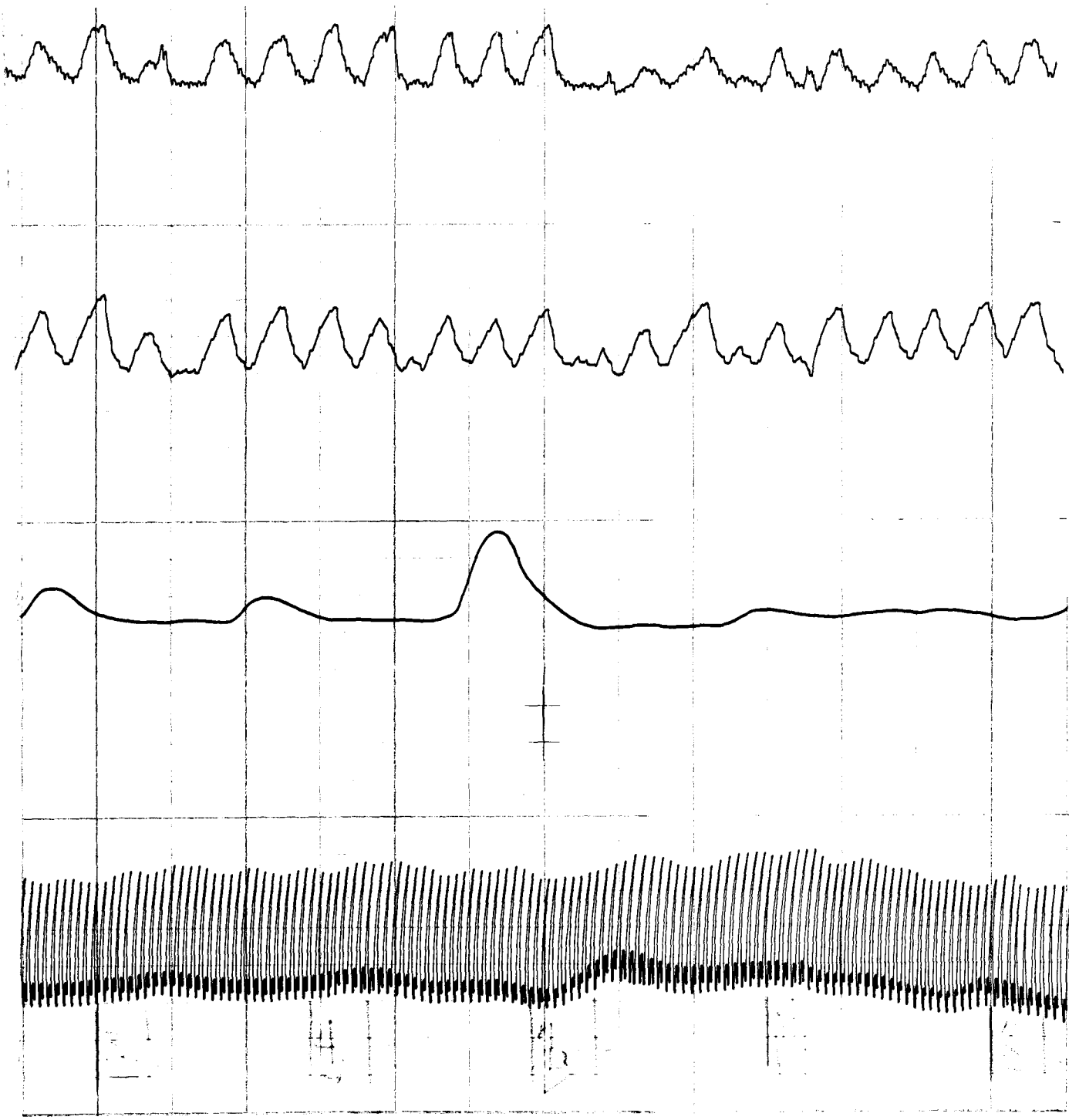

Figure 5

Reaction to Q7a, 2nd chart

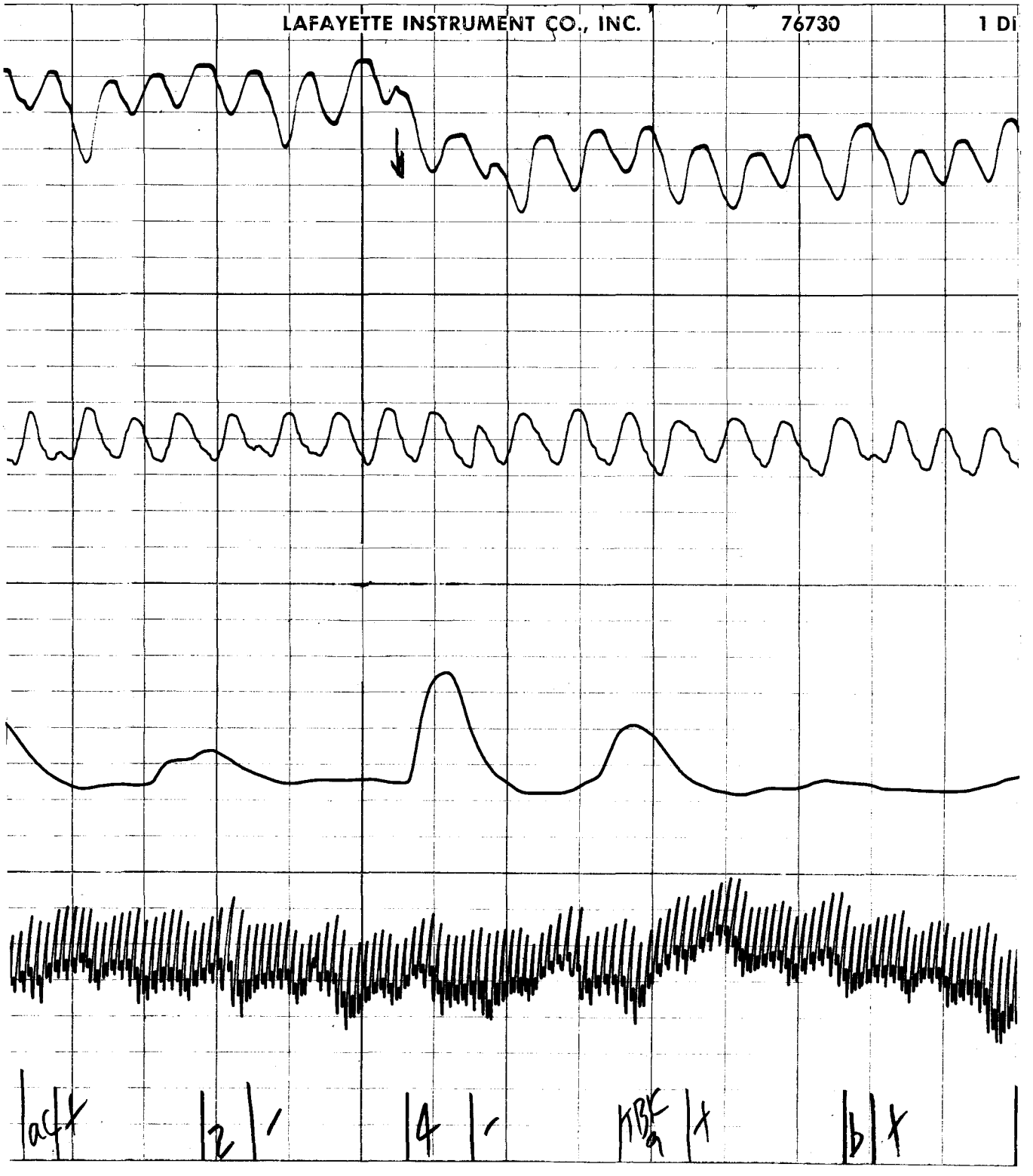

Figure 6

Reaction to Q TBK9, 1st time 2nd chart

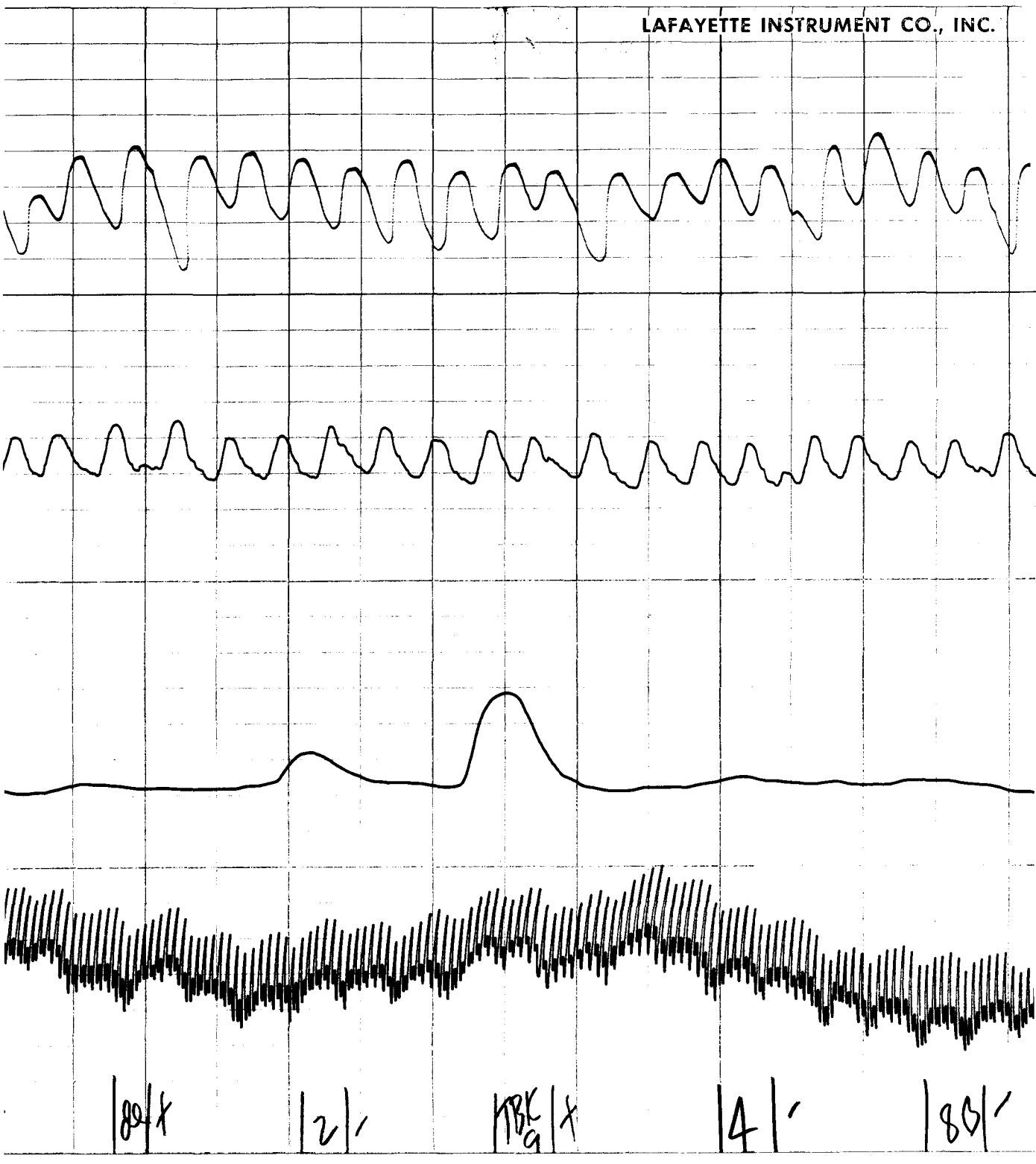

Figure 7

Reaction to Q TBK9, 2nd time, 2nd chart

THE POLICE OPERATION OF POLYGRAPH DETECTION AND ITS ASSESSMENT FROM A JUDICIAL STANDPOINT IN JAPAN

By

Minoru Takahashi

Introduction

Twenty years have passed since the polygraph examination techniques have become fully operational in criminal investigations conducted by the police of Japan.

During this period, qualified polygraph examiners who have experience in the theory and techniques of polygraph examination have been assigned to all Prefectural Police Headquarters throughout the country contributing to the solution of many difficult criminal cases. In addition, it is interesting to note that with the development of polygraph equipment and its detection techniques, the examiners' report containing the progress and final results of polygraph of the examinations conducted by qualified examiners have been judicially rated and accorded with a "probative value" from a standpoint of our Code of Criminal Procedure, thus making a great contribution to the support of public trials.

In this way, it is not too much to say that the method of how to detect the authenticity of a suspect's statement made through the judgment of his physiological responses has found its unique and solid position as an aspect of criminal investigation, conducted by the police of Japan.

The origin of the truth or false detection techniques of an examinee's statement in Japanese police service goes back to 1951, with the research work on the "psycho-galvanometer" (an apparatus recording examinee's electrical skin reflex) was first conducted by the National Research Institute of Police Science in Tokyo, Japan.

In 1953, the polygraph techniques which then had been in full operation in Far East Criminal Laboratory of the United States of America was introduced into Japan for the first time from the U.S. Far East Criminal Laboratory in Japan, and since 1956, polygraph detection operations have been in full swing in all Prefectural police forces across the country.

The author is Police Superintendent, Criminal Identification Division, CIB, National Police Agency, Tokyo, Japan. This paper was presented at the American Polygraph Association Annual Seminar in New Orleans, August 2, 1976.

Present Status of the Japanese Police Polygraph Examination Operations

I would like to introduce the polygraph operation situation to you by quoting statistics recorded in 1975, and several examples of the latest examinations conducted, so as to illustrate the highlights of this particular type of examination conducted at all the Prefectural Police Headquarters in this country.

1. The total number of examinees who underwent examinations in 1975, was about 4,700 persons. When this total number was viewed from the composite ratio of the results of the examinations conducted, those who were found to be "positive" were 41.8 per cent, those "negative" were 53.2 per cent, and the other 5 percent were those who had found to be very hard for making any judgment (inconclusive), because the examinees' health conditions were not good enough, or because of other various reasons.

Among the above total examinees there were several persons who were examined by the police as a result of the requests from other special judicial police agencies, such as the Postal Inspection Bureau of the Ministry of Postal Services, and the Japan Self-Defense Forces in Japan.

2. About 100 polygraph examination specialists have been assigned to all the Identification Sections and the Crime Laboratories of all Prefectural Police Headquarters across Japan, all of whom have been selected either from those university graduates majoring in psychology, or those from other technical fields of related universities.

Furthermore, all those specialists must complete their special polygraph examination trainings including physiology and psychology to be conducted by the National Research Institute of Police Science (NIPS) in Tokyo.[1]

3. When we review the category of those crimes committed by those examinees who had undergone the polygraph examinations, it is noted that 60 per cent of all examinees were involved in larceny (or theft), and their main "modus operandi" are represented by larceny or theft which frequently occurred among group-living conditions, such as "Doyoto" (in Japanese a theft committed by persons sharing the same house), or "Shokubato" (in Japanese a theft committee in the respective "place of employment".)

In addition, there are several cases of polygraph examinations conducted in cases of homicide, arson and robbery.

4. Examples of criminal cases in which polygraph examinations were conducted by police in Japan:

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[1]The training takes 2 months.

Case A:

At about 13:00 hours of October 31, 1975, a construction contractor who went to visit the victim's house for the payment of his work noticed a lot of traces of blood at the front-door of the victim's house, and lost no time in reporting his awful findings to the nearby police.

The police confirmed the fact that the house had been ransacked, and that the victim had been found lying murdered in his bathtub full of water.

The Tokyo Metropolitan Police Department (TMPD) investigating this case analyzed a memo believed to have been written by the unidentified murderer, the blood type of the 'saliva' taken from a glass cup found in the victim's house, other investigative clues they had taken from the crime scene, and other relevant information they had successfully uncovered.

Upon completion, the police concluded that the killer had to be a 34-year-old male who was to visit the house for sale of an automobile, and the suspect asked for his voluntary appearance before the police.

On May 24, 1976, prior to the start of the police interrogation, the suspect was put to a polygraph examination, the result of which was determined to be positive by the polygraph examiner.

The examinee was later arrested by police and, upon being questioned he confessed to committing the murder of the victim to police investigators, thus solving the murder case.

Case B:

On a day in late February of 1968, a plastic processing contractor was reported missing after his departure from his house, and there was a strong suspicion about "foul play" in a certain type of a crime. Therefore, the Osaka Prefectural Police continued its investigation for 8 consecutive years about the unknown incident, collecting and analyzing all possible information and clues they could obtain about the missing victim.

They decided a 57-year-old person who had been one of the joint managers to this victim to be the best possible suspect.

He was therefore asked to make a voluntary appearance before the police. On February 20, 1976, he underwent a polygraph examination prior to the start of his questioning by the police.

The results were found 'positive' by the examiner. The suspect, however, demanded a re-examination of his test by saying that if the same results could be obtained, he would tell the whole truth about this incident.

The re-examination produced a clear record of his reaction to the examination, which was the same as that obtained in the first polygraph examination.

It is of special interest to note that questions included places where the corpse might have been buried. Because of the clear reactions of the

examinee, the corpse was unearthed by the police.

He was therefore arrested by the police on the very anniversary day of the death of the victim. The arrestee was ready to confess his killing, and the homicide case was thus cleared up by the police.

The Polygraph Examination Standards Adopted by the Police of Japan

In May of 1971, the standard for polygraph examinations was first established nationally in Japan, which was designed to formalize use on a nationwide basis so as to strengthen the polygraph examination structure throughout the country. The polygraph examinations so far conducted have made a great contribution toward the investigation of various crimes, and maintaining public trials of those persons committing all kinds of crimes.

Take just one example. In 1964, the Supreme Court of Japan acknowledged a document prepared for a polygraph examination conducted to have the "probative force of evidence" in accordance with Article 328 of our Code of Criminal Procedure quoted below: Law Nr. 131 of 1948 with several amendments later):

> Article 328: "Any document or oral statement, which shall not be used as evidence in accordance with the provision of Article 321 to 324, may be used as a method for the purpose of determining the credibility of the statement made on the date either for the preparation for public trial or for the public trial by the accused, witness or other persons."

Furthermore, in 1965, at a public trial, the Maebashi District Court ordered a polygraph examiner assigned to the police to conduct a polygraph examination concerning the credibility of the statement made by the accused, and used the results of this particular examination as an evidence of "finding of guilty of the accused."

Contrary to the effectiveness brought about by the results of a polygraph examination, this particular test has its limitation which have to be originated from its innate function which is greatly depended upon: physical condition of an examinee, constitution of questions to be asked, and the influence of a 'stimulus' other than the questions, as well as the professional skill level of the examiner.

Under the influence of these factors, it was first considered by the police that the examiner's judgement on the results of his examination would be further dependent on the personal proficiency differences between one examiner to another, considering the importance of each examiner's professional experience in this field.

Therefore, the Criminal Investigation Bureau of the National Police Agency (NPA) recognized the importance of standardizing the polygraph examination procedure on a national basis so that inadequate polygraph examinations which may have the possibility of raising a disputable point about the authenticity of this particular type of examination may be eliminated, the

social appropriateness of this examination may also be insured, and the results of this examination may be elevated. In May of 1971, the Bureau formalized the "Polygraph Examination Guideline" for all the police across the country, the main gist of which is as follows:

(1) The definition of technical terms was defined in connection with the polygraph examination, and also clarified the concept of polygraph examination as 'part of the function' of conducting overall criminal investigations in Japan.

(2) Several regulations and restrictions were also provided for in this guideline concerning the qualifications of a polygraph examiner for the police:

The examiners are those who have learned the necessary knowledge and skill in properly conducting a polygraph examination, such as psychology, physiology, and others. The technical aspect of police examiner's training is conducted by the National Research Institute of Police Science in Tokyo, Japan.

(3) Matters relative to the polygraph examinees.

The examinees who have to undergo police polygraph examinations are restricted to those who have consented to this particular examination and who stick to their denying of their commission of certain crimes, and whose statements' validity and the degree of their guilt conscience should necessarily be judged together with those who have had a high necessity for further polygraph examinations.

Furthermore, a signed document of one's consent to a polygraph examination is to be collected from each of those who have consented to receive this type of examination.

(4) A prohibitive control action over a polygraph examination.

One of the elements which brings difficulty in the interpretation of the record of a polygraph examination is the examinee's "physical abnormality". It is therefore stipulated in this guideline that no polygraph examination shall be conducted upon any examinee who is:

* A person who is suffering from "hypertension", or "hypotension", or catching a high fever, excluding those who are diagnosed by a doctor to be allowed to undergo a polygraph examination.

* A person who is mentally deranged, or a feeble-minded.

* A person who is emotionally and behaviorally unstabilized due to a "psychoneurosis."

* A person who is in a "sedative", or "agitated" condition under the influence of chemical drugs and other means.

* A person who has had insufficient sleep, or who is in a state of "extreme fatigue."

* A person who is under the influence of liquor and drunk.

In addition, for a woman who is pregnant, conducting a polygraph examination is also prohibited.

(5) Method of how to conduct a polygraph examination.

There are two methods which are in full operation at present: "Peak of tension questioning method," and "Comparative questioning" method.

(6) Polygraph Examination apparatus and devices.

All the polygraph apparatus and devices to be used by the police for all polygraph examination purposes must meet the standards established by the National Police Agency (NPA). All polygraph apparatus are ordered in a block by the NPA from the manufacturers in Japan. After delivery of the instruments only those which pass the NPA's inspection are distributed to police forces.

(7) The period and place of a polygraph examination.

The polygraph examination should be conducted in an early stage of crime investigation; in such a place where the credibility of the polygraph examination can be insured.

(8) Record of a polygraph examination conducted.

It is extremely important in conducting a polygraph examination to record all conditions under which a polygraph examination was conducted, and the circumstances surrounding the examinations as definitely as possible so that the objectivity of a polygraph examination can be insured.

(1) A 'polygraph examination log' is the written record of why a polygraph examination was requested and the circumstances under which the examinee's consent which was given for the polygraph examination.

(2) A 'record of a polygraph examination' is to be written by an examiner and contains various kinds of marks or symbols relating to a polygraph examination procedure, so that at a later date reexamination by another expert can be arranged easily. In addition, at the end of this record, an examinee's "own signature", and his own "personal seal" should be duly attached.

(3) A 'polygraph examination report' should contain those rules which had been obtained by an examiner's knowledge and experience, and the examiner's judgement, by applying these rules which are written as compactly as possible, as to the progress and results of his polygraph examination.

(9) Others.

In addition to the above control regulations, the examination guideline contains other regulations concerning how to request a polygraph examiner's special examination, preparing a questionnaire, and other matters.

As stated above, several highlights on the polygraph examination guideline were mentioned, however, the research and development of the method of how to conduct a polygraph examination and its apparatus are still continuing by the National Research Institute of police science, outside these control provisions, so as to carry out fluid activities in order to cope with the 'rigitity' of this control regulation placed over polygraph examination, and with an occurrence of a new situation facing both the polygraph examiner, and the police.

A Judicial Recognition

Scientific investigative techniques have developed new methods of conducting crime investigations over which the Code of Criminal Procedures has not made any projection at all. A polygraph examination is one of these new innovations. Because of the non-existence of statutory laws governing this particular type of examination, there are many kinds of theories, or doctrines and criticism relating to how to cope with this technical examination adequately.

Under these circumstances, many actual "public action cases" have been contested in courts for the purpose of seeking the courts' judgement upon the judicial position of this examination, in particular, whether or not this particular examination is a kind of "interrogation" by a 'judicial police officer' as stipulated by our Code of Criminal Procedure, or whether or not it is an "expert's testimony, or evidence".

(1) A common opinion on the polygraph examination in Japan.

It has been interpreted in Japan that a polygraph examination requires high level techniques based on technical training and an individual's personal experience, as well as required technical knowledge about psychology, and physiology.

In this context, supposing that the fundamentals and related techniques of a polygraph examination were "scientifically acknowledged", (Please refer to Wigmore Evidence, Student's Textbook), it could then be interpreted that the process of a polygraph examination would be considered as a kind of "Kantei" (in Japanese, "expert evidence") based on the facts which had been experienced by the examiner (as stipulated by Article 165 and Article 223 of the Code of our Criminal Procedure, quoted below.)

(Article 165)

"A court may order persons of learning or experience to give 'expert evidence.'

(Article 223)

"A public prosecutor, public prosecutor's assistant officer and judicial police officer may ask any person other than the suspect to appear in their offices, question him or request him to formulate an opinion as an expert or act as an interpreter or translator, if it is necessary for pursuing the criminal investigation.

Proviso of Paragraph 1 of Article 198 and Paragraph 3 to 5 of the same Article shall apply mutatis mutandis to the prescribed by the preceding paragraph." [Quoted from the Code of the Criminal Procedure in Japan.]

(By Shigeru Yamazaki: Jitsurei Hogaku Zenshu: (Actual Example Jurisprudence Series) Code of Criminal Procedure published by Seirin Shoin Shinsha/Japan.)

To let an examinee to answer prepared questions which has a relevancy to the charge, and to record the examinee's physiological changes or an examination paper by a special scientific apparatus known as "Polygraph," and after observing and assessing the examination record thus produced, to make a report of the examiner's opinion on the "authenticity" of the examinee's response, — these resulting products are considered to be a kind of an "expert evidence" based on the facts of the examiner's own experience.

Here is another judicial precedent.

On June 30, 1966, the Tokyo High Court made the following decision in a murder trial against the defendant's defense lawyer's complaint, the purport of which is as follows:

"Because an examiner poses a question to an examinee, the examination itself is the so-called an 'investigation' ("Torishirabe" in Japanese), and the examination report originated from this process is the document which indicates the recorded statement made by the examinee. Viewed in the above context, this examination report 'cannot' be acknowledged as an expert evidence which is stipulated under Paragraph 4 of Article 321 of the Code of the Criminal Procedure."

The Tokyo High Court, however, rendered the ruling that "a polygraph examination report is a document prepared by the examiner who had conducted the examination describing all the progress and results of his polygraph examination, and so it is evident that this particular report is not the document with a recorded statement made by the accused. Therefore in deciding whether or not the examination report can be admissible as evidence, it will be "utterly illogical" to question the accused who was made an examinee in this polygraph examination concerning the circumstances under which he had gone through in order to ascertain the 'voluntariness' of the statement he had made."

Against the defense lawyer's complaint contending that a polygraph examination is considered to be an act violating the 'Constitution of Japan,' because the examination itself is none other than the act which deprives the examinee of his right to keep silent, the Tokyo High Court handed the judgement in the above murder case that it was not considered necessary for the examinee to answer questions which were posed by the examiner, and that even in cases when the examinee answered the question posed to him, his answers would not be used against him as his 'testimonial evidence'. The results of his psychological examination would be used merely as a "non-testimonial evidence" against him.

Therefore it seems that the Court judges that the polygraph examination itself will not infringe upon the examinee's right to keep silent.

However, viewed from the standpoint of the function of a polygraph examination, several lower courts have had some doubts about making a judgement on the "accuracy" of the polygraph examination."

Concerning this matter, on July 20, 1960, the Tokyo District Court ruled in a larceny and arson case that it was extremely necessary to observe various conditions under which the polygraph examination was conducted, and that, after that, it was considered to be next to impossible to make a judgement on the accuracy of the examination report.

Consequently, results of a polygraph examination that cannot guarantee fully the accuracy of the results of a polygraph examination 'cannot' be accepted as evidence concerning the credibility of the statement made by the defendant in this case."

In handing down the above ruling, the Tokyo District Court cited the following requirements as the conditions necessary for insuring the accuracy of the defendant's statement he had made in a polygraph examination:

(1) The examinee's consciousness must be clear, and both of his mental and physical conditions should be sound and healthy.

(2) Preparation of a questionnaire document and the method of questionning are both considered to be reasonable.

(3) The examiner should be a person who has a basic knowledge and a specialized training in this particular field.

(4) The examination is to be made in such a place where there are no other stimuli and influence than the questioning stimuli itself.

In addition to the above instance, there are several cases in which the evidential power of the results of a polygraph examination had been judged to be unacceptable by our courts because of inappropriateness of procedure or conditions of a polygraph examination.

Generally speaking, however, at the present stage of development of a scientific investigation, as for 'the acceptance as evidence of the document containing the examiner's judgement on the results of the polygraph examination after administering it to the suspected examinee', the results of the examination have been accepted as evidence by the courts in Japan through the efforts in (1) conducting the test only by a specialized staff after the consent of the examinee, and also (2) by meeting various requirements necessary for insuring the accuracy of this particular type of examination.

One Actual Example Concerning the Judgement Made by the Supreme Court of Japan

As the results of this defendant's (a housewife) tangled amorous relationship with another male, the defendant set fire to the house of her "fornicator" which resulted in total destruction. During the fire, the defendant took advantage of this occasion to violently inflict injuries on this fornicator's wife who tried to bring out part of their property from her burning house. Therefore the defendant was charged with arson and a crime of inflicting bodily injuries to another person.

The defendant denied all of the charges, during the initial stage of her questionning which was made without giving physical restraints on this defendant. On the third occasion of her interrogation, under the request of the police, she consented to the police request of a polygraph examination.

She confessed all the facts of her acts in this incident to the police interrogator after she was told that the results of her test had indicated a strong suspicion on her possible acts in this incident. In the First instance, however, the police interrogators and other persons concerned were summoned to the court so as to clarify the interrogation situation. The court adopted the investigative report of her confession as evidence after admitting that the report had been made under circumstances which could be particularly confided in, and found her to be guilty in this incident.

Her defense lawyers, however, appealed to a higher court by contending that (1) "The investigative report of her confession accepted by the court as evidence is the "recorded transcript" of her total confession by a police interrogator as the results of a "compulsion" pressed upon her that "now that the results of her polygraph examination had turned out to be 'conclusive to her guilt,' the only way out she had to do was to confess everything."

"Consequently, her coerced confession report should, and 'could not' be accepted as evidence."

And furthermore, in (2) the original judgement, the lower court reviewed her polygraph examination report in accordance with Article 328 of the Code of the Criminal Procedure. However, at the present stage, the scientific accuracy of a polygraph examination is <u>not</u> generally acknowledged in Japan.

"Therefore, we had to entertain a doubt on the 'evidential power' of the results of her polygraph examination."

<u>Summary of the judgement handed down in the appeal</u>

Concerning Item (1) of the statement of a reasons for the "Koso appeal": The notification given to the suspect by a police interrogator that the results of her polygraph examination indicated a strong suspicion, that is to say, 'the results had been so conclusive is, needless to say, a matter to be avoided by an interrogator, and there is no denial of this act which tends to give a kind of psychological restraint upon the suspect."

Even though she was notified that her test indicated a conclusive result, the act in question <u>does not</u> necessarily have to be interpreted as the act of pressing her for her total confession.

"In this case, she had not been under physical restraint or detention. Therefore, when a judicial police officer informed her of the "conclusive" results of her polygraph examination, his act itself seemed to have been restricted to the area of his personal 'advice' to her, namely if she still had 'guilty conscience' in this incident, and namely to the framework of

giving her the chance of 'meeting the fate with resignation.' Also it is quite evident that the interrogator in this case seems not to have told the suspect that, for instance, 'now that the polygraph examination had turned up a conclusive result, she would not be able to find her way out."

"Therefore, it cannot be said that on the strength of the results of the polygraph examination, the interrogator had compelled her to confess all of her acts."

"As the consequence, the court 'cannot' acknowledge that the said investigative report in question had been prepared under the 'coersion' of the judicial police interrogator."

Concerning Item (2) of the statement of reasons for the 'Koso appeal'

"From the record of the original lower court trial of this case, it is evident that in the original instance, the court duly reviewed the investigative report on the results of this suspect's polygraph examination in accordance with Article 328 of the Code of the Criminal Procedure. However, it has been acknowledged that the polygraph examinations in conjunction with the progress of the polygraph apparatus so far conducted in this country and its technical method has shown a considerable degree of "probability" of operation, on the judgement of whether or not the examinee has had a guilty conscience.

So much so, the results of polygraph examination in question should be interpreted to have had the 'evidential power' at least as the so-called "counter evidence" ('Hansho' in Japanese) which is stipulated by Article 328 of the 'Code of the Criminal Procedure'. Therefore, under the said Article, presenting the polygraph examination report to the court 'cannot' be considered to be unreasonable."

On September 26, 1962, however, the Tokyo High Court turned the suit by this defendant out of court.

Summary of judgement handed down at the trial of the Court of Review

"When the progress of circumstances under which the first confession of the defendant was made in the course of the investigation conducted into this case is reviewed from the official record, it is evident that with the consent on the part of the defendant who had disavowed her own action, the polygraph examination was put on her by a specialized staff engaged in the field of criminal identification.

In the course of subsequent interrogation of this defendant, the police interrogator informed her of the results of her examination, and advised her to tell the whole truth. After silence for a while, the defendant asked the interrogator to keep what she had to say secret to all persons concerned. After that, she confessed the whole of her acts she had made in this incident to the police interrogator.

During which time, there were no actual facts of this interrogator's 'coersion' allegedly given to her in order to compel her to confess the

whole thing, nor were there any circumstances under which the voluntariness of her total confession might be suspected."

On June 1, 1964, the Third Petty Bench of the Supreme Court therefore decided to turn down the above defendant's appeal lodged with the Supreme Court.

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THE POLYGRAPH AND RESEARCH IN ISRAEL

By

H. Victor Cohen

I think I need not dwell at length on the many close ties existing between the great super-power, the United States of America, now celebrating the 200th anniversary of its independence, and the little state of Israel, which although only 29 years old, has an ancient past in human history. I would like to take the opportunity of conveying my greetings to the largest democracy in the world on the occasion of its national holiday, from a representative of a small democracy, the State of Israel.

It is true that in the past as well as the present, the United States has influenced many areas in Israel, and almost everything, ranging from the best to the worst, comes to us from the U.S., albeit after a delay of a few years. One of the things that came to Israel from the U.S. was the polygraph and although it had a very modest start at first, over the years it has attained a recognized status and today is at the peak of its upward swing.

Our first acquaintance with the polygraph was during the late fifties when we were searching for technological means to advance our interrogations and came across the book Lie Detection by Inbau and Reid. An Israeli police officer and I took a six month course in Mr. Reid's office in Chicago in 1959, during which we learned polygraph theory and observed at first hand the efficacy of its use. And since our return to Israel, fully convinced of the effectiveness of this tool, we worked hard to assure the acceptance of the polygraph as an important interrogation aid in Israel. Since the use of a technological means for detecting the truth was something of an innovation, it is quite natural that there were many who expressed doubts about the effectiveness of the machine.

I will try to explain the basic thinking that impelled us to push the idea of polygraph and to do our best to see that it took its rightful place in our interrogation system.

In almost every other sphere of life there are various ways of arriving at diagnosis by variegated and different means. For example, in the field of medicine, which is somehow related to the polygraph, the physician has at his disposal various diverse means, both in the area of instrumentation and of laboratory tests such as: X-ray films, blood tests, urine tests, etc. which can assist him in arriving at the correct diagnosis. This is not the case when it comes to the detection of truth concealed by the subject. An instrument has not yet been invented that can probe the depths of a man's soul to determine whether he is speaking the truth or not. Various instruments have been invented to check brain activity and see if there are

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Mr. Cohen is a Member of the APA and an official of the Government of Israel. This paper was presented at the American Polygraph Association Annual Seminar in New Orleans, August 1976.

pathological defects, however, no instrument has yet been found to examine the brain cells and indicate which of them contains truthful information and which others contain false information. And it may be all to the good, because if we stop for a moment to consider what sort of society would be created if everyone could discover the true thoughts of anyone he was conversing with by means of a sophisticated mechanical instrument, it seems to me such a society could not continue to exist, and the world would turn into Sodom and Gommorah.

It seems that together with the creation of man, the instincts of evil and deceit were created as well. In the Bible, Book of Genesis, we find an allusion to the first interrogation carried out on the earth. After Cain killed his brother Abel, God called out to Cain, asking "Where is Abel thy brother?" And Cain replied "I know not", adding the evasive answer "Am I my brother's keeper?" One may suppose that the Almighty knew very well that Cain was guilty of the murder of his brother and surely did not require an interrogation or a polygraph instrument to arrive at this factual truth. However, perhaps the story in the Book of Genesis teaches us that simultaneously with the creation of man, the lie was born.

We are told that the ancient Chinese used to give a suspect rice to chew and ask him to swallow it. In this way they were able to determine if the suspect was speaking the truth or not, the supposition being that if he were lying his mouth would be dry and it would be difficult for him to swallow the rice, in which case they would conclude that he was telling a lie.

In the Old Testament, in the Book of Numbers, there is a passage, which I will quote from, which shows that our ancient forefathers tried to devise means by which to detect the truth through the combination of psychological situations and physiological phenomena. And I quote from the Book of Numbers, Chapter V, 11-38:

> and the Lord said to Moses:
> Say to the people of Israel, if any man's wife
> goes astray and acts unfaithfully against him,
> if a man lies with her carnally, and it is
> hidden from the eyes of her husband, and she
> is undetected though she has defiled herself,
> and there is no witness against her,
> since she was not taken in the act: ...
> then the man shall bring his wife to the priest,
> ...
> and the priest shall bring her near, and set
> her before the Lord.
> and the priest shall take holy water in an earthen
> vessel, and take some of the dust that is on
> the floor of the tabernacle and put it into the
> water.
> And the priest shall set the woman before the Lord,
> and unbind the hair of the woman's head, and place
> in her hands the cereal offering of remembrance,
> which is the cereal offering of jealousy. And in his
> hand the priest shall have the water of bitterness

that brings the curse.
Then the priest shall make her take a oath, saying 'If
no man has lain with you, and if you have not turned
aside to uncleanness, while you were under your
husband's authority, be free from this water of
bitterness that brings the curse.
But if you have gone astray, though you are under
your husband's authority, and if you have defiled
yourself, and some man other than your husband has
lain with you,
then (let the priest make the woman take the oath
of curse, and say to the woman) 'the Lord makes
your thigh fall away and your body swell;
may this water that brings the curse pass
into your bowels and make your body swell and
your thigh fall away.' And the woman shall
say 'Amen, Amen.'
Then the priest shall write these curses in a book, and
wash them off into the water of bitterness and he shall make
the woman drink the water of bitterness that brings the curse.
. . .
And when he has made her drink the water, then, if she
has defiled herself and has acted unfaithfully
against her husband, the water that brings the curse
shall enter into her and cause bitter pain, and
her body shall swell, and her thigh shall
fall away, and the woman shall become an
execration among her people.
But if the woman has not defiled herself and is
clean, then she shall be free and shall
conceive children.

It's quite clear that in those days there was no feminist movement for women's liberation or they would never have dared think of such methods.

Thousands of years of history have passed and the interrogator has always been faced with the difficult problem of detecting whether the suspect is speaking the truth or not. In the dark ages, the interrogators preferred to use methods of torture to extract a confession from the suspect and it mattered very little whether the confession was true or false. But in the Twentieth Century, along with technological development and the recognition of man's right to freedom and dignity, efforts were made to find technological means which would provide signs enabling a polygraph examination to conclude whether or not the examinee is speaking the truth.

In Israel, since we are subject to "Judges rules" regarding methods of interrogation, and we really adhere to them, we were very pleased to find in the polygraph an auxiliary means which can guide the interrogator and assist him in arriving at conclusions which are as definitive as possible.

We are faced in Israel with two major problems. One is the existence of a large minority of Arabs with their own background and mentality and

their special attitude to the state. And the second problem is that a large part of the Jewish inhabitants of Israel are those who came from all the dispersed Jewish communities which were gathered together in Israel from the four corners of the earth. Each of these brings from his country of origin his own special cultural heritage, not to speak of those who were the remnants of the Holocaust in Europe, each of whom certainly has in addition special emotional scars resulting from the mental suffering he underwent during the Second World War.

These two problems always confront us when we examine subjects with the polygraph. I recall that more than once, when observing the examination of American citizens in Mr. Reid's laboratory, I envied him and his team of co-workers because I could see that the examinees have a straightforward approach to the polygraph with no special complexes and no sharp and diverse emotional and cultural blocks, as is the case in Israel.

I would like to illustrate with a few examples.

1. We interrogated an Arab suspected of participating in a terrorist act. Although all the evidence pointed to his guilt, the subject stuck to his denial and when we told him we have a machine that can detect the truth and suggested he be tested on it, he treated the whole matter with contempt and disbelief. And despite the fact that the card test proved that the machine was working on him, his attitude remained scornful. The results of the examination were definitely against him, and when the examiner confronted him with this fact, he simply replied, "I think the machine is lying and I am the one who is telling the truth."

2. Another case of an Arab who was also suspected of a criminal act and whose examination clearly showed he was lying. When the examiner confronted him with the chart and showed him the signs of his lie, the Arab stuck to his denial. The interrogator said to him: "Listen, my friend, this is an American machine that costs lots of dollars and we wouldn't waste time and money on these examinations if we didn't believe in its effectiveness." To this, the examinee responded by calmly saying: "As far as I'm concerned, you can throw it into the sea."

3. Another Arab, an older man, with a very distinguished face and a long white beard, was examined in connection with a suspicion of aiding a terrorist organization. He was offered a polygraph examination and accepted. We decided to use the Baxter method on him and one of the questions of the outside issue type was: "Is there anything else you are afraid I might ask you about, even though I promised that I wouldn't ask you?" He responded with no hesitation, but with surprise at the very question: "Why, you, the government, can ask me anything you please!"

4. I will close this series of examples of Arab subjects by telling about a suspect who saw the examiner entering the examination room wearing a white coat. He said: "But I'm healthy. I didn't complain that I was sick, so why did you bring me a doctor?"

The common denominator of the above examinations and with regard to all

subjects of a low intelligence quota is their lack of confidence in the machine. We often start with a card test, and for those who cannot read figures we use pictures of various objects. What is surprising about these subjects is that once they are convinced of the effectiveness of the machine, they respond very well and very clearly in breathing recording. Our explanation for this is that the sudden transition from total disbelief in the machine to a feeling of fear and anxiety that this mysterious machine may reveal their lies causes these subjects to show acute reactions of deception mainly in their breathing. Quite often the reactions are also acute with regard to relevant questions, so that we are forced to use questions of the guilty complex type in order to arrive at a final conclusion.

I should also like to tell you about two examples of examinations of Jewish immigrants to Israel.

1. An immigrant from Rumania, an elderly man who had been through the concentration camps, appeared for an examination. When he saw the machine and the examiner in the white coat, he panicked and began asking questions about the possibility of any ill effects to his health from the examination. He was told explicitly that the examination would have no ill effects, except for some slight discomfort in the arm due to the blood pressure in the cuff. He hesitated about agreeing, and after we had answered all his questions, he still refused to be examined. After an argument with him, we asked why he refused, and he then asked if the examination might not adversely affect his sexual powers. He was of course given an absolutely negative reply, and he then asked for a written certificate from the doctor that after the examination he would not lose any of his virility. Of course, we decided to forego the examination just in order not to get involved in a damages suit, for it would have been very bad to have lost in such a suit.

2. Another subject was a Jew from Russia - these people have been educated to strictly follow the instructions of people in authority - who was asked during the examination to look directly at the wall, not to move and to concentrate on a single spot. He carried out orders to the letter and as we were about to begin the examination following the card test, it seemed he had fallen asleep. I woke him up and asked him what had happened. He explained that he had once read a book on hypnosis which said that if someone concentrated and stared at one spot, he would become hypnotized and that is in fact what happened to him. He added that he thought I was interested in his becoming hypnotized when I asked him to look at one point on the opposite wall.

I will just mention a few more phenomena which we frequently encounter. When we ask the subject an irrelevant question such as: Are you wearing a shirt? or Is today Monday?, he begins to laugh, looks at the examiner out of the corner of his eye and often says: "Hey, listen are you trying to make a fool of me? You can see that I'm wearing a shirt and you know damn well that today is Monday. Is this why you're taking the trouble to give me a polygraph test?"

You may be surprised to hear this, but it is very difficult to convince

such types, who are suspicious by nature, that such questions are for the purpose of the examination technique. They do not believe the examiner and are sure that something terrible is concealed behind the asking of such seemingly innocent questions, and they are certain we are laying a trap for them. The trouble is that they respond in the examination with strong deception to such questions. This in my view results from the fact that they are racking their brains trying to find out what is hidden behind the presentation of irrelevant questions.

Another frequent occurrence is related to the card test. It happens quite often that the examinee takes, actually grabs, the whole deck of cards from the examiner and says: "Hey, let me teach you some card tricks."

On this same topic of the card tests, even after explaining to the subject that he must reply in the negative to all the numbers, including the card he has selected, and in spite of the fact that he has agreed, during the test he gives a positive reply to the card he chose. We stop the examination and ask him: Why did you give a positive answer after you had agreed to reply in the negative because I, the examiner, need to know if the machine can discover which card you chose. Then the subject, with a maligned look on his face, says: "What do you want from me? I'm an honest man and I just can't tell a lie!"

A final illustration of the problems we run into. We used to use red ink for recording. One of our subjects was watching the recording and in the middle of the examination suddenly stopped, removed the cuff, and turned to me in anger, asking "Why are you sucking blood from me?" Since that day we have stopped using red ink and use only blue ink for recording.

From these examples, one should not jump to the conclusion that we have complicated problems with every second subject. I just wanted to illustrate the type of problem we are confronted with because of the special structure of the Israeli population.

On the other hand, we use the polygraph quite successfully when we put the stress on quality rather than quantity. We do not carry out mass testing but prefer to be selective. And in every case where we have the option of arriving at the truth by means of an interrogation or an investigation, we prefer that to the use of the polygraph. Since, compared with the United States, the polygraph in Israel does not have such widespread use and it has not yet permeated the public consciousness sufficiently, we are fearful of every failure of the results of a test, and on the other hand, we are very pleased every time the polygraph proves its effectiveness. We proceed on the assumption that there is no point in speaking of the failure of one or another examiner but the view that takes hold in the general public is that the polygraph as an instrument is a failure and it s credibility in the eyes of the public is damaged.

Recently a polygraph school was opened within the framework of the Israeli Police and close cooperation exists with the Police examiners, our common aim being to create a positive image for the polygraph and to lay a firm foundation for its use in all fields. There is cooperation as well

with a number of professors from the Hebrew University in Jerusalem as well as the Weizmann Institute of Science to try to find solutions to specific problems with a view to improving polygraph examinations and making them more efficient. Four years ago at the APA Convention in Chicago, an Israeli police officer demonstrated a micro-wave machine which was developed at the Weizmann Institute which is designed to record the subject's breathing without the need to attach a Pneumograph around his chest.

Today the attitude of the greater part of the Israeli public to the polygraph is one of respect and confidence. And although polygraph results are not acceptable as firm evidence in court, there have been a number of cases in which the court expressed a positive opinion on these tests.

In a verdict in an Israeli court, the judge stated, "I am pleased to see that the results of the polygraph test confirm the conclusion I arrived at through a process of thought independent of the test. The findings of the polygraph examination were helpful to the court in deciding in favor of the party whose words were found worthy of trust."

In another judgement in a paternity case in 1960 the district court stated the following opinion, in the words of the judge: "It gave me a feeling of satisfaction to see that the polygraph in its own way, which in a sense is a leap forward, arrived at the same point I reached in the lengthy and traditional way. I am not qualified to pass judgement on the effectiveness of the polygraph machine, but it seems to me the time has come to consider whether this examination made by means of the polygraph shouldn't be included among the beneficial and even essential laboratory tests for detection of the truth. Naturally, this authority lies in the hands of the legislators, but perhaps the time has come for them to inquire into the matter, perhaps through a committee of experts which will check to see if it is desirable to turn the polygraph examination, along with other examinations, into an auxiliary tool for arriving at judgements."

In Israel, as in the U.S., the prosecution and the defense in criminal cases frequently agree among themselves to avail themselves of the use of a polygraph examination, on condition that the defense is obliged to plead guilty if the subject is found to be lying, whereas the prosecution is obliged to withdraw its charges, at least in part, if the subject is found to be telling the truth.

I will cite several examples:

In a court case in Israel in 1965 a man was brought to trial on the charge of having stolen used motors. The defendant claimed that he did not know the goods were stolen but had transported the used motors in his car at the request of a man unknown to him in return for the usual payment. The defense and the prosecution both agreed to the defendant's request for a polygraph examination. When he was shown to be telling the truth, the prosecution withdrew its charges and the defendant was acquitted.

In another court case held in Tel-Aviv in 1967 regarding a serious road accident, a contradiction was found between the testimony of the defendant

and that of a witness for the prosecution. Both parties expressed their willingness to undergo a polygraph examination and with the approval of the court the examination was carried out. Its findings showed that the defendant was telling the truth while the witness for the prosecution was shown to be lying. The prosecution withdrew its charges and the defendant was acquitted.

On the other hand, the Supreme Court in Jerusalem in 1967 acquitted a defendant who had refused to undergo a polygraph examination. This court accepted the defendant's appeal and cleared him because of the suspicion that the judge of the lower court was influenced when reaching his verdict by the fact that the defendant had refused to take the polygraph examination. The superior judge added the statement that "When this examination is not compulsory by law, the refusal of a defendant to undergo the test should in no way be injurious to his case. For if not so stated, this may impair the rights of a defendant who will then feel compelled to accept the suggestion." And at the end of his judgement, the judge laid down the following two principles:

"A. There is no legal compulsion to be examined by a lie detector, and therefore one can not draw conclusions to the detriment of the defendant from the fact that he refuses to undergo such an examination, and it is in fact desirable not to present evidence in this respect.

"B. The refusal of the defendant to undergo the examination may have influenced the process of thought of the judge in the lower court in reaching his verdict as to the guilty or innocence of the defendant. And as the judge himself did not take steps to guard against such a danger, the defendant should be cleared of all charges."

Although we mainly follow the Reid techniques, we receive nearly all the polygraph publications published in the U.S., in which different methods are described, such as Arther, Backster, Keeler, and others, and we are open to every new idea and experience in order to learn and gain the greatest benefit from every innovation in the field of polygraph. We also try every examination method such as "Yes and No Test" and "Silent Test", and in general we do not reject any new method as long as it suits the subject.

The trainees we choose to study polygraph technique are selected from among university graduates, given lectures in psychology and physiology, and undergo lengthy courses, learning mainly through on the job training, under the supervision of one of our experienced veteran polygraph examiners. The total number of hours of training for each trainee is 250 hours of study, practice, and running of examinations. Even after the trainee has completed his course of study and is capable of carrying out examinations on his own, he usually consults with more experienced examiners before giving an opinion on examination results. In this way, we hope to avoid errors as far as possible.

From a follow-up examination results that we ran, we found that we make very few errors indeed, and even those take the direction of exoneration rather than conviction. We tend to avoid giving indefinite answers, and the truth is that we often take risks and give a definite opinion, when we could

have evaded that and given an indefinite answer. We do this not out of a love of danger or taking risks but to convince our polygraph clients that they have an address to which to turn and from whom they can get answers.

Our basic concept is not to regard our polygraph examiners as simply technicians but consider them as thoroughly experienced interrogators. The polygraph is an auxiliary tool which aids them in arriving at correct conclusions as far as this is possible.

In summary, I can state that the experience in operating the polygraph in Israel for more than 20 years has been a very positive one and has made a great contribution to the advancement of interrogations which would have progressed with difficulty without this aid. But over and above everything else - and to my mind this is the most important thing - it has assisted us in many cases in arriving at the truth, and this is after all the motto of the A.P.A. - "Dedicated to truth."

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APPLICATION OF THE POLYGRAPH IN THE INVESTIGATION OF CRIME IN INDIA

By

A. K. Ganguly and S. K. Lahri*

A major portion of a criminal investigation today is nothing more than a battle against the lie. To achieve this objective through scientific means, Keeler and Larson in the U.S.A., were the first around 1920's who independently developed the "Polygraph" commonly known as lie-detector. Its scientific principle is based on psycho-somatic interactions of an individual, i.e., the organic activity of the body is increased to encounter the stimulating situation (Eysenck, 1958). Psychologically, a change in a person's perception or consciously held feelings produces a defense reaction in the form of physiological changes in his blood pressure, pulse rate, respiration and electrodermal response (G.S.R.). Fear of detection, which induces a person to lie, can produce such physiological reactions. Since the development of polygraph it has been widely applied in criminal investigation in advanced countries. While its use in Canada or other European countries, like U.K., France, Germany, etc. is rather limited; in U.S.A., Japan and to some extent even in Israel, it is under extensive use (Abrams, 1973). During a very short period of its use as compared to other scientific techniques, the lie-detector and allied deception tests have been able to prove their worth as reliable and efficient aids to the investigation (Inbau and Reid, 1953). Although, lie detection test results are not readily acceptable in courts as an evidence due to criticism against its use raised by those who do not fully understand either the working of the instrument or the technique of detecting deception through instrumental means (Cook, 1968), yet, there are instances where courts in U.S.A. and Japan have selectively recognized and utilized the polygraph test results to base their final judgement (Romig, 1971; and Abrams, 1973). To counter the views of critics of polygraph, numerous studies have been conducted both in the laboratory as well as in the field to establish its reliability and validity (Horvath and Reid, 1971; Hunter and Ash, 1973; Abrams, 1973). In addition, research studies in two more directions are also being carried out by professional polygraphists and specialists; (a) to develop further either the accuracy of the current instrument or new devices to record physiological changes and (b) to devise new methods and procedures for conducting and interpreting deception tests (Bami and Ganguly, 1974).

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*A. K. Ganguly, M.A. in Psychology, 1959; Ph.D. in Experimental Psychology, 1965; Muslim University, Aligarh. Assistant Director (Lie Detector), Central Forensic Science Laboratory, Central Bureau of Investigation, Ministry of Home Affairs, Indian (East Block VII, R.K. Puram, New Delhi-22).

S. K. Lahri, M.A. in Psychology, 1962; doctoral candidate in Experimental Psychology, Agra University. Senior Scientific Assistant (Lie Detector), Central Forensic Science Laboratory, New Delhi.

The authors thanks are due to Dr. H. K. Bami, Director, Central Forensic Science Laboratory, New Delhi for his keen interest and suggestions.

In view of the fact that lie detector, since its development, has been found to be a good scientific-aid to the investigation of crime, this has been introduced in India on a regular basis at Delhi. The Central Forensic Science Laboratory under the Central Bureau of Investigation, New Delhi thus established a full fledged Lie-Dectector Division for this work in order to assist Delhi Police and the C.B.I. The present short study gives detail of the work carried out so far indicating the success achieved.

METHODOLOGY:

(i) Machines: Two different types of polygraphs are under use in the Lie Detector Division of the C.F.S.L. One is Keeler Polygraph (Model 6338) which has four channels to record respiration by pneumograph, Cardiovascular changes by sphygmograph and plethysmograph and electrodermal response by galvanograph. Another type is Lafayette Polygraph (Model 76058). It has two channels to record respiration, one from thoracic region and the other from abdominal region. Cardio-vascular changes and electrodermal responses are recorded by sphygmograph and galvanograph respectively. In the interrogation room the machines are mounted on specially designed tables. Similarly, for the suspect as well as for the polygraph examiner specially designed chairs are made available.

(ii) Qualification of the polygraph examiner: Polygraph examiner's most important task and responsibility consist in the diagnosis of deception from an examination of the physiological changes recorded by the instrument. Along with his skill in that respect, he must, however, be able to perform the next most important task to interrogate a subject skillfully with a view to obtain a confession from him in case he is guilty (Boon, 1952). In view of above, therefore, senior polygraph examiner associated with this study had a post-graduate degree in psychology with several year's experience in applied psychology. He also had some experience of handling polygraph and interrogations.

(iii) Source of case for lie detection test: The Central Forensic Science Laboratory cater to the needs of the Central Bureau of Investigation and Delhi Police apart from assistance to other states and State Forensic Science Laboratories. For lie detection tests from January, 1974 to December, 1975, 50 cases involving 120 suspects/witnesses/complainants were received in this laboratory. Of these, 6 cases involving 27 suspects/witnesses were referred to by the C.B.I., 1 case involving 17 suspects was referred from Gujrat Police and the remaining cases from Delhi Police. Table I gives the break up crime-wide for which the aforesaid suspects/witnesses/complainants were examined in these 50 cases.

TABLE I

Break Up of Subjects Examined for Various Offenses

Sl. No.	Offense	No. of Subjects
1.	Theft/Burglary	41
2.	Murder (including attempt to murder)	30
3.	Forgery	18
4.	Robbery	17
5.	Mischief by Fire	4
6.	Kidnapping	3
7.	Death by Negligence	3
8.	Smuggling	2
9.	Criminal Breach of Trust	1
10.	Explosives Substances Act and Indian Post Offices Act	1
	Total	120

Interrogation including questioning is an important and integral part of the Lie detection technique where language should be such that the subject can fully understand and comprehend it (Lee, 1953). In conducting our tests it was particularly kept in view as to which of the languages the subject is conversant with and would feel easy to talk. Table II gives the break up of subjects and the language in which interrogation was conducted.

TABLE II

Break-up of Subjects Examined and the Language Used During Interrogation

	Suspects	Witnesses	Complainants	Total
No. of subjects interrogated in Hindi	101	3	4	108
No. of subjects interrogated in English	7	2	1	10
No. of subjects interrogated in Bengali	2	-	-	2
Total	110	5	5	120

TECHNIQUES OF INTERROGATION AND ANALYSIS:

Several methods of lie detection are in common use today (Bami & Ganguly, 1974). However, Relevant-Irrelevant and Peak-of-Tension methods were followed in conducting the tests in this laboratory. In a few cases none the less, we also applied "Polygraph Silent Answer Test" method developed by Horvath and Reid (1972).

In analyzing, evaluating and interpreting the polygrams the following aspects were carefully considered:

(i) Simultaneous occurance of a suppression in respiration and in increase in blood-pressure immediately after the subject's reply;

(ii) Decrease in blood pressure several seconds after the subject's reply;

(iii) Heavier breathing 15-20 seconds after reply to a relevant question;

(iv) slowing up of subject's pulse beat after the questioning was over and he was told that no more questions were going to be asked;

(v) The general trend of the entire polygraph tracing during the interrogation.

In addition to the above mentioned objective criteria, observation of the subject's general behaviour during testing session and interrogation viz., movements, coughing, change in voice, etc., also rendered valuable help in arriving at meaningful conclusions.

RESULTS AND DISCUSSION:

Out of the total 120 subjects examined, in respect of 34 subjects (28.3%) deceptive response, i.e., lying or guilty knowledge regarding the offense could be detected, where as in respect of 83 (69.2%) subjects, no deceptive response could be detected. Of the total number of subjects tested, in respect of 3 persons (2.5%) the results of the lie detection test remained inconclusive. Thirty-four subjects in respect of whom deceptive response was detected pertain to 22 cases out of the total of 50 cases studied. Out of these 22 cases, in 8 cases (involving 11 suspects) the lie detection test proved useful as the suspects admitted their guilt to the Police. Regarding the remaining 23 suspects (14 cases) who did not admit their guilt or in respect of 83 suspects who did not reveal deceptive response nothing definite could be commented upon as yet. However, to what extent the lie detector test results proved successful in rendering help to the Police would be clear from the following few cases studied:

(i) In a double murder case at New Delhi, two suspects were subjected to lie-detection test. When they were confronted with the test results, they admitted their guilt and the stolen property was recovered by the police.

(ii) In a case of theft, the suspect denied getting jewelry, etc., from the bags/suitcases, etc., he had lifted. He also claimed that he is a bachelor and came to Delhi only a few days ago. In this case also, the test revealed that he was telling lies. When confronted with these results, he admitted that he was staying in Delhi with his family and did get jewelry, costly garments, etc., worth around Rs. 12,000/-from the bags he lifted.

(iii) In a murder case, the suspect who was a hardened criminal initially denied all the charges against him. The lie detection test revealed that although he did not commit the offense, yet, he had some guilty knowledge. When confronted with these results, he admitted to the police that the victim was murdered by two other bad characters in his presence and he himself removed the body from the scene of crime by dumping it on a railway track far away.

(iv) In a murder case, Police, on report; discovered two injured people one with grevious stab wounds who had succumbed to his injuries and another lying by his side with a few stab injuries but still alive. He was removed

to the hospital where he stated that one of their room mates had murdered his partner and also inflicted stab injuries on him with the intention to kill him. The room mate in question was subjected to lie-detection test which revealed that he was not involved in the crime. However, later when the wounded person was released from the hospital he was also brought to this laboratory to take the test. As a result, he admitted that he himself had committed the offense and to divert the suspicion on someone else he had inflicted stab injuries on himself.

The present systematic study in India has indicated that the polygraph test can provide rewarding results to the investigating agencies. It can detect the guilt of a suspect and induce him to admit his guilt before the Police. Also, it can successfully reveal the innocence of a suspect as well as check the veracity of a complainant. The study also confirmed that language of questioning or interrogation would not affect the test results if care is taken to converse with the subject in a language that he is able to follow and understand conveniently.

The laboratory proposes to continue with the present studies to see the extent of success which can be achieved with different Indian languages.

REFERENCES:

Abrams, S.(1973): Polygraph Validity and reliability, Jr. Forensic Sc., Vol. 18, No. 4, pp. 313-326.

Bami, H. L. and Ganguly, A.K.(1974): Polygraph (Lie Detector) - Its Application and Legal Status, C.B.I. Bulletin, Vol. VIII, No. 5, pp. 1-8.

Boon, J.(1952): The Lie Detector, International Criminal Police Review, No. 62 (Nov.), pp. 289-293.

Cook, R.E. (1968): Truth, Statistics and the Polygraph, Police, (Nov.-Dec.), pp. 36-41.

Eysenck, H.J. (1968): Sense and Non-Sense in Psychology, Penguin Books, Middlesex, U.K.

Horvath, F.S. and Reid, J.E.(1971): The reliability of Polygraph Examiner Diagnosis of Truth and Deception, Jr. Crim. Law, Criminology & Police Sc., Vol. 62, No. 2, pp. 276-281.

Horvath, F.S. and Reid, J.E.(1972): The polygraph silent answer test, Jr. Crim. Law, Criminol. and Police Sc., Vol. 63, No. 2, pp. 285-293.

Hunter, F.L. and Ash, P.(1973): The Accuracy and consistency of Polygraph Examiner's Diagnosis, Jr. Police Sc. & Adm., Vol. 1, No. 3, pp. 370-376.

Inbau, F.E. and Reid, J.E.(1953): Lie Detection and Criminal Investigation, (3rd ed.) Williams & Wilkins, Baltimore, U.S.A.

Lee, C.D.(1953): The Instrumental Detection of Deception, Ill., C.C.Thomas, U.S.A.

Romig, C.H.A.(1971): The status of Polygraph legislation of the fifty states, Police (Pt. III), pp. 55-61.

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CONFESSION AFTER POLYGRAPH NOT COERCIVE IN NEW YORK

By

Thomas G. Beatty

New York has joined the list of states recognizing that a suspect's oral inculpatory admissions made upon confronting him with evidence that he lied during a polygraph test, are not inadmissable per se on grounds of coercion.

In People v Wilson 78 Misc.2d 468 (1974), the defendant, despite repeated Miranda warnings and his signing of consent waivers, tried to suppress his subsequent inculpatory statements. Judge Alexander Vitale examined the entire record to determine whether coercion existed. That court had previously decided in People v Zimmer 68 Misc.2d 1067 that coercion did exist destroying the validity of the confession when 1) the subject was mentally deranged, 2) the subject was wrongfully told that the polygraph results could be used in evidence, 3) the examiner's techniques were found to be unorthodox, and 4) the examination was excessively long. The facts in Wilson did not approximate the facts in Zimmer.

Defendant Wilson was one of several employees who were routinely given a polygraph examination following an outbreak of arson at his place of employment. He was by no means the sole suspect. The examiner gave Wilson his Miranda warnings, and Wilson signed a waiver. Wilson was cautioned not to take the test if he planned not to tell the truth. The machine's operative principles were explained to him. A card test was performed, wherein Wilson was shown seven cards, one of which he had previously identified, and he was to deny recognizing all seven. The examiner correctly recognized the "lie", heightening Wilson's faith in the reliability of the machine, a technique of the examiner's intended to amplify the subject's physiological responses. The examiner asked irrelevant questions such as, "Do you live in the United States?", control questions such as, "Do you ever commit any unusual sexual acts", and relevant questions such as, "Did you start the fires?"

The series of questions was asked twice. The examiner after studying the graphs, determined that Wilson was lying. When confronted with the examiner's opinions, Wilson capitulated and confessed to the examiner, and then to the detectives. At no time was Wilson under arrest, nor had any threats been made towards him or physical abuse inflicted.

Judge Vitale held that the circumstances of this polygraph examination were not so coercive as to render inadmissable Wilson's confession.

> It is only when the submission to such investigative aids as drugs or the polygraph is involuntary that the fruits of the poisonous tree doctrine is applied. While the confessions may have been triggered by the tests, the tests, if consented to, were not 'poisonous' in the first instance and never became so.

Judge Vitale acknowledged that Wilson had been given his Miranda rights and found that:

> Wilson knowingly and intelligently waived his rights to silence and to counsel and chose to speak. He could have stopped the test at any point by invoking his right to silence but he chose to continue. When confronted with the polygraph results indicative of deception, Wilson made a rationale choice among the available options and confessed. The motion to suppress is in all respects denied.

The impact of the Wilson case is not monumental, as Oregon, Connecticut, the District of Columbia, and other states have held similarly. However, decisions such as Wilson are indicative of a growing judicial acceptance of the polygraph as a scientific and jurisprudential tool.

* * * * * *

ANSWER KEY TO POLYGRAPH REVIEW ON PSYCHOLOGY:

1. d. Psychological set.
2. b. An emotional offender.
3. c. Regression.
4. c. Brain impairment.
5. d. Paranoid schizophrenia.
6. a. Contain many nervous responses.
7. b. Schizophrenia, paranoid type.
8. c. Super dampening effect.
9. d. Hunger.
10. b. Seek an admission about some other offense.

SOME REMINISCENCES ON EARLY DAYS OF THE LIE DETECTOR

By

Colonel Calvin H. Goddard, U.S. Army*

Mr. President and Secretary, ladies and gentlemen, I am going to join Dr. Higley's class of deviates, and deviate from the written or typed talk which I had planned to give, because since writing it I have received some additional material which I think is worthy of presentation and a good deal more interesting than some of the excerpts from long-existing publications which constitute a very considerable part of the paper as originally prepared.

Those of you who are familiar with my history are aware that I lay no claim to being an experienced lie-detector operator. But I have known and enjoyed the friendship of those who are experienced, dating back to the early days of the successful use of the instrument, and I shall talk about their activities because, as I say, I lack sufficient of my own to give you an interesting account.

The two men of whom I wish to speak primarily are John Larson and Leonarde Keeler - very contrasting types - Keeler, unfortunately, dead in his prime; Larson still active in his field of psychiatry. But before I go on with a discussion of these two gentlemen, I want to read you another paper, or excerpts therefrom, which reveal the fact that all is not plain sailing in the realm of the polygraph and that some people of very substantial background have little faith and less confidence in its present, its past and its future. I think those of you who are not familiar with this article will be intrigued and perhaps shocked by some of the expressions it contains. It appeared in a fifty-cent slick magazine (I shall give you the name and date later) and is entitled - HOW TO BEAT THE LIE DETECTOR. I quote - "armed with these instructions for fooling the quack who operates it, you need not fear this modern instrument of torture". How many of you are familiar with this article, will you raise hands? Only about six or eight, so I think I may safely give you a paragraph or two —

"In the first place, it's the bunk. In spite of what the newspapers and the so-called experts would have you believe, there is no machine on earth capable of detecting a lie. The popular conception of a lie detector machine, and a belief sponsored by the propaganda of those who live off the racket, is that of an almighty contraption that rings a gong every time a lie is told — a machine whose instrument gauge points a naughty-naughty! finger at anyone who dares to fib to it. You would hardly think it necessary to say there ain't no such animal, and yet in this age when the public is ready to believe anything and everything so long as it is labeled scientific, quacks are finding an easy market for their pretended infallible crime cureall, the lie detector. Some of the guilty are being passed up while the innocent are often being made to suffer."

The author then goes on for some several thousand words in this vein. The magazine is ESQUIRE, for November 1941.

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*Reprinted from the Bulletin of the Academy for Scientific Interrogation 7 (3) (July 1954): 11-21. Col. Goddard delivered this lecture at the 1953 ASI Seminar in Louisville. He was introduced by Dr. LeMoyne Snyder, President, ASI.

Being curious as to whether this gentleman, whose background I have unfortunately not investigated as exhaustively as I might - being curious, I say, as to his present attitude (his name is William Scott Stewart) - I wrote to ESQUIRE asking his current address, which they gave me as 77 West Washington Street, Chicago, Illinois. Those of you who live around Chicago might find it to your advantage to make Mr. Stewart's acquaintance and see if you can effect a conversion. I wrote to him as follows — Dear Mr. Stewart - I am scheduled to address the International Society for the Detection of Deception, the membership of which is made up almost entirely of lie-detector operators, at its convention in Louisville, Kentucky the early part of October. I have a copy of ESQUIRE for November 1941, which runs your article on HOW TO BEAT THE LIE DETECTOR. I am curious to learn whether your evaluation of that instrument is the same today as it was in 1941. May I have a word from you on the subject?"

Written in pencil on the bottom of my letter and two added sheets was this: "Dear Colonel Goddard - Nothing has caused me to change my mind. I note an increase in its use and believe I could add a few more objections. It is not generally known that when a man refuses to take a lie-detector examination, the fact that he has refused cannot be shown in Court. Otherwise, the lie-detector has no value. This is never explained, so far as I know, when a person is requested to take a test. Even if the operators could claim 100%, they would still have to admit that interpretation is a matter of opinion. One trouble with these gadgets and so-called reforms is that they burden the under-privileged and furnish instruments to be dealt with unfairly." (That doesn't make too much sense - I think this fellow sounds as though he was counsel for the Civil Liberties Union). "I could go on and on. My fear is of a police state abusive power. Pardon the pencil - this is done hurriedly on Saturday when I merely called here to pick up my mail - I must be in court Monday. Yours truly - Stewart."

Well, I repeat, I think it might be to the advantage of those of you who live in and around Chicago to find out who Stewart is and get him into a discussion and see how much sense he can make.

In connection with my expectation of reading a paper here, I wrote to John Larson and asked him for some information as to his past and present activities in the field of the lie-detector. He, in return, sent me copious material - here are a few samples - and some of that which he sent I think is worthy of reading into the record. I shall dilate upon Larson more as we go along, but this particular item is of especial interest because it shows that there is perhaps no need for this association (the ASI), since in the Fall of 1950 a society was organized to "save the lie detector." It was formed by John Larson, and a record of the establishment of this interesting organization appeared in the MICHIGAN POLICE JOURNAL, Vol. 19, No. 7-8, July-August 1950, in an article by Patrick S. McDougall, which reads as follows:

"In recent years much damage has been wrought on the good name of the 'lie detector'. This has come about because of widespread use of the device in police work and elsewhere by improperly trained lay operators. Consequently the machine is no nearer now to becoming an evidentiary tool with

full high court sanction throughout the land than it was when Dr. John A. Larson developed the test and improved on known techniques back in 1921.

In the three decades since then much has been written on the lie detector with many fabulous claims made for it with the results that instead of just being a psychological tool to be used as an adjunct for police investigations, it has been called on to do the impossible with a resultant public skepticism of its value and in many cases it has been utilized only as a psychological 'third degree' with which to extract confessions."

I would like to pause at this point; here we have a society which to all intents and purposes, is nourished and flourishes, to whatever extent it may flourish, through Larson, the man who really rates priority in the field of polygraph work with respect to the development of the antecedent, the prototype, of the instruments now in use, and of methods of interrogation essentially as they are today in use. Keller was a concurrent cultivator of the garden, laborer in the vineyard, and I shall go into that phase of it. But here is a man who could be of inestimable value as a member of this organization (ASI), but who is fostering a counter organization because he evidently feels quite strongly that this society of ours is getting beyond itself and applying the lie detector to uses beyond its current ability to sustain. It is an unfortuante situation. I have urged him to make himself known to this group - to join it. I told him, "if you can't lick 'em, join 'em, and you may find that they are not such a bad crowd after all". But he hasn't responded so far.

I now proceed with Mr. McDougall's article:

"In an effort to fence in the use of the lie detector to proper dimensions and to regain some of its shrunken good will in police science and to have its operation conducted and guided by adequately trained men, forward steps are being taken in that direction by a group of scientists and criminologists, including Dr. Larson.

"The organization - recently formed in Indiana - is called the INTERNATIONAL SOCIETY OF POLICE PSYCHIATRY AND CRIMINOLOGY and while the program of controlled operation of the lie detector is merely one phase of the society's excellent aims, it foretells of great good from the group for the furtherance of police science.

"The purposes of the association are:

"1. To promote the theory of an approach to criminal problems that recognizes the importance of coordination, of articulating the work of the doctor, the psychiatrist, the psychologist, sociologist, criminologist, lawyer, jurist, and the law enforcement officer.

"2. To develop the techniques of investigation based upon principles of clinical approach.

"3. To establish training courses designed to provide competent clinical teams.

"4. To develop and establish ethical standards among members of the association.

"5. To establish standards of training and encourage educational institutions to provide adequate training centers.

"For the benefit of those in law enforcement a brief summary of the historical development of the lie detector follows:

"In 1921 after reading early experiments of Dr. William N. Marston and his discontinuous methods of measuring suspects, Dr. Larson became interested and began independent research.

"At that time Dr. Larson had three degrees and had taught physiology in medical schools and taken graduate work in police psychiatry and also attended state hospital clinics. He was employed as a police officer with the (Berkeley, California)| Police Department under August Vollmer. Because he felt a knowledge of psychiatry was necessary, he spent four years as a research psychologist in the division of criminology and in Illinois, while completing medical studies. He then spent two years studying psychiatry at Johns Hopkins and subsequently taught psychiatry in several universities.

"During this time Dr. Larson read early literature in the field and studied experimental work done by Hugo Munsterberg, Vittorio Benussi, Harold E. Burtt, Carl Jung, Lombroso, Luria and others.

"Dr. Larson then improved on the early thinking and experiments of Marston and others and decided that besides blood pressure recording the recordings of breathing were equally vital, and concluded that these recordings should be continuous during questioning."

Marston, as you know, took blood pressures with an ordinary sphygmograph, making estimations one minute apart, a discontinuous method of visual readings with nothing recorded on a continuous graph; he obviously had a lot of blind spots in his records since these do not exist in the continuous form which Larson introduced. I read further —

"In 1922, the first official apparatus used for lie tests was developed and borrowed from the University of California and demonstrated by Dr. Larson before the International Association of Chiefs of Police in convention at San Francisco. He had also used similar apparatus while serving with the Berkeley Police Department.

"The first time a deception test device was officially used was in the California murder case of William Hightower charged with killing Father P. E. Heslin. Larson tested Hightower and concluded that he was guilty. Hightower was subsequently convicted and sentenced to San Quenton for life.

"The newspapers at that time gave the case much space and dubbed the

machine the 'lie detector'. The name stuck.

"Meanwhile Larson and Earl Bryant made an improved machine in 1923 that provided inked recordings of both blood and breathing tracings."

That apparently marks the beginning of the machine as we know it. Prior to this time they used the old kymograph which had two vertical revolving drums just like two pulleys in a factory with a belt revolving around them. The best consisted of a broad strip of paper which was smoked with an oil flame. Recording pens wrote vertically on this smoked paper as it revolved past them. Obviously it was a much less satisfactory device than one using ink; you had to spray some sort of fixative on the record after it had been taken or the smoked surface would be wiped off the paper by the slightest touch. It was clumsy and spring-driven, not electrically driven, and was not capable of the accuracy that an electrically driven machine possesses. But with that old kymograph they did get pretty good results there in Berkeley under August Vollmer - results such as to set them to developing this new instrument which came out in 1923, as I have just indicated. Proceeding —

"This machine, the first polygraph ever made, has with some modifications, become the standard device used for deception tests.

"While Larson was doing his early work on deception tests and equipment, Leonarde Keeler, then a high school student, became interested. Keeler had a machine built, called it the Keeler Polygraph, and became well known as a criminologist. After he was named head of the Crime Laboratory at Northwestern University he trained many operators in the United States before his death in 1949."

Goddard: I don't recall that Keeler was ever officially head of the Laboratory - I may be wrong. I established the Laboratory in 1929. I went on a year's leave of absence in 1934 and resigned in 1935. After me came Professor Baker of the Law School and then Professor Inbau and then the Laboratory was sold, lock, stock and barrel, to the Chicago Police Department, and Charlie Wilson (who had been an assistant to Keeler) became Director. I think Keeler acted in a more or less administrative capacity under Inbau - isn't that right?

Dr. Snyder: As I recall it, Keeler was in active charge of the Laboratory at the time it was sold to the Chicago Police Department, and Inbau didn't become Director of the Laboratory until it was sold to the Chicago Police Department, and he worked in that capacity for two years, when he resigned to go into private practice, and then Charlie Wilson became Director of the Lab.

Goddard: Well, I have a blind spot over that period - I wasn't in Chicago - I never knew that Inbau had any connection with the Laboratory after it went to the Police Department.

Dr. Snyder: Yes, and you will recall that Professor Baker was killed in an automobile accident and then Keeler was Director of the Lab.

Goddard: I stand corrected, then. To continue with the article which I have been quoting:

"Another machine was developed by Captain C. D. Lee, who was then with the Berkeley Police Department. It was called the Berkeley Psychograph.

"The work of Father Walter C. Summers, S.J. of Fordham University, New York, is important. The machine used by Father Summers was called the Psycho-galvanometer and a great deal of research was done by him. Since his death his associate, Dr. Joseph Kubis, has been carrying on the great work of Father Summers."

Now, others are carrying the work still further, and in two recently received lists of gadgets which I get from various distributors in the East, I find that for the sum of $25.00 you can become possessed of a galvanometer-type lie detector, so it won't be so difficult hereafter to get started in the game. The machine is apparently quite simple and guaranteed to produce perfect results. (Editor's note - laughter from the audience.) Going back to McDougall:

"Another researcher in the field, Chester Darrow, an outstanding experimental psychologist at the Institute of Juvenile Research in Chicago, also developed a device. However, his apparatus, according to experts, does not seem to have general criminological application.

"The first essential mechanical improvement in Larson's test was the result of experimental work by Prof. H. Edwards of the University of California, Southern Branch.

"Among the experimental psychologists there has been considerable controversy about the naming of blood pressure curves and blood volume variations . . . "

This is just dialectics so far as I am concerned, regardless of what they call it.

"Whether this curve is called blood pressure or accepted as vasomotor variations was to Larson immaterial. He selected this method as the most easily controlled and the most indicative as well as most suitable of all blood vascular recordings.

"Still another who developed a device was Adelbert Ford. His apparatus is called the 'Electro-Kymograph'. It makes use of high voltage, high frequency electric current. This machine was the first to do away with smoked paper which was used on most such instruments prior to 1924.

"Dr. Larson, over the years, has used various types of polygraphs but presently leans towards the new apparatus of G. B. Higley, of Columbus, Ohio. Dr. Larson and his associates plan to manufacture - for non-profit - an improved machine possessing additional units of far-reaching value.

"Dr. Larson contends the type of machine is not of paramount importance. He contends that the important phase of the work is to have a proper team of operators.

"No apparatus diagnoses deception but merely painful emotional complexes. These must be 'differentiated' as in any case of medical diagnosis, Dr. Larson declares. 'All deception tests should be part of an analysis of the crime settings integrated with each individual personality analysis,' he said, 'Neither medical nor criminological training alone is requisite. A combined staff consisting of the investigator, the examiner with legal psychological training, a psychologist, and a licensed physician or a forensic psychiatrist should be used as a team for the proper testing to lessen chance of error', Dr. Larson concluded. 'Physiological or psychological deception tests used as instruments for the ascertainment of the truthfulness of a witness are still too much in the experimental field for the courts to approve of their general use.'"

That's Larson, who, as I say, is the living daddy of what this group is now perpetuating. To continue with the article, although there seems to be some text missing at this point —

"Other recent cases in Michigan include People vs. Morse (325 Michigan 270) and in the People vs. Ignofto (315 Michigan 624). Both cases affirm the Becker case so there isn't much question as to where Michigan stands on lie detector evidence.

"Dr. Larson himself is against the admission of the lie detector in courts of law for the reason that tests are usually inconclusive and because of the major errors of interpretation.

"He has voiced these opinions many times in his writings and speeches. He contends that the main value of the apparatus comes during the investigation of cases and that it also has certain psychological advantages. He has stressed these views in his book, LYING AND ITS DETECTION, published in 1932, later published in the MICHIGAN MEDICAL JOURNAL.

"Dr. Larson is now Superintendent of the Indiana State Hospital in Logansport, Indiana."

For those of you who are not familiar with his book, LYING AND ITS DETECTION, which was published by the University of Chicago in 1932, I brought a copy with me which I borrowed from a library in Washington. And Dr. Snyder tells me that Larson has produced another book within recent years - am I right? (Dr. Snyder): within recent months. (Goddard): a book of approximately the same type. I am surprised that in this copious correspondence we have been exchanging in the past couple of months, he said nothing about this book. He sent me, perhaps fearful that his priority in the field might be attacked, copies of letters which I cannot take the time to read, but here is a long letter from August Vollmer dated June 12, 1951 to John Larson, conceding him priority in the development of the lie detector and of the interrogation techniques currently in use. However, Vollmer, knowing Larson's

unwillingness to see the machine exploited to the degree to which everyone here feels that it should be exploited, ends his letter with the statement, "even though all these errors as it affects the records are not known to the scientist, the instrument in the hands of a well-trained policeman is a helpful tool, provided of course the operator knows his limitations. This fact is being constantly demonstrated here in Berkeley where the instrument has been functioning ever since you had the original constructed by your friend. At seventy-five, one does not travel far, consequently I cannot accept your kind invitation", etc.

Here's another one from John Greening, retired Chief of Police, Berkeley, dated July 10, 1951, to Larson, conceding him priority in this field.

And here's one from Larson to Keeler (this is rather interesting!) dated January 16, 1923 - this is the year they developed the ink-recording lie detector. "Dear Keeler - I was delighted to hear from you again and especially glad to hear of your affiliation with the Chief" (that's Vollmer). "In regard to the reprint, I sent him 10 copies. In regard to the apparatus, if you can wait a few days I may be able to fix you up myself, or you can go ahead any way you want. Some months ago, about August, we ordered apparatus to be made which will take the place of the cumbersome smoked and shellack method". (That's the method I mentioned: you see, early in 1923 they were just getting out of the smoke-and-shellac stage.)

So this is another gesture towards establishing his priority, which nobody argues so far as I know. In Keeler's writings he gives Larson full credit for all that he did. Larson early became put out with Keeler for his energetic development of the instrument and for his endeavors to interest scientifically inclined people in its use and further development, Larson being a very, very conservative person who evidently feels that maybe after another 50 years we might talk about introducing lie-detector evidence in court. I have an excerpt here from an article written by Keeler in 1921 in which he says, "at the suggestion of Chief August Vollmer, Larson conducted tests on some 4000 criminals", etc. — gives Larson full credit — and with respect to himself, Keeler says "the author was most fortunate inbeing able to conduct deception tests under Chief Vollmer while in Los Angeles in 1924". That's three years after Larson started. So Keeler has been perfectly fair towards Larson so far as I know, and I think Larson has been not too generous in his recognition of Keeler's contributions to the science.

My original meeting with Keeler was in the Fall of 1929. I had been invited to organize a crime detection laboratory for Northwestern University. I had spent the Summer visiting 13 European countries and going to the police science laboratories of all their major cities, also the better known medio-legal institutes, and getting together the information upon which to establish this laboratory in Chicago. At that time, no adequate information existed in America; there was no police science laboratory in the United States. The famous FBI laboratory which we all now regard so highly, did not exist. In 1931 we conducted our first training class in Chicago, and the FBI sent an agent there who took the course, and in 1932 it came out with a course practically equivalent to ours and a laboratory in every respect identical to ours so far as I was able to ascertain. But that definitely made ours the prototype and the pioneer, a fact of which I am rather proud.

Well anyway, I was trying to get the staff of this laboratory together in the Fall of 1929 when John Henry Wigmore was Dean Emeritus of Northwestern. After the laboratory became established, they set up a new chair on the law faculty there and made me professor of Police Science, so I naturally had a great deal to do both with the active Dean and the Dean Emeritus of the Law School. As a matter of fact, I had known Wigmore for some years, very happily, prior to that time, and he had been largely instrumental in getting Northwestern to take this laboratory to its heart.

One day in November or December of 1929, Wigmore told me that there was going to be an interesting meeting of the Chicago Bar Association which he would like me to attend because a young fellow named Keeler, who had a little black box that he did mysterious things with, was going to come and demonstrate. I wasn't particularly intrigued with the idea but I had a great fondness for the Dean and thought I had better go. So Keeler was there with his little black box and his pack of cards and did his card test two or three times, and I talked to all the subjects and was tremendously impressed. So, since I was engaged in assembling my staff, I ascertained Keeler's name and address and found that he was doing some research work in what was then a small outfit on the West side, the Institute for Juvenile Research. I also ascertained that he was making $150 a month, so I tempted him with $300 to join my staff, and I didn't have to twist his arm very long before he came over and set up the Polygraph Section of the Scientific Crime Detection Laboratory of Northwestern University. That was one of the smartest things I ever did in my life, because you all know what Keeler's history was after that; he had a meteoric career — he put the lie detector on its feet — he interested in the work a lot of competent people who would never have come anywhere near the stage to which it has advanced as of this moment. And on the contrary, here is my friend Larson (for whom I have a great deal fo respect) nipping at it all the time - is not yet ready to do anything with it except sit around with a crew of seven or eight men with long faces, all of whom must have six or eight degrees, and then when you get the record it is almost always going to be inconclusive (you will remember that expression).

So these two men, who are sobasically responsible for the development of the lie detector have had such contrasting careers that the picture is extremely interesting to me, for I have known and worked with Keeler and have known Larson pretty well because he was in Chicago at the same time I was, at least for part of that time.

Shortly after Keeler joined us, Charlie Wilson came along from the West Coast, and Keeler suggested that we ask him to join our staff, which we did, and he did. As you know Charlie has had a very successful career in criminology since then - first with our laboratory and now with his own outfit in Wisconsin (the Wisconsin State Crime Laboratory), and his association with this particular organization assembled here is even better known to you than it is to me.

Keeler and I had some very interesting experiences while we were working together. We had occasion to visit meetings such as this. The first one which we jointly attended was an IAI convention in Miami - I think it was in 1932. The Scientific Crime Detection Laboratory and the lie detector

as well were still relatively new and exciting in the world of law enforcement and I clearly recall how our rooms were filled from morn till eve with visitors, a large percentage of them newsseeking members of the fourth estate. I seem to recall also that despite the fact that the country was then in the throes of prohibition, there was plenty of antifreeze available in Miami and that it was definitely potable. However, my memory is obviously at fault for I am sure that no reputable association of law enforcement agents such as the IAI would have permitted such conditions to exist in a locality frequented by its sternly upright members.

On another occasion Keeler and I jointly attended a Bar Association convention held in the city of Birmingham, Alabama. After his talk, Keeler was invited to visit the local jail and run polygraph tests on various persons held there; some awaiting trial; some, sentence; some, execution. I do not presently recall why I did not accompany him. Probably I went out with a prohibition enforcement squad to satisfy myself at first hand that the 18th Amendment was being properly observed in Alabama. At any rate, when we met again that evening I recall how Keeler told me of his frustration over inability to secure a clear-cut polygraph record on a negro man then under sentence of death for rape. The case had received nationwide publicity, and the condemned enjoyed the sympathy of many who believed that he had been convicted on inadequate or even perjured testimony. Here was our opportunity to clear an innocent man, if he was innocent, and gain for the lie detector the recognition and respect which we felt to be its due. And then the subject had to go and run a record which Keeler was unable to evaluate. We returned to Chicago depressed in mind and spirit.

However, we did accomplish something quite substantial during our stay in Birmingham. That city had only recently witnessed the end of a series of axe-murders which had help householders jittery for well over a year. Every so often the killers would strike, and one more mutilated body would be found in his or her home, the premises a welter of blood and gore.

Despite every effort, no progress was made toward a solution of these crimes until a member of the local prosecutor's staff who had heard of the scopolamine ("truth serum") experiments of Dr. E. M. House of Ferris, Texas, undertook to familiarize himself with the technique involved and to enlist a prominent local M.D. in his scheme. Under this, an incarcerated suspect would be informed that he was to be given a routine physical examination by the jail physician. Thereupon the doctor friend was called in, and the examination, which included the drawing of a sample of blood, conducted. A few minutes later the medic would return armed with a small syringe and the information that the blood showed the examinee to be suffering from a serious affection requiring immediate treatment - by hypodermic. The patient was instructed to bare his arm. Bang went the needle into the flesh, and through it passed a measured amount of a solution of scopolamin hydrobromide. Not too long thereafter the suspect, who until then had remained uncommunicative, was telling everything he knew. Within a matter of weeks the axe murders were solved and the guilty apprehended. The procedure may not have been strictly legal, but for my money, the end certainly justified the means.

Keeler and I took copious notes of our conversations with the prosecutor

and the physician whose joint efforts had brought to an end the activities of the axe murderers, and after our return to Chicago Keeler undertook to employ scopolamine experimentally in an effort to determine its suitability for general use in criminal interrogation. He later tried sodium amytal as well, and with considerable success. Without a medical degree, he was taking quite a chance in carrying on these tests, but he was an adventurous soul and fortunately no accident ever marred them. I do recall one occasion when three or four of our laboratory staff, Keeler and I included, stayed up all night playing poker and waiting to see whether a certain sergeant of Park Police who had volunteered for a test and to whom we had evidently given an overdose of sodium amytal intravenously, was going to come out of it, or acquire a halo and a pair of wings. Finally, sometime during the early morning hours he opened his eyes, and there was a universal sigh of relief. In the last analysis, I would have taken the rap had anything gone wrong, despite the fact that I never personnally gave the injections, for I was the director of the laboratory and held a medical degree, and Keeler was conducting his experiments with my knowledge and approval.

These very tests, as you well know, have led to today's rather widespread use of various drugs in psychological experiments and criminal interrogation. Properly controlled, I see in them an increasingly valuable aid to law enforcement. However, in the wrong hands they can, by the same token, bring much discredit not only upon those who misuse them but upon their more ethical brethren as well.

Since we owe to Dr. House everything for the development of today's methods of interrogating persons under narcosis, I think it might be of interest to read some of his observations on how he was led to experiment in this field. I now insert a quotation or excerpt from House's writings, which I shall read very briefly:

"Scopolamin will depress the cerebrum to such a degree as to destroy the power of reasoning. Events stored in the cerebrum as memory can be obtained by direct stimulation of the centers of hearing.

"My attention was first attracted to this peculiar phenomenon September 7, 1916, while conducting a case of labor under the influence of scopolamin. We desired to weigh the baby, and inquired for the scales. The husband stated that he could not find them. The wife, apparently sound asleep, spoke up and said, 'they are in the kitchen on a nail behind the picture'. The fact that this woman suffered no pain and did not remember when her child was delivered, yet could answer correctly a question she had overheard, appealed to me so strongly that I decided to ascertain if that in reality were another function of scopalamin. In a confinement case you find the dosage by engaging the patient in conversation to note the memory test. Hence, my investigation was a simple matter. I observed that without exception the patient always replied with the truth. The uniqueness of the results obtained from a large number of cases examined was sufficient to prove to me that I could make anyone tell the truth on any question."

Then he goes into a very elaborate discussion of his techniques. I want to impress upon you that to my best knowledge, House is the father of

all the techniques of interrogation under narcosis as today employed and should receive credit for it. His writings on the subject date back to the 1920's.

In connection with recording House's activities, I came upon, entirely unexpectedly, a record of similar experiments which was to me fascinatingly interesting. This is an excerpt from a book by Otto Eisenschiml - IN THE SHADOW OF LINCOLN'S DEATH. It was published in New York in 1940 —

"...one Dr. Charles E. Cady, a military surgeon . . . During his three years' experience in the army" (this was during the Civil War) ... "had upon numerous occasions procured from Rebel officers much important information while they were partially under the influence of chloroform, information which they had positively refused to communicate in their normal state. The worthy doctor had even figured out the exact method of procedure. He respectfully advised that the experiment be conducted by men thoroughly skilled in the administration of chloroform and in a large room free from furniture. The patient was to be placed flat on his back with his head slightly elevated. Two or three windows were to be thrown open so as to insure perfect admixture of air with the vapor of the anesthetic. Pure unadulterated chloroform was then to be carefully but rapidly administered, and while the patient was in a semiconscious condition, he was to be questioned bluntly and pointedly."

So here we go back to the Civil War and find the same interrogation techniques in use, and if they were in use by this one man, they were obviously in use by others. So when I say that House is the father of present techniques of interrogation under narcosis, I mean those not involving chloroform as an agent, although House in his writings always advocated the use of chloroform as an adjunct to the scopolamine; he used them jointly and got much better results than from the use of either one separately.

In the course of another joint trip by Keeler and myself on laboratory business, we found ourselves in the vicinity of a spot where a kidnapping had recently taken place. Like the Birmingham rape case, this was making daily front-page headlines the country over. Thinking that this might prove a golden opportunity for the lie detector to prove its worth, I undertook to get in touch with the chief of the state police force who was in overall charge of the investigation, planning to offer him the services of Keeler and his machine secretly, and entirely without publicity of any kind unless he chose to release it. (I figured that otherwise he would think we were trying to break into his case to publicize the polygraph and the laboratory which we represented.)

Well, I never before or since ran into such a glorious state of numbo-jumbo, such a never, never land of make-believe, as our police official had evolved for the special handling of this particular case. In effect, he had gone into seclusion, and a certain "Mr. X" had taken over. "Mr. X" could not be reached in person, but messages or inquiries left for him at a certain state police installation would be relayed to him. Thereafter he might, or might not, be moved to leave a reply with the same agency. This in turn would be delivered to the interested party if he should call back after an appropriate interval.

I left a message, namely my offer of Keeler and his lie-box, the transaction to be strictly on the q.t. Hours later I called back. Mr. X had not yet vouchsafed me a reply. A day later, as I recall, as we were about to leave the state, I called again. There was a message for me, to wit: "Mr. X was not interested in my proposition".

Later, it did my soul good, and Keeler's too, when the case was solved not by the state police and their Mr. X, but by wholly unrelated agencies. And when the worthy superintendent came in for a wonderful oral drubbing at the annual convention of the International Association of Chiefs of Police later that year, we were even more happy. Revenge is sweet, even when gained vicariously.

I have thus far failed to record that during one of the years over which I directed the laboratory at Northwestern and held the chair of Police Science on its law faculty, Chief Vollmer came to the University of Chicago as Professor of Police Administration. Thus I had, and embraced, the opportunity to become acquainted with the father of scientific police work in America. I greatly enjoyed meeting and knowing him. But he was unhappy in Chicago. The West was his home and he yearned for it, and when the academic year ended he resigned and returned to his beloved California.

So you see, it has been my privilege to know the man, August Vollmer, who inspired first Larson and next Keeler, to develop a good, and then a better, polygraph. It has been my further privilege to know and admire, both Larson and Keeler, two men about as unlike as men possibly can be yet each fine in his own way, and to work intimately with the latter for a period of years.

In that connection, I take credit for having furnished Keeler the proper springboard, as a member of the staff of a great university, for the brilliant career that was his, which came to an untimely end in the Fall of 1949. I had had little contact with him for many years previous, having resigned from Northwestern and the laboratory when, in the depression year of 1934, the budget for the latter, originally established at $60,000 a year ($15,000 of that being my personal salary) reached the all-time low of $10,000. Thereafter I had deserted the field of criminology and law enforcement and spent some years as an ordnance technician (I had held a reserve ordnance commission in the Army since 1922) - working with civilian groups who were developing new material in the field of small arms and ammunition. Then, suddenly and unexpectedly, I was invited to take charge of the revision of all of the articles on military, and many of those on naval, subjects in the Encyclopedia Britannica. I handled what I could (I have 100,000 words on ordnance matters in current printings of that publication) and persuaded qualified military and naval officers to do the others. The result was that in 1940 I found myself American military editor of the Britannica, and I'm still stuck with it.

Came World War II. I was now marked before all men as a writer and editor. (I had produced close to 200 scientific and technical articles in many fields before I tangled with Britannica.) So from early 1941 when I went back into uniform (I had resigned from the regular army in 1920) I

functioned for almost seven years not as an ordnance technical officer, the job for which I had been training for two decades, but as a military historian, first in the United States and then in the Far East. Finally, in January 1948, General MacArthur's Provost Marshal, having somehow learned of my Chicago experience, pried me away from G-2 where I was serving (still wearing my inappropriate ordnance collar device) and had me assigned to the Military Police Corps to command the Far East Criminal Investigation Laboratory in Tokyo. For the next three years and four months, indeed until I was airlifted to the United States as a stretcher patient, I functioned in that capacity. And I need hardly say that I was delighted to discover when I took up my new duties, that the activities of the Laboratory included a polygraph section.

So at long last I was back in the game. But our lie detector achievements suffered at first from a defective instrument, later from a defective operator. To correct the former situation I hand-carried the machine to Washington. That is, I hand-carried it to a plane that flew me to Washington for a 30-day leave period. Thence I shipped it to Chicago for repairs. When my leave was about to expire I proceded to that city, picked up the gadget and hand-carried it, aided by various military transportation media, back to Tokyo.

Then began my troubles with the defective operator. He was a likely lad, but overfond of the cup that cheers. In the end I had to let him go. But once again, fate was kind. Jack Richmond, then Captain, now Major, Military Police Corps, dropped in to say hello on his way from the States to duty in Korea. I screamed to high heaven that I had to have him, and I got him. You who know him (he went to Keeler's school in 1947 as I recall) will realize how lucky I was.

At Christmas, 1948, Keeler, from whom I had had perhaps one letter in a dozen years, sent me greetings by radio. I was quite touched, and wrote him a letter to which he replied. One thing led to another and finally, without much expectation of success, I put in a request for permission to take the Keeler polygraph course with the class entering in September 1949.

Lo and behold, my application was approved. I flew to the United States, reaching Chicago a few days after Keeler had suffered the paralytic stroke which was soon to end his life. Thus I was denied the pleasure of seeing and working with him again after all those years.

I enjoyed the course at Keeler's. And I took much pride in the fact that despite competition from a lot of keen youngsters who could have been my grandchildren, I came out with top scholastic standing in the class. Indeed, I think I was happier over that than any other similar rating I have ever received. That, however, comes far from making me eligible for active membership in your estimable organization, as I well realize.

And so the dial had gone full circle. I had been foresighted enough (and I am proud of it) to bring Keeler to Northwestern when his life work was just commencing to take substantial shape. Together we had sold a skeptical world the idea that there was something in the lie detector, something in a "truth serum", and together we had mingled our blood and sweat

in building up the first scientific crime detection laboratory in America, the first training class in police laboratory methods, and in developing the first truly scientific police journal to appear in the United States. That was the AMERICAN JOURNAL OF POLICE SCIENCE, of which I was Editor in Chief from its establishment in 1930, to 1932, when it was combined with the JOURNAL OF CRIMINAL LAW and which, as you know, is now known as the JOURNAL OF CRIMINAL LAW, CRIMINOLOGY AND POLICE SCIENCE.

It remained only for us to meet once more, he in the heyday of his accomplishment, I a rolling stone gathering no moss but happy in the memories which I have just recited and proud of the man who had once been my assistant and who had gone on to carve for himself a niche in the Hall of Fame. That meeting was denied me, and by a margin of so few days!

God moves in mysterious ways his wonders to perform!

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BUFFALO CITY COURT:

PEOPLE OF THE STATE OF NEW YORK

-vs- DOCKET NO. 1B-39905

EDWARD CARTER WHITE

DEFENDANT

Proceeding held before the HONORABLE JULIAN F. KUBINIEC, Associate Judge, City Court, 50 Delaware Ave., Buffalo, New York on the 20th day of February, 1975 in Part 6 thereof.

APPEARANCES: Edward C. Cosgrove, Esq., ECDA
By: Wesley Taylor, Esq., of counsel
Appearing for the People

James Robinson, Esq.
Statler Hilton
Buffalo, New York
Appearing for the Defendant

TESTIMONY OF ROBERT J. GIBBONS:

ROBERT J. GIBBONS, residing at 72 Dumont Terrace in the Town of Tonawanda, having been first called as a witness in behalf of the Defendant and having been dully sworn by the Court, was examined and testified as follows:

DIRECT EXAMINATION BY MR ROBINSON:

in building up the first scientific crime detection laboratory in America, the first training class in police laboratory methods, and in developing the first truly scientific police journal to appear in the United States. That was the AMERICAN JOURNAL OF POLICE SCIENCE, of which I was Editor in Chief from its establishment in 1930, to 1932, when it was combined with the JOURNAL OF CRIMINAL LAW and which, as you know, is now known as the JOURNAL OF CRIMINAL LAW, CRIMINOLOGY AND POLICE SCIENCE.

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TESTIMONY OF ROBERT J. GIBBONS:

ROBERT J. GIBBONS, residing at 72 Dumont Terrace in the Town of Tonawanda, having been first called as a witness in behalf of the Defendant and having been dully sworn by the Court, was examined and testified as follows:

DIRECT EXAMINATION BY MR ROBINSON:

Q Mr. Gibbons, what is your position, sir?

A Chief polygraph examiner for the City.

Q And how long have you been doing that, sir?

A Nine (9) years.

Q For the past nine years and you make all the polygraphs for the City of Buffalo?

A Yes, sir.

Q Now, did there come a time when I contacted you concerning a polygraph for a defendant White?

A Yes, sir.

Q And did you consent to make a polygraph of that?

A Yes, I did.

Q When was that done, sir?

A that was done — it commenced at 5:15 P.M., 12 February, 1975.

Q And how long did it last?

A Approximately an hour and a half.

Q And how many polygraph tests did you give to the defendant?

A Two.

Q What was your finding as a result thereof?

A My finding as a result of the polygraph conducted on Mr. White was that I could find no deception to the relevant questions asked of him concerning the allegations made.

Q And as a result of your findings, do you have an opinion as to the guilt or innocence of this man involved in this particular matter?

A It is my considered opinion that the defendant was not involved.

THE COURT: Mr. Taylor, do you have any questions?

MR. TAYLOR: Yes, Your Honor.

CROSS EXAMINATION BY MR. TAYLOR:

Q Would it be (pause) possible for the defendant to — say — "fool the machine"?

A No sir. Because the machine is inanimate; it has no intellect. The only thing that can be fooled is the examiner.

Q This machine operates on impulses?

A It's a four phase instrument. It records blood pressure, heart rate, galvanic skin response, breathing, any changes in any of those.

Q You say there's no way absent not making any what? Breathing doesn't decrease or increase, blood pressure doesn't go up or down; is it possible to lie without having any of these re-actions?

A If you have an intellect, you can't lie without knowing it and that's the theory behind polygraphy. You would have to think to lie and you're making a decision yourself to do so. Therefore, you are in a conflict state when you do lie; blood pressure increases, heart rate increases and all these things are or could be manifested in the charts.

MR. TAYLOR: No further questions.

THE COURT: Charge is dismissed.

(PROCEEDING CONCLUDED)

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THE PNEUMOGRAPH: A BIBLIOGRAPHY

By

Norman Ansley

Allison, R.D. Volumetric Dynamics of Respiration as Measured by Electrical Impedence. Ph.D. Thesis. Wayne State University, Detroit, 1962.

Abrams, Stanley. "Polygraph Validity and Reliability: A Review." Journal of Forensic Sciences 18 (4) (October 1973): 313-326.

Arther, Richard O. "Breathing Analysis." Journal of Polygraph Studies 5 (4) (January-February 1971): 1-4 and 5 (5) (March-April 1971): 1-4.

Arther, Richard O. "The Breathing Unit." Journal of Polygraph Studies 5 (3) (November-December 1970): 1-4.

Backster, Cleve. "Total Chart Minutes Concept." Law and Order 11 (10) (1963): 77-79.

Benussi, Vittorio. "Die Atmongssymptome der Luge." Arch. Fid. Ges. Psychol. 31 (1914): 244-273.

Benussi, Vittorio. "The Respiratory System of Lying." Polygraph 4 (1) (March 1975): 52-76. (English Translation of the 1914 Article.)

Burtt, Harold E. "Further Technique for Inspiration Expiration Ratios." Journal of Experimental Psychology 4 (2) (April 1921): 106-111.

Burtt, Harold E. "The Inspiration-Expiration Ratio During Truth and Falsehood." Journlof Experimental Psychology 4 (1) (February 1921): 1-23.

Burtt, Harold E. "A Pneumograph for Inspiration Expiration Ratios." Psychological Bulletin 15 (10) (1918): 323-328.

Christianson, B. Studies in Respiration and Personality. Oslo: Institute for Social Research, 1965.

Cohen, Harvey D., Donald R. Goodenough, Herman A. Witkin, Philip Oltman, Harry Gould and Ernest Shulman, "The Effects of Stress on Components of the Respiration Cycle." Psychophysiology 12:4, 377-380, July 1975.

Cutrow, Robert, Parks, Arther, Lucas, Nelson, and Thomas, Kathryn. "The Objective Use of Multiple Physiological Indices in the Detection of Deception." Psychophysiology 9 (6) (November 1972): 578-587.

Decker, Ronald E. "Repairing the Stoelting Pneumograph Attachment." Polygraph 1 (4) (December 1972): 251-252.

Edel, Eugene C. and Jacoby, Jacob. "Examiner Reliability in Polygraph Chart Analysis: Identification of Physiological Responses." Journal

of Applied Psychology 60 (5) (1975): 632-634.

Faulkner, W. B. "The Effect of the Emotions Upon Diaphragmatic Function." Psychosom. Med., 3, (1941): 187-189.

Feleky, Antionette. "The Influence of the Emotions on Respiration." Journal of Experimental Psychology, 1, (1916): 218-241.

Finesinger, J. E. "The Effect of Pleasant and Unpleasant Ideas on the Respiratory Pattern in Psychoneurotic Patients." American Journal of Psychiatry, 100 (1944): 659-667.

Finesinger, J.E., and Mazick, Sarah G. "The Effect of a Painful Stimulus and its Recall upon Respiration in Psychoneurotic Patients." Psychosom. Med., 2, (1940): 333-368.

Goldman, Eisler F. "Speech-breathing Activity - A Measure of Tension and Affect During Interview." British Journal of Psychology, 1955, 46, 53-63.

Harney, Joseph W. "The Analysis of Respiratory Criteria in Deception Tests - A Possible Source of Misinterpretation." Journal of Criminal Law and Criminology, 34 (May 1943): 268-273.

Kubis, Joseph F. "Analysis of Polygraphic Data, Dependent and Independent Situations." Polygraph 2 (1) (March 1973): 42-58 and 2(2) (June 1973): 89-107.

Landis, Carney and Gullette, Ruth. "Studies of Emotional Reactions, Systolic Blood Pressure and Inspiration-Expiration Ratios." Journal of Comparative Psychology 5 (3) (1925): 221-253.

Landis, Carney and Wiley, L.E. "Changes in Blood Pressure and Respiration During Deception." Journal of Comparative Psychology 6 (1) (February 1926): 1-19.

Lee, Clarence D. The Instrumental Detection of Deception - The Lie Test. Springfield, Illinois: Charles C. Thomas, 1953.

Magiera, Alex C. "Patterns of Purposeful Distortion," in Ansley, Norman (Ed.) Legal Admissibility of the Polygraph, Springfield, Illinois: Charles C. Thomas, 1975, pp. 199-209.

Maksuel, M., Coults, K. and Hamilton, L. "Oxygen uptake, ventilation and heart rate." Archives of Environmental Health, 23 (1971): 23-28.

Nims, L.F. "Anatomy and Physics of Respiration," in Fulton, J.F. (Ed.) Howell's Textbook of Physiology, 15th edition, Philadelphia: Saunders, 1947, pp. 858-877.

Nixon, H.K. "A Simple Device for Recording Inspiration-Expiration Time," Journal of Experimental Psychology 6 (1923): 383-384.

Peterson, F., and Jung, C.G. "Psychophysical Investigations With the Galvanometer and Pneumograph in Normal and Insane Individuals." Brain 30 (1907): 153-218.

Porges, S. W. and Raskin, D.C. "Respiratory and Heart Rate Components of Attention." Journal of Experimental Psychology 81 (1969): 497-503.

Raskin, David C. "Psychopathy and Detection of Deception in a Prison Population." Report No. 75-1 LEAA Contract 75 N1 99-0001, Department of Psychology, University of Utah, Salt Lake City, Utah, 84112.

Reid, John E. and Inbau, Fred E. Truth and Deception: The Polygraph ("Lie Detector") Technique. Baltimore: Williams and Wilkins, 1966.

Robbins, E. and Marko, A. "An Improved Method of Registering Respiration Rate." Digest of the 15th Annual Conference on Engineering in Medicine and Biology, 1962, p. 18.

Robbins, Norman E. and Penley, William J. "Polygraph Progress Study: United States Postal Service" Polygraph 3 (3) (September 1974): 247-255.

Robbins, Norman E. and Penley, William J. "Review of POlygraph Charts of Non-Deceptive Subjects." Polygraph 4 (3) (September 1975): 199-206.

Ruppel, Gregg. Manual of Pulmonary Function Testing. St. Louis: C. V. Mosby, 1975.

Slowik, Stanley M. and Buckley, Joseph P. "Relative Accuracy of Polygraph Examiner Diagnosis of Respiration, Blood Pressure, and GSR Recordings." Journal of Police Science and Administration 3 (3) (September 1975): 305-309.

Slowik, Stanley M., Buckley, Joseph P., Kroeker, Leonard, and Ash, Philip. "Abdominal and Thoracic Respiration Recording in the Detection of Deception." Polygraph 2 (1) (March 1973): 12-78.

Slowik, Stanley M., Reid, John E., Buckley, Joseph P., Kroeker, Leonard, and Ash, Philip. "Abdominal and Thoracic Respiration Recordings in the Detection of Deception." in Norman Ansley (ED.) Legal Admissibility of the Polygraph. Springfield, Illinois: Charles C. Thomas, 1975, pp. 189-198.

Smith, Joseph R., Jr. "Development of an Impedance Pneumograph." Final Report. 28 May 1964. NASA-CR-56834. SR-64-1006. Spacelabs, Inc. Contract: NAS 2-1097.

Stevenson, I.P. and Ripley, H.S. "Variations in Respiration and Respiratory Symptoms During Changes in Emotion." Psychosomatic Medicine 14 (1952): 476-490.

Svebak, Sven. "Respiratory Patterns as Predictors of Laughter." Psychophysiology. 17 (1) (January 1975): 62-65.

Tebbs, Clark J. "Calibrating the Polygraph, A Programmed Text, The Pneumograph (Part 1)." Polygraph 4 (2) (June 1975): 165-174.

Trumper, M. "A Hemato-Respiratory Study of 101 Consecutive Cases of Stammering." Psychology Abstracts, Philadelphia, University Pennsylvania, 1928.

Varni, John G., Clark, R. Ernest and Giddon, Donald B. "Analysis of Cyclic Heart Rate Variability." Psychophysiology 8 (3) (1971): 406-431.

Wakamatsu, Takeshi and Yoshizumi, Koichi. "The Study of Respiratory Waves During Polygraph Examinations (The First Report)." Kagaku Keisatsu Kenkyusho Hokoku (Reports of the National Research Institute of Police Science) 21 (2) (1968): 150-155.

Wakamatsu, Takeshi and Yoshizumi, Koichi. "The Study of Respiratory Waves During Polygraph Examinations (The Second Report)." Kagaku Keisatsu Kenkyusho Hokoku (A Report of the National Research Institute of Police Science) 21 (3) (1968): 158-164.

Yankee, William J. "An Investigation of Mutual Relationships Between 'Sighs' and 'Cardio' Tracings." Keeler Polygraph Institute Alumni Association Seminar, Chicago: Keeler Polygraph Institute, 1964.

Yankee, William J. and Laughner, Donald L. "An Investigation of Mutual Relationships Between 'Sighs' and 'Cardio' Tracings in Chart Interpretation." Polygraph 2 (1) (March 1973): 28-35.

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POLYGRAPH REVIEW

By

Bobby J. Daily

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 psychology. (Answers are on page 251.)

1. A person's fears, anxieties and apprehensions are channeled toward the situation which holds greatest immediate threat to his self-preservation or general well being. This channeling of attention to a specific area or situation during polygraph testing is identified by Cleve Backster as:

   a. general nervous tension.
   b. perseverate set.
   c. anxiety reaction.
   d. psychological set.

2. A man killed his girlfriend when he discovered her in a compromising situation with another man. According to Reid and Inbau, an offender of this type is classified for interrogation as:

   a. a psychopathic offender.
   b. an emotional offender.
   c. a circumspectual offender.
   d. an introspective offender.

3. When an individual retreats to an earlier developmental level involving less mature responses, he is using the ego defense mechanism of:

   a. sympathism.
   b. sublimation.
   c. regression.
   d. repression.

4. The neurotic is <u>NOT</u> characterized by:

   a. high anxiety.
   b. a fair adjustment to daily living.
   c. brain impairment.
   d. feelings of foreboding and panic.

5. Symptoms such as illogical, absurd and changeable delusions with a persecutory and suspicious theme typify:

5. a. simple schizophrenia.
   b. hebephrenia.
   c. catatonia.
   d. paranoid schizophrenia.

6. You are conducting a polygraph examination of a man who is suffering from a neurotic-anxiety reaction. You would expect his charts to:

   a. contain many nervous responses.
   b. be rather unresponsive.
   c. contain no conclusive responses.
   d. contain occasional violent responses.

7. A soldier you are to examine has frequently made formal complaints against other soldiers in his barracks. Investigations revealed most were minor or ill-founded, yet he continues to make them. During pre-test interview, the soldier tells you his sergeant is slowly poisoning him. You ask how he knows this and he says God told him. You suspect this soldier is suffering from:

   a. hypochondriacal reaction.
   b. schizophrenia, paranoid type.
   c. neurosis.
   d. psychopathic personality.

8. In the Backster Zone Comparison technique, the suppression or reduction of responses to relevant and control questions due to a strong outside issue is called:

   a. psychological set.
   b. anticlimax dampening effect.
   c. super dampening effect.
   d. guilt complex reaction.

9. Maslow set up a hierarchy of needs. Which one of the following needs is the most basic?

   a. Love.
   b. Safety.
   c. Esteem.
   d. Hunger.

10. You are going to conduct a post-test interrogation of a deceptive, non-emotional offender. A good technique would be to:

   a. tell him that anyone else under similar conditions or circumstances might have done the same thing.
   b. seek an admission about some other offense.
   c. sympathize with him.
   d. rationalize the moral seriousness of the offense.

ABSTRACTS

Hastrup, Janice L. and Edward S. Katkin. "Electrodermal Lability: An Attempt to Measure Its Psychological Correlates." Psychophysiology 13 (4) (July 1976): 296-301.

Differences in electrodermal lability (frequency of spontaneous fluctuations in skin resistance) have been shown to predict certain types of behavior. Further, electrodermal lability has in some cases been related to psychometric measures of personality. The purpose of this experiment was to develop a self-report inventory which would predict electrodermal lability. A pool of 478 items was administered to 120 male undergraduate students. These students were subsequently tested for electrodermal lability level. Correlational and x^2 analyses were employed to identify items which were significantly related to electrodermal lability. Then these items were subjected to linear discriminant function analysis to determine their optimal weighting. Although 34 items were initially identified as significant predictors, split-sample analyses suggested that the predictors would not replicate. Previous findings which have suggested a relationship between electrodermal lability and personality variables such as anxiety were discussed. It was concluded that although electrodermal lability is a reliable predictor of certain responses, it is not readily related to traditional self-descriptive psychometrics. The interpretation supports the view that autonomic functions are independent of self-awareness. [Authors abstract]

Ikeda, Yukinobu and Hisashi Hirai. "Voluntary Control of Electrodermal Activity in Relation to Imagery and Internal Perception Scores." Psychophysiology 13 (4) (July 1976): 330-333.

Feedback of spontaneous electrodermal fluctuations in human subjects increased their frequency of occurrence relative to a non-contingent feedback control group. The effect was facilitated for subjects having high imagery and/or high internal perception as measured by the Sophian Scale of Imagery (SSI) and Sophian Scale of Internal Perception (SSP) respectively. These data suggest the existence of individual differences in self-control of autonomic responses.
[Author abstract]

Tahmoush, Albert J., J. Richard Jennings, Alison L. Lee, Stephen Camp, and Frederick Weber. "Characteristics of a Light Emitting Diode — Transistor Photoplethysmograph." Psychophysiology 13 (4) (July 1976): 357-362.

A reflective transducer which combines a gallium arsenide infrared emitting diode and silicon phototransistor has been adapted for use as a photoelectric plethysmograph. This device is inexpensive, compact, and easily applied to the skin surface. The phototransistor responds in a linear fashion to the range of light intensities generally obtained from normal subjects, and the phototransistor output is relatively independent of both temperature and prior light exposure. The light source possesses a narrow spectral distribution in the infrared region. These characteristics suggest that the LED-transistor photoplethysmograph is superior to the

miniature tungsten lamp-photoconductive cell combination generally employed in photoplethysmography.
[Authors abstract]

Juris, Michael. "A Faster and More Accurate Instrument for Digital Measurement of Pupil Diameter." Psychophysiology 13 (4) (July 1976): 363-365.

This low cost device enables the experimenter to make a faster and more accurate measurement of pupil diameter registered on a TV recorder. Instead of a direct external measurement on the TV screen with a scale, two black or dark areas with sharp vertical edges are electronically superimposed on the pupil projection on the monitor. These dark areas can easily be moved independently in both horizontal directions, so that the pupil becomes confined at its edges.

The time required by the cathode ray to pass the field between these areas is a linear index of pupillary diameter. The time can be registered with a frequency counter.
[Author abstract]

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