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STATE LAWS AND THE POLYGRAPH IN 1975

By

Clarence H. A. Romig
Associate Professor

Department of Criminology
Indiana State University
Terre Haute, Indiana 47809

Polygraphy is rapidly growing as a profession. There are several definitions for the term profession, but the characteristics most frequently used throughout include the development and adherance to a code of ethics, formation of associations with membership criteria, monopolization of certain theories, knowledge and skills, and the formal recognition and acceptance by governmental agencies, as well as by the general public. All these characteristics, and more, have been increasingly attained by the untiring efforts of a burgeoning group of dedicated people who call themselves the American Polygraph Association.

This association has promulgated a code of ethics consonant with high moral standards, yet practical enough to be satisfied by diligent application and concern for others before the self. The code consists of a number of interrelated prepositions which assert the occupation's devotion to the public welfare and stipulate standards of practice and prerequisites for admission. This professional stance was recognized by eighteen separate state governments, since 1959, by their assignment of a legal position, otherwise called polygraph licensing statutes. Invariably the licensing legislation is closely synonymous with the APA requirements that limit polygraph use to persons who are certified by state examinations, completion of specialized training, possession of higher education, and a myriad of other criteria. The states' assertion that violation of the licensing acts is unlawful, and that performing polygraph tests is reserve to licensed members, assign certain legal status to the profession in general.

Although polygraphy is not a secret or mystical occupation, access to its special knowledge is sufficiently restricted that one can call it a monopoly. The technique is not taught in every community, nor are publications of research and progress of organization available on every library bookshelf. However, definition of the content of the knowledge is fairly uniform and there are efforts expended to ensure that only qualified personnel and schools be permitted to teach the theories and intricacies of the technique. The certification of polygraph schools by the APA, coupled with the laws that require such attendance, provides some minimum standards of knowledge and skill of the entering practitioner. This exclusionary device ensures a form of healthy monopolization within the profession. Hopefully technically unqualified persons will always be excluded in this fashion.

Moreover, professionalization implies that personnel will not engage in certain practices, just as it implies that certain practices are reserved to the elite group of personnel. The need to remain neutral in legal controversies involving colleagues and the confidentiality necessary after unique information is disclosed by an examinee are but two examples of moral restrictions that must always be honored, not to mention the avoidance of indiscreet gossiping, or otherwise behaving obnoxiously in public.

Yet the large scale acceptance of the polygraph profession by the public and the special recognition afforded by the legislation of eighteen states does not imply that this is a unanimous situation throughout the country. While eighteen states have legalized the profession, fifteen state governments have not looked so kindly on the polygraph. Perhaps shortly after this will be published, the figures will reflect nineteen states with polygraph laws, because it is understood that the Oregon legislature has prepared a licensing statute despite the fact that an anti-polygraph law presently exists that precludes polygraphing as a condition of employment in Oregon.

Further attention to professional standards is necessary, not only in those states that are without anti- or pro-polygraph legislation, but also in the states with licensing laws. Oregon's changed position, as reflected in the forthcoming new law, should alert all in the profession to continue to upgrade individual practitioners and the state and national associations. The 1974 congressional inquiry into the polygraph should remind everyone that the profession is being closely watched by people with many personal biases. Perhaps some of the questions that were posed and could not be readily answered should become professional goals. That is, such questions as how much of the annual income of the APA was budgeted toward research, what outside research has been generated to replicate the few studies of validity or reliability of the polygraph, and where are the names, dates, and cases of those many innocent people who were vindicated by the polygraph? Such questions will be posed again and again until the polygraph profession either presents some good answers, or else they will succumb to the newly proposed federally sponsored anti-polygraph legislation.

Polygraph Limiting Statutes

Fifteen states have legislated statutes that prohibit the use of the polygraph in the area of pre-employment and periodic testing as a condition of employment within business, industry, and commercial enterprises. Ambiguously, the majority of these statutes exempt law enforcement, governmental agencies, or drug dispensing firms from the legislation for such testing. None of the fifteen legislative acts outlaw the use of the polygraph technique completely within a state, rather they selectively circumscribe its use for non-governmental personnel matters. Polygraph testing for police, government, or drug dispensing employment purposes and for routine police or governmental investigations is untouched by these laws.

Although they have the same effect, the language of the prohibiting statutes varies somewhat, as do the penalties. Generally, each of the statutes is less than a page in length, but all states in essence: "No

employer shall (request, require, demand, suggest, subject, cause, influence) any prospective employee or employee to take a polygraph examination as a condition of employment or continuing employment." Some statutes include one prohibiting word, such as require or demand, and others have as many as three. A typical statute is California's 1963 statute:

> Chapter 3, Article 3, Paragraph 432.2.
> Prohibition against employer requiring applicant or employee to take lie detector test, etc. Inapplicability to government entities or agencies. No employer shall demand or require any applicant for employment or prospective employment or any employee to submit to or take a polygraph, lie detector or similar test or examination as a condition of employment or continued employment. The prohibition of this section does not apply to the federal government or any agency thereof or the state government or any agency or local subdivision thereof, including, but not limited to, counties, cities and counties, cities, districts, authorities, and agencies.

In a ruling offered on January 14, 1964, the California Attorney General stated that as concerns Labor Code Section 432.2, prohibiting an employer from demanding or requiring polygraph tests of a person as a condition of employment or continued employment, does not prohibit him from requesting or permitting such tests. One wonders whether other attorneys general in states with prohibitory legislation have been requested to similarly clarify their state laws. And, in view of the many recent court declarations of unconstitutional or discriminatory practices in housing, education, sports and hiring, one further wonders whether the prohibitory legislation is constitutional at all.

Table 1 outlines the salient features of the various state legislation. The limiting phraseology, penalties and exemptions are listed for each state, with the identifying statutes, where they are known.

Polygraph Licensing Statutes

Eighteen states and the Department of Defense have promulgated formal laws or standards prescribing guidelines for the use of the polygraph technique in the same period that fifteen states have enacted legislation that precludes the use of the polygraph for some pre-employment and periodic screening. At the time of this writing, legislation to license polygraph examiners has been forwarded to the governor of Oregon for his executive approval. Should he sign the licensing act, Oregon will be the only state with separate laws that will license polygraph examiners and prohibit the requirement of employees to undergo polygraph examinations as a condition of employment, although Michigan's law includes both provisions in its single statute. The Department of Defense regulation concerning polygraphy requires that examiners be accredited or certified in order to conduct examinations and for this reason those prerequisites are included in the following charts and discussions. Table 2 presents the list of state laws and effective dates of the licensing statutes.

TABLE 1

POLYGRAPH LIMITING STATUTES, PENALTIES, AND EXEMPTIONS

State, Statute and Date:	No employer may "____" any prospective employee or employee to take a polygraph examination . . .	Penalty:	Exempted:
Alaska Ch. 3, Art. 3 1964	request or suggest	fine of $1000 and/or 1 year jail	policemen or prospective policemen
California Ch. 3. Art. 3 1963	demand or require	none stated	any federal or state government or subdivision thereof
Connecticut Pub. Act 488 after 1966	request or require	none stated	state or local police departments
Delaware Ch. 7, Title 19 1966	require, request or suggest	fine of $500 and/or 90 days jail	law enforcement agencies
Hawaii Ch. 378	require	fine of $1000 and/or 1 year jail	law enforcement agencies
Idaho Sect. 44-903	require	unknown	unknown
Maryland Ch. 724, par 95 1966	demand or require	misdemeanor; fine not to exceed $100	federal, state, or subdivision of government
Massachusetts Ch. 797 1959, amended 1963	subject or cause	none stated	law enforcement agencies
Minnesota Sect. 181.75	request or require	unknown	unknown
Montana 1974	require	unknown	unknown

TABLE 1 (continued)

State, Statute and Date:	No employer may "____" any prospective employee or em-employee to take a polygraph examination . . .	Penalty:	Exempted:
New Jersey Ch. 114, Sect. 1 1966	influence, request or require	"is a disorderly person."	none stated
Oregon Ch. 249 1963	require	maximum $500 fine and/or 1 year in jail	none stated
Pennsylvania P.L. 782, Sect. 666.1, 1969	require	fine of $500 and/or 1 year jail	public law enforcement agents; drug dispensers
Rhode Island Gen. Assem. Jan. 1964	subjects or causes	$200 fine	law enforcement agencies
Washington Code 49.44.120 1965	requires	gross misdemeanor	law enforcement; drug dispensers; national security

TABLE 2

POLYGRAPH LICENSING STATUTES IN FORCE IN JUNE 1975

STATE	STATUTE	DATE
Alabama	Act No. 2056	1971
Arkansas	Act 413	1967
Florida	Chapter 493, Florida Statutes	1967
Georgia	Georgia Polygraph Examiners' Act	1968
Illinois	Detection of Deception Examiner Ill. Rev. Stat., Ch. 38, Sect 202-1 to 30	1963-1967
Kentucky	Detection of Deception Examiner Act amended by Senate Bill No. 245	1962 1970
Michigan	Forensic Polygraph Examiners' Act	1972
Mississippi	Polygraph Examiners Act	1968
Nevada	Chapter 648, NRS	1967
New Mexico	Act (67-31-1 to 67-31-14); Laws 1963	1963
North Carolina	Article 9A, Chapter 66, Gen. Stat. of N.C.	1972
North Dakota	Chapter 43-31, North Century Code	1965
Oklahoma	Chapter 140, 68, S.B. No. 39	1971
South Carolina	Polygraph Examiner's Act S-996	1972
Texas	Texas Polygraph Examiners Act S.B. 740	1965
Utah	Detection of Deception Examiners Act	1973
Vermont	V.S.A. Chapter 45, Section 1	1975
Virginia	Code of Virginia, Sections 54-729.01 through 54-729.018	1968
Dept. of Defense	DOD Regulation 5210.48	1974

Despite the need to standardize the rules and regulations throughout the country in order to facilitate reciprocity agreements and to further professionalize polygraphy, the laws enacted by the licensing states have enough dissimilarities to make each one distinctive.

There is a recent trend toward creating licensing boards to supervise the issuance of licenses and renewals, formulate necessary regulations and adjust fees as appropriate. What this means is that in the future the published licensing statutes will often be of shorter version and will refer the applicant to the board, who will have the authority to change the details of the law as they deem necessary. Albeit this new concept will provide for the flexibility necessary to adjust to changing times and needs, this system may result in ad hoc decisions that are ultimately detrimental to polygraphy in general, and which will be difficult to overcome when they are found to be inappropriate or intolerable. The licensing boards will not necessarily be comprised of active polygraphers but may be civil service or appointed personnel without polygraph experience or interest, and they may be combined with the office that licenses taxi drivers, hair dressers, chiropractors and itinerant book salesmen.

Virginia has proposed legislation to shorten the published statute and and place the licensing authority in the hands of the professional licensing division of the state. Minimum standards for licensing would then be issued by that office in consonance with the new law. Other states have expressed interest in this concept, and one has intimated the need to adopt this system as a means of consolidating the licensing agencies and as a more efficient way of collecting revenue. Hopefully the fees will not become a more important issue than the qualifications or regulation of the applicants or licensees. At this writing, such regulations are not in force and will not be included in the following data.

Except for the amounts of fees, each of the eighteen licensing statutes cited a licensing and revocation authority, prescribed fees, had complaint-revocation-appeals channels, and required issuances of a license certificate. Applicants were unanimously required to be free from court convictions. The statutes were not in common agreement in the remainder of the stated prerequisites.

Not all the states with licensing statutes required the licensing of all examiners. The statutes of six of the states exempt law enforcement officials from the requirement. Two statutes specifically require that local government examiners be licensed, but they do not specifically include or exclude state or federal government examiners. The fees are waived for law enforcement examiners in two statutes.

The minimum age requirement for licensees is twenty-five in two statutes, twenty-one in twelve, eighteen in three statutes, and is unmentioned in Vermont's law.

Honorable discharge from military service is a prerequisite of six laws. Nine require submission of fingerprints, and seven request photographs. Background investigations are listed in five statutes and another law

stipulates that background investigations will be conducted as necessary.

Polygraph instruments that include a minimum of the pneumograph and cardiosphygmograph recordings are required by all laws except one. These statutes allow the use of additional physiological recording elements.

Ten statutes provided for reciprocal agreements with other licensing authorities; the remaining laws did not mention this possibility, although sixteen states do require that non-resident examiners be licensed to examine in those states. Eleven laws provide for a separate written or oral examination before the license is issued.

Fees, surety bonds, penalties and educational requirements are too varied, to describe here, but are included in Table 3.

An examiner employed by or in the service of the U.S. Army, U.S. Navy, U.S. Air Force, or U.S. Marine Corps must be a U.S. citizen, twenty-five years of age, have a baccalaureate degree from an accredited college or university and have two years of experience as an investigator in a government or law enforcement agency. He must have been subjected to a polygraph examination and have been cleared by a background investigation as being a person of high moral character and sound emotional temperament.

The prescribed training is a fourteen week course of instruction at Fort Gordon, Georgia, under the auspices of the U.S. Army Military Police School. Each trained intern serves six months to a year under the direct supervision of a certified examiner, during which time the intern must demonstrate proficiency in no less than twenty-five examinations. All Department of Defense polygraph examinations are reviewed by a central quality control office for each service.

Formal refresher training is required every two years. To maintain certification an examiner must conduct eighteen examinations semi-annually. If certification lapses, refresher training is required.

The Army conducts the three week refresher courses semi-annually at Fort Gordon. The refresher courses may be used by any federal agency. The fourteen week basic polygraph course is also open to other federal agencies on a limited basis to military reservists and to law enforcement officers under Law Enforcement Assistance Administration sponsorship. Foreign examiners may also be trained at the Military Police School.

TABLE 3

STATE LICENSE PREREQUISITES FOR THE POLYGRAPH

NOTE: A vacant space indicates no specific mention of this item in the statute

	Alabama	Arkansas	Florida	Georgia	Illinois	Kentucky	Michigan	Mississippi	Nevada	New Mexico	North Carolina	North Dakota	Oklahoma	South Carolina	Texas	Utah	Vermont	Virginia	Dept. of Defense
License Required	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Persons exempted from License	b1	b	b	b		b1	b2		b		b	b		b2					
Renewal Period in years	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	2
Application Fee $	60	60	25	50	50	20	100	50	25	100		25	60		60				
State Examination	X	X		X	X		X	X		X	c1		c	X			X		
Examination Fee (in dollars)	30	20					50		e				20						
Annual Fee $	30	25	50	25	25	15	50	25	75	50	a 200	10	25	50	25	25	20	25	
Internship License	X	X	X	X	X	X	X	X			X		X	X	X	X	X		
Internship Period in months	6	12	12	6	12	18	6	12					12	12	12	12	12		6+
Internship Fee #	30	30	50	25	10		25	30					30	25	30	10	20		

TABLE 3

(continued)

	Alabama	Arkansas	Florida	Georgia	Illinois	Kentucky	Michigan	Mississippi	Nevada	New Mexico	North Carolina	North Dakota	Oklahoma	South Carolina	Texas	Utah	Vermont	Virginia	Dept. of Defense
Non-Resident License Required	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
Surety Bond in thousands $	5	1	5					5	2		5			5	5				
Citizenship	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X
Minimum Age	25	21	21	21	21	18	18	21	21	25	18	21	21	21	21	21		21	25
Character Statement	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X		
References									X										X
Conviction Free	X	X	X	X	X	X	r	X	X	X	X	X	X	X	X	X	X	X	X
Honorable Discharge (military)			X		X	X						X				X		X	X
Fingerprints			X	X		X	X	X	X		X					X		X	X
Photograph			X	X	X			X	X		X					X			

TABLE 3

(continued)

	Alabama	Arkansas	Florida	Georgia	Illinois	Kentucky	Michigan	Missis-sippi	Nevada	New Mexico	North Carolina	North Dakota	Oklahoma	South Carolina	Texas	Utah	Vermont	Virginia	Dept. of Defense
Background Investigation			X			X			X		X				X	As nec.			X
Formal Education	h	h	h	h	g		h	h		f	f		h	h	h	g or i		f	g
Polygraph School required	k1	n	X	X	X	X j		k	l		k	m	k2	k	k or o	p	X	X	k1
Grandfather Clause	X	X	X	X	X	X	X	X	X				X	X	X	X		X	
Instrument Prescribed	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X
License to be Displayed	X	X	X	X	X	X		X	X		X	X	X	X	X	X		X	
Reciprocal Agreements	X	X	X	X	X		X					X	X	X		X			
Revocation Authority	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Appeals Channels Stated	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X		X	
License Violation Penalty (maximum)	d4	d4	d3	d	d2	d1	d	d4	d	d	d	d2	d4	d4	d4	d	d5	d6	

TABLE 3 (continued)

SYMBOLS:

X - Specifically cited in statute

a - Fees are for two years

b - Municipal, County, State and Federal law enforcement agents exempted

b1 - License required, but fees are waived for official police authorities

b2 - License required by private and local government examiners; federal agents not mentioned

c - Exam waived if g, h, or k1 are satisfied

d - Misdemeanor penalty

d1 - Fine from $20. to $500.
d2 - Fine from $25. to $500.and/or 6 months jail
d3 - Fine from $100. to $1,000. and/or 1 year jail
d4 - Fine from $100. to $1,000. and/or 6 months jail
d5 - Fine up to $1,000. and/or 6 months jail
d6 - Fine from $100. to $500. and/or 12 months jail

e - Application fee covers cost of examination

f - High school graduate

g - Baccalaureate degree

h - Baccalaureate degree waivable with 5 years investigative experience

i - High school graduate and 4 years investigative experience

j - Two years internship or experience

k - Either graduate from polygraph school and have 6 months internship, or have 12 months internship without school

k1 - Graduate from polygraph school and have 6 months internship

k2 - Polygraph school waived if either g, h, or state exams are satisfied

l - Two years experience

m - Specialized training as approved by Attorney General

TABLE 3 (continued)

SYMBOLS (continued)

n - Polygraph school waivable by 5 years investigative experience

0 - Only state listing specifically the acceptable schools

p - One year internship and 250 exams

q - Waived upon satisfactory completion of state examination

r - Within 5 years

* * * * * * *

EMOTIONAL STRESS AND OSCILLOMETRIC VARIATIONS OF THE PULSE CURVE

By

Ed Glassford, D.Sc.

and

Jan Nyboer, M.D., D.Sc.

ABSTRACT

Recent studies on the action of the vasomotor system in the extremeties have shown correlation with emotional stimuli. This report is concerned with variations in the oscillometric recordings on the upper arm associated with stress. Plethysmographic studies of the fingers indicate that there is sufficient vasoconstriction in the hand and arm to alter the oscillogram of the entire upper extremity when the subject is emotionally stressed.

FORWORD

This paper was prepared because of an expressed interest on the part of polygraph examiners and at the request of Lafayette Instrument Company. It presents a general study of hemodynamics, and specifically the incidence of the dichrotic notch at pressures from 10mm Hg to that in excess of the systolic pressure.

Oscillometery refers to the measurements of oscillations. Oscillations associated with the arterial pressure pulse. On standard polygraph instruments this measurement is made by the cardiographic or "cardio" component. The plethysmograph measures variations in the volume of a body segment or organ. Not to be confused with the photoelectric plethysmography which is influenced by factors other than volume.

INTRODUCTION

Historically man has used physiologic variations to detect deception. The American Indian was known for the application of a hot knife blade to the tongue of the suspect. If the blade adhered to the tongue the suspect was believed to be guilty. The mouth becomes dry when threatened or stressed and fear of detection could cause the blade to stick to the dry tongue.

Ed Glassford, D.Sc., is an Industrial Research Psychologist, Member of the Society for Psychophysiological Research, Consultant to the Michigan State Police Polygraph Unit, National Aeronautics and Space Administration and other clinical research groups.

Jan Nyboer, M.D., D.Sc., is a Professor, Dept. of Physiology, Wayne State University; Consultant, The Dept. of Physiology, Physical Medicine and Rehabilitation at Harper Hospital Wayne State University School of Medicine. Former chief, Cardiovascular physiology research, Harper Hospital, Detroit.

The use of heart rate variability (HRV) has been used as far back as 200 B.C. and has been discussed by Trovillo in Polygraph, Volume 1, Numbers 2 and 3, 1972. HRV is in use today by many investigators.

A variety of methods are in use for measuring or obtaining an index of blood pressure or pulse curve variations, but investigators[1] are not in agreement as to the physiologic cause of the changes observed. Investigators refer to arterial contraction, blood pressure variation, arterial dilation, or volume changes to the finger and hand, while others refer to "stricture of the vessels" and arteriovenous pressure. If an oscillometeric index of pulse curve variation is obtained and observed, all of these references can be considered to be correct because of the relationship of blood pressure volume and hinderance to blood flow within the vascular bed.

While it may be difficult to detect deception by utilizing a single polygraph channel because of disease, drugs, certain chemicals on the skin of the hand, or a psychosis it has been noted that a high degree of reliability of recognizing the activation of the subjects defense mechanism can be established by using the pressure pulse curve which usually can be observed within three to six seconds after stimulation.

DISCUSSION

An emotion will result in a response of the total organism in which the normal pattern of physiological balance is altered. This alteration is to prepare the organism for extensive or less specific emergency action. This involves: subjective experiences, observable changes in behavior, and changes in the functions of the vital organs. The subjective experiences include feelings such as pleasures or unpleasantness, lassitude or excitement, tension, or relaxation. The observable changes are: Facial expressions, adjustments in posture, gestures, changes in the qualities of the voice and plethoric changes in the skin.

Visceral changes or changes in vital functions, may be extremely complex. Although they are complex, they can be recorded. These changes are concerned with the maintenance of homeostatic balance — a sensitive physiochemical balance in the internal environment of the body. These include such factors as temperature regulation, fluid balances, heart rate, blood pressure and respiration rate. These adjustments are necessary in emotional experiences because of unusual demands placed on a system that is normally held in fine balance.

The physiological correlates of behavior in emotional stress are seen as a function of the autonomic nervous system. This system is normally an involuntary mechanism through which homeostatic balance is maintained. The two divisions of the autonomic nervous system are the parasympathetic and sympathetic. It is the sympathetic nervous sustem that has dominant control over most of the smooth muscle activity of the vascular system.

The parasympathetic system overlaps in control in many regions but is not the dominating influence of vasomotor activity. The organs innervated by the parasympathetic system alone are the iris of the eye, glands of the

stomach, muscles of the rectum and colon and other functions that have little or no bearing on the subject under discussion.[2]

A person subjected to stress for a long period of time or a person suffering from a psychosis can develop a real illness. High blood pressure, ulcers, diarrhea, fainting, headache, tachycardia, rapid and laboring breathing are examples.[3] Stress for a brief period of time will bring about minor measurable variations of their more chronic counterparts. The measurements of these variations are as follows: Respiration rate and volume, heart rate, blood pressure, the movement of blood through the tissue, and skin reactions which can be a resistance change or a voltage potential.

The movement of blood through the tissue is regulated by autonomic reflexes. The sympathetic system would act in the case of emotional or thermal variations. If a body was exposed to the cold, the blood flow through the unprotected skin would be reduced to maintain a balance of the internal body temperatures. The other emergency situation could be an emotional stimulus which would constitute a threat to the individual with the same reduction of blood flow. This sympathetic reaction could be explained as a narrowing of the vessel through the action of the vasomotor system. The end result is a reduction of blood volume in the extremities and skin, an increase in systemic blood pressure.

One would not expect a measurable change in the volume of a 4.1 ml. segment of fingertip with only the sound of a mild handclap. Figure 1 shows a significant decrease in segmental volume measured with the mechanical (upper) and electrical plethysmograph (lower). These records indicate each cardiac cycle. Observation of the portion after the stimulus will show vasoconstriction resulting in a segmental volume decrease. The differences in the pulse can be observed by comparing the volume displacement curves before and after stimulus. This plethysmogram clearly demonstrates the sympathetic function. The differences in flow rates through a segment of finger were measured. The flow changed from a rate of 4.9 ml/min/100 ml to 2.6 ml/min/100 ml with a minor vasoconstriction. The decrease in base represented a 13.7 ml/100 reduction in segmental volume.

The reduced flow through the feet, hands, fingers and skin will redistribute that volume to the larger muscles of the extremity resulting in increased segmental volume and arterial pressure.

It has been stated that the total organism responds to emotion. An increase in systolic blood pressure and pulse pressure could result with vasocontriction brought about by that stimulus. With vasoconstriction there is a reduction in the size of the lumen with alteration to the elasticity of the vessel by the contraction of the surrounding smooth muscle. With a constant stroke volume of the heart and a reduction in the flow capacity, an increased pressure will result. This is shown in Figure 2. Also, if elasticity is reduced, the pulse pressure will rise.

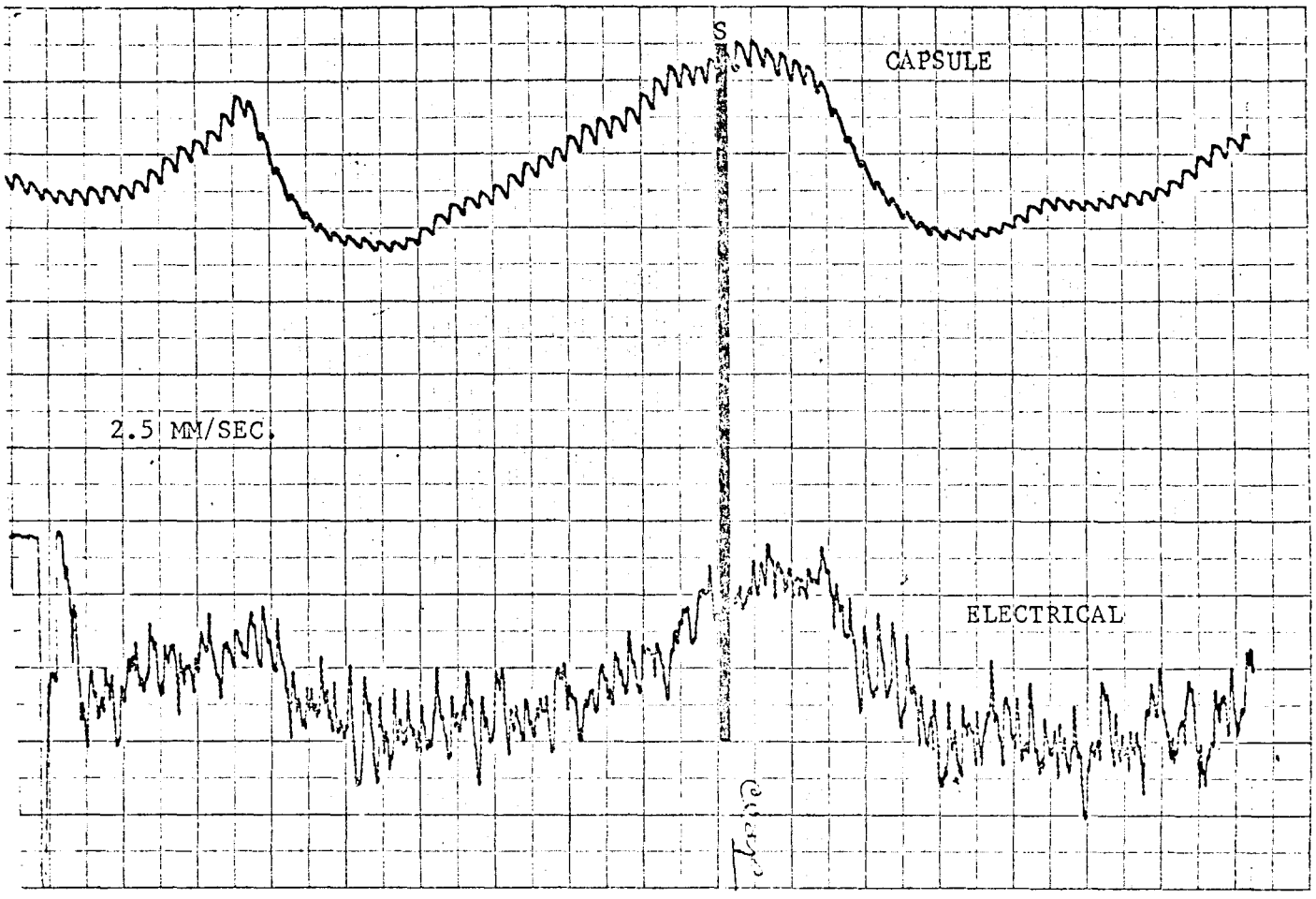


Figure 1

Response to hand clap sound as recorded by capsule Plethsymograph (top) and electrical impedance Plethsymograph (bottom). Records taken from distal portion of 2nd finger. Time of stimulus indicated by line. Chart speed 2.5 mm/Sec.

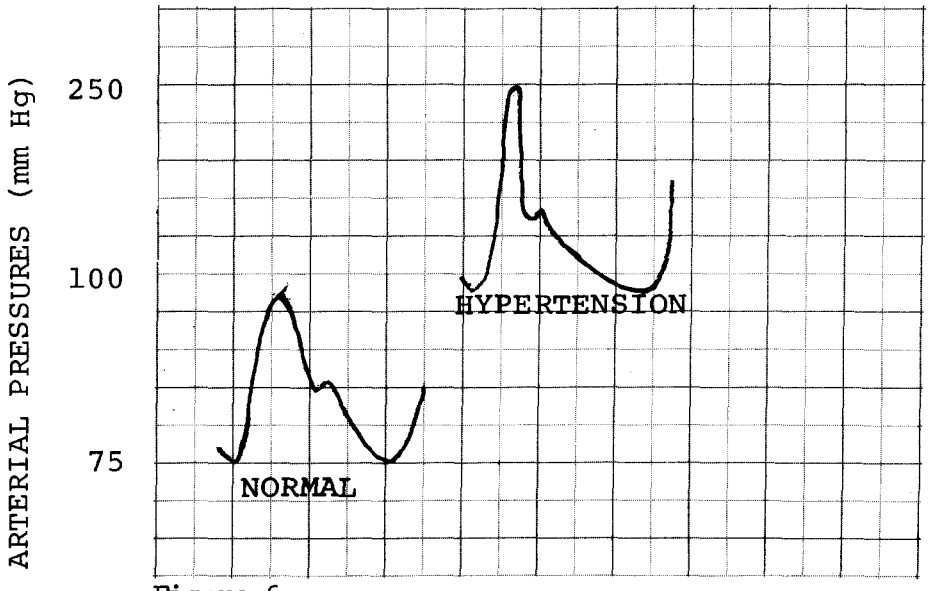


Figure 2

Arterial pressure curves in the brachial artery. Ref: Human Physiology, by R. S. Shepard, pp. 183.

These phenomena could be compared to a plumbing system supplied by a pulsating pump. If the system was fitted with a flexible rubber hose, there would be a continuous output through the nozzle. A high volume output would occur during and after the pump cycle gradually becoming less until the beginning of next cycle. The pressure in this system would be relieved by the expansion of the hose and the continued output because of the pressure exerted on the fluid by the elasticity of the vessel or hose. The pressure at the pump cycle would be compared to systolic pressure and the pressure at the lowest flow the diastolic pressure. The difference between the two being the pulse pressure: example — 120 mm Hg Systolic 75 mm Hg Diastolic or a pulse pressure of 45 mm Hg.

An extreme comparison of vasoconstruction could be the same system fitted with rigid pipe. The pressure during the pump cycle could be 200mm Hg. causing a high pressure "spurt" dropping off to no flow of pressure after the pump cycle. In this case the systolic and pulse pressure would be nearly the same with the diastolic pressure approaching zero. The human circulatory system will react in a similar but less dramatic manner.

This discussion has shown the relationship of flow to pressure and provides a background to better understand the changes found in the oscillogram when the subject is emotionally stressed.

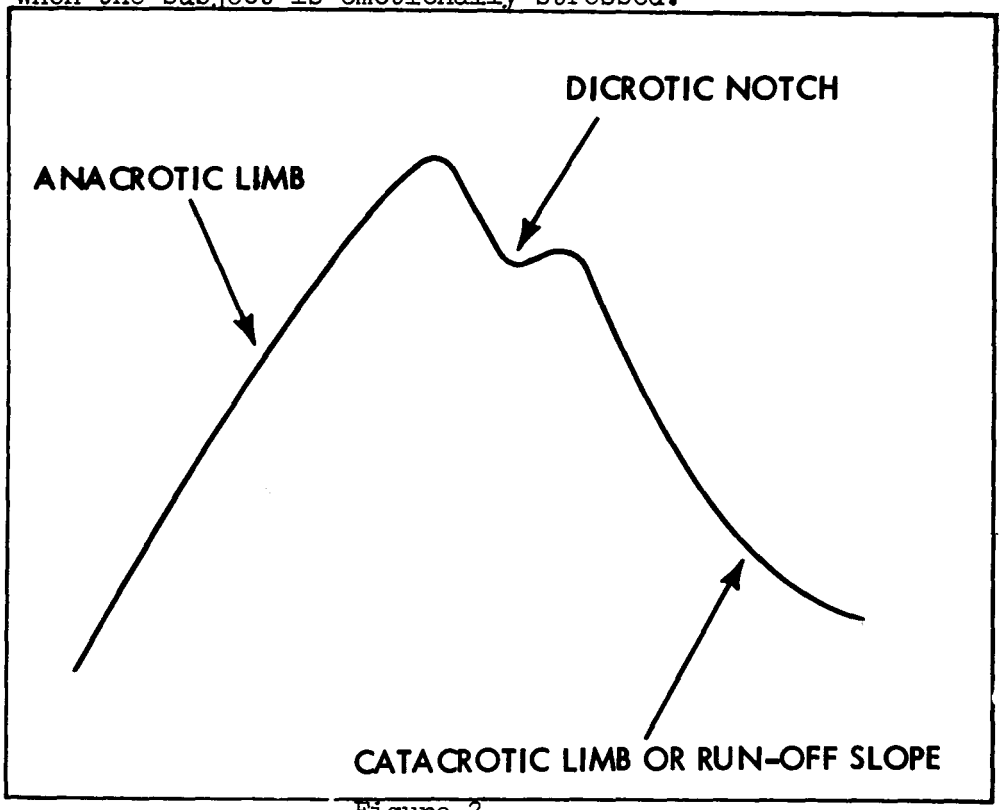


Figure 3

The pulse curve showing inflow to the artery during systole (anacrotic limb), the dicrotic wave occuring at the end of systole and the run-off slope during the emptying of the blood from the segment.

The Pulse Curve

The pulse curve is generated by rhythmic contractions of the heart, filling and distending the arteries with each ejection. During the cardiac cycle the heart muscle relaxes and the ventricle fills for the next ejection. Blood continues to move through the system during the filling and rest cycle due to the pressure exerted on the blood by the expanded elastic vessels. A typical pulse curve is shown in Figure 3.

The anacrotic limb rises sharply with increasing pressures in the aorta and arteries with each ventricular ejection. This limb continues to climb until the ventricle is emptied reducing the volume and pressure of the ejection. This pressure drop results in a sharp dip or incisura in the curve known as the dicrotic wave or notch. The notch or dicrotic wave occurs at approximately the same time as closure of the semilunar valves.

The slope of the catacrotic limb or run off slope depends largely on the elasticity of the arteries and the resistance to flow through the arterioles, capillaries and veins.

Although the dicrotic wave is present in all tissue perfusion and blood pressure recordings it may be damped in tissue distal to the central system, such as the fingers and toes. Changes in vasomotor tone will alter the blood pressure curve and will change the relative position of the notch from the peak of the anacrotic limb as shown in Figure 2.

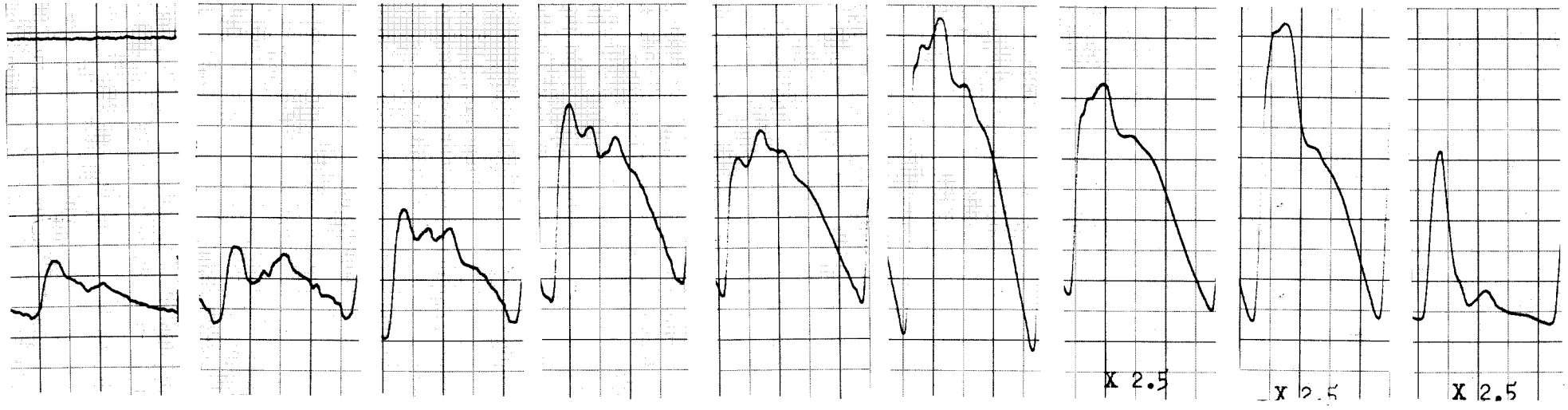
The Oscillogram

The oscillogram is usually obtained by enclosing a body segment in an air filled cuff, similar to a blood pressure cuff, inflated to a reference pressure and recording pressure variations within the cuff. This is an accepted diagnostic screening procedure at this time and is used as a qualitative assessment of peripheral vascular competence.[4] The plethysmogram differs from the oscillogram as no pressures are applied to the tissue producing a more quantitative result from the record. Either method can be used to indicate vasomotor activity.

A change in baseline will also be observed in most cases. This can be related to the respiratory cycle or an indication of vasomotor activity. With vasoconstriction in the hand, fingers, and skin, there is an increase in the upper arm or bicep due to the redistribution of blood to the larger muscles. The respiratory influence is usually not observed when reference pressures in excess of 40mm Hg are used.

The oscillogram can be altered by the reference or cuff pressure. Figure 4 shows pulse curves obtained at different cuff pressures. The subject selected had a dicrotic pulse curve. It can be observed that as the cuff pressure is increased the dicrotic wave is amplified. Although it is greatly modified it is present with pressure exceeding systolic blood pressure.

Oscillograms obtained at reference pressures exceeding systolic blood blood pressure will show a dicrotic wave. The brachial artery is closed

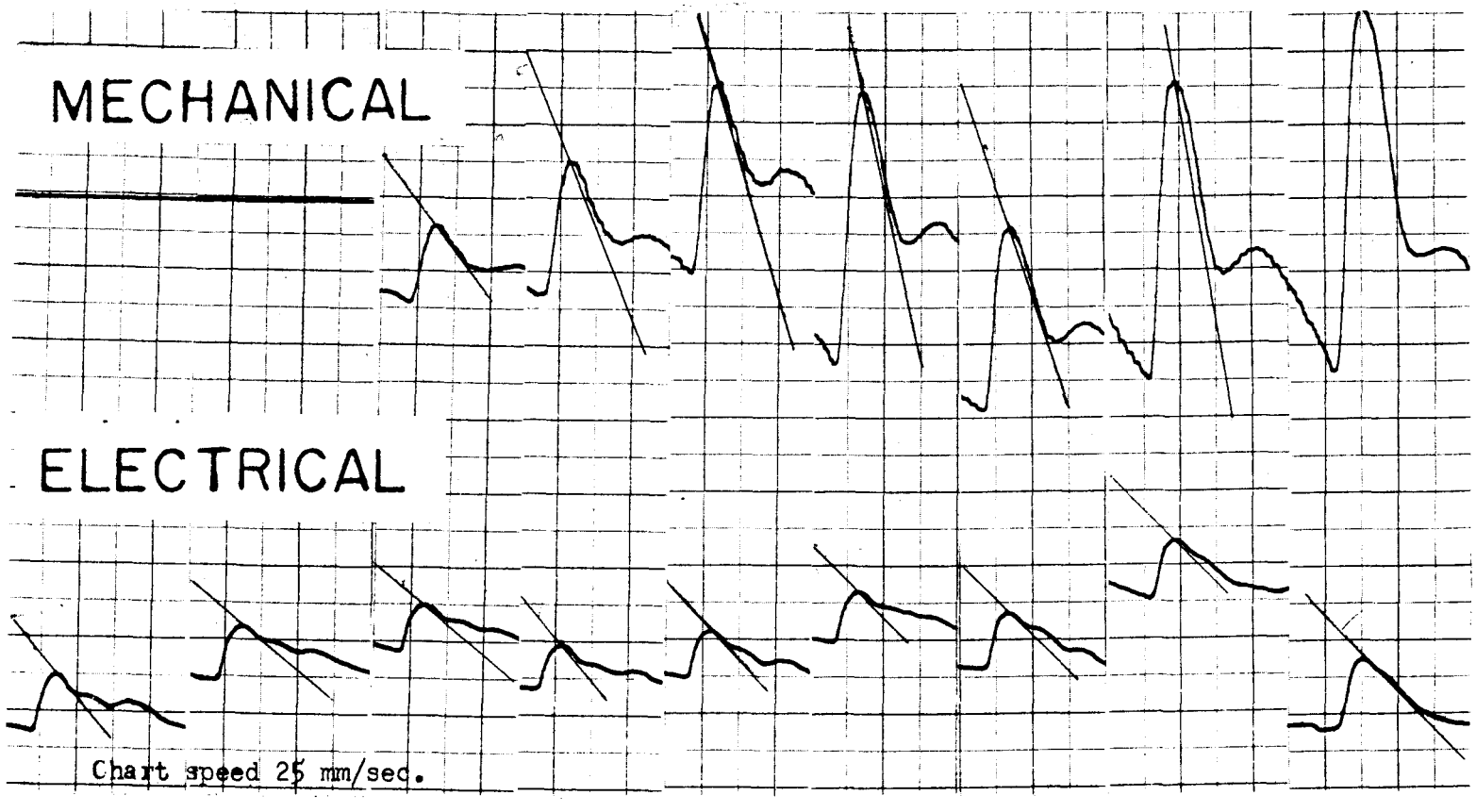


CUFF PRESSURES mm Hg								
10	20	30	40	50	60	70	80	120
EXCURSION HEIGHT mm								
10	13	22	34	28	53	88	125	70

Figure 4

An oscillogram of a dicrotic pulse when applying cuff pressures. Note the presence of the dicrotic notch at pressures from 10mm Hg to that in excess of the systolic blood pressure.

Excursion heights increase with increasing cuff pressures. Chart speed 25mm/sec. Subject; D.D.M. 21, 180#, BP 110/60, Segment upper left arm. 10-27-74 Glassford

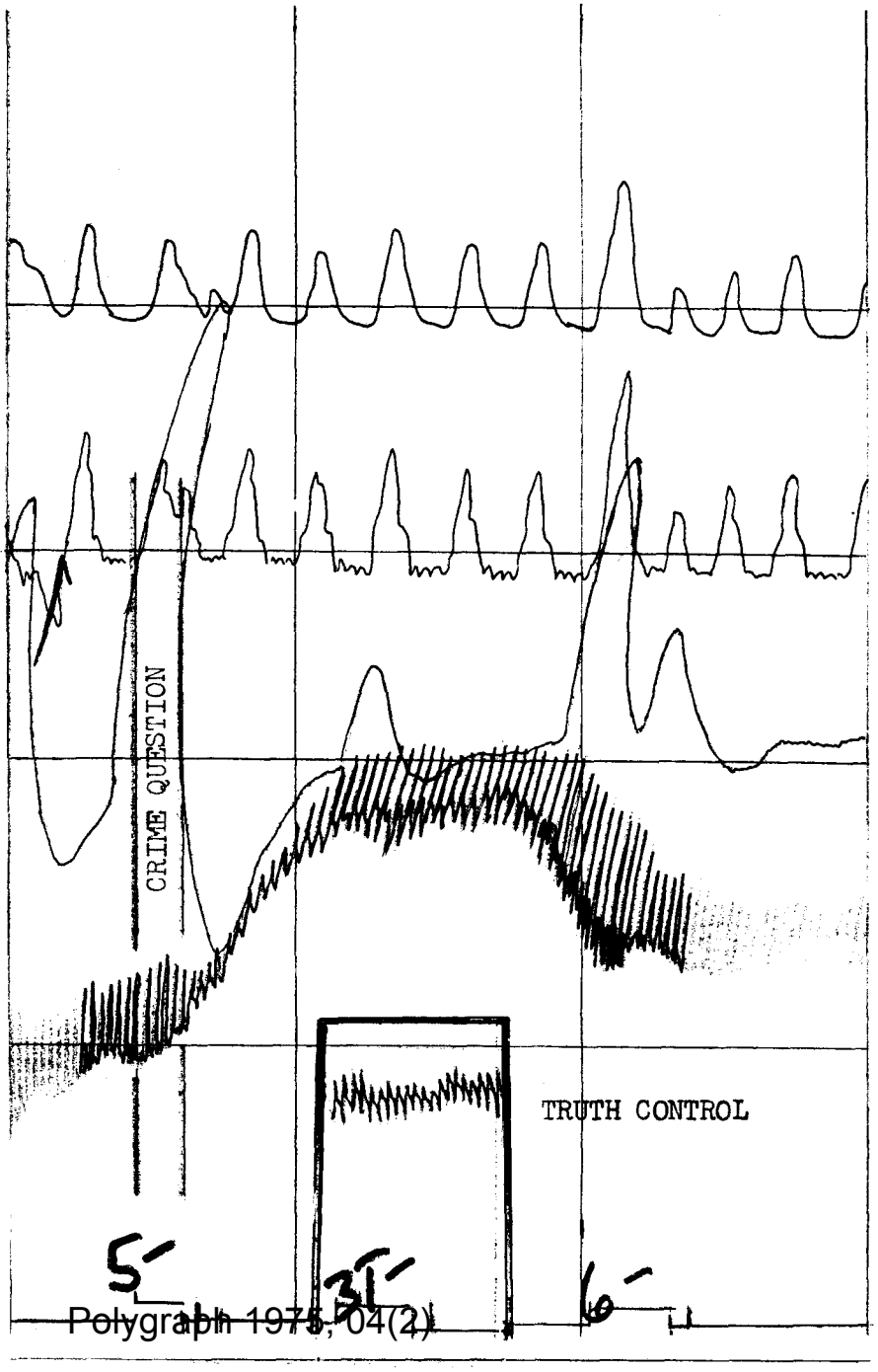


PRESSURE	0	10	20	30	40	50	60	70	80	mm Hg
OSC. INDEX	-	-	1.9	3.2	3.4	4.6	6.6	10.6	14.8	ml/min/100
PLETH.INDEX	5.1	4.2	4.0	3.9	4.2	4.4	4.6	5.2	6.2	" " "

G.L.,M,21,145#,68",BP 110/70,12cm dia.calf,1020 segmwnt vol.,31 ohms res. 73-07-12 Nyboer,Glassford

A comparison of records obtained from the same body segment using the mechanical oscillograph and the electrical impedance plethysmograph. Note that blood flow indices are similar when the cuff pressure is approx. 75% of the diastolic blood pressure.

Polygraph 1975, 04(2)



Polygraph 1975, 04(2)

FIGURE 6

The oscillographic portion of a four chanel polygraph recording obtained during the examination of a murder suspect. Note the base line shift indicating a volume increase of the body segment enclosed under the cuff and oscillations associated with a brief period of hypertension after stimulation by the key crime question.

The suspect confessed to the crime at a later time. (Courtesy of Michigan State Police , Polygraph Unit)

off by the cuff pressure distal from the top portion of the cuff. The portion of open artery proximal from the point of closures will cause pressure variations within the cuff producing a record. This is not a recommended practice as it may be harmful to the subject and will produce a distorted record of doubtful value.

Pressures above 15mm Hg tend to distort the pulse curve by creating a resistance to normal venous return. Figure 4 will show the curve is not seriously altered until the cuff pressure approximates or exceeds diastolic blood pressure. It is recommended that oscillometric records be obtained by applying a cuff pressure equal to 75% of diastolic blood pressure. It has been reported that pressures up to 15mm Hg will not alter the blood flow through that segment.[5] Figure 5 shows blood flow indices obtained by Electrical Impedance Plethysmography and Mechanical Oscillometry on the same body segment. There is no great change in the blood flow index obtained by electrical impedance until 80 mm Hg pressure is applied to the tissue under the cuff. This can be explained as Bier's Reactive Hyperemia as previously reported by one of the authors.[6] The oscillometer produces increasingly higher indices with increased cuff pressures. It can be concluded that oscillographic records are reasonable indices of arterial blood pressure variations when obtained with cuff pressures approximating disastolic blood pressures, 40 to 60mm Hg.

Figure 6 shows the oscillogram recorded on a four channel polygraph obtained during examination of a murder suspect. The key crime question resulted in the physiologic change that has been discussed in this text.

CONCLUSION

Emotional stimuli will alter the blood pressure and flow in the fingers and arm which are reflected in the oscillogram obtained from a segment of upper arm.

Vasoconstriction reduces the blood flow and volume in the distal position of the extremity resulting in an increase in arterial blood pressure and volume in a proximal segment. These pressure flow variations can be seen using oscillometric procedures providing applied cuff pressures are not in excess of those physiologic pressures to be observed.

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THE SEARCH FOR TRUTH AT TRIAL:

AN ARGUMENT FOR ADMISSION OF POLYGRAPH RESULTS AT TRIAL

By

Charles Sevilla*

A. Will it Work?

The legal standard for the admissibility of scientific evidence has generally been in the form of a question: does the evidence have general acceptance within the scientific community to which it belongs? In other words, do the experts in the field agree that the evidence is an accurate representation of what it purports to represent? Although it took almost a century to convince the courts, and substantially less time to convince the scientists, polygraph evidence is a valid determinant of deception when produced by a competent polygraphist. Most courts which have conducted lengthy foundational hearings with witnesses from psychology, psychophysiology and polygraphy agree that "simply stated, the evidence . . . vigorously supports the accuracy of polygraphic evidence."[1]

Admittedly, not all courts are in agreement. However the disputants of polygraph accuracy may quibble over accuracy statistics, the fact remains that no polygrapher or psychologist-conducted study has ever concluded that a competently run polygraph is not valid as an indicator of deception.[2] The issue of admissibility does not disappear, however, despite indication of polygraph accuracy. Other legitimate concerns, discussed below, must be considered in determining how wide the door of court admissibility should be opened.

B. Will it Help?

Once the issue turns from reliability and validity of polygraph results, two questions remain: does the evidence have anything to contribute to our adversary trial system, and if so, does the judiciary have the tools to admit the evidence under proper conditions?

As Justice Stewart notes,"Any rule that impedes the discovery of truth in a court of law impedes as well the doing of justice."[3] If justice is to be equated with the search for truth, then it would appear that "the judiciary can no longer afford to ignore the polygraph. . . "[4] Most practicing attorneys and judges involved in the criminal justice arena would concede that typical pre-trial and trial proceedings are plagued with perjury.[5] Without question, the admission of polygraph evidence would deter

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*Charles Sevilla, San Diego, Calif. B.A. San Jose State College, 1966; J.D. University of Santa Clara, 1969; LL.M. George Washington University, 1971; Member of Supreme Court, California, and District of Columbia Bars; Chief Trial Attorney, Federal Defenders of San Diego, Inc., San Diego, California.

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THE SEARCH FOR TRUTH AT TRIAL:

AN ARGUMENT AGAINST THE ADMISSION OF POLYGRAPH TEST RESULTS AT TRIAL

By

Robert St. John Roper, J.D.*
Deputy Director, D.C. Law Students in Court Program

INTRODUCTION

In 1923, the United States Court of Appeals for the District of Columbia Circuit ruled on the then novel issue of the admissibility of the results of a polygraph examination of a witness.[1] Holding that the "deception test," as it was called, had "not yet gained [generally accepted] standing and scientific recognition among physiological and psychological authorities,"[2] the court refused to allow its admission. Almost fifty years later, and despite some eighty years of experimentation, refinement and sophistication of the "polygraph technique,"[3] the court still refuses to allow its admission.[4]

These two cases, one-half century apart, mark the progress that has been made in persuading courts of appeal[5] of the evidentiary value of a polygraphic examination, whether the proffer is made as substantive evidence or as relating to a witness' credibility.[6]

The arguments most often used against the admissibility of the results of a polygraphic examination fall into three categories:

(1) severe doubt about the reliability of the polygraph as an instrument capable of detecting deception;

(2) uncertainty as to the standards for judging the competence of the operator who administers any particular test; and

(3) fear that because of its aura of scientific accuracy polygraph evidence would have undue influence on the jury.[7]

Arguments for the polygraph's admissability at trial are numerous and exhaustive,[8] and include the dramatic accounts of their use by a well-known

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*Deputy Director, D.C. Law Students in Court Program, Consortium of Universities, Washington, D.C. B.S. Boston University, 1966; J.D. Georgetown University Law Center, 1969. Member of Supreme Court Bar and District of Columbia Bar.

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such a phenomena and aid the fact-finder in resolving conflicts of credibility. It would supplement, not replace, cross-examination, impeachment, and inferences from demeanor evidence in the search for truth.

In light of the scientific data verifying the validity and reliability of polygraph results and the undeniable assist it offers to the administration of justice, most critics argue that the judicial process is ill-equipped to receive such evidence. The criticism usually fall into six categories and may best be answered as follows:

1. Polygraph verificiation statistics are not verifiable. This criticism simply ignores the scientific research to date.[6]

2. Polygraph evidence will not be received with the equanimity given other types of scientific evidence. This argument misconceives the role of polygraph evidence. A polygrapher would not testify whether or not acts were committed by a subject. His testimony would not displace the trier-of-facts function to determine what happened after considering all the evidence. When a witness testifies, he or she is subject to cross-examination in such areas as: (a) bias or prejudice, (b) motive for exaggeration or distortion, (c) previous conflicts with law, (d) memory, (e) faculties, (f) opportunities for observation, (g) testimony at previous hearings, (h) prior statements to prosecutor or his agents, and (i) memoranda relied upon.[7] Polygraph evidence would affect none of the above. It is only relevant to whether or not the witness believes that which he or she contends is true.

The concern that a jury will be unable to receive polygraph evidence as it does other expert evidence displays a contempt for the intelligence of the American juror. The fact is that jurors can and do disregard polygraph evidence when they find sufficient contrary evidence to warrant it.[8]

3. Polygraph responses may be caused by the subject's mental disorder, counter-measures by the subject to defeat the test, or the subject's extreme nervous condition. Persons with mental diseases are usually discovered by counsel prior to a polygraph or by the polygrapher in considering discovery or during the lengthy pre-test interview. If there is a question as to the mental state of the subject, a psychiatric examination may be ordered. If a subject attempts to use physical, mental or drug-induced countermeasures to defeat an examination, such attempts are easily detectable and usually fruitless. To defeat the examination, the subject would have to be able to know how, when, where, and how much to respond on each of the channels of the polygraph on each relevant, irrelevant, control and stygmatic question.[9]

Problems of nervousness due to the fact that one is accused are not unusual. Even when extreme, "the disturbances induced by nervousness usually appear on the polygraph record without relationship to any particular question."[10] Thus, nervousness appears on the charts as a constant and would not enlarge or diminish deceptive or non-deceptive responses.

Apprehension over inaccurate results is generally allayed by the card test by which an examiner determines the subject to be responsive by identifying a card the subject previous selected. This will "assure truthful

subjects of the techniques dependability..."[11] Other fears or anxieties raised over eagerness to cooperate, fear of physical hurt from the instrument, or over the scope of the questioning are dispelled by the pretest interview. It is at this time that the examiner tells the subject about the instrument and how it works; he informs the subject of each and every question which will be asked on the test "to dispel any apprehension on his subject's part about being asked questions dealing with some unrelated matter that may be disturbing him."[12] Finally, the assertion that responses may result from a "guilt complex" on the subject rather than deception ignores established polygraph procedure (a "guilt complex" test) to deal with such individuals.[13]

4. Polygraph evidence will greatly lengthen the trial process, confuses issues for the trier-of-fact, and deny equal protection of the law to the indigent. With the validity of the polygraph technique established when properly conducted, the only barrier to admissibility will be the qualifications of the examiner. "General scientific acceptance is a proper condition for taking judicial notice of scientific facts . . . ," according to McCormick.[14] Thus, trial courts need not be concerned with lengthy foundational hearings to establish the validity of the polygraph technique. Rather, the focus must be on the competency of the polygrapher. Trial courts familiar with the evidence agree that ". . . a qualified examiner can be identified without consuming more court time than is presently necessary to qualify any physician or psychiatrist, and an incompetent can be discovered through ordinary diligence . . . "[15] Although court time would be invested in qualifying examiners, undeniable benefits would result.

> It seems likely that fewer cases will reach trial once the use of the polygraph is fully developed by the prosecution and the defense. The validity of polygraph opinions is clearly established and when a method has been developed to assure the check of the defendant's clearance by the examiners, it is likely that more cases will be dismissed. In the same way, when procedures have been opened to permit government use of the polygraph opinion under the checks suggested herein, it appears that the probability of pleas will be increased. In either case, the result is likely to be a benefit to the innocent and society and will eliminate many cases from the courts.[16]

That the introduction of polygraph evidence would assist rather than hinder juries in resolving factual issues hardly warrants explanation. Judge Joiner, author of the Ridling opinion, from which the above quotation comes, found polygraph evidence an ideal tool to assist the modern juror:

> The argument that the jury will be displaced by a machine or by a polygraph examiner lacks merit. The jury will make the final determination of guilt or innocence. In this connection it is important to understand how different juries are today than they were when the restrictive rules of evidence were first developed. On the whole they read widely. Largely because of television they know generally what is

> going on in the world. Their educational background is extensive. They think. They reason. They are really very good at sorting out good evidence from bad, of separating the credible witness from the incredible, and of disregarding experts who attempt to inject their opinions into areas of which they have little knowledge. They would welcome all evidence having a bearing on the problem they are deciding and the give and take of deliberation would expose weaknesses in any witness or evidence. A modern jury, that must deliberate, and must agree, is the ideal body to evaluate opinions of this kind. The search for truth should be enhanced, eliminating some cases in which both sides agree there is no real issue, and in other cases assisting the jury to reach a just result.[17]

At least one court has been troubled by the potential denial of equal protection for indigent defendants ". . . who cannot take an examination without the government's financing and knowledge."[18] This fear is unfound. The Congress in providing for the adequate representation of federal indigent defendants in 18 U.S.C. § 3006A(e) allows for investigative funds under the Criminal Justice Act of 1964. Hearings for such services must be ex parte where counsel objects to the presence of government counsel, and the failure to hold an ex parte hearing on motion is prejudicial error.[19] Further, the defendant would be entitled to the polygrapher of his choice.[20]

Another wealth-related hypothetical problem is that a rich defendant will take numerous secret polygraphs until he or she "passes." This problem is easily met by requiring a defendant who wishes to introduce polygraph evidence to disgorge all previous exams. Further, to ensure fairness and reliability, the defendant must be willing to submit to another exam by a court-appointed expert. This solution defeats criticisms that defendants will resort to polygrapher-charlatans who will insure them of a "pass." A subsequent "flunk" by the neutral court-appointed expert would provide a basis for denying the admissibility of all such evidence on the ground that its probative value is outweighed by its tendency to unduly consume trial time and confuse the issues before the trier-of-fact.[21]

5. The Prosecution will never be able to introduce polygraph evidence against a defendant because of the Fifth Amendment privilege. No competent polygrapher would test a subject unless the latter were fully cooperative and willing to take the exam. Any coercion invalidates the results. A police-sponsored exam would have to be preceded by warnings and waiver under Miranda v. Arizona.[22] Further, if a complaint or indictment is filed, the police-polygraph of a defendant would be a critical stage of the accusatory process warranting a right to counsel prior to the exam.[23] The above procedural guarantees are sufficient to insure no violation of a defendant's protection against self-incrimination.

The dangers of the police-sponsored polygraph flow from the lack of competency of many police examiners rather than from constitutional considerations. Many of the police examiners today would probably be unable to meet the standards of competency proposed by the courts who have considered the issue.[24] Yet police examiners are used by prosecutors and

investigative agencies to test suspects in criminal cases. Their decisions may screen out many persons from further prosecution. However, the present system where such evidence is inadmissible in court is one-sided and unfair for two reasons: it allows only prosecutors to determine who will be the "lucky" beneficiary of a "pass" of a prosecution-sponsored test; and it places these "lucky" individuals in the hands of many incompetent police polygraphers whose test decision will be of crucial importance to the subject. If the polygraph is to be used to include or exclude individuals from the criminal process, then fairness dictates that its admitted investigative value be coupled with discretionary courtroom admissibility. In this manner, both sides might make use of the polygraph and incompetent police examiners will be exposed by courtroom examination and hopefully promptly retired.

C. Suggested Approaches to Admissibility

The rule of blanket exclusion of polygraph evidence is eroding. Progressive courts are cautiously admitting such evidence where it aids the trier-of-fact in resolving factual disputes. The following factors should be considered by a trial court before exercising its discretion to admit the evidence: a) its probative value should outweigh dangers of prejudice, undue time consumption, or a confusion of issues; b) rigorous standards of examiner competency must be required; c) a witness seeking introduction of the evidence should be required to take the stand as a condition of admissibility; d) all previous exams must be disgorged to the opposition; and e) upon demand, the party seeking introduction must submit to an exam by a polygrapher selected by the trial court.

The following suggestions, in outline form, are factors for counsel to consider in seeking to use and introduce polygraph evidence.

1. The most important decision an attorney can make before considering the use of a polygraph on behalf of his client is the selection of a competent polygrapher. The lack of standardization of qualifications for polygraphers makes this decision difficult. It is suggested the following criteria be kept in mind when selected a polygrapher. The polygrapher should:

   A. Be a graduate of an accredited American Polygraph Association school and licensed to practice in those states which license polygraphers. States requiring licensing are listed in United States v. DeBetham.[25]

   B. Membership in professional organizations such as American Polygraph Association and state organizations.

   C. Use control questions as part of his general questioning technique in tests involving a subject accused of crime.

   D. Be able to numerically score polygraph charts.

   E. Preferably be a college graduate, or have a comparable educational background.

F. If the case is a criminal one, it is important that the polygrapher have a great deal of experience running subjects within the context of a criminal case. Thus, the polygrapher should have at least several hundred examinations of this sort behind him.

G. The polygrapher should indicate that any other competent polygrapher would be able to read his charts and arrive at the same conclusion. Any time a polygrapher indicates that only he can read his charts, great caution should be used in employing this individual. Thus, if the examiner would explain away deceptive reactions (e.g. "The subject told me he was thinking of something else when I asked him that question") the best course of action would be to hire a psychiatrist for your client rather than a polygrapher. The results a polygrapher intends to rely on must be in the charts and other polygraphers using the same technique should be able to read his charts and arrive at the same conclusion.

H. The polygrapher should be able to be a good witness in court. This presupposes his basic integrity and experience in his field. I have made suggestions for polygraphers testifying in "Polygraph Examiner As a Witness in Court", 2 American Polygraph Journal 122 (June 1973). The most comprehensive review of the scientific literature validating the polygraph technique may be found in Barland & Raskin, "Detection of Deception," Electro-Dermal Activity in Psychological Research (Academic Press 1973). The polygrapher must be familiar with this research.

II. After selecting a competent polygrapher, the attorney's next step is to adequately prepare the examiner for the test of the subject. Suggestions in this area include:

A. Supply the examiner with all the discovery reports available as well as information concerning the charges. Also, any initial interviews between the attorney and client should be reviewed to supply the polygrapher with essential background information. This information will be useful to the polygrapher in forumulating control questions.

B. Indicate to the polygrapher that the entire polygraph examination and pretest interview should be tape-recorded (and perhaps video-taped) for possible use in court. This will prevent the opposition from raising questions as to the manner in which the test was conducted.

C. In cases where the client is suspected of drug use, it may be advisable to have the subject's urine tested for drug traces just prior to the test. This would eliminate opposition question as to whether or not the subject was on drugs at the time of the test. This is not an absolute prerequisite since there is no proof that a subject on drugs at the time of a polygraph examination can "beat the test." The most that could happen under these circumstances is an inconclusive result.

D. If the results are favorable, the subject should be interviewed by a psychiatrist. The psychiatrist should then be allowed to hear the tape of the polygraph examination. In this manner, the psychiatrist will be able to determine both that your client is a "normal" human being and that he was functioning normally on the day he took the examination. This evidence will counter any attacks that the client is a psychopathic liar or otherwise defeated the test by mental counter-measures.[26]

E. Insist that the polygrapher maintain a personal chain of custody of the original charts from the time of the examination to the appearance in court. Thus, the charts should be kept in the examiner's office under lock and key. So that there will be no question of "chart switching," make sure the polygrapher has the subject sign each individual chart after the test has been completed.

F. After the examination is over, the polygrapher should xerox his charts and they should be reviewed by at least one other competent polygrapher. Tests have demonstrated that experienced, competent examiners have a high degree of success in reading correctly the charts of other examiners using similar techniques.[27] If the examiners cannot agree on the results, great caution should be used before attempting to enter them into evidence since this will produce an inevitable battle of experts, waste time, and disillusion the trial court as to the scientific nature of polygraph evidence.[28]

III. Areas for use by defense counsel of polygraph results are numerous. Virtually any time there is a factual dispute concerning a concrete issue, the polygraph is available to shed light on the subject's version of that issue. Examples of areas in the criminal law context are:

A. Investigation. Where the subject's version of the facts is incredible, polygraphying the individual on various issues is fruitful in preventing wild-goose chase investigations. Testing a subject who has such a story is often worthwhile when the evidence against him is heavy and a very favorable offer by the government is available, should the case be terminated by means of a negotiated plea. Often, the polygraph test of the individual (and a resounding flunk) is the only procedure which brings the subject around to facing reality. This does not mean that the polygraph is to be used on a client merely because his story differs from that of the prosecution. It would be all too easy to use the polygraph as an instrument to "crack" a client whom others believe is being less than candid. Thus, this process should not be abused. A client undergoing a polygraph test must do so voluntarily. Sometimes, however, an early and successful polygraph can avoid an indictment. This is especially true in sex cases where the prosecutor may doubt the credibility of the complaining witness after learning of the defendant's successful polygraph.

B. Motions to suppress evidence. Often, major factual disputes exist between the client and the agent who conducted a search which produced evidence. Thus, there may be conflicting testimony as to

whether or not your client consented to the search, or dropped the contraband in the view of the officer, or whether the officer was in fact able to smell marijuana, or whether or not there was compliance with a knock and announce statute, and a myriad of other examples. Introduction of polygraph results in this area would aid the fact finder in resolving the dispute between the officer and the defendant.[29]

C. Sentencing. Probation officers often will indicate in pre-sentence reports information that is detrimental to your client above and beyond the factors which led to a guilty plea or to an adverse verdict. Polygraph examinations in this area can resolve such disputes. The same would apply with respect to disputes which form the basis for probation or parole violations.

D. Miscellaneous uses. Polygraph results may be quite useful in buttressing the opinion of a psychiatrist or a psychologist as to a subject's mental state at the time of an offense. Since an expert may rely on hearsay to formulate opinions, polygraph results would be a very powerful factor upon which to place such reliance. Bail reviews, grand jury appearances and preliminary examinations are also hearings where polygraph evidence may play a role.

IV. Laying a foundation for the admission of polygraph evidence.

A. Stipulation. If both parties stipulate to the admissibility of the polygraph results, the vast majority of courts allow the ev idence to be received.[30]

B. Without stipulation. When one party attempts to introduce polygraph evidence without a stipulation, the general rule has been to deny admission because polygraphic evidence is said not to be generally accepted in the field to which it belongs.[31]

1. A more modern view is emerging in which the court, after evidentiary foundational hearings, concludes that the polygraph technique is highly reliable.[32] Eight recent state and federal cases admitting the results of polygraph tests are nicely summarized in "The Emergence of the Polygraph at Trial," 73 Columbia Law Journal 1120 (1973). See also an excellent, comprehensive review of the polygraph in court, Tarlow, "Admissibility of Polygraph Evidence in 1975: An Aid in Determining Credibility in a Perjury Plagued System," 26 Hastings Law Journal 917 (Feb. 1975).

2. In United States v. DeBetham,[33] the district court judge denied admissibility while also noting the high reliability of the polygraph technique in determining deception. This opinion was underscored in the appellate opinion which indicated that polygraph results would be admissible on a discretionary basis with the trial court.[34]

C. Those courts which have recently considered polygraph admissibility and rejected it have done so for a variety of reasons. The citations

below will be areas of concern for trial courts considering admitting polygraph evidence.

1. Lack of standardization in the polygraph community. In United States v. Urquidez,[35] the trial court ruled,

> The most obvious conclusion that resulted from the three days of testimony is that there are many variables, other than the ultimate question of truth or falsity, that can influence the results of a polygraph test. There are also many areas in which 'experts' can disagree as to the appropriateness of the way in which the test is given and as to how the results should be interpreted.

In Urquidez, the court noted that the experts disagreed at length on such items as the appropriate control questions, the wording of the relevant questions and how to read the charts (the experts read the same charts and had opposite conclusions.)[36]

2. Unpreparedness of examiner. In United States v. Lanza,[37] the failure of the examiner to be informed of the evidence in the case and the consequent inability to draft unambiguous questions led to rejection of the polygraph evidence.

3. Probability of error. In United States v. Wilson,[38] the trial court ruled that the current state of polygraphy does not rule out the probability of examiner error. This decision was a product of an evidentiary hearing where the lack of professional standards played a key role in the rejection of the evidence.

D. Recommended resource material for attorneys attempting to introduce polygraph evidence:

1. Reid and Inbau, Truth and Deception, (1973); C. Zimmerman, The Polygraph in Court (1972); H. Altarescu, "Problems Remaining for the Generally Accepted Polygraph," 53 Boston University Law Review 375 (March 1973). It should be noted that there are numerous excellent references in this area and the suggested reading noted here are only preliminary to a full understanding of the subject matter.

E. To conduct an adequate foundational hearing, testimony of leading proponents of the polygraph technique may be necessary to establish its reliability. These witnesses should include the leading polygraphers in the field as well as scientists who have conducted laboratory studies of the polygraph technique. In United States v. Wainwright,[39] the failure of the defendant to produce such foundational evidence was held sufficient to affirm to trial court's refusal to admit the evidence.

> Despite the periodical literature cited relating to the reliability of polygraph testing, Wainwright laid no predicate for the admissibility of this evidence. Without doubt, matters of factual proof must keep pace with developing scientific standards. And rules of evidence exist to assist the jury in arriving at factual conclusions. But no judgment can be made without relevant expert testimony relating to the probative value of such evidence. Wainwright totally failed to supply the condition noted by Wigmore that before such evidence be admitted an expert testify "that the proposed test is an accepted one in his profession and that it has a reasonable measure of precision in its indications." 3 Wigmore on Evidence (3rd Ed. 1940) § 990. The trial court properly excluded it even though in a proper case it may be admissible.

> Although the necessity for such hearings appears dubious in light of the state of the polygraph science today, some trial courts continue to require them. McCormick predicted over two decades ago that the day of judicial notice of the validity of the polygraph would come in the 1960's.[40] Today, the focus of court inquiry should be on examiner qualifications rather than the validity of the polygraph technique.

Nevertheless, where it is necessary to conduct a foundational hearing, extensive preparations are neccessary. In The Polygraph in Court, supra, the testimony of numerous leading experts in the field are included as part of the transcript of the Captain Ernest Medina court martial hearings. The transcribed testimony of leading polygraphers will provide counsel with numerous ideas for properly conducting a foundational hearing. However, Because the process of laying a foundation can be quite costly, if the opposition is agreeable, a stipulation as to the proposed testimony of the experts might be in order, as by stipulating to testimony in previously conducted hearings.[41]

Footnotes

[1] United States v. DeBetham, 470 F.2d 167, 168 (9th Cir. 1972). See also United States v. Ridling, 350 F. Supp. 90 (E.D. Mich. 1972).

[2] See Barland and Raskin, "Detection of Deception," Electrodermal Activity in Psychological Research (Academic Press 1973).

[3] Hawkins v. United States, 358 U.S. 74, 81 (1958) (Steward, J., concurring).

[4] United States v. DeBetham, 348 F. Supp. 1377, 1384 (S.D. Cal. 1972), aff'd 470 F.2d 167 (9th Cir. 1972).

[5] See, e.g., Sevilla, The Exclusionary Rule and Police Perjury, 11 U. San Diego L. R. 839 (1974).

[6]See Barland and Raskin, supra n.2, at 470-77.

[7]See Bailey and Rothblatt, Successful Techniques for Criminal Trials 168 (1971).

[8]E.g., Commonwealth v. Edgerly, Sup. Ct., Middlesex County, Mass. (March 1961) cited in Bailey and Rothblatt, Investigation and Preparation of a Criminal Case, (1970).

[9]See Barland and Raskin, supra n. 2, at 458-470.

[10]J. Reid and F. Inbau, Truth and Deception 169 (1966).

[11]Id. at 268-269.

[12]Id. at 21.

[13]Id. at 32-33.

[14]McCormick, Evidence, p. 491 (2d Ed. 1972).

[15]DeBetham, supra n. 4, at 1386.

[16]Ridling, supra n. 1, at 98.

[17]Id.

[18]United States v. Wilson, 361 F. Supp. 510, 514 (D. Md. 1973).

[19]United States v. Sutton, 464 F.2d 552 (5th Cir. 1972); Marshall v. United States, 423 F. 2d 1315 (10th Cir. 1970).

[20]See United States v. Bass, 477 F.2d 723 (9th Cir. 1973) (indigent defendent entitled to psychiatrist of own choice.)

[21]See Ridling, supra n. 1, at 95-99.

[22]384 U.S. 436 (1966).

[23]E.g., United States v. Wade, 388 U.S. 218 (1967).

[24]E.G., DeBetham, supra n. 4, at 1386. See also Dobrowski, The Polygraph Revisited: An Argument for Admissibility, 4 Suffolk Univ. L. R. 63, 73 (Fall 1969).

[25]Supra n. 4, at 1386, n. 34.

[26]See Heckel, et al., Polygraph Variations in Reactivity Between Delusional, Non-Delusional, and Control Groups in a Crime Situation, 63 J. Crim. L. C. & P.S. 380, 383 (1962).

[27]See Horvath and Reid, The Reliability of Polygraphic Diagnoses of Truth and Deception, 62 J. Crim L. C. & P.S. 276 (1971).

[28]See, e.g., United States v. Uriguidez, 356 F. Supp. 1363 (C.D. Cal. 1973).

[29]See Sevilla, supra n. 5, at 863-875.

[30]E.g., State v. Valdez, 91 Ariz. 274, 371 P.2d 894 (1962); State v. Ross, 7 Wash. 62, 497 P.2d 1314 (Wash. App. 1972); People v. Houser, 85 Cal. App. 2d 686, 193 P.2d 937 (1948).

[31]Frye v. United States, 293 F. 1013 (D.C. Cir. 1923).

[32]Ridling, supra n. 1; People v. Cutler, L.A. Sup. Ct. No. A-176, 965 (Nov. 6, 1972); 12 Cr. L. Rptr. 2133; see also United States v. Zeiger, 350 F. Supp. 685 (D.D.C. 1972) [reversed on appeal without opinion]; Commonwealth v. A. Juvenile, 313 N.E.2d 120 (Mass. Jud. Council 1974).

[33]DeBetham, supra n. 4.

[34]De Betham, supra. n. 1, at 1368.

[35]Urguidez, supra n. 28.

[36]See also Wilson, supra n. 18.

[37]356 F. Supp. 27 (M.D. Fla. 1973).

[38]Supra n. 18, at 513.

[39]413 F.2d 796, 803 (10th Cir. 1969).

[40]McCormick, The Law of Evidence, §§ 174, 369-370 (1954).

[41]E.g., Wilson, supra n. 18, at 511.

* * * * * *

Roper (cont.)

criminal defense lawyer.[9] Yet, it is striking that the polygraph's supporters expend almost all their energies defending only the polygraph examination's reliability and the polygraph examiner's competence. Although imbedded in our concepts of due process is the maxim that the credibility of a witness is exclusively for the jury to determine,[10] no adequate resolution to the threat of the polygraph's intrusion upon traditional jury functions has been offered nor is apparent. And absent a viable solution, polygraph test results should continue to be excluded from evidence at trial.

The Results of a Polygraph Examination of a Witness Should be Excluded From Evidence at Trial*

*We may assume that the proponents of the polygraph's use at trial are correct in their assertions about the examination's reliability and

That there is an inherent and devastating conflict between the jury and the polygraph expert as to who will determine where the truth lies is made explicit by the attempted (and unsuccessful) resolution of the hearsay objection in Ridling:[11]

> The hearsay problem must be put in context. The questions of the examiner and the answers of the subject are not received in evidence to prove the truth of the fact asserted. They have value and will be received as evidence of the stimulus for the response of the autonomic nervous system of the subject that is being interpreted by the expert, and to identify the opinion with a statement or act otherwise made or done by the subject. The testimony to be admitted is the opinion of the expert that the subject is or is not telling the truth. The expert may base his opinion on matters which are '... reasonably relied upon by experts in the particular field.' It is clear that a well conducted polygraph examination, including the questions, answers and the recorded responses, is the stuff on which polygraph experts rely. In one sense, the expert is stating his opinion on what he sees, what he hears and what he knows are the physiological responses of the body to statements that are truthful or not truthful. In this sense, he is like a physician who examines a patient and is permitted to express his opinion on the physiological condition of the patient. This has nothing to do with hearsay.
>
> In another sense, he must report to the jury the statements made by the subject so as to make his opinion relevant to the issues in the case, and as a result of his expertise and the tests conducted he must indicate his opinion of the truthfulness of the statement. In this sense the statements supported by the opinion of the expert appear to be hearsay but since the very purpose of the test is to determine truthfulness, the evidence should be admitted as an exception to the hearsay rule because of its high degree of truthfulness.
> [350 F. Supp. at 99 (emphasis added)]

[*note continued] examiner's qualifications, for these issues are moot if the examiner's testimony must be kept from the jury because of its unwarranted intrusion upon its function. So, too, are the spectre of unreasonable searches and seizures and a denial of the right to remain silent, although the nature of the examination process contemplates a valid waiver of these rights. Ridling, supra n. 5. However, the ensuing argument clearly implies, and is intimately connected with, traditional objections to the

Despite what has appropriately been characterized as efforts to summarily dismiss the hearsay objections to polygraph test results evidence,[12] the Ridling opinion ultimately acknowledges the true nature of such evidence and urges its acceptance "as an exception to the hearsay rule because of its high degree of trustworthiness. Proposed Rules of Evidence of the U.S. District Courts. Rule 803 (24)."

But, more importantly, as the opinion points out, "the very purpose of the test is to determine truthfulness." What then is left for the jury — whose very purpose also is to determine truthfulness — to do but echo the scientific expert's opinion as to who is to be believed? The Court, without citation to any authority or empirical data, answers in conclusionary terms:

> The argument that the jury will be displaced by a machine or by a polygraph examiner lacks merit. The jury will make the final determination of guilt or innocence. In this connection it is important to understand how different juries are today than they were when the restrictive rules of evidence were first developed. On the whole they read widely, largely because of television they know generally what is going on in the world. Their educational background is extensive. They think. They reason. They are really very good at sorting out good evidence from bad, of [sic] separating the credible witness from the incredible, and of [sic] disregarding experts who attempt to inject their opinions into areas of which they have little knowledge. They would welcome all evidence having a bearing on the problem they are deciding and the give and take of deliberation would expose weaknesses in any witness or evidence. A modern jury, that must deliberate, and must agree, is the ideal body to evaluate opinions of this kind. The search for truth should be enhanced, eliminating some cases in which both sides agree there is no real issue, and in other cases assisting the jury to reach a just result.
> [350 F. Supp. at 98]

In contrast, the concession by most supporters of the admissability of the expert's opinion of a witness' credibility, that it "might have an unusually great influence on the jury,"[13] perhaps to the extent of being "conclusive"[14] appears conservative if not entirely gratuitous in light of the observation that in those reported cases in which such evidence was presented to the finder of fact for its consideration (Kenny, Watson, Matter of Stenzel,

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[*note continued] admission of hearsay evidence, keeping that issue viable.

Moreover, the thesis that the use of polygraph results at trial offends concepts of human dignity as fostered by principals of due process, Silving, Testing of the Unconscious in Criminal Cases, 69 Harv. L. Rev. 683 (1956), is also advanced herein.

Walther and Cutter)[15] it resolved factual disputes in favor of the party whom the expert opined was telling the truth.[16]

Nevertheless, in spite of the frightening magnitude of this threatened disruption of the truth-finding process, commentators simply urge that adequate safeguards are found in cross-examination of the expert and limiting instructions to the jury.[17]

The purpose of cross-examination would be to highlight the subjective nature of the results of the polygraph examination[18] — with particular emphasis upon the nature of the examinee's physical and mental condition, the competency, integrity and attitude of the examiner, the wording of relevant questions, the appropriateness of the control questions, and the reading of the graphs.[19] But, having convinced the fact finder of the test's subjectivity, opposing counsel has gained no advantage but simply has minimized or neutralized a distinct disadvantage. Furthermore, if the test is not reliable because of its excessively subjective nature, it has no probative value outweighing probably prejudice or the inordinate "time required in order to explore and seek such factors"[20] bearing on the test's validity. And despite vigorous cross-examination, "the tendency to treat such evidence conclusively would still exist."[21]

Limiting jury instructions is the other means urged as an effective control on the intrusion of the expert's opinions into the jury function.[22] But "[i]t should be reemphasized that the polygraph is unlike other scientific evidence, since the quantity it attempts to measure — the truthfulness of a witness — is so directly related to the essence of the trial process"[23] and, more significantly, "[t]he naive assumption that [the] prejudicial effects [of a witness' testimony] can be overcome by instruction to the jury . . . all practicing lawyers know to be unmitigated fiction."[24]

In spite of this, proponents of the admissibility of the polygraph operator's expert opinion argue that the objections to admissability based upon the undue influence upon the jury is ill-conceived because identical problems arise with respect to other expert witnesses' opinion testimony. And, they argue, if other expert opinion testimony is admissable, why not the polygrapher's?[25] This, of course, is merely a variation of the schoolboy's justification to his teacher for his misconduct ("Everybody else was doing it.") and merits little response. Nevertheless, the lack of any rational basis for this argument is evident in this quotation:

> Perhaps even more significant, however, than improvements in the polygraph itself or the studies about it, is the trend in the modern law of evidence towards all that might legitimately aid a trier of fact in making his determination. As older more formulaic rules of evidence break down, the courts have shown an increasing tendency to admit any evidence that is relevant to the issue at hand absent some specific reason for exclusion. The Proposed Federal Rules of Evidence, for example, say that (save for recognized constitutional and statutory exceptions) all relevant evidence is admissible unless its probative value is 'substantially outweighed by

> the danger of unfair prejudice, confusion of the issues, or misleading the jury . . . ' Rule 401 defines relevant evidence as that 'having any tendency to make the existence of any fact that is of consequence to the determination of the action more probably or less probable than it would be without the evidence.' The polygraph seemingly fits this definition of relevance and has probative value. The only question is whether its probative value is outweighed by the possibility of unfair prejudice before the jury. The recent tendency, as evidenced by such developments as the liberalization of the hearsay rule, is to assume that the jury will evaluate evidence only for what it is worth. As the Ridling court pointed out, modern juries are considered competent to evaluate all kinds of scientific tests. Two good examples are ballistics evidence and voice prints. None consider ballistics tests infallible; there is considerable evidence that such tests are of uncertain reliability. The same is true of voice print tests, which were recently ruled admissible as evidence although they are much less widely used than polygraph, although experimentation with them has been much less extensive, and although statistical claims of reliability are much less impressive.[26]

The opening sentence implicitly states the contested issue: does the expert's opinion aid or abrogate the trier of fact in reaching a verdict? The answer suggested is based on an assumption about people, and, indeed, also begs the question. For if jurors evaluate the expert's opinion as conclusive on the issue of where the truth lies, the trial process is turned on its head and is no more than a charade, the verdict having been reached even before trial.[27] In fact, the recognition of the very real threat posed by the admission of such evidence at trial is demonstrated in another passage from the same Note quoted above.

> Other considerations apply, however, to the situations in which the defendant in a criminal case agrees to take a polygraph examination on the basis of an understanding that if he passes the test he will have indictment dismissed, but if he fails he will plead guilty. Both sides are essentially gambling on the outcome of a mechanical test. Even though the polygraph is claimed to have great statistical accuracy, it is not infallible. The result of such agreements is to revert the judicial process to a more sophisticated modern analogue of the ancient practice of trial by ordeal: if a defendant is able to pass the mechanical test he will go free, if not, he will be punished.[28]

If polygraph evidence is used at trial, aren't both sides still gambling on the outcome of a mechanical test and doesn't the judicial process revert to the ancient practices of inquisition and trial by ordeal? The answer is clearly in the affirmative.[29]

Finally, the argument which seeks support for admission of polygraph evidence in the admission of other expert opinion evidence overlooks an extremely effective means of neutralizing the admittedly unduly prejudicial effect on the jury of much opinion testimony: bifurcation. For example, a criminal defendant who intends to raise a defense of insanity may, in the trial court's discretion, have separate trials on the issues of guilt and insanity.[30] But as the factual issues are resolved only by resolution of witnesses' credibility, bifurcation is obviously not feasible when polygraph evidence is offered.

CONCLUSION

Before the question of the admissability of polygraph test results at trial is answered, we must first determine whether the promise of elimination of human bias[31] is one we wish fulfilled. The price for eliminating bias would include, inter alia, elimination of pathos as well. The result could only be justice diminished.

That is, in reality, what the use of polygraph test results at trial promises; there can be little disagreement that the suggested methods of tempering its devastating impact are ineffectual. Perhaps that is why so little attention has been paid by commentators to this problem. They recognize that the methods of control — cross-examination and limiting jury instructions — can not by themselves be taken seriously.

Because of what the admission of such evidence means to the traditional trial process, we must either find an effective means of controlling its use at trial or be prepared to accept the consequences of the promise delivered. If there is no viable control then such evidence must remain outside the courtroom, or justice and due process as we know them must step aside for a cold, unsympathetic search for truth.

Footnotes

[1] Frye v. United States, 54 App. D.C. 46, 293 F. 1013 (1923).

[2] Id. at 47, 293 F. at 1014.

[3] J. Reid and F. Inbau, Truth and Deception: The Polygraph ("Lie Detection") Technique, (1966); See, e.g., F. Horvath and J. Reid, The Polygraph Silent Answer Test, J. Crim. L. 285 (1972); C. Vetter, The Lie Machine, Playboy, p. 93 (April, 1973).

[4] United States v. Zeiger, ____ U.S. App. D.C. ____, 475 F.2d 1280 (1972) (per curiam order reversing United States v. Zeiger, 350 F. Supp. 685 (D.D.C., 1972) in which the trial court found that polygraphy had emerged from the "twilight zone between experimental and demonstrable stages . . . into an established field of science and technology." 350 F. Supp. at 688). The court has even gone so far as to hold that it is not error for the trial court to refuse to hold a hearing on the test's admissability. United States v. Skeens, ____U.S. App. D.C.____, 494 F.2d 1050 (1974).

[5]Trial courts are more receptive to allowing the use of polygraphic evidence at trial. United States v. Zeiger, 350 F. Supp. 685 (DD.C., 1972), rev'd, ___U.S. App. D.C.___, 475 F.2d 1280 (1972); United States v. Ridling, 350 F. Supp. 90 (E.D. Mich., 1972) ("The opinion of the polygraph examiner . . . is direct evidence on [whether the perjury defendant was lying] and may be offered by either side . . ."); United States v. Dioguadi, 12 Crim. L. Rev. 1102 (E.D.N.Y., 1972); United States v. Hart, 344 F. Supp. 522 (E.D.N.Y., 1971) (Results of test admissable to test government witness' credibility); Walther v. O'Connell, 72 Misc. 2d 316, 339 N.Y.S. 2d 386 (Queens Cty. Ct., 1972) ("Even the wisdom of a King Solomon would be tried in deciding a case such as this"); Matter of Stenzel v. B., 71 Misc. 2d 719, 336 N.Y.S. 2d 839 (NIagra Cty. Ct., 1972) ("Everyone but the court's (sic) have found it a useful, reliable guide to the truth."); People v. Kenny, 167 Misc. 51, 3 N.Y.S. 348 (Queens Cty. Ct., 1938) (result of lie detection test of robbery defendant, like handwriting, psychiatric and other expert testimony, is admissible). Further, such evidence has been admitted in pre-and-post trial proceedings. People v. Cutter, 12 Cr. L. 2133 (Calif. Super, Ct., 1972) (Suppression hearing; "The principal role of the trier of fact is the search for truth and any reasonable procedure or method to assist the court in this search should be employed."); State v. Watson, 115 N.J. Super. Ct. 213, 278 A. 2d 543 (Hudson Cty. Ct., 1971) (Probation revocation; Results admitted to show defendant's attitude, obedience to court order, and to disprove accusations of misconduct on probation.)

[6]McCormick, Evidence, p. 506 (1972); Reid and Inbau, at pp. 237-254. McCormick points out, however, that a small minority of courts allow such evidence if the parties stipulate to its admissability. McCormick, p. 507; e.g., State v. Stanislowski, 15 Cr. L. 2095 (Wisc. Sup. Ct., 1974) Note: The Role of the Polygraph in Our Judicial System, 20 S. Cal. L. R. 804, 811-814 (1968); See, Note: The Emergence of the Polygraph at Trial, 73 Col. L. R. 1120 (1973).

[7]The Emergence of the Polygraph at Trial, supra n. 5, at p. 1122.

[8]E.g., Reid and Inbau, at pp. 254-262; F. Horvath and J. Reid, The Reliability of Polygraph Examiners' Diagnosis of Truth and Deception, 62 J. Crim. L. 276 (1971); The Emergence of the Polygraph at Trial, supra 6; Note: The Polygraph Revisited: An Argument for Admissability, 4 Suffolk L. R. III (1968); The Role of the Polygraph in Our Judicial System, supra n. 6. And see the cases cited supra 5.

[9]F. Bailey, The Defense Never Rests, (1971); F. Bailey, Book Review, 1 Suffolk L. R. 137 (1967).

[10]E.g., Curley v. United States, 81 U.S. App. D.C. 389, 160 F. 2d 229, cert. den., 331 U.S. 837 (1964).

[11]Supra n. 5.

[12]Silving, Testing of the Unconscious in Criminal Cases, 69 Harv. L. R. 683, 686-687, n. 17 (1956).

[13]The Role of the Polygraph in Our Judicial System, supra n. 6., at p. 833.

[14]The Polygraph Revisited: An Argument for Admissability, supra n. 8, at p. 123.

[15]These cases are fully cited supra n. 5.

[16]Of significant interest also is the recently articulated opposition of the United States Department of Justice to the use of polygraph results at trial on the grounds, inter alia, that:

> . . . because of the undue reliance juries are likely to place on the apparent mechanistic accuracy of polygraph results, we believe that the introduction in evidence of polygraph results would virtually vitiate juries' historical fact-finding responsibilities." Justice Opposes Evidentiary Use of Polygraph Results 16 Cr. L. 2306 (1975).

[17]E.g., Commonwealth v. A Juvenile, 15 Cr. L. 2323 (Mass. Sup. Jud. Ct., 1974).

[18]"It should be pointed out that the test requires the examiner to draw inferences from the objective results (physiological measurements) of the instrument." The Polygraph Revisited: An Argument for Admissability, supra n. 8, at p. 123.

[19]United States v. Urquidez, ____ F. Supp. ____, 13 Cr. L. 2151, 2152 (C.D. Calif., 1973).

[20]Id.

[21]The Polygraph Revisited: An Argument for Admissability, supra n. 8, at p. 123.

[22]United States v. Zeiger, 350 F. Supp. at 691; Reid and Inbau, at p. 257; The Polygraph Revisited: An Argument for Admissability, supra n. 8.

The standard instruction used in the District of Columbia criminal courts is as follows:

> An expert in a particular field is entitled to give his opinion in evidence. You should consider his testimony in connection with other evidence in the case and give it such weight as in your judgment it is fairly entitled to receive.

Criminal Jury Instructions for the District of Columbia, Instruction # 1.05 (2d Ed., 1972).

[23]The Emergence of the Polygraph at Trial, supra n. 6, p. 1141.

[24]Krulewitch v. United States, 336 U.S. 400 at 453 (1949) (Jackson, J., concurrir

[25] E.g., Reid and Inbau, supra n. 3, at pp. 254-262.

[26] The Emergence of the Polygraph at Trial, supra n. 6 at pp. 1138-1139 (emphasis added; footnotes omitted).

[27] Commonwealth v. A Juvenile, 15 Cr. L. 2323, 2325 (Quirico, Reardon and Kaplan, J.J., dissenting).

[28] Id., at p. 1140 (footnote omitted).

[29] Testing of the Unconscious in Criminal Cases, supra n. 12, at p. 683.

[30] E.g., United States v. Ashe, 138 U.S. App. D.C. 356, 427 F. 2d 626 (1970).

[31] Skolnick, Scientific Theory and Scientific Evidence: An Analysis of Lie Detection, 70 Yale L. J. 694 (1961).

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ANSWER KEY TO POLYGRAPH REVIEW ON SEMANTICS:

COMMENT: Semantics is a critical part of every polygraph examination. Far too many examiners fail to remember that the words and expressions they use in phrasing test questions, or even in conversation with the examinee, may be the most important factor in determining the reliability and validity of their examinations. We tend to forget that our words have the power to mold men's thinking, to channel their feelings, and to direct their behavior. Only if an examinee properly comprehends a test question, can the examiner accurately interpret a response, or lack thereof, to that question. The examiner must assure that his interpretation, and that of the examinee, are the same, to every test question. In this regard, the examiner must yield to the vocabulary of the examinee. Also, the examiner must be careful that certain words used in question construction do not, in and of themselves, create an emotional response.

ANSWERS:	1.	d	6.	True
	2.	a	7.	True
	3.	c	8.	True
	4.	b	9.	False
	5.	c	10.	True

* * * * * *

PREDICTING DISHONESTY WITH THE REID REPORT

By

Philip Ash, Ph.D.
Director of Research
John E. Reid and Associates[1]

INTRODUCTION

Employee theft of money and merchandise imposes a heavy tax upon business — particularly in department stores, on home delivery, bakery and milk routes, in banks and warehouse guard positions, in toll-road collection booths, in grocery stores, on coin-vending machine pick-up routes, and in other activities and establishments where clerks, drivers, guards and salespersons daily handle cash and goods with only limited supervision. Virgil Martin (1970), Chairman of the Board of Trustees of Carson Pirie Scott, a large Chicago department store chain, estimated that retail department store losses due to employee theft equalled profits before taxes, and amounted to two to four percent of gross sales income in 1970. Police-reported losses for employee theft were estimated at over $380 million a year in 1968, and increasing rapidly. In the decade from 1960 through 1969, crimes of larceny, including theft, increased from 282.3 per 100,000 inhabitants to 749.3 per 100,000, an increase of 265 percent. Norman Jaspan (1968) reported that white-collar employee thefts were running at the rate of five million dollars a day.

Control of Losses

Attempts to control and reduce losses due to employee theft have used three principal methods: apprehension and prosecution of the thief, various security devices to make theft more difficult and more readily detectable, and screening job applicants to weed out potential thieves.

A fourth approach was advanced by Lawrence R. Zeitlin (1971), arguing that "a little larceny can do a lot for employee morale." If management in unwilling to increase the quality of workers' jobs, or their pay and other benefits, employees will resort to stealing. He went on to urge that management use "such illicit job enrichment" to keep employees happy, at little expense; that groundrules be established setting maximum limits for employee theft. For thefts below this amount, management would look away. The largely critical letters to the editor that appeared in subsequent issues of Psychology Today, however, made it fairly clear that neither businessmen nor social scientists are yet willing to rewrite the current codes of ethics and morality to qualify the Commandment to read "Thou shalt not steal — too much". It is furthermore extremely doubtful that

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[1]Dr. Ash is a Professor of Psychology at the University of Illinois, Chicago Circle Campus, now on sabbatical at the University of Witwatersrand, Johannesburg, South Africa.

permitting theft would either lead to a controlled level of losses or to better employee morale. Zeitlin describes his procedure as "job enrichment" and invokes Herzberg's motivator-hygiene theory of job satisfaction (1959), to provide theoretical support for the proposal. This is about as bad as misinterpretation of the implications of the theory as any critic of Herzberg has ever made. In the first place, in the whole literature of industrial psychology it would be difficult to find a work resting more firmly on Judaic-Christian ethics and morality than Herzberg's Work and the Nature of Man (1967) and the spirit of this book infuses all of Herzberg's technical writings. In the second place, even if the moral thrust of the two-factor theory were ignored, "money as a benefit" would be classified as a "hygiene factor," not as a "motivator." The theory would predict that (a) the effects (in regard to job satisfaction) of stealing would be short-lived, (b) these effects would only reduce dissatisfaction, not increase job satisfaction, and (c) the demand level for the "benefit" would escalate — to reduce dissatisfaction workers would demand ever-increasing amounts of money.

The three more conventional alternatives, however, have not been very successful in preventing employee theft either (Ash, 1971). The first involves apprehension and prosecution of the thief. The second includes security devices of various sorts. These, too, have had only limited success. The third line of defense has been to attempt to screen dishonest people out of the flow of applicants for employment. Here, again, three main approaches have been attempted: (1) the polygraph or lie detector, (2) the employment reference, retail credit bureau, and police check, and (3) the questionnaire, test or inventory which the applicant is asked to fill out, and which purports to yield a prediction as to whether or not this applicant, if hired, would steal or otherwise be dishonest.

Most of the psychological tests and questionnaires used share one important characteristic. From the point of view of the person taking the test or questionnaire its intended function is disguised. The subject is generally aware that the test measures some aspect of personality; he generally is not aware that the test is supposed to yield a measure of his honesty or proneness to delinquency.

The Reid Report

The Reid Report (1967, 1971), a recently developed paper-and-pencil device, differs from these other devices in two important respects: first, it has been designed to predict only one kind of delinquent behavior, proneness to theft; and second, its purpose should be transparent to the examinee.

The Reid Report consists of three main sections. The first section (called the Reid Report Inventory) comprises a yes-no questionnaire including two sets of items. The first set yields a measure of punitiveness as reflected in attitudes toward punishment for crimes of theft (e.g., "Do you believe there are some cases where a person has a right to steal from an employer?"; "An employer discovers that a long-service, trusted employee has been taking a few dollars out of the cash register each week. Should the employer have him arrested?"). The second set of questions is intended to measure the individual's own attitude and behaviors relating to theft

(e.g., "Did you ever think about committing a burglary?"; "Are you too honest to steal?").

The second section of the Reid Report consists of a detailed biographical data blank covering previous employment, education, personal history, financial history and indebtedness, and medical and social history (use of alcohol and drugs, psychotherapy, experience with police including questioning about arrest* for and conviction of a variety of theft related crimes, and gambling practices.)

The third section includes a list of questions about one's own honesty ("How honest are you?", with alternatives ranging from "Under 1 percent" to "Over 50 percent"), and questions to which a "yes" response constitutes an admission of a committed theft or other defalcation (e.g., "Did you write a check knowing there was not enough money in the bank more than three times?", "Did you make a false insurance claim for personal gain?").

Personnel people, looking over the questions on the three parts of the Reid Report frequently express astonishment that it works. The typical reaction is that an employment applicant will "see through" the test and "fake good." In fact, this does not seem to happen. Although it may seem incredible, applicants in significant numbers admit to all kinds of delinquencies, defalcations, and crimes. Hard data are not yet available to prove why this should be the case, but at least two important human tendencies seem to be at work. In the first place, in contemporary American society, there exists a strong tendency toward confession, expressed in the aphorism "Confession is good for the soul." Confession reduces guilt; the act of confession itself seems to mitigate the offense confessed. In the second place, response to the questions in the Reid Report is strongly determined by the individual's own practices: someone who steals will approve of punishment only for thefts greater than his own.

To date, studies of scores on the Reid Report Inventory in relation to previous theft behavior and theft-related attitudes have been made over samples of over 3,500 subjects — bona fide applicants for employment, college students, and prison inmates. These studies have demonstrated that scores on the Reid Report Inventory (the objective yes-no attitude questionnaire) are correlated with the previous, verified theft behavior, and that there is little or no ethnic difference in relation to theft proneness (Ash, 1970, 1971, 1973, 1974).

Predictive validity studies are hard to conduct in this area. While "shrinkage" rates go down, the identification of individual thiefs remains uncertain.

A predictive validity study was attempted in a leading Chicago bank. A total of 251 employment applicants were given the Report; 140 were hired without reference to Inventory score. Table 1 compares the tested and hired samples: there were no significant differences on the Inventory

*Recent court decisions prohibit questioning of employment applicants about arrests. These questions are no longer included in the Reid Report.

scores, demographic characteristics (age and education), or responses to the Admissions section of the Report.

Table 1

Means and Standard Deviations,
Total Samples (N=251) and Hireds (N=140)
of a Major Bank

Variable	Total Sample		Hired	
	Mean	S.D.	Mean	S.D.
RR Inventory				
Punitive Score	23.6	6.1	23.9	6.3
Project Score	27.9	5.1	28.1	4.9
Total Score	51.5	9.8	52.0	9.9
Age	22.2	8.2	21.8	8.4
Education-Years	12.8	1.9	12.5	1.5
Education-Level	1.1	0.4	1.09	0.3
Self-Rating	1.4	1.1	2.45	1.05
Other-Rating	1.6	1.6	2.8	1.8
Money Taken	0.1	0.3	0.01	0.8
Merchandise Taken	0.1	0.5	0.03	0.2
Admissions	0.03	0.2	0.03	0.2
Arrests	0.04	0.6	0.01	0.08

In this study, there were no polygraph interview criterion. Of the five criteria used (status, termination reason, would rehire?, length of service, theft from bank) only the last related to the honesty, and only two individuals (Table 2, Reason for Termination) of the 140 hires were terminated for theft.

The intercorrelations among the 14 Reid Report measures and the 5 criterion measures are presented in Table 3. Three are substantial correlations among the RR Inventory scores and among the criteria, but most of the other correlations are negligible small. However, the Reid Report as a whole can be a fairly good predictor of the entire set of criteria that measures "employee excellence".

The canonical correlation (Hotelling, 1935; Hotelling, 1936; Whitla, 1968, p. 124-126) between the initial hire predictors derived from the Reid Report and the five criteria is 0.74. On the predictor side, the three items that have the highest coefficients are: RR Inventory Punitive Score (.63) and Total Score (.68), and Number of Reported Arrests (-.92).

Table 2

Bank Study: Distribution of Hires (140 Cases)

	N	Pct.
1. Sex		
Male	32	22.9
Female	108	77.1
2. Race		
White	101	72.1
Black	35	25.0
Other	4	2.9
3. Age		
20 & Under	93	66.4
21-25	24	17.1
26-35	12	8.6
36 & Over	11	7.9
4. Education (Years)		
10	4	2.9
11	15	10.7
12	81	57.9
13	15	10.7
14	12	8.6
15	3	2.1
16	6	4.3
17	1	0.7
18	3	2.1
5. Education (Level)		
No Degree	130	92.9
Bachelors	8	5.7
Masters	2	1.4
6. Self-Rating of Honesty		
Far Above Average	29	20.7
Above Average	50	35.7
Somewhat Above Average	30	21.4
Average	31	22.1
7. Percent of Employees Dishonest		
1 percent	43	30.7
5 percent	32	22.9
10 percent	20	14.3
15 percent	18	12.9
25 percent	13	9.3
35 percent	7	5.0
50 percent	5	3.5
Over 50 percent	2	1.4

	N	Pct.
8. Money Taken from Employers		
None	139	99.3
Can't Remember	1	0.7
9. Merchandise Taken		
None	137	97.9
Can't Remember	2	1.4
$1	1	0.7
10. Admissions		
None	136	97.1
1	4	2.9
11. Arrests		
None	139	99.3
1	1	0.7
12. Status		
Terminated	74	52.9
Still Employed	66	47.1
13. Reason for Termination		
Voluntary	66	47.1
Involuntary-No Theft	6	4.3
Involuntary-Theft	2	1.4
Not Terminated	66	47.1
14. Would Rehire?		
No	15	10.7
Yes	59	42.1
Still Employed	66	47.1
15. Length of Service (Months)		
1-4	26	18.6
5-8	10	7.1
9-12	15	10.7
13-16	15	10.7
17-20	6	4.3
21-24+	68	48.6

Table 3

Intercorrelation Matrix for Sample of 140 Applicants Hired by a Bank

	Variable Number																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
REID REPORT Inventory																			
1. Punitive Score	--	56*	91	00	-01	21	-03	-03	-22	-35	-11	-20	-20	-07	06	05	02	00	09
2. Project Score		--	85	18	00	09	-09	-02	-24	-44	-24	-25	-34	00	04	00	02	-02	-03
3. Total Score			--	09	-02	18	-06	-03	-26	-44	-19	-25	-29	-04	06	04	04	00	04
4. Sex				--	03	-01	-26	-32	10	10	05	-01	-11	05	-10	-06	-11	-06	08
5. Race					--	12	05	-03	14	07	-05	12	06	11	10	-02	-01	06	-16
6. Age						--	19	13	07	-17	-05	01	-08	06	18	15	13	18	-02
7. Years of Education							--	76	-14	03	-03	04	00	03	04	-02	01	-02	00
8. Level of Education								--	-13	-04	-02	-04	-04	-02	10	05	09	05	03
REID REPORT																			
9. Self-Rating									--	09	-12	04	-03	-04	04	13	08	12	05
10. Rating of Others										--	05	07	06	-09	-11	-10	-15	-02	12
11. Took Money											--	40	-01	-01	09	07	08	08	01
12. Took Merchandise												--	-02	-01	15	12	13	13	02
13. Admissions of Defalcations													--	-01	-08	-02	-03	-02	02
14. Number of Arrests														--	-08	-26	-17	-15	-70
Bank Criteria																			
15. Status (Employed or Term.)															--	80	90	87	11
16. Termination Reason																--	90	79	36
17. Would Rehire?																	--	84	24
18. Length of Service																		--	19
19. Theft from Bank																			--

*Decimal Points Omitted

On the criterion side, in spite of the very lop-sided split, the most heavily-weighted item (0.98) is theft at the bank, and the second is the supervisor's response to the question, "Would you rehire this individual?" The signs of these weights are artefacts of score assignments.

Table 4

Canonical Coefficinets Between Initial Hire Predictors And End-Of-Study Criteria

Initial Hire Predictors		End-Of-Study Criteria	
Punitive Score	63	Status	-03
Project Score	21	Termination	15
Total Score	68	Would Rehire	-27
Sex	22	Length of Service	12
Race	-14	Theft at Bank	98
Age	06		
Education-Years	-01		
Education-Level	09		
Self-Rating	04		
Rating of Others	13		
Took Money	-04		
Took Merchandise	04		
Admissions	05		
Arrests	-92		

Canonical Correlation = .74

A series of stepwise multiple regression analyses of the Reid Report predictors against each of the five criteria showed that the non-theft criteria could be predicted with a multiple of r of about .3, but that the theft criterion, badly split as it was, yielded a multiple r of .7.

It is recognized that the results of a canonical correlation are unstable; data collection is in progress to replicate these results in other companies, over longer periods.

Attitudes Toward Theft and Related Attitudes

The bank study also yielded data on the relationship of honesty as measured by the Reid Report Inventory of other attitudes and behaviors, including the individual's rating of his or her own honesty, his estimates of the percent of employees who he thinks are dishonest, the amount of money or merchandise he is willing to report that he has taken from employers, the number of illegal acts he is willing to admit he has committed, and the

number of times he admits to having been arrested. These attitudes are also substantially correlated with scores on the RR Inventory.

Table 5 presents a comparison between "Recommendeds" and "Not Recommendeds", for males and females, on the question of personal honesty. Not one "Recommended" person described his or her honesty as Below Average, and most of them rate their own honesty as Above Average, (Slightly Above, Above, Far Above). The "Not Recommendeds", on the other hand, are much more modest in this respect. Some do rate themselves as Slightly Below Average (and at least one, Far Below Average!). Most describe themselves as Average.

"Not Recommendeds" also tend to project their own attitudes on others; they are likely to estimate that substantial numbers of their fellows — twenty-five percent or more — are dishonest, and they are not likely to estimate that most employees (all but one percent) are honest. As the Table shows, "Recommendeds", on the other hand, tend to attribute honesty to all but a small proportion of fellow-employees.

"Recommendeds" and "Not Recommendeds" also differ slightly with respect to the admission of theft of money (Table 7) or merchandise (Table 8) from employers. Almost all "Recommendeds", but only 75 to 80 percent of "Not Recommendeds" deny taking any money; "Not Recommendeds" either say they "can't remember" how much they took, or admit to thefts occasionally ranging into hundreds of dollars.

In a polygraph interview, furthermore, they almost always admit to dollar amounts several times greater than the amounts they check off in the Report. Tables 7 and 8 also support another observation: both "Recommended" and "Not Recommended" applicants admit to taking merchandise whose dollar amount substantially exceeds the dollar amount of cash money taken. Theft of merchandise is either more prevalent because it is easier to take merchandise than money, or applicants "discount" the value of merchandise (e.g., "the hat sells for $10, but it only cost the boss $5").

Finally, as one might well anticipate, "Recommended" applicants (i.e., applicants who went through a polygraph interview without confessing to previous thefts) were much less likely to have been arrested (Table 9) or to have admitted to commission of one or more of twenty-one theft-related defalcations (Table 10), such as making false insurance claims, borrowing cars for "joy riding", writing checks in the knowledge that there was no money in the account to cover them.

SUMMARY

The prediction of theft proneness is an important selection problem for companies in which the opportunity to steal is widespread. A device such as the Reid Report seems to be a useful instrument for identifying those individuals whose attitudes lead them to be theft-prone. Honest behavior in employment is probably a complex resultant of need, opportunity, and attitude. There does seem to be a stable attitudinal complex toward theft. Its use for employment applicant screening will not eliminate employee theft, but it will probably reduce its incidence. It is particularly

Table 5

Distribution of Sample by Sex, Ethnic Group, and Recommendation, on the Question "As Far As Your Own Honesty Is Concerned, Do You Think You Are . . . ?"

Ethnic Group	Sex	Recommend Status	No. Cases	Correlation with REID REPORT Total	Self-Rating (Percent)						
					Far Above Average	Above Average	Slightly Above Average	Average	Slightly Below Average	Below Average	Far Below Average
W	M	R	451	-	22.6	33.3	15.3	28.8	0	0	0
W	M	NR	346	-	10.4	28.9	16.2	41.9	2.3	0.3	0
W	M	-	797	0.25**	17.3	31.4	15.7	34.5	1.0	0.1	0
B	M	R	118	-	16.1	27.2	12.7	44.1	0	0	0
B	M	NR	115	-	7.8	13.9	16.5	57.4	3.8	0	0.9
B	M	-	233	0.28**	12.2	20.6	14.6	50.6	1.7	0	0.4
W	F	R	124	-	23.4	35.5	11.3	29.8	0	0	0
W	F	NR	22	-	0	18.2	18.2	63.6	0	0	0
W	F	-	146	0.27**	19.9	32.9	12.3	34.9	0	0	0
B	F	R	37	-	16.2	27.0	10.8	50.0	0	0	0
B	F	NR	17	-	29.4	11.8	23.5	29.4	5.9	0	0
B	F	-	54	0.12	20.4	22.2	14.8	40.7	1.9	0	0
-	- -	-	1230	0.27**	16.8	29.1	15.0	37.9	1.1	0.1	0.1

** Significant at the 1% level of Confidence

Table 6

Distribution of Sample by Sex, Ethnic Group, and Recommendation, on the Question, "What Percentage of Employees Do You Think Steal Something . . .?"

Ethnic Group	Sex	Recommend Status	No. Cases	Correlation with REID REPORT Total	Percent Who Steal (Percent)							
					>50%	50%	35%	25%	15%	10%	5%	1%
W	M	R	451	-	1.8	3.3	2.7	4.4	8.8	14.0	25.5	39.5
W	M	NR	346	-	11.9	8.4	6.7	11.9	9.5	15.6	20.5	15.6
W	M	-	797	0.44**	6.2	5.5	4.4	7.7	9.2	14.7	23.3	29.1
B	M	R	118	-	1.7	8.5	5.9	8.5	3.4	11.0	27.1	33.9
B	M	NR	115	-	8.7	5.2	7.8	9.6	7.8	17.4	27.8	15.7
B	M	-	233	0.26**	5.2	6.9	6.9	9.0	5.6	14.2	27.5	24.9
W	F	R	124	-	2.4	6.5	1.6	6.5	5.7	6.5	26.6	44.4
W	F	NR	22	-	4.6	4.6	0	9.1	22.7	18.2	18.2	22.7
W	F	-	146	0.29**	2.7	6.2	1.4	6.9	8.2	8.2	25.3	41.1
B	F	R	37	-	2.7	0	8.1	5.4	5.4	24.3	27.0	27.0
B	F	NR	17	-	11.8	0	11.8	11.8	5.9	17.7	35.3	5.9
B	F	-	54	0.21*	5.6	0	9.3	7.4	5.6	22.2	29.6	20.4
-	-	-	1230	0.40**	29.4	24.6	14.2	8.2	7.8	4.7	5.6	5.5

* Significant at the 5% level of confidence
** Significant at the 1% level of confidence

Table 7

Distribution of Sample by Sex, Ethnic Group, and Recommendation, on the Question, "The Total Amount of Money That Did Not Belong To Me That I Have Taken From Jobs Would Be About . . .?"

Ethnic Group	Sex	Recommend Status	No. Cases	Correlation with REID REPORT Total	Percent Reporting Each Amount Taken									
					None	Forgot	$1-2	$5	$8-10	$25-40	$60-100	$150-300	$400-800	$1000+
W	M	R	451	-	98.9	0.2	0.9	0	0	0	0	0	0	0
W	M	NR	346	-	71.4	6.9	6.4	2.0	5.2	4.0	2.6	0.6	0.6	0.3
W	M	-	797	0.32**	87.0	3.1	3.3	0.9	2.3	1.8	1.1	0.3	0.3	0.1
B	M	R	118	-	100.0	0	0	0	0	0	0	0	0	0
B	M	NR	115	-	83.5	6.1	4.4	2.6	3.5	0	0	0	0	0
B	M	-	233	0.24**	91.9	3.0	2.2	1.3	1.7	0	0	0	0	0
W	F	R	124	-	100.0	0	0	0	0	0	0	0	0	0
W	F	NR	22	-	81.8	4.6	9.1	0	0	4.6	0	0	0	0
W	F	-	146	0.13	97.3	0.7	1.4	0	0	0.7	0	0	0	0
B	F	R	37	-	100.0	0	0	0	0	0	0	0	0	0
B	F	NR	17	-	76.5	5.9	0	0	5.9	0	11.8	0	0	0
B	F	-	54	0.13	92.6	1.9	0	0	1.9	0	3.7	0	0	0
-	-	-	1230	0.30**	89.4	2.8	2.7	0.8	1.9	1.2	0.9	0.2	0.2	0.1

** Significant at the 1% level of confidence

Table 8

Dsitribution of Sample by Sex, Ethnic Group, and Recommendation, on the Question, "The Total Dollar Value of Merchandise or Goods That Did Not Belong To Me, That I Have Taken From Jobs Would Be About . . .?"

Ethnic Group	Sex	Recommend Status	No. Cases	Correlation with REID REPORT Total	Percent Reporting Each Amount Taken									
					None	Forgot	$1-2	$5	$8-10	$25-40	$60-100	$150-300	$400-800	$1000+
W	M	R	451	-	86.0	1.8	6.2	4.0	1.8	0.2	0	0	0	0
W	M	NR	346	-	41.6	9.8	7.5	9.0	11.9	14.2	3.2	1.5	0.9	0.6
W	M	-	797	0.50**	60.8	5.3	6.8	6.2	6.2	6.3	1.4	0.6	0.4	0.3
B	M	R	118	-	91.5	2.5	3.4	2.5	0	0	0	0	0	0
B	M	NR	115	-	68.7	7.0	7.8	6.1	7.8	0.9	0	1.7	0	0
B	M	-	233	0.33**	80.3	4.7	5.6	4.3	3.9	0.4	0	0.9	0	0
W	F	R	124	-	90.3	0	3.2	5.7	0	0.8	0	0	0	0
W	F	NR	22	-	72.7	4.6	18.2	0	4.6	0	0	0	0	0
W	F	-	146	0.20*	87.7	0.7	5.5	4.8	0.7	0.7	0	0	0	0
B	F	R	37	-	100.0	0	0	0	0	0	0	0	0	0
B	F	NR	17	-	70.6	11.8	5.4	0	5.9	0	5.9	0	0	0
B	F	-	54	0.21	90.7	3.7	1.9	0	1.9	0	1.9	0	0	0
-	-	-	1230	0.45**	72.9	4.6	6.2	5.4	4.9	4.2	1.0	0.6	0.2	0.2

* Significant at the 5% level of confidence

**Significant at the 1% level of confidence

Table 9

Distribution of Sample by Sex, Ethnic Group, and Recommendation, on the Question, "Were You Arrested For (any of 11 listed crimes or any not-listed crimes) . . .?"

Ethnic Group	Sex	Recommend Status	No. Cases	Correlation with REID REPORT Total	Percent Reporting Each Number of Arrests					
					None	1	2	3	4	5+
W	M	R	471	-	91.8	7.3	0.9	0	0	0
W	M	NR	346	-	74.6	18.5	5.2	1.2	0.6	0
W	M	-	797	0.18	84.3	12.2	2.8	0.5	0.3	0
B	M	R	118	-	89.0	9.3	1.7	0	0	0
B	M	NR	115	-	70.4	24.4	2.6	0	2.6	0
B	M	-	233	0.16	79.8	16.7	2.2	0	1.3	0
W	F	R	124	-	98.4	1.6	0	0	0	0
W	F	NR	22	-	95.5	4.6	0	0	0	0
W	F	-	146	0.05	98.0	2.0	0	0	0	0
B	F	R	37	-	100.0	0	0	0	0	0
B	F	NR	17	-	76.5	11.8	11.8	0	0	0
B	F	-	54	0.00	92.6	3.7	3.7	0	0	0
-	-	-	1230	0.18	85.5	11.5	2.4	0.3	0.4	0

Table 10

Distribution of Sample by Sex, Ethnic Group, and Recommendation, on the Question, "You May Be Questioned...on one or More of the Issues... (21 illegal or unethical sets involving theft of money or merchandise)... Mark...Whether You Did or Did Not Do Any of the Following . . .?"

Ethnic Group	Sex	Recommend Status	No. Cases	Correlation with REID REPORT Total	Percent Reporting Each Number of Admissions							
					None	1	2	3	4	5-9	10-14	15+
W	M	R	471	-	89.4	8.0	2.0	0.2	0.2	0	0	0.2
W	M	NR	346	-	41.9	25.1	15.1	8.1	8.1	4.9	0	0.3
W	M	-	797	0.44**	68.8	15.4	7.7	3.6	3.6	2.1	0	0.3
B	M	R	118	-	89.8	5.1	5.1	0	0	0	0	0
B	M	NR	115	-	62.6	19.1	10.4	4.4	0.9	1.7	0	0.9
B	M	-	233	0.31**	76.4	12.0	7.7	2.1	0.4	0.9	0	0.4
W	F	R	124	-	94.4	4.0	0.8	0	0	0	0	0
W	F	NR	22	-	68.2	31.8	0	0	0	0	0	0
W	F	-	146	0.15	90.4	8.2	0.7	0	0	0	0	0
B	F	R	37	-	94.6	5.4	0	0	0	0	0	0
B	F	NR	17	-	58.8	11.8	17.7	11.8	0	0	0	0
B	F	-	54	0.30*	83.3	7.4	5.6	3.7	0	0	0	0
-	-	-	1230	0.41**	78.4	13.6	6.8	2.9	1.5	1.5	0	0.2

*Significant at the 5% level of confidence

**Significant at the 1% level of confidence

appropriate for those usually low-level clerical, sales, and service positions on which the employee must be trusted with money or merchandise with little supervision. Furthermore, today, when the question of discrimination on racial or sex grounds by tests is a salient factor in developing employee selection programs, the Reid Report does not seem to discriminate on either basis. A test of this sort should not be considered a bar to employment, but rather a device to permit selective placement. Just as one would not want a potential alcoholic as a bartender, an individual with attitudes conducive to theft should not, for both his own good and the good of the enterprise, be placed where the opportunity to steal is strongly present.

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THE AMERICAN POLYGRAPH AS THE PARTY AFFIRMING LEGAL AND SOCIAL JUSTICE

By

Michael B. Lynch*

The scales of justice are supported by the staff of truth. Throughout history two systems of justice have served to control man's behavior. Legal justice on the right and social justice on the left. Legal justice is the end result of intellectual synthesis to the exclusion of moral certainty. Social justice is the end result of moral certainty to the exclusion of intellectual synthesis. Justice, legal or social, cannot be served in the absence of truth; for both intellectual synthesis and moral certainty seek the ultimate confirmation of fact or reality. In contemporary society the polygraph and polygraph technique, when employed by a competent examiner, can be that truth.

> Just when a scientific principle or discovery crosses the line between the experimental and demonstrable stages is difficult to determine. Somewhere in this twilight zone the evidential force of the principle must be recognized, and while the courts will go a long way in admitting expert testimony deduced from a well-recognized scientific principle or discovery, the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which it belongs . . . [1]

In August of 1921, James Alphonzo Frye was arrested by investigators of the Washington, D.C. Police Department. He was suspected of fatally shooting Dr. Robert W. Brown — an unsolved homicide which had taken place in the District of Columbia some ten months earlier. Frye initially denied any and all involvement in the crime but later made a full confession and supplied the investigators with details which tended to support his confession. Frye was indicted for first degree murder.

Subsequent to his indictment, Frye repudiated his confession and changed his plea to not guilty. It was Frye's contention that his original confession and guilty plea were part of a conspiracy between himself and a friend. Under the terms of the conspiracy Frye was to confess and plead guilty to the Brown murder in return for one-half of the $1,000 reward offered by the victim's family for information leading to the arrest and conviction of the killer. The other half of the reward was to be shared with the friend. For his half of the reward, the friend was to furnish Frye with enough information

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*Mr. Lynch is a polygraph examiner in Santa Ana, California.

to support a confession, turn Frye over to the police and collect the reward. Frye further contended that after his indictment the friend withdrew from the conspiracy and reneged on the financial arrangement. It was at this point that Frye withdrew his guilty plea and insisted on his innocence.

Dr. William M. Marston was a physician, practicing attorney and inventor of one of the early cardiosphygmomanometers used for the detection of truth and deception. Frye's attorneys enlisted the services of Dr. Marston in the hope that by exposing Frye to his own deception concerning the death of Dr. Brown he would relent his position of denial and re-enter a plea of guilty. The examination was conducted by Dr. Marston in the Washington, D.C. jail.

> The instrument employed for the detection of deception in Frye was a systolic blood pressure device, essentially consisting of a sphygmomanometer, an instrument used by physicians in determining a patient's blood pressure, by means of which periodic discontinuous blood pressure readings were obtained (J. Reid and F. Inbau, Truth and Deception, 2, 1966). This was a crude instrument compared to the modern polygraph, which by definition records more than a single parameter such as blood pressure.[2]

Based on the results of the examination, Dr. Marston rendered an opinion that Frye was truthful in his denials of involvement in the Brown homicide.

Frye went to trial. His attorneys attempted to qualify Dr. Marston as an expert witness and to introduce his opinion of non-deception as evidence. Chief Justice McCoy of the District Supreme Court, presiding, chose to exclude Dr. Marston as a witness.

> I have gotten too old and too much inured to certain general principles in regard to the trial of cases to depart from them rashly.[3]

Frye was convicted of second degree murder and sentenced to life imprisonment. He appealed his conviction on the grounds that the trial court had improperly excluded Dr. Marston's expert testimony. In affirming Frye's conviction, the appellate court stated:

> . . . we think the systolic blood pressure deception test has not yet gained such standing and scientific recognition among physiological and psychological authorities as would justify the courts in admitting expert testimony deduced from the discovery, development and experiments thus far made.[4]

Three years after Frye's conviction, investigators discovered that the friend with whom Frye had conspired to collect the reward was in fact the individual responsible for the death of Dr. Brown.[5]

And ye shall know the truth and
the truth shall make you free.

John 8:32
Circa A.D. 50

For more than fifty years the general acceptance rule of Frye has precluded the admissibility of expert testimony by polygraph examiners over objection in American courts.[6] While experts from other scientific disciplines have been allowed to testify as to their expert opinion to prove or disprove the collateral issues,[7] the expert testimony of polygraph examiners concerning the primary issue of witness and defendant veracity has been silenced. It would seem that since Frye the scales of American jurisprudence have been heavily weighted to the right and that social justice on the left has yet to bring the scales back into balance.

Today, as the scientific principles of polygraphy cross the line from experimental to demonstrable,[8] American jurisprudence is relaxing its exile of objectively demonstrable veracity from the courtroom.[9] This judicial aberration is not solely the consequence of polygraphic advancement to meet the general acceptance rule required in Frye. Such a thesis negates two thousand years of legal evolution and social heritage.

. . . refuses to answer questions, makes evasive answers, talks nonsense, blushes, is nervous and tries by every means to be excused.[10]

circa 500 B.C.

Five hundred years before Christ, Rome was a tribal nation; a peninsula of nomadic peoples isolated from Mediterranean culture and commerce by water on three sides and impassable alps to the north. In the absence of a central government, all justice was social justice derived from primary group intra-relationships. The Twelve Tables, a code of suggested social behavior based on tribal mores and folkways proclaimed about 449 B.C., provided the only codified legal foundation to Roman law until the founding of the Empire several hundred years later.

In early Roman accusatory pleadings under the Twelve Tables, it was the praetor's function to act as a referee and establish an equitable solution. Other than in his catalytic role, the praetor did not become involved. The individual, not the state, was the victim. Although the praetor prescribed the penalty, the victim, not the state, collected the fine or exacted the penalty. Thus, if corporal or capital punishment were decreed by the praetor, it was the prevailing party in the proceedings who carried out the execution.

Statutory law and legal justice evolved as the Roman power to rule became the ability to levy taxes and impose fines. In an accusatory pleading of failure to pay taxes to Rome, the state became the victim of a violation of a law commanding the payment of tribute. Now, the state, in the form of a praetor-plaintiff, determined truth and equity, passed judgement and enacted the penalties on the accused. Under this system of justice, the burden of proof fell not on the infallible state but on the fallible defendant. The Praetor was no longer an impartial referee. He had become the accuser,

judge, and active participant in the proceedings. He was the ultimate finder of truth whose primary goal was legal justice arrived at through intellectual synthesis.

> Detected the presence of deception by noting the increased heart beat upon the application of stimuli related to the issue.[11]
>
> circa 300 B.C.

It was not until A.D. 527, more than fifty years after the final conquest of Rome by the Goths, that Roman laws were codified under the direction of the Eastern Emperor Justinian. Many of the concepts of justice and individual rights found in this "Body of Civil Law" have become foundations for later contemporary jurisprudence.[12]

"No one is compelled to defend a cause against his will."

"No one suffers a penalty for what he thinks."

"No one may be forcibly removed from his home."

"Anything not permitted the defendant ought not be allowed the plaintiff."

"The burden of proof is on the party affirming, not the party denying."

Roman law was a two-edged sword. The leading edge of legal justice and the trailing edge of social justice cut a path of intellectual synthesis through the mainstream of the Roman Empire, five hundred years of the Middle Ages and embedded themselves in the genesis of British common law.

> The accused could prove his innocence and/or veracity by submitting to trial by ordeal. He could hold his hand in a fire, carry a red hot iron bar or extract a stone from the bottom of a pot of boiling water. If, after several days, his wounds had healed without infection, he was pronounced innocent. If his wounds were infected, he was pronounced guilty.
>
> Each accused was told that the bray of a sacred ass would disclose the identity of the liar. Each of the accused was instructed to enter a darkened room and stroke three times the tail of the sacred ass which therein resided. The accused were not told that the tail of the ass had been covered with lamp black. It was the theory that the innocent, having nothing to fear, would stroke the tail and emerge from the room with blackened hands. The guilty, fearing the bray of the ass, would not stroke the tail and emerge from the darkened room with clean hands.[13]
>
> circa A.D. 755

Two systems of society co-existed in tenth century Europe.

On the continent, the descendants of Roman law and culture survived and functioned under the Feudal system. Characterized by centralized governments, structured social groups and viable trade routes, the Feudal system provided organization and stability to those who came under its influence.

Across the waters of the North Sea, to the west, lay Germanic Britain. Culturally isolated from her Feudal neighbor, England was struggling for an existence under the Manoral system. Centuries of medieval tribal conflicts, countless invasions and an agrarian economy supported by landless peasants had left Britannia in the backwash of the Middle Ages. A population of dissident manoral knights, oppressed serfs and isolated monks had created both governmental as well as social decentralization. What few criminal laws existed were dictated by the manoral lord and enforced at his pleasure. Venue was determined by economic control. Social justice for the common man was administered by circuit judges whose decisions at equity were based largely on comtemporary custom and the common experience of their fellow jurists.

One of the most important concepts to emerge from the English common law is the jury system and the role of the British jurist within that context. In small static population groups the circuit judge could function well as a truth finder at equity in a social justice setting. Because of his prior and often frequent contact with the litigants he could easily derive witness veracity from subjective observations. In his role of truth finder he was an active participant in the proceedings. As populations grew and equity proceedings became more frequent, the jurist became less able to subjectively determine witness credibility. In the absence of a demonstrably scientific method of determining witness veracity, the judgement of members of the litigant's peer group was relied upon. The role of the judge within the jury system did not change. The jurist remained an active participant in the proceedings; an inquisitor whose role it was to insure social justice, often to the exclusion of intellectual synthesis.

In the year 1066 England was invaded and conquered by Prince William of Normandy, a resident of continental Europe and a product of Feudalism. With this conquest came British exposure to cultural ties with continental Europe and the introduction of the Feudal system into the English social and economic structure. For the first time in history, England was ruled by a socio-economic structured single government. The power to rule once again became the power to tax and impose criminal laws and penalties. As in Roman law, the state became a victim and legal justice under uniform law began to abuse the people.[14]

For almost one hundred fifty years the Feudal system, administered by despotic kings, brought unity of government and social system to England. The abuses of excessive legal justice, however, became so excessive that in 1213 the English nobility revolted against King John and in 1215 forced him to sign a Magna Carta.

The Magna Carta was not a victory for social justice. It was a small victory for the victims of oppressive legal justice. The divine right of kings had been challenged and the demands of the people for a voice in

their government had been needed and the egg of legislative representative had been fertilized.

Post Magna Carta English law became, therefore, a combination of legislative enactments and common law. Legal justice was still administered by the king. Appeals from abusive legal justice to obtain moral justice were heard by the church which sat as an appellate court for the administration of social justice.

> Galileo, in 1581, provided the first device for scientifically counting pulse rate and observing blood pressure.[15] Although this device was not used for the determination of deception, it did provide the basis upon which the cardiosphygmomanometer section of the present day polygraph is founded.

Although governed by England, mid-eighteenth century America was a melting pot of European peoples, values, and cultures. This diverse population received all of the benefits of English rule but was denied certain rights under English common law.

> The History of the present King of Great-Britain is a History of repeated Injuries and Usurpations, all having in direct Object the Establishment of an absolute Tyranny over these States. To prove this, let facts be submitted to a candid World . . . He has obstructed the Administration of Justice, by refusing his Assent to Laws for establishing Judicial Powers . . . For imposing Taxes on us without our Consent . . . For depriving us, in many Cases, of the Benefits of Trial by Jury . . . For abolishing the Free System of English Laws in a neighboring Province, establishing therein an arbitrary Government, and enlarging its boundaries, so as to render it at once an Example and fit Instrument for introducing the same absolute Rule into these Colonies . . . [16]

The one common bond shared by the colonial American people was antagonism toward government. In writing the Constitution of the United States, the founding fathers were determined that it should be an instrument which would guarantee that no man or element of government would ever again abuse the people. The Constitution of 1776 very carefully prescribed all of those things permitted the federal government. Eleven years later the states unanimously amended the Constitution to limit the actions and power of government and even more carefully prescribe the rights and privileges of the people.[17]

Judicial proceedings under this new Constitution became a contest between litigants rather than a search for truth. The people, fearing the power of government, limited the powers of the judge and cast him in the role of a referee whose sole function it was to insure legal justice. Unlike his inquisitorial English cousin who was an active participant in the trial, the American magistrate was confined to insuring that neither party would land an unfair blow below the belt of his opponent. In civil

proceedings this judge could, with the ultimate decision of a jury, insure adherence to legal procedure and administer social justice. "The burden of proof (being) on the party affirming, not the party denying,"[18] the government was not directly involved and could therefore function effectively as a detached and impartial observer.

> . . . examiner utters stimulus words to which the subject replies with the first word that comes into his mind . . . the two main deception criteria are incriminating answer words and delayed answers.[19]
>
> circa 1870

> In 1875 the Italian scientist Mosso theorized that in emotional stress or tension blood rushed to the brain. He built a delicate balance tiltboard device which tilted down when the subject reacted (to a specific stimulus).[20]

> In 1879 the French scientist Vigouroux discovered involuntary change in electrical resistance of the body when external stimulus is applied in a controlled environment.[21]

> An ideal system of law should draw its postulates and its legislative justification from science. As it is now, we rely on tradition, or vague sentiment, or the fact that we never thought of any other way of doing things, as our only warrant for rules which we enforce with as much confidence as if they embodied revealed wisdom.[22]
>
> circa 1895

It would seem that American jurisprudence at the turn of the twentieth century was about to embark on an era of judicial notice of scientifically demonstrable methods of proving or disproving an issue before the bar of justice. If any such hopes were raised, Frye soon put them to rest.

> . . . (Stricker in 1897) used galvanic skin response (GSR) in discovering hidden emotions. Earlier experiments by Jung and others in the field had shown that human kind has no voluntary control over its base emotions. Stricker, therefore, felt that GSR might be a valid criteria in the detection of deception.[23]

> In 1895 Lombroso used blood pressure recording instruments to detect deception in criminal suspects.[24]

> In 1914 Bennussi detected deception in human response with an instrument which recorded breathing rates and volume of air intake.[25]

> In 1915 Doctor William Marston tested 200 subjects experimentally and determined that systolic blood

pressure constituted an accurate means for detecting deception.[26]

Starting in 1915, W. G. Summers researched psycho-galvanic reflex and found it alone to be a valid criteria of deception.[27]

In 1921 J. A. Larson used recorded tracings of heart activity (cardio) and breathing rates (pneumo) to test 400 "live" criminal suspects at the Berkeley, California, Police Department. Although high accuracy was achieved, Larson's findings were not reported statistically.[28]

In 1926 Leonard Keeler, the father of modern polygraphy, built and used some of the first two-channel (cardio and pneumo) polygraphs at Berkeley, California.[29]

It is in the trial of criminal matters that the people's fear of abusive governmental power comes to grips with the dichotomy of legal versus social justice. In criminal matters, the people are the victim of the transgressions of the accused and being the party affirming, bear the burden of proof beyond any reasonable doubt. American courts are therefore caught on the horns of a dilemma. On the right they must protect the accused from the abuses of excessive legal justice and on the left they must assure the rights of society under the tenets of social justice. To the end that both social and legal justice be served, the American praetor often finds himself the sole determinant of witness veracity in court or in evidential hearings of motions to suppress or admit evidence.

In 1972 Raymond Cutler -

. . . was arrested at the Los Angeles International Airport by a U.S. Marshal after a search of his carry-on luggage by the Marshal revealed a plastic baggie containing marijuana. There was a direct conflict between the testimony of the Marshal and that of (Mr. Cutler) who testified at the preliminary hearing as to whether the luggage was opened by the Marshal or (Mr. Cutler) and whether (Mr. Cutler), on request, gave consent to the opening of the bag.[30]

Mr. Cutler claimed that he had not given his permission for the bag to be opened and therefore moved to exclude the seized marijuana on the grounds of an unlawful search.[31] To support such a claim Cutler submitted to a polygraph examination and attempted to introduce the findings of that examination into evidence.

In admitting the findings of the examination and the testimony of the polygraph examiner, both of which supported Cutler's contention that the Marshal had opened his luggage without his consent, Judge Allen Miller stated:

It is the experience of this court during his ten years of presiding at criminal trials that the great majority

> of trials on issue of guilt or innocence turn on the credibility of witnesses; that perjury is prevalent and the oath taken by witness has little effect to deter false testimony. The principal role of the trier of fact is the search for truth and any reasonable procedure or method to assist the court in this search should be employed.[32]

Cutler's motion to exclude the evidence (marijuana) was granted and the case was dismissed. The people did not appeal.[33]

In Frye, intellectual synthesis to the exclusion of moral certainty condemned an innocent man to three years in prison. In Cutler, moral certainty to the exclusion of intellectual synthesis freed a guilty man.[34] In each case, truth, in the form of demonstrable witness veracity, played the leading role.

The pendulum of American jurisprudence is slowing swinging from right to left; from legal justice to social justice. As the pendulum swings, the role of the American jurist moves with it; from the adversarial system evidenced in Frye (which demanded justice to the exclusion of the truth) to the inquisitional system evidenced in Cutler (which allowed the truth to the exclusion of justice). American jurists are shedding their traditional roles as referees and assuming more active and inquisitorial roles in all proceedings to the end that truth may firmly support the scales of justice.

> . . . when the social needs demand one settlement rather than another, there are times when we must bend symmetry, ignore history and sacrifice custom in the pursuit of other and larger ends . . . (as) the final cause of law is the welfare of society.[35]

What we, the American people, are witnessing is the beginning of the end of mankind's search for an honest witness. For the first time in the history of civilization mankind has the opportunity to prove beyond any reasonable doubt the veracity of his testimony through a generally accepted and scientific valid examination of his own psyche. God gave us the polygraph. May He also give us the wisdom to use it wisely so that no man may ever again be abused by government, legal justice, social justice, or another human being.

Footnotes

[1] Frye v. United States, 54 App. D.C. 46, 293 F. 1013 (1923).

[2] United States v. Zeiger, 350 F. Supp. at 691 (1972).

[3] Frye v. United States, op. cit.

[4] Ibid.

[5]New York Judicial Council, 14th Annual Report 265, 1948.

[6]Polygraph examiners have been allowed to testify as expert witness over objection and by stipulation of both/all parties to the action and the court. People v. McDavitt, 62 N.J. 36 (1972).

[7]Jordon v. Mace, 144 Me. 351-4, 69 A 2d 670.
Berry v. Chaplin, 74 Cal. App. 652, 169 P. 2d 442.
Comm. v. Best, 180 Mass. 492, 62 NE 748 (1902).
Comm. v. Millen, 290 Mass. 406, 195 NE 541 (1935).
State v. Duguid, 50 Ariz. 276, 72 P. 2d. 435 (1937).
Comm. v. Capalbo, 308 Mass. 376, 32 NE 2d. 255 (1941).
People v. Morse, 325 Mich. 270, 38 NE 2d. 322 (1949).
Hensen v. State, Tex. Cr. App. 266 SW 2d. 864 (1953).

[8]Gustafson, L. A. and M. T. Orne. "The Effects of Task and Method of Stimulus Presentation on the Detection of Deception," Journal of Applied Psychology, Vol. 48, (1964), pp. 383-387.

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[9]United States v. DeBetham, 348 F. Supp. 1391 (S.D. Cal. 1972).
United States v. Ridling, 350 F. Supp. 90 (E.D. Mich. 1972).
United States v. Zeiger, op. cit.
People v. Cutler, 12 Crim. L. Rep. 2133 (Cal. Super. Ct. Nov. 6, 1972).

[10]Anonymous. Ayur-Veda (Book of Health and Science), Hindu origin, circa 500 B.C.

[11]Erasistratus (Greek physician), circa 300-250 B.C.

[12]Corpus Juris Civilis, A.D. 529.

[13]A compilation of medieval trials by ordeal and circumstance to determine the truth of an issue, circa A.D. 755.

[14]The legends of Robin Hood emerged during this void of social justice in English history.

[15]Clendenning, L. "The History of Certain Medical Instruments," Annals of Internal Medicine, Vol. 4, (1931), pp. 176-189.

[16]The American Declaration of Independence, July 4, 1776.

[17]The first ten amendments to the Constitution, The Bill of Rights, 1787.

[18]Corpus Juris Civilis, op. cit.

[19]Galton, F. "Psychometric Experiments," Brain, 1879, p. 162.

Jung, C. "The Association Reaction Method," American Journal of Psychology, Vol. 21 (1910), p. 162.

Munsterberg, H. On the Witness Stand, 1933, pp. 118-133.

[20]Mosso, A. Fear (published in) 1896.

[21]Vigouroux, R. "Sur le rôle de la resistance electrique des tissus dans l'electrodiagnostic," Comptes rendus des Séances de la Societe de Biologie, Vol. 31 (1879), pp. 336-339.

[22]Holmes, O. W. Speeches (Boston: Little, Brown & Co., 1918).

[23]Binswanger, L. Jung's Studies in Word Association, 1919, p. 448.

[24]Lombroso, C. L'Homme Criminel (2nd French edition), 1895, 336-346.

Ferrero, G. L. The Criminal Man, 1911, pp. 303-304.

[25]Benussi, V. "Die Atmungssymptome der Luge," Archiv die Gesamte Psychologie, Vol. 1, p. 244.

[26]Marston, W. M. "Systolic Blood Pressure Symptoms of Deception," Journal of Experimental Psychology, Vol. 2 (1917), pp. 117-163.

[27]Summers, W. G. "A New Psychogalvanometric Technique in Criminal Investigation," Psychology Bulletin, Vol. 34 (1937), p. 551.

[28]Larson, J. A. "The Cardio-pneumo-psychogram and its Use in the Study of the Emotions with Practical Application," Journal of Experimental Psychology, Vol. 5 (1922), pp. 323-328.

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Inbau, F. "The Keeler Polygraph," Science Monthly, Vol. 40 (January 1935), pp. 81-87.

[30] People v. Cutler, op. cit.

[31] Palko v. Connecticut, 302 U.S. 319 (1937).
Mapp v. Ohio, 367 U.S. 643 (1961).
California Penal Code, Section 1538.5.

[32] People v. Cutler, op. cit.

[33] The statute of limitation for an appeal expired November of 1973.

[34] The fact that Cutler was freed on a legal technicality does not alter the fact that he did have contraband (marijuana) in his constructive possession, an act of commission contrary to a law forbidding such possession.

[35] Cardozo, Benjamin N. The Nature of the Judicial Process (New Haven, Conn.: Yale University Press, 1921), pp. 65-66.

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CALIBRATING THE POLYGRAPH, A PROGRAMMED TEXT

The Pneumograph (Part 1)

By

Clark J. Tebbs

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

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

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

This program of instruction was prepared by WO1 Clark J. Tebbs, Instructor, DALET, Polygraph Committee, US Army Military Police School, Fort Gordon, Georgia, for the polygraph student as an aid to improve his ability to properly calibrate all components within the AN/USS-2D and 2F polygraph instruments.

[30] People v. Cutler, op. cit.

[31] Palko v. Connecticut, 302 U.S. 319 (1937).
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PNEUMOGRAPH SYSTEM

This portion of the programmed instruction will develop your skill in performing the pneumograph calibration procedure in the AN/USS-2D or 2F polygraph instrument.

Using a polygraph instrument capable of recording at least the respiration channel and utilizing this program of instruction, you will calibrate the pneumograph system to the satisfaction of a certified polygraph examiner within 15 minutes.

Prior to beginning the calibration check on any of the components within the polygraph instrument, first insure that all controls are in the NEUTRAL position. This is necessary because the instrument can be damaged if the controls are not properly set before going into operation.

1. Prior to starting a calibration check of any component within the polygraph instrument, you should first _____ all of the controls.

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

Answer to 1:

NEUTRALIZE

2. To perform a calibration check of a system within the polygraph instrument, the appropriate and related components must be properly attached to the instrument. The related component necessary to perform a pneumograph calibration is the pneumograph chest assembly.

To calibrate the pneumograph component you must attach the pneumograph chest assembly to the _____.

Answer to 2:

INSTRUMENT

3. With the instrument controls in the neutral position, note that on the pneumograph component, the pneumograph vent is placed in the OPEN or DOWN position. This will allow sudden changes in pressure to be vented while handling the pneumograph chest assembly (convoluted tube) and will prevent possible damage from occurring to the bellows within the pneumograph component.

Prior to attaching the pneumograph chest assembly to the instrument you should check to be sure the _____ _____ is OPEN to prevent possible damage to the pneumograph bellows.

Answer to 3:

PNEUMOGRAPH VENT

4. With the pneumograph vent open (down position) place the pneumograph chest assembly (convoluted tube) around an immobile or non-flexible object, expand it approximately one inch and secure it with the beaded chain already attached to the convoluted tube. An immobile or non-flexible object must be used to prevent possible changes in pressure from occurring due to object movement.

To prevent possible damage to the instrument prior to handling the pneumograph chest assembly you must insure that the pneumograph _____ is in the _____ or _____ position.

Answer to 4:

VENT

OPEN or DOWN

5. With the pneumograph chest assembly properly secured around a non-flexible object, adjust the pen centering control to center the pneumograph recording pen on the base line, then CLOSE the pneumograph vent by placing it in the UP POSITION. Closing the pneumograph vent seals the pneumograph system and makes it air tight.

The pneumograph vent is closed when it is in the _____ position. This will cause the pneumograph system to be _____ _____ so that any changes in pressure can be detected by the pneumograph component, then recorded by the pneumograph recording pen.

Answer to 5:

UP

AIR TIGHT

6. Turn on the chart drive switch. This will cause the chart paper to move under the recording pen and help reduce friction by allowing the pen to move more freely. Also insure that the pen is properly balanced in order to further reduce friction. Adjust the pneumograph pen centering control and observe overall pen travel from lower to upper limits, thus checking the pen travel limiting screws for proper adjustment.

The pen should be allowed to travel within one-eighth to one-quarter of an inch of the top horizontal line and the same distance above the center horizontal line on the chart paper.

It may be necessary to bend the pen slightly, however if a slight bend of the recording pen will not place it within the specified tolerance it will be necessary to adjust the _____ _____ limiting screws for proper pen travel within the pneumograph component.

Answer to 6:

PEN TRAVEL

7. Center the pneumograph recording pen on the base line with the pen centering control to establish a reference line prior to checking the pneumograph SENSITIVITY. Create a small change of pressure within the sealed system by expanding the pneumograph chest assembly (convoluted tube) one-quarter of an inch on the immobile object. The pneumograph pen should deflect upward one-inch. (NOTE: If unable to measure one-quarter of an inch movement of the convoluted tube use one bead on the chain which should cause three-quarters of an inch deflection of the recording pen).

The amount of deflection noted by the recording pen after expanding the convoluted tube indicates the _____ of the pneumograph component and will be observed as a new reference line on the chart paper.

Answer to 7:

SENSITIVITY

8. Turn off the chart drive switch (this saves chart paper). Measure the distance between the original reference line and the now established new reference line. The distance traveled by the recording pen indicates the SENSITIVITY of the pneumograph component. (NOTE: If proper pen deflection cannot be maintained, an adjustment of the fulcrum is required on the center shaft of the pneumograph bellows.) If this adjustment is indicated, notify your instructor who will assist you.

To insure that the system is airtight and that no excess leakage exists, allow the pen to remain at the new reference line position for two minutes.

If the pneumograph recording pen returns to base line within _____ minutes this indicates _____ within the system and appropriate repairs will have to be made prior to using the polygraph instrument for an examination.

Answer to 8:

TWO

LEAKAGE

Notify your instructor at this time that you are ready to demonstrate the calibration procedure of the pneumograph system. He will monitor your ability to properly calibrate the pneumograph system by observing that you perform correctly each key item necessary and in proper sequence according to the following checklist:

a. Insure that pneumograph vent is open. ____

b. Fasten chest assembly around non-flexible object. ____

c. Close pneumograph vent. ____

d. Check pen travel. ____

e. Center pneumograph pen on base line. ____

f. Extend chest assembly one-quarter of an inch. ____

g. Insure a one-inch upward pen movement on the chart paper. ____

h. Insure that pen remains on new reference line for two minutes. ____

Return all controls to the neutral position (pneumograph vent open,) and disconnect the pneumograph chest assembly from around the immobile or non-flexible object. If the instructor is satisfied with your ability to perform the calibration check of the pneumograph system, you may continue with the program by turning to the next page.

NOTE: In the next issue: The Galvanograph Component.

POLYGRAPH CHALLENGED IN DISMISSAL OF POLICE OFFICERS

SYNOPSIS

Two Portsmouth, Virginia police officers acquited of larceny and bribery were nonetheless dismissed. Investigation included polygraph examinations. Plaintiffs sued, claiming, inter alia, that the polygraph examinations were relied upon contrary to law. The Circuit Court supported the City dismissal, noting that although polygraph examinations are not legal evidence in criminal trials, it does not mean they are banned for all purposes. The Court said "the use of the polygraph per se has never been prohibited by law. It follows that its use and weight outside the courtroom must rest with the agency employing it, free from judicial review."

VIRGINIA: IN THE CIRCUIT COURT OF THE CITY OF PORTSMOUTH

ROBERT C. SALAS,
Plaintiff

vs

Law Docket No.
L-74-455

CIVIL SERVICE COMMISSION,
CITY OF PORTSMOUTH,
Defendant

MEMORANDUM
February 21, 1975

Before this Court on certiorari is the action of the city authorities in discharging for cause the petitioner, Robert C. Salas, as a member of the Portsmouth Police Department.

Salas was indicted by a Special Grand Jury of two acts of larceny while in the performance of his duties as a police officer after an extensive investigation by the State Police which included a polygraph test upon him. He was thereupon suspended by the City Manager who notified him of his right to a hearing and to counsel at a specified time should he so elect. He was acquitted by a jury on each of the two charges. After further investigation, including the administering of another polygraph test, the City Manager advised Salas under date of May 14th, 1974, that he was dismissed because of the two larceny charges which were violations of the Civil Service Rules. Salas appealed to the Civil Service Commission which, after the taking of evidence in an open hearing, affirmed the action of the City Manager. This appeal followed.

The attack upon the action of the City Manager and Civil Service Commission takes three approaches: (1) that the provisions of the City Charter resulting in the suspension and dismissal of Salas were not followed; (2) that inadmissable evidence in the form of the polygraph test was used and relied upon contrary to law; and (3) that Salas' rights under the equal protection and due process clauses of the U.S. and Virginia

Constitutions were violated by manner in which the investigations were undertaken and evidence favorable to the petitioner was ignored or not produced.

Section 11.13 of the Charter of the City of Portsmouth provides that no person in the Civil Service shall be removed, suspended, demoted or discharged except for cause and only upon the written accusation of the appointing power, or any citizen or tax-payer, a written statement of which accusation in general terms shall be served upon the accused within forty-eight hours. The accused may within ten days file with the Commission a written demand for an investigation. The investigation shall be confined to the determination of whether such removal, suspension, demotion or discharge was or was not for political, religious, racial or other unlawfully discriminatory reasons and was or was not made in good faith for cause. It is also provided that if the appointing power fails to properly notify the accused the Commission shall set a date for hearing and approve or disapprove the action taken by the appointing power. The employee shall have the right to appeal to the Circuit Court from the decision of the Commission but the "hearing shall be confined to the determination of whether the order or judgment of removal, suspension, demotion or discharge was made by the appointing power and concurred in by the Commission was or was not made in good faith for cause or was or was not made for political, religious, racial or other unlawfully discriminatory reason."

The first complaint is obviously without merit. Whether the preliminary steps taken by the City Manager were or were not in accordance with the Charter provision the employee received a full and public hearing before the Commission with the assistance of his own counsel who was permitted to and did in fact cross examine all the witnesses who were called. This not only cured any deficiencies in the preliminary actions but also is specifically authorized by the Charter provision.

The petitioner seems to argue that the use of the polygraph tests was of itself illegal, and if it were not, it was relied on to an unwarranted extent by those charged with the dismissal decision.

The petitioner argues that because the results of polygraph tests have been ruled inadmissible in criminal trials by the Virginia Supreme Court in three cases that they are illegal in an administrative hearing. The only direct authority cited by him are two New York and New Mexico cases which support his position. On the other hand, orders to take tests directed to Civil Service and particularly policeman by higher authority appear to be widespread and have been upheld in a number of States. The only limitation from a constitutional standpoint was enuciated by the U.S. Supreme Court in Garrity v. N.J. 17 L. Ed. 2nd 562 which held in a five to four decision that information obtained from policemen in the course of an investigation could not be used in a subsequent prosecution of them. This decision was based on the constitutional provision that no accused can be compelled to give testimony against himself-which is not involved here.

Although polygraph tests at this stage of development are not recognized as legal evidence in a criminal trial in this State it does not follow that such have no usefulness for any purpose. What can be utilized in a prosecution of a criminally accused whose guilt must be established beyond a

reasonable doubt is quite a different thing from a proceeding before an employing authority to determine whether an individual should be retained upon the public payroll. If acquittal in a criminal trial were the sole criterion for eligibility to a position of public trust the dispatcher of the public business would be shackled by a standard not applicable to any other type of employment.

The outlawing of polygraph evidence in a criminal case does not mean that the use of polygraph tests are banned for all purposes. In point of fact the polygraph is widely used in employment, administration, social security, paternity and other situations, and its use is becoming broader and more pervasive as times goes on. See recent articles in 51 N.C. Law Review 900 and 73 Columbia Law Review 1120. It is even noted that in recent years its results have been accepted in Courts in bastardy and domestic relations cases. U.S. v Ridley, 350 F. Supp. 90; U.S. v. Deoguardi, (EDNY unreported) U.S. v. Hart, 344 F. Supp. 522; A. v B. 336 N.Y. S(2) 2839; State v. Walston, (N.J. 1971) 278 A. 543. The use of the polygraph per se has never been prohibited by law. It follows that its use and weight outside the courtroom must rest with the agency employing it, free from judicial review.

The Portsmouth charter provision not only places the hiring - firing decision upon the appointing power and Civil Service Commission but strictly eliminates that ground of inquiry from consideration on an appeal to the Court. If either or both choose to include the results of polygraph tests among the factors considered in reaching a decision in a particular case, that is their prerogative. As the City Attorney has aptly pointed out in his brief if it were the law that the use of a polygraph was illegal for all purposes there would be no basis for the many decisions all over the country holding that refusal of police officers to take such a test is ground for discipline. The administering of the tests contemplates use of the results.

The third challenge asserted by the petitioner is that the processings before the City Manager and Civil Service Commission were unfair, that they failed to give proper consideration and weight to some of the evidence, and that they failed to call for certain available evidence that the petitioner's rights under the due process and equal protection clauses of the U.S. and Virginia State Constitutions have been violated.

The Portsmouth charter provision make it explicitly clear that the resolution of factual disputes bearing upon the status of Civil Service employees rests exclusively with the appointing authority and the Civil Service Commission; the Court's jurisdiction on review is specifically confined to the determination of "whether the order or judgment of removal, suspension, demotion or discharge was or was not made in good faith for cause or was or was not for political, religious, racial or other unlawfully discriminatory reasons, and no appeal to such Court shall be taken except upon such ground or grounds." Although it is not so stated in the charter provision it must be recognized that any person who claims that his constitutional rights have been violated by another has the right to demand that the issue be tried before a court of law.

Under the law as stated what evidence the City Manager and the Civil Service Commission chose to consider and what weight would be attached to its various components were exclusively their rights and the Court cannot substitute its judgment for theirs. It is only when it is so patently clear that these authorities have acted in an arbitrary or discriminatory manner or that the employee has been denied the right to be heard that a constitutional issue can be said to arise. Suffice it to say that the entire record reveals no evidence of such delinquencies in this case.

The petitioner argues that the U.S. Supreme Court decision of Goldberg v Kelly, 397 U.S. 254, 25 L. Ed.2d 287, provides authority for a court to step into the decision — making process in administration proceedings on constitutional grounds. That decision does not go so far. The issue there was the right of a welfare recipient to challenge his removal from the welfare rolls by an administrative decision without his having a prior opportunity to be heard. The Court held that by the Act of Congress a qualified person had a vested right to receive welfare benefits and that due process required that he be given a hearing before such right could be terminated. Even then the majority of the Court remarked: "These considerations justified the limitation of the pre-termination hearing to minimum procedural safeguards . . . we wish to add that we, no less than the dissenters, recognize the importance of not imposing upon the States or the Federal Government in this developing field of law any procedural requirements beyond those demanded by rudimentary due process."

The same Court in a case involving administrative rulings on purchasing procedures states: "Courts have never reviewed or supervised the administration of such an executive responsibility even where executive duties require interpretation of the law. Judicial restraint of those who administer the government's purchasing would constitute a break with settled judicial practice and a departure into fields hitherto wisely and happily apportioned by the genius of our polity to the administration of another branch of government." Perkins v Lukens Steel Co. 310 U.S. 113, 84 L. Ed. 1108. The petitioner had no vested right in his job as did the welfare recipient in his claim for payment. The right of the people to protection transcends any right of the employee to his job. Roux v. New Orleans Police Dept. (La.) 223 S 2nd 905. The ability to hire and fire for cause must necessarily rest upon those officials who are charged with the responsibility of getting the job done for the public's benefit. They are not held to that kind and character of proof that would support conviction of a crime. They may utilize those sources of information which they feel might be helpful and are only restrained by the fact that an employee cannot be fired or demoted without having a chance to be heard.

The petitioner has been given every opportunity to present his own testimony and all other evidence he wished; he has been represented by counsel who has had unlimited authority to cross examine all witnesses presented. That he had full opportunity to be heard cannot be questioned. The decision of both the appointing authority and the Civil Service Commission has gone against him in their judgment of what the public interest and service requires which decision cannot be disturbed by this Court. The decision of the Civil Service Commission is accordingly affirmed.

HENRY W. MACKENZIE, JR.
(signed)

VIRGINIA: IN THE CIRCUIT COURT OF THE CITY OF PORTSMOUTH

EDWARD A. MAITUCCI,
Petitioner

vs

CITY OF PORTSMOUTH,
Defendant

Law Docket No.
L-74-446

MEMORANDUM
February 21, 1975

the material facts in this case are identical with those in Robert C. Salas vs. Civil Service Commission this day decided.

The petitioner Edward A. Mattucci was a police officer of the City of Portsmouth who was indicted by the same Special Grand Jury that returned the true bill against Salas upon several charges of larceny and bribery, which acts however, were not the same as those charged to Salas. He was suspended by the City Manager, tried and acquitted by the jury on the two charges with which we are now concerned, applied for re-instatement, required to take a polygraph test which was unfavorable to him and discharged by the Cith Manager on recommendation of the Chief of Police. He appealed the decision to the Civil Service Commission which affirmed the City Manager and the case is now here on certiorari. He questions the sufficiency of the evidence to support the decision of dismissal and objects to the use of the polygraph examination against him.

For the reasons stated in the Court's memorandum in the Salas case the sufficiency of the evidence and weight accorded its components by the appointing authority and the Civil Service Commission are not subject to review by this Court.

For the reasons stated in the Salas memorandum the objection to the use of the polygraph test and its conclusions are not legally objectionable.

The judgment of the Civil Service Commission is accordingly affirmed.

HENRY W. MACKENZIE, JR.
(signed)

* * * * * *

CARDIOVASCULAR PSYCHOPHYSIOLOGY

A Book Review

By

N. Ansley

Cardiovascular Psychophysiology, Current Issues in Response Mechanisms, Biofeedback, and Methodology, Edited by Paul A. Obrist, A. H. Black, Eugene R. Bleeker, Jasper Brener and Leo V. Di Cara; Chicago: Aldine Publishing Company, 1974: 662 pages, illustrations, bibliography, index.*

The book is the result of a conference held at the University of North Carolina in 1972, devoted to a review of the state of the art. It is primarily a collection of individual papers of exceptional merit, placed between a brief introduction and summary, containing the commentary A. H. Black on goals, technique and clinical applications; Paul A. Obrist on biological strategies; techniques, and cardiac-somatic effects; and Jasper Brener on conceptual issues related to learned cardiovascular control in humans, technique, and cardiac-somatic effects. To make the book useful as as text, chapters have been added on cardiovascular physiology and central nervous control of the heart. A bibliography of over fifty pages and close to a thousand citations is of great potential value.

Of five groups of papers, the first is about cardiovascular function and measurement. It begins with basic overviews by Forsyth and Cohen, then includes papers on peripheral vascular changes, the contractile force of the heart, and blood pressure.

The second section groups papers on experimental studies in cardiovascular function, involving the complex interaction of behavior and hemodynamic events. The most interesting of these is Obrist et. al. on neural control of heart rate and contractile force, and their relationship to somatic activity. However, the paper by Cohen, discussing the relationship and lack of relationship between blood pressure changes and heart rates, and heart rate and respiration, plus the analysis of a possible common path for heart rate conditioning, is of practical value to polygraph examiners and those doing research in this area.

The seven chapters on operant conditioning of animals consider the issues of autonomic response, and the role of the effector systems. Also

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*Contributors: A. H. Black, Jasper Brener, Rachel Keen Clifton, David H. Cohen, Mary R. Cook, Leo V. Di Cara, Barry R. Dworkin, Rogers Elliott, Bernard T. Engel, Ethel Eissenberg, Ralph R. Forsyth, Claude J. Gaebelin, Richard A. Galosy, S. A. Grose, William W. Hahn, J. Alan Herd, James L. Howard, R. T. Kelleher, Beatrice C. Lacey, John I. Lacy, Michael Lacroix, Peter J. Lang, James E. Lawler, Robert L. MacDonald, Kathleen A. Meters, Susan Middaugh, Neal E. Miller, W. H. Morse, Paul A. Obrist, Lary E. Roberts, Neil Schneiderman, Gary E. Schwartz, David Shapiro, Bernard Tursky, and Marion Wright.

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discussed is the conditioning of the curarized rat, important because the drug prevents the interference of skeletal mediation of autonomic change.

The fourth section, entitled "Human Operant Conditioning," has five chapters devoted to conditioning of autonomic responses. The authors cover two major topics, describing the procedures used to establish voluntary control, and practical therapeutic applications.

If 20 million of our population suffer from hypertension, a technique for lowering blood pressure has significance of great social value. The possibility of patients being able to prevent cardiac arrhythmias outside of a hospital is also important. Because of the value of these immediate applications, it is even more important that we understand the mechanisms that control visceral functions.

Finally, the book has a section of three chapters focusing on the relationship of heart rate to sensormotor processes. The most intriguing chapter is that of Beatrice C. Lacey and John I. Lacey, discussing directional fractionation of responses, and particularly the analysis of heart rate and blood pressure in differentiating between external and internal stimuli.

Specific Interest to Examiners

Polygraph examiners will find the general chapters on cardiovascular control mechanisms and the central control of cardiovascular activity worth reviewing before taking state board examinations or testifying in court. Mary R. Cook's chapter on peripheral vascular changes is of positive interest to all examiners who employ instruments with photoelectric plethysmographs or cardio activity monitors. Bernard Tursky's review of indirect recording of human blood pressure will be of interest because of its discussion of the practical problems in obtaining accurate recordings, and the descriptions of some recent instruments devised to record continuous flow.

Examiners will be interested in a chapter by Larry E. Roberts, on "Comparative Psychophysiology of Electrodermal and Cardiac Control Systems" which describes the neural processes that control electrodermal and heart rate during conditioned emotional response training, in which aversive classical conditioning is superimposed upon an operant base line. Roberts hypothesized that cardiac and electrodermal neural control systems are organized differently with respect to striate muscular activity and motivational or attentional arrousal. He notes the close relationship of heart rate and somatic activity and the general failure to control heart rate by motivational processes. He suggests that segmental electrodermal responses to movement may be produced independent of motivational processes, but motivational arousal is a more important determinant of electrodermal response, while motor activity is a more important determinant of heart rate change.

Summary

This is an excellent book. The editors have overcome the common fault of collected papers by adding explanatory chapters, by writing an introductory

overview to each section, and by adding an unusual and lengthy summary. The bibliography is superb, and the index more than adequate. The contributors are outstanding in their fields, with the merit of being able to write well. The topic shows great promise in medical therapy and psychophysiological research. I recommend it to all in the field of psychophysiology; and to all polygraph examiners who are involved in teaching, advanced study, and research.

* * * * * *

POLYGRAPH REVIEW - SEMANTICS

By

Bobby J. Daily and Frederick C. Link

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 semantics and was prepared by Frederick C. Link of Augusta, Georgia. (The answers are on page 138.)

1. Words used in the construction of polygraph test questions:

a. are relatively unimportant as long as the questions are grammatically correct.

b. do not materially affect the reliability or validity of polygraph examinations.

c. should always conform to the common interpretation and usage.

d. may be a most important factor in determining the reliability and validity of polygraph examinations.

2. In a case in which a man died due to a bullet wound, the probable best question semantically would be:

a. Did you shoot Mr. _____?

b. Did you cause the death of Mr. _____?

c. Did you kill Mr. _____?

d. Did you murder Mr. _____?

3. The polygraph examiner must be careful never to phrase any questions using:

a. four-letter words which are pornographic in nature.

b. the words of the examinee.

overview to each section, and by adding an unusual and lengthy summary. The bibliography is superb, and the index more than adequate. The contributors are outstanding in their fields, with the merit of being able to write well. The topic shows great promise in medical therapy and psychophysiological research. I recommend it to all in the field of psychophysiology; and to all polygraph examiners who are involved in teaching, advanced study, and research.

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3. The polygraph examiner must be careful never to phrase any questions using:

a. four-letter words which are pornographic in nature.

b. the words of the examinee.

3c. a word which could evoke an emotional response.

d. a word which is not in the dictionary.

4. The best definition of semantics is:

a. The science of the historical development of words.

b. The science of communicating with others.

c. The science of conducting a polygraph pre-test interview.

d. The science of public speaking.

5. When formulating test questions for a person suspected of forging an endorsement on a check, the probably best question phrasing would be:

a. Did you embezzle that check?

b. Did you forge that endorsement?

c. Did you write that false endorsement?

d. Did you phony that endorsement?

6. T or F: An examinee from a cultural background different from yours may not understand your words in exactly the same way you do.

7. T or F: Most examinees will not tell you that they don't understand you because they don't want to appear dumb.

8. T or F: A word has only the meaning that the particular speaker or hearer gives to it.

9. T or F: The examiner, since he is unable to read the mind of the examinee, must assume that the common interpretation of any given word is the same as the interpretation of the examinee.

10. T or F: If a person is sensitive to a particular word, he could become emotionally aroused when he hears it, even though he is telling the truth.

* * * * * *

Psychopathic Personality - A Bibliography

A bibliography on psychopathic personality is available from Professor R. R. Ross, price $1,00, address: Canadian Journal of Criminology and Corrections, 55 Parkdale Avenue, Ottowa, Canada, K1Y 1E5.

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ABSTRACTS

Police Screening

Ansley, N. "Police Screening - The Results of 413 Examinations" Maryland Polygraph Review, April 1975, pp. 2-7.

The article gives statistics from a screening program in 1971 and 1972 in which a police department gave polygraph examinations to 413 eligible applicants for policemen. All of those polygraphed had been subjected to background investigatiors, medical examinations, and professional interviews; and considered acceptable. However, information derived solely from the polygraph examinations disqualified 217 of these candidates (52%). The primary and secondary reasons for disqualifications are given with numbers and percentages. Definitions of the terms and types of admissions are given. For example, the most common reason for rejection was the use of drugs which was defined as "repeated use of any controlled dangerous substance illegally, two or more uses of "hard" or addictive narcotics, or selling of any illegal drug for profit." The number rejected (primary) was 48, or 22.1%. As a secondary reason for rejection, there were 94, or 43.3% who also made admissions that fit the description, but were disqualified for some other, more important reason. (Author abstract.)

Attitudes Toward Theft

Ash, Philip. "Screening Employment Applicants for Attitudes Toward Theft," Journal of Applied Psychology, 1971, 55:2, pp. 161-164.

The Reid Report is a three-part instrument (scorable attitudes-toward-theft inventory, biographical data blank, admissions list of past delinquencies) designed to predict the likelihood that an employment applicant will steal from his employer. For a sample of 254 employment applicants, Reid Report evaluations were correlated with evaluations based on polygraph (lie detector) interviews. For each device the evaluation alternatives were: recommended for hire, qualified recommendation, not recommended. Chi-square for the 3 x 3 table was 45.15 ($p < .001$). A Pearson product-moment correlation coefficient between polygraph evaluations and Reid Report evaluations was .43 ($p < .001$). (Author abstract)

Drug Addicts - Responsivity

Prystav, Gunther H. "Autonomic Responsivity to Sensory Stimulation in Drug Addicts," Psychophysiology, 12:2, 1975, pp. 170-178.

Skin conductance responses (SCRs), heart rate (HR), arterial blood pressure (BP), and respiration were recorded under rest and sensory stimulation (11 Hz strobe light, 100 dB white noise) in former drug addicts (DG) and in controls (CG) matched for sex and age in a repeated measures design. DG consisted of long-term users of barbiturates and narcotic

analgesics and had been free of drugs for a period of 3 wks prior to the first session. The hypothesis was tested that autonomic functions are decreased in DG due to the drug effects. In various ANOVAs, significant main effects for all factors were found. The results in DG compared to CG were: (1) diastolic but not systolic BP was significantly lower; (2) SCR magnitudes were significantly smaller during rest periods; (3) SCR magnitudes and SCR recruitment latencies were significantly smaller in both sessions to visual and auditory stimuli; (4) the habituation rates of SCR magnitudes and SCR recruitment latencies were significantly greater at stimulus offset. The results of SCRs and diastolic BP indicated a decreased autonomic activity in the drug dependents compared to the controls. (Author abstract)

Effects of Noise

Reburn, John W. and Mayo, James F. "The effect of Noise on Polygraph Tracings," Maryland Polygraph Review, April 1975, pp. 8-9.

Subjects were systematically exposed to background music in one chart, an array of sounds during a second chart, and soft background music on the third chart. Subjects reacted to the noise in a manner quite similar to the reactions described as significant in the detection of deception. A Stoelting model #22500 was used. The necessity of noting extraneous sounds on the polygraph chart, and the requirement to be generally free from outside noise, is supported. (Editor abstract.)

Electrodermal Response

Blair, Michael O. and Zill, Nicholas II, "Using Variance as a Discriminator in Lie Detection," Journal of Applied Psychology, 1974, vol. 59, No. 1, pp. 110-112.

Using galvanic skin response (GSR) data from an earlier study by Orne and Thackray, it was shown that variance of response was a suitable discriminator between liars and truthtellers when an individual's deception is detected on a single trial. Subjects who were liars differed from subjects who were truthtellers on all trials, not just on the ones in which they tried to deceive the experimenter. The discrimination between liars and truthtellers was facilitated by Gruvaeus and Wainer's method of cluster analysis.(Author abstract)

Varni, John G. "Learned Asymmetry of Localized Electrodermal Responses," Psychophysiology, 12:1, 1975, pp. 41-45.

The present study investigated the possiblity of establishing bilateral electrodermal responsivity of skin on the digits following the pairing of electric shock applied to one hand in conjunction with the visual presentation of a triangle. Ten subjects (Ss) displayed significantly larger electrodermal responses on the hand previously shocked when presented with the image of a triangle without shock. No bilateral differences were observed during the presentation of a neutral stimulus, a circle. These results are interpreted as supporting the notion of learned asymmetry of localized electrodermal responses. (Author abstract.)

Bernstein, Alvin S., Taylor, Kenneth W., and Weinstein, Erica. "The Phasic Electrodermal Response as a Differentiated Complex Reflecting Stimulus Significance," Psychophysiology, 12:2, 1975, pp. 158-169.

To examine the influence of stimulus significance on the skin conductance response (SCR) a 21 sec, 1000-Hz tone was sounded variously in one ear or the other. A click occurred during many tones, and a light signal always followed offset by 9 sec. Four groups were studied: one was told to press a pedal immediately on hearing any click; another only on hearing the click during a tone in a specified ear; a third was also to respond only to the specified ear, but was to withhold the press until the light following tone-offset; a fourth group simply listened without any response. Each of a series of predictions regarding the incremental effect of stimulus significance on the SCR was confirmed, at each point at which information was delivered on any trial — i.e., tone-onset, click, tone-offset, light-onset. This was true for both independent as well as for within-S (between ear) comparisons. The presence of verbally-induced "significance" as well as the complex nature of its influence indicated the presence of central mediation in the elicitation of "peripheral" SCRs. An execute-SCR was identified which correlated uniquely with motor reaction time, did not simply reflect judgments of "significance"; rather, it was qualitatively distinguished from other SCRs which, in general, were associated with stimulus "significance." There was some evidence of an alerting SCR too, but this was less sharply defined. (Author abstract.)

Heart Rate and Electrodermal Response

Epstein, Seymour, Boudreau, Louis and Klirig, Stephen, "Magnitude of the Heart Rate and Electrodermal Response as a Function of Stimulus Input, Motor output, and their Interaction," Psychophysiology, 12:1, 1975, pp. 15-24.

In Part I, 20 Ss squeezed a dynamometer at various levels of capacity. Heart rate and skin conductance were monitored during the anticipatory period and during each squeeze. In Part II, reactivity to the four combinations of the presence and absence of a loud noise and the presence and absence of a strong squeeze was examined. Part III compared reactivity to the loud noise under the following condutions: as an unfamiliar, surprise stimulus; as a familiar surprise stimulus; as a familiar, expected stimulus. Major conclusions were: (1) Heart rate varies more directly and reliably with motor output than skin conductance; (2) Skin conductance is more sensitive to small cognitive than to small motor effects; (3) Skin conductance is more reactive to stimulus input than to motor output, while the opposite is true for heart rate; (4) A strong familiar stimulus presented by surprise elicits a marked heart rate decelerative reaction, usually, but not always, preceded by a smaller accelerative reaction; (5) Baseline changes immediately preceding stimulus onset markedly affect the response to stimulation, and can account for the attenuated reactions observed when a noxious stimulus is preceded by a warning signal. (Author abstract.)

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