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Is the Lie Detector an American Obsession? A Response to K. Alder

This is an important book. It is the best work that has appeared in the field in a long, long while. It's a fascinating, terribly overdue historical assessment, a semi-supplement to Trovillo's (1939; 1940) early history and a personality-focused extension of Bunn's (1998) dissertation on the history of the 'lie detector'. Alder's book is an account of "...the lie detector [which] promised to redeem the innocent, scarify the guilty, and ensure political loyalty..." from an examination of persons and personalities of primary historical forefathers, Leonarde Keeler, Dr. John Larson, Dr. William Moulton Marston and, in a limited and terribly understated way, Fred E. Inbau, J.D.

I wish to note that I heard no mention of this book in any of the sessions I attended at the APA seminar in New Orleans, August 19–25, 2007. Nor was there any comment on this book at another polygraphy-related workshop that I attended after the APA meeting. There were no casual conversations

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I heard about the book at either seminar. This, even though the book has been available since March, 2007. It has been widely discussed in the printed media and has been prominently featured on some internet sites. Reviews of the book have appeared in leading newspapers and magazines. Yet, those most active and directly involved in the field aren't talking about it. Why? I don't know. But, that's a shame. A better understanding of what the field is about, how it got to where it is, and how those who were instrumental in its early development, especially Marston, Keeler, Larson and Inbau, are promising points of discussion; had they been attended to earlier, the field may well have headed off some of the difficulties it has faced. All is not lost though; careful attention to the instructional points this book has to offer could serve as a useful guide for the field in the future. I wonder if anyone will take heed.

Perhaps, many in the field are aware of this book; maybe some have even read it. It is possible that they have simply ignored it because the author is, or appears to be, in this case at least, as much a polemicist as an historian. He tends to disregard the positive and to focus on the negative. He takes some 'facts' at face value and ignores others. For instance, he doesn't seem to have truly appreciated the fact that in the science related to the field there are equally sound arguments pro and con regarding issues such as accuracy, utility and so forth. There are also equally credible scientists on both sides of the arguments. The author, a distinguished academic historian, has for whatever reason ignored these facts, the two sides of the science. At various times and in various ways he offers his personal views – which he presents as if they are fully supported by science – in order to mislead or, if not that, to appeal to an audience more widely interested in the topic than those in the polygraph examiner community.

It has become a cliché to say that history repeats itself. I repeat it here because the fact that there was no mention of this book at the APA conference is strongly suggestive of the truism in that aphorism. We have learned little from our history, though it is fair to say not many have taken the time to organize that history in a coherent way. Alder has done that. But bear in mind that he is not and was not, other than having an historical interest, affiliated in any way with the field of polygraphy. Why someone with such an affiliation did not broach this topic before this time is a terrible omission. (It is within my knowledge that several prominent persons in the field, with a personal knowledge of its history, were specifically invited to take on this task in years past. They declined.)

The polemical nature of this work aside, this book still provides a fascinating account of the early history of the field. The snide, unnecessary insertions of personal bias need to be overlooked; all examiners ought to read this book. Historical analysis is by its nature interpretive and gives the author an entitlement to express his view; but he does not seem to understand the historical development beyond what his narrow focus was. That's too bad, because it has led to two serious errors in presentation. Each of these is an important prong of the author's position. And, in each case, the author is on the wrong side of the facts. However, it is possible that Alder was not and perhaps still is not aware of the importance of these errors. It's also possible that many examiners are not aware of them. I'll discuss them here in some detail before I get to a more substantive review of this book.

Alder's Major Premises

When I first entered this field I observed that one of the major points of disagreement amongst examiners was that some believed that only the testing examiner was capable of 'interpreting' the data, of reaching a valid conclusion of truthfulness and deception. This was said to be the case because only that examiner had actually discussed the case with the examinee; only that examiner knew what were the circumstances when the physiological data were collected; only that examiner interacted with the examinee and could understand the real meaning of the physiological data.

On the other hand, there was another school of examiners who believed that it was possible for one examiner to interpret 'blindly' another examiner's 'charts' in a particular case. A reviewing evaluator could take a decision regarding truthfulness and could provide feedback and advice regarding the examination outcome. In fact, in the office where I worked, in which there were about 10 to 15 examiners at any one time, it was customary for one examiner to review another's work in a case. In important cases such a review might involve multiple evaluators, almost always including John Reid.

It is of interest to note at this point that persons holding these two schools of thought strongly believed in the correctness of their respective positions; yet neither school had actually sought to test their views empirically. Fortunately, that situation has changed, but discussion of that change is not the point here. The immediate issue is that my observations about these two schools of thought separate, historically, the focus of Alder's work from more

contemporary developments. That is, Alder's coverage ends close to where Polygraphy, as I came to understand it, begins.

In my early experience, the first school of thought was represented by the Keeler Polygraph (school) Institute; the second by the Reid Polygraph School. I need to note here, however, that while each of these institutions is mentioned specifically, my intent is not to single them out, but merely to use them for convenience's sake as clear representatives of the two opposing viewpoints about polygraph testing.

It is fair to say that at the time I attended and then worked at the Reid school a less than positive relationship existed between John Reid and the person who headed the Keeler school; the two schools were located only a few miles apart in Chicago. This schism was based in large part on the divergence of views on how polygraphy and interrogation are, or are not, to be blended together in a properly conducted polygraph examination. Reid was of the view that interrogation followed polygraph testing once the examination revealed 'deception'. The head of the Keeler School held that interrogation and polygraph testing were essentially undifferentiated; the two were to be combined in some way, as determined by the examiner, to arrive at whatever the 'truth' was.

My observations about these two schools of thought were confirmed in a conversation I had with Lynn Marcy, one of the premier examiners in the field. He was employed at the Keeler school for some time, and he understands well the principles of the teaching offered at that institution. He also understands well the position of the Reid School. He has confirmed that the Keeler school, and especially Leonarde Keeler and his direct disciples, strongly held to the conviction that polygraph testing and interrogation were inseparable arts; the polygraph testing and the charts produced during an examination took on meaning in a particular case as the examiner and the examinee interacted throughout the entire process. One could not know (infer) from access only to the charts whether a response was produced by a 'lie'; to know that one had to interrogate. (A point on which I and the late Raymond Weir, another premier polygraph examiner for whom I had and have the greatest respect, strongly disagreed, even though we spent many long nights and early morning hours discussing it without either of us ever changing or rearranging our positions in the slightest.)

The difference between these two schools of thought, at least as they are represented in my experience, is key to understanding one of the serious shortcomings in Alder's book. He fails to note and does not seem to understand the difference between the "old school" (Keeler) and the "new school" (Reid). He reports, for example, "Keeler's style of lie detection succeeded at its principal task – extracting confessions and intimidating subjects – only if the operators consistently refused to be bound by even the most basic norms and standards. If polygraphers have thrived, it is because they are consummate antiprofessionals... Indeed, the lie detector is a placebo science, in that it works to the extent the popular culture has been convinced it works – even though it works best when its operators lie" and "a whiff of hokum has always trailed after the device [lie detector] since its early days in Berkeley... But, there always remains a residual skepticism about skepticism – the sort of self-doubt that P.T. Barnum knew how to exploit so well... There is always a lingering suspicion that the damn machine just might possibly work... The one major technical innovation in the polygraph since the 1930s actually confirms the power of this ruse. In the 1990s new computer algorithms were developed that could analyze the subject's physiological responses with mechanical neutrality. But because the algorithms might preclude operators from accusing subjects of lying (whatever the machine said), the nation's top examiners at the Department of Defense Polygraph Institute report that most operators turn the computer off." "In sum, Keeler and his followers operated his lie detector according to the same logic as judicial torture. This explains why the police... ultimately welcomed the device." So Keeler's lie detector in a 'box' provided for almost anyone who was "less interested in the polygraph record per se than in using it to screen suspects, intimidate detainees, and extract confessions."

The other school of thought, represented by the Reid School, is not, as I have said, directly discussed or even alluded to in Alder's book. Alder either doesn't know about or has deliberately ignored the six decades of history following that which was the focus of his interest. To him 'lie detection' following Keeler's era is the same as that in and before that period of time. Keeler's approach, however, is not what Reid advocated. While it is true that Reid's approach, the use of a carefully structured testing process that permits independent review of collected physiological data, is still not universally adhered to in the field, there is little doubt that such an approach is a significant departure from the idiosyncratic methods of Keeler. Though Alder ignores this fact, it is of historical note that Keeler's contemporary and mentor and a prominent figure in this volume, Dr. John Larson, viewed what

Keeler did with the 'lie detector' with great skepticism. He was, in some sense, an early representative of what J. Reid advocated, as these quotes from Alder make clear. "Unlike Keeler...he [Larson] had always published his results in journals of criminology and psychology, as it was priority that mattered in science... He feared that Keeler would sell machines 'to every Tom, Dick and Harry,' allowing poorly trained operators to ruin the reputation of the new science." "Larson obliquely condemned Keeler for 'interrogation' akin to torture... But the device ought not be called a 'lie detector'", and "Larson was adamant that exams be conducted only by a fully trained psychiatric expert, working in conjunction with experts in psychology, criminology, social work and police procedure" ... "For Keeler... police units using his polygraph technique [demonstrated that] ... [of the] one-third of subjects labeled 'deceptive,' an impressive average of 60 percent were persuaded to confess" ... "This survey... may offer the best picture we will ever have of how the police deploy the polygraph when they think no outsider is watching" "The operator with the Indiana state police achieved a confession rate of only 6 percent... Why the huge difference? The operator in Indiana was the only one trained not by Leonard Keeler but by John Larson..." John Larson, the nation's first cop with a Ph.D., "wanted to transform the ...lie detector. He was concerned about Keeler as his 'first pupil' and his interest in 'training unethical interrogators.'" Larson was much more of a scientific bent and his efforts in 'lie detection' were, at core, "part of the division between early statistical approaches to psychology and sociology and those who saw an individualistic approach to problems as being the more viable method." "Larson tried to work with Marston to denounce Keeler's false claims about the lie detector and his training scheme 'a racket that had ruined the field with 'quacks'. Behind the Taylorism and intelligence testing", [and] "Behind the public façade, the polygraph, depending on how it was operated, did not necessarily restrict the discretion of examiners. Indeed, as Keeler conceived it, the lie detector might even enhance the power of the police, by becoming a psychological third degree. And it was here that Larson and Keeler would part company."

In summary of this point, Alder is correct in stating that the split between Larson and Keeler "would be two distinct lie detectors". but, as history shows, it was not Larson, but Reid, who turned out to endure on the opposite side of Keeler.

The other major prong of Alder's thesis is that the 'lie detector' is a peculiarly American device. Americans, and Americans alone, Alder declares, have

been obsessed with the 'lie detector.' "Keeler sold only one machine outside the United States, to Selfridges in England. Even in Canada the American instrument was spurned by both the police and business." "Only in America was the lie detector used to interrogate criminals and vet employees. Abroad, it was disparaged as a typical American gimmick." "Yet no country other than the United States has made use of the technique to any significant degree" ... "Why, despite the avalanche of scientific denunciations, does the United States – and only the United States – continue to make significant use of the lie detector?"

Alder answers the question he raises, in accord with his thesis, by stating that: "The lie detector has thrived in America because the instrument played into one of the great projects of the twentieth century: the effort to transform the central moral question of our collective life – how to fashion a just society – into a legal problem." "...the proponents of lie detection have packaged their technique as a mechanical oracle that can read the body's hidden signs for evidence of deceit – while they sidestep the skeptical interpretive labor that scientists ordinarily demand of such claims. The lie detector and its progeny have been repeatedly denounced by respectable science... In the end, though. We believe in the lie detector because—no matter what respectable science says – we are tempted."

Alder's position on 'lie detection' being a peculiarly American phenomenon might well have been true in the formative years of its history. But it is disappointing to realize that Alder's research did not reveal the growing use of Polygraphy outside of the United States from at least the 1950s. It is true, as Alder states in his penultimate chapter titled "Pinkos", that: "In reality, neither the Soviet Union nor Nazi Germany before it saw any need for the lie detector – as the CIA secretly acknowledged. Totalitarian governments brook no impediment to their control..." However, in today's world the situation is dramatically different from what one might conclude from a reading of Alder's book. The polygraph was used in Europe, Poland in particular, since at least the 1950s, possibly earlier (Pasko-Porys 2007; Widacki 2007; Widacki 2007a). In Russia, as well as in many other former Soviet Union states, polygraph testing is now widely used. When I first visited there with a delegation of polygraph examiners and police officials in 1991, there may have been, as was acknowledged by local scientists, fewer than ten examiners in Russia. Today, by all accounts there are many hundreds, and according to some perhaps close to 1,000. There are several companies in Russia who today manufacture their own brand name polygraph instruments. Similarly, when

I first led a delegation to China in the mid-1990s there were few examiners there, most using instruments illegally obtained from the U.S. Today there may be as many as five or six, perhaps more, different Chinese manufactured instruments in use. The total number of examiners in China is not certain but it may well be in the hundreds. And, aside from China, Russia and other former Soviet Union states, polygraph testing is widely used in many countries in Europe, Africa, Asia, and Central and South America, including, among others, Belgium, Canada, Columbia, Egypt, Hungary, Israel, Japan, Lithuania, Mexico, Romania, Singapore, South Africa and Thailand.

Any astute observer of Polygraphy today would surely realize that the field has been and is expanding dramatically, more so outside of the U.S. than within. This is not because American gimmickry is easy to pass on to naïve audiences. And it is not because other countries wish to be foolhardy, to defy the ostensible wisdom of American criminal courts and scientific opinion in what Alder points out is the case in the U.S. where he states: "And even in America, the lie detector has been consistently banned from criminal courts and discredited by panels of illustrious scientists, from the Congressional Office of Technology Assessment to the National Academy of Sciences." The truth is that in spite of what Alder and like-minded observers state, Polygraphy is an invaluable technique that contributes to criminal and other investigations in ways that, as yet, are not possible with any other method. This is a lesson that Americans have learned and one that has been and is being learned in many countries across the world. Polygraphy, in contrast to what Alder speculates, is not an American phenomenon that was fashioned in the sociology of societal transformation; there is clearly something more going on here. It is simply undeniable that in spite of its many flaws and limitations, the field of Polygraphy is growing around the world. Those with a serious interest in history and science ought to be more honest about this.

Now, aside from being based on faulty premises, what is it that Alder has to say about 'lie detection', about its history and those who pioneered the field? Well, there is plenty of material in this book, some never before available. That ought to be of interest to persons in the field as well as those with a special interest in policing, police science and even the broader forensic sciences.

On the Composition of the Field

In the U.S. the field of Polygraphy is male-dominated, police-affiliated, and short of persons holding advanced academic credentials (Horvath 2007; Weber & Horvath, in press). It is of interest to note, however, that in policing today it is relatively easy to find sworn officers with Ph.D.s; but that is not so in Polygraphy. Of even more interest is the fact that the very first police officer in the nation with a Ph.D. was John Larson, one of the principal figures in this book and, of course, one of the first contributors to Polygraphy. It was Larson, as pointed out in this book, who emphasized “science” as opposed to “interrogation” in his approach to ‘lie detection’. Though not meeting the educational standard set by Larson, examiners today do overwhelmingly represent policing, with over 80% of them being directly affiliated with law enforcement in some way (Horvath 1995, 2007). Today, about 10% of the polygraph examiner population is female; that has not changed dramatically in the past ten years and, considering that in “...1939 Keeler set himself up as Keeler, Inc., ...and “trained Jane Wilson – Katherine’s [Keeler’s wife] friend and the wife of his partner Charlie Wilson – as the nation’s first female polygraph operator” females in the field are clearly underrepresented. Why hasn’t the field organized in such a way as to try to remedy this imbalance?

On Courtroom Admissibility

With respect to courtroom admissibility almost every examiner can trace back to the Frye case in 1923. Some are even aware that that case involved the work of Dr. William Moulton Marston, not Larson or Keeler. Most may not know, however, that Keeler, a relatively uneducated but very popularized practitioner, believed that courtroom admissibility was key to the conditional success of the field. In the courtroom Keeler recognized that: “Without a college degree, ...[he] would have been an easy mark on the stand. So he immediately got on the horn and ‘shouted loudly for John L. [Larson] with his experience and many degrees.” Alder explains: “Then, a year later, Keeler achieved the breakthrough so far denied him: he formally presented results from his lie detector to a jury.” “According to the judge’s private survey, the jurors found the lie detector offered “corroborative evidence in connection with other facts proved”, and they voted to convict. “The case did, however, set a legal precedent: prior stipulation remains the sole basis for the polygraph tests in most criminal courts.” During this same period, however, the judiciary invoked the same Frye rule to admit many other forensic sciences treated

with considerable skepticism outside the immediate circle of practitioners: handwriting analysis, ballistic identification, and forensic psychology, to name a few. The lie detector alone has been banned. As several judges have hinted, the courts rejected the lie detector not for its failings but for its power – what one called its ‘aura of near infallibility, akin to the ancient oracle of Delphi.’ “the judiciary kept the polygraph out of their criminal courts – while, of course, allowing it to play a role in the invisible 90 percent of criminal cases where it functioned as just another chip in a game of plea bargaining.” One can see that in spite of Keeler’s efforts, and in spite of the many years that have intervened between those efforts and today’s world, the judicial view on Polygraphy has not changed much. Why is it that the field has not addressed this issue with greater energy and directness?

On the ‘Guilty Knowledge Test’

Many observers credit the late David Lykken (1959) with the development and dissemination of information about what he termed the Guilty Knowledge Test (GKT). Though his GKT is unique in important ways, Ansley (1992) reviewed the literature on this topic and found that variations of the GKT were used early in the history of the field, long before Lykken published on the topic. These uses were not, strictly speaking, only dealing with the GKT-related Peak of Tension Test (POT). The GKT, which in my view is more properly termed Information Recognition Test (IRT), seems to have been initially used by Keeler in what was known in 1935 as the Valier Mine case. Here Keeler was called to investigate an explosion at a labor-related event. He went to the crime scene and “picked out evidence of guilty knowledge”, “a half-shattered alarm clock, which he assumed was the bomb’s timer because of its copper leads and adhesive tape.” With this knowledge in mind Keeler examined two suspects, McDonald and Robertson. His examinations led to “a physiological reaction from McDonald and Robertson after an eighteen-hour interrogation on the lie detector that was so intense that Robertson had ended it by smashing the machine with his fist.” McDonald and Robertson didn’t confess but their trial was a presentation of scientific evidence, based on Keeler’s crime scene findings, ‘Res ipsa loquitur’ – the thing speaks for itself – that led to widespread recognition of Keeler’s laboratory and colleagues in forensic science.

In another early use of a similar examination Keeler examined a person named Anderson who was a suspect in a homicide. “He asked if Anderson

had killed her with a stone, with a stick, with a fist, with a shoe, with an iron pipe. And every time Keeler mentioned the iron pipe, the 'delicate needles of the detector... wavered violently.' Anderson, the examinee, went out to get some air... he was overheard to say, 'This is just as good a time as any.' just before he dived headfirst through the... window and landed... four floors below."

What is most interesting regarding the reference to the IRT use by Keeler (I assume but don't know with certainty that he was the first to do what is described in this book.) is that he did what is now standard procedure in some locations. He actually visited a crime scene, collected evidence and information of value to polygraph testing, and then designed his testing approach based on such data. Though such a process is not widely practiced in the United States, the one country where the use of the IRT in this way is common is Japan, where the CQT is seldom emphasized (Mizutani, 2005). Some examiners in Slovenia reportedly also do this.

On Training

Keeler's, after the war, "was still the only place in the nation to go for training in lie detection: either a two-week orientation course for \$30 a week, or the more extensive six-week courses for certificate as a graduate of 'Leonarde Keeler, Incorporated' – though Keeler always pointed out that it took at least a year of supervised casework to become a proficient examiner." Keeler's approach greatly concerned Larson. "Unlike Keeler... he had always published his results in journals of criminology and psychology, as it was priority that mattered in science... He feared that Keeler would sell machines 'to every Tom, Dick and Harry,' allowing poorly trained operators to ruin the reputation of the new science." It was Reid, however, not Larson, who challenged Keeler's training model. Reid's approach required a six-month training program involving academic study and a strong, closely supervised internship with 'real-life' testing carried out under the tutelage of an experienced examiner. In the U.S. the only training program that is active today with a program similar to what Reid implemented and which Larson advocated is that connected with the federal government. The Defense Academy of Credibility Assessment (DACA) program is much shorter than the Reid program, but it does include an emphasis on closely monitored testing experience.

On the Court of Last Resort

In Chapter 17, *Deus Ex Machina*, Alder describes, in part, how Keeler was sought out to exonerate those who were or claimed to be wrongly accused and those who he could absolve of guilt, nameless or otherwise, for a real or perceived offense. Importantly, though, in a more formal effort, Keeler did, along with the help of Earle Stanley Gardner and Raymond Schindler, bestselling author and famous detective, found the Court of Last Resort. There was a time when the APA actively promoted the 'Court' and sought to carry on its purposes. Sadly, that activity has ceased or, at the least, does not appear to be a vital part of the APA's agenda.

Examiners will have to read this chapter with a bit of caution – perhaps restraint is a better term. Alder's perspective on Keeler, and, more generally, on the field of Polygraphy, is revealed in his concluding commentary. He says: Quaesalid did not become a great shaman because he cured his patients; he cured his patients because he became a great shaman." "Leonard (sic) Keeler was such a shaman." No doubt, Alder believes this to be the case for all in Polygraphy.

On the Development of the 'Lie Detector'

Who really invented the 'lie detector?' Well, as we all know no one did; there is not now and never has been a Lie Detector. In the early years of the field there was, however, the media. It was... "the newspapers [who] baptized the lie detector; they named the device, launched its career, gave it its purpose. The machine made great copy, great pictures, great drama."

In developing his 'lie detector' Keeler had at least three problems to solve: "how to register blood pressure fluctuations in quantitative terms, how to combine physiological measures on a single scale, and how to make the device portable..." He surmounted those problems, of course. And, in chapter 18, titled, "Frankenstein lives!" we learn that rightly or wrongly, deserved or not: "Leonarde Keeler got much of the credit for 'lie detection' in the popular media." But his mentor, John Larson, believed "he had created a monster: a 'salesman,' an 'exploiter,' 'a showman'..." "Lee, Keeler and many others had allowed the 'so-called lie detector' to be turned into a 'psychological third degree.' But 'If Larson had not invented the lie detector, someone else would have' ... all of the

men formerly famous for having ‘invented’ the lie detector have been forgotten, except one. Only William Moulton Marston... has endured” ... “He was proud of his creation, and never seemed to suffer for it.”

On Alternatives to the Keeler Polygraph

In the years covered by Alder, Polygraphy was a high-profile media topic and, as already noted, Keeler was at the forefront of this public attention. With that as a backdrop it is perhaps no surprise that some persons tried to capitalize on this new ‘science’. For instance, as Alder points out there was Dr. Orlando Scott, a Chicago surgeon, who developed and “out-grandstanded” the lab where Keeler worked in order to promote his “own 100-percent-effective ‘Thought-Wave-Detector’, which tapped, he said, the electrical currents of the brain.” Scott proudly advertised his National Detection of Deception Laboratories with the motto, “Diogenes searched for them... We find them.” Then there was “Darrow’s Stoelting device and Lee’s Berkeley Psychograph.” Each promoter claimed, of course, to have developed a better ‘lie detector’, more accurate, faster and easier than what Keeler was offering. Sound familiar? Maybe something like what so-called voice-stress proponents today are offering to those naïve enough to believe the promotional materials?

In Conclusion

In chapter 19 – Vox Populi – the last chapter, Alder states: “Over the course of the past eighty years, lie detection has been perhaps the most investigated forensic technique.” This is, in my view, probably true. It is also one of the most often unstated and unrecognized facts about this field. Why?

The conclusion according to Alder is: “the techniques of lie detection, as used in investigative work by polygraphers, do not pass scientific muster. Yet lie detection lives on.” “The lie detector cannot be killed by science, because it is not born of science.” “The one constant is the machinery’s role in political theater. For the past several decades nary a public scandal has gone by without its polygraph moment.” It should be obvious that I disagree with Alder’s perspective here. In resolving such scandals as well as in many other situations involving human affairs and social conflict is there, despite the limitations in Polygraphy, a better, fairer, more accurate alternative to ‘lie detection’? Not yet; at least that is my view and the view of the National Academy of Sciences (2003).

There is a lot more in this book than what I have been able to cover. And, as I have stated, the historical record of this field is only partially set out by what can be found in this volume. If there is among the readers of this review one who would like to take the opportunity to update the history of the field, that would be a most welcome event. And, I might add, among those who would welcome it are many persons still available who have lived the history and are willing to share it.²

Finally, Alder states: "...polygraph experts have urged their colleagues to set rigorous protocols for interrogation and to establish licensed training schools. In fact, only cursory standards have been adopted, and the reason is simple enough. Keeler's style of Polygraphy works best when the examiners are not constrained by norms." Alder's point notwithstanding, we have, of course, made some inroads here, and we are continuing to work at this. The history of the field, though, tells us there is still a lot to do, and maybe there are better ways to do this than what is now being done. Isn't it time to use the lessons of history to guide us into the future?

Notes

1. Alder, K. (2007), *The lie detectors: The history of an American Obsession*, New York: Free Press, p. 336. [A personal note: Be forewarned – The footnoting/reference system in this book is, to say the least, disconcerting. It takes considerable effort to try to determine the source of attribution for the author's commentary and even with that it is not always possible to be certain that the correct source has been identified.]

2. During certain periods of the APA's history, there was a formal attempt to record organized interviews with prominent examiners and others in order to document recollections of events in the field. I believe that some of these recordings are still available. The idea, however, is a good one and ought to be vigorously pursued on a more frequent and regular basis.

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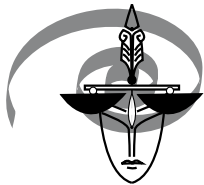
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The Event Knowledge Test (EKT)

In Lithuania polygraphs have been in use since 1992. Tests that are based on a comparison-relevant question system are not popular. The results of psychophysiological tests and their conclusions are difficult to prove in courts. The results of tests have almost no use to the police and prosecutor's department in pre-trial investigation. Those results in criminal investigations that were evaluated highest in court decisions were achieved using an event knowledge test (EKT).

The peak of tension test (POT) was developed by Leonarde Keeler (1994). He developed the foundations of the guilty knowledge test (GKT). Keeler's test contained the following:

1. Within the last two days did you steal a car?
2. Within the last two days did you steal a bicycle?

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3. Within the last two days did you hold someone up?
4. Within the last two days did you burgle a house?
5. Within the last two days did you try to spend a bad cheque?
6. Within the last two days did you rob a bank?

According to S. Abrams (1989) two types of POT procedures exist – a known solution peak and a searching peak. In the former, both the perpetrator and the examiner know the critical crime issues, while in the searching peak, only the person with guilty knowledge is aware of them. David T. Lykken (1981) conducted extensive research and popularized the guilty knowledge test among scientists. Gershon Ben-Shakhar (2002) contributed significantly to a more extensive application of GKT. This method is widely used in Japan (Nakayama 2002). Japanese police polygraph examiners call GKT a ‘concealed information test’ (CIT). Polish polygraph examiner A. Krzyscin (2001) proposed the term ‘multiple-choice test’. According to Matte (1997), the North American version of the GKT often includes a second key question that serves as a kind of control question as a ‘true key’ in the form of a ‘false key’ to protect innocent subjects. On the whole polygraph specialists from North America use GKT quite seldom. For instance, up to 1994 FBI examiners used GKT for up to 18% (Podlesny 1994) of all the examinations conducted. In Russia the V. Varlamov (2000, 2001) school of polygraph examiners is dominant. In this school GKT is considered the main polygraph test. Varlamov says that during a polygraph examination one should not increase the stress of the examined subject and questions should be indirect. In a murder case the test would look like this:

In your opinion, how many people fired at subject A?

0. six
1. five
2. three
3. one
4. four
5. two (a relevant question)
6. seven

In Varlamov’s test the first question is what the author calls “offered”, indicated by number ‘0’, and goes first. He also emphasizes the requirement to formulate the question in indirect form. P. Ekman (1992) formulated five

reasons that would cause significant stress to the suspect just because the police have arrested him/her. A strict direct question might provoke even greater stress to the examined person.

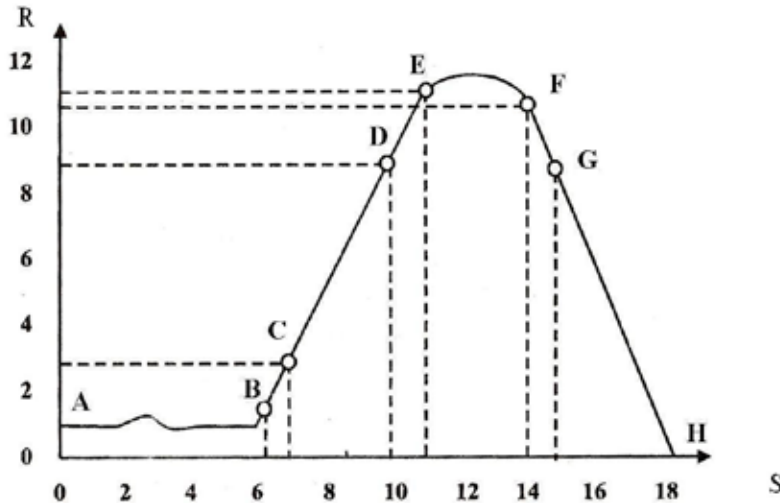


Figure 1

Dependence of human functional possibilities or psychophysiological reactions R of the body on emotional stress S. According to Varlamov (2000).

Figure 1 demonstrates the possible dependency of human reactions on stress. Varlamov recommends examining a person when his/her stressful state is between the interval B and D. Within this interval human psychophysiological reactions may have an almost linear dependence on increase of emotional stress, i.e. when the stress increases, the volume of psychophysiological reaction increases accordingly. If the results of a polygraph-examined person are within the interval EH due to significant stress, reactions measured with the help of a polygraph may be wrongly interpreted by an examiner (an examiner may fail to measure variation of the psychophysiological reaction). This means that if the functional possibilities of a person arrested by the police are within the interval of the curve DE, human functional possibilities that were caused by stress due to a direct question will appear in the EH part of the curve, and it will not be possible to use the measured psychophysiological reactions for evaluation of the effect of a question. An experienced examiner can spot from the behaviour of the examined person that he/she is undergoing stress, but cannot determine

exactly in what part of the curve his/her functional possibilities are. Recently several computerized polygraphs have been developed which have an additional emotional stress assessment scale (the DIANA polygraph). Recently in criminal and official (the latter are examinations conducted inside special services) examinations EKT has been used as a polygraph in Lithuania. The essence of this test is based on GKT. During the test what the suspect knows about the event is also checked, and at the same time police investigators try to find details of the criminal act which are later investigated using other police methods. The majority of people examined by polygraph are witnesses to the crime or innocent people. This is due to two reasons. First, in each criminal or official examination there are a few times more suspects than people who commit a crime. Second, as suspects have a right to refuse a polygraph examination, some perpetrators use this right. If the polygraph examiner determines that the suspect could not have committed a crime, this is a very positive thing to the criminal investigation and the public. The names of the tests itself – guilty knowledge and concealed information – are in their essence of an accusatory nature. Justice calls not just for finding the perpetrator, but also for acquitting any person who has been unsatisfactorily accused. It is not the examiner who judges whether the subject is guilty or not guilty of the committed crime according to the test results. The court makes a final decision based on a set of evidence. Therefore, one of the reasons for emphasizing that the test is objective to all participants of the criminal act is called an events knowledge test (EKT). EKT is also different from GKT in formulation of questions and answers. EKT questions are formed in accordance with the material available on a criminal act and its prepared versions. Some questions include the facts that are already known to the police (e.g. nature of murder, instrument of murder, place of murder, etc.) and the facts the police are not yet aware of (e.g. time of murder, number of perpetrators, means of transport by which the perpetrators got to the place of a crime). Each question is followed by 6–12 ready possible answers (in GKT they are called questions). 5–14 questions with answers are prepared. The first answer, numbered 0, is considered as offered and is not included in the assessment of the reactions. For instance:

Are you aware of what car the perpetrators used for getting to the bank?

0. NIVA
1. FORD
2. OPEL
3. TOYOTA
4. MAZDA
5. NISSAN

The examined or critical circumstances of the crime may be in any answer except '0'. On making questions and answers possible, the psychophysiological reactions of the examinee to the given answers are anticipated. Therefore, additional questions with answers are also prepared, which may be included or rejected by an examiner during a polygraph examination. We can discuss this in detail in our next article. We would also like to point out that the answers are very short. We try to make them from one or two words. When the answers are very short, there is no need to introduce them to the examinee before the test because he/she immediately understands them. Of course, words for the answers are chosen according to the education of the examinee and the vocabulary he/she uses. Short answers help to avoid occurrence of artefacts. There is a higher probability that the psychophysiological reactions of the examinee would begin not in the middle but at the end of the sentence, or after the answer yes-no. Whereas the examinee does not know the answers until a polygraph examination, it is more difficult for him/her to prepare tactics for contra actions. In our practice we had some cases when the suspect, trying to hide circumstances after critical answers, gave the answers "no" apparently faster. We do not conduct pre-test interviews. Prior to the test the examinee is given a short description of how a polygraph operates. The examiner finds out whether the examined person is rested, has any serious health issues or has used some medicine on the day of examination. The examinee has his/her rights explained and signs consent to a polygraph examination. When the polygraph sensors are already connected, the examiner reads out the first question to the examinee, asks if he/she understands the question and whether he/she knows the answer to it. Sometimes the examinee gives a critical answer. Then the examiner does not record psychophysiological reactions to the answers of this question and transfers the version given by the examinee to police investigators for verification. If the questions are well prepared, such cases almost never happen. Most often the examinee says that he/she does not know the answer. Then the examiner explains that he/she will read several versions of answers and he/she will answer to each question "no" because he/she is not aware of the crime circumstances. Sometimes after recording psychophysiological reactions of all the answers to one of the questions, the examinee wants to explain his/her feelings or his/her state to a certain answer. The examiner listens and corrects his/her explanation, if necessary. The same procedure is applied to all other questions. If no significant psychophysiological reaction to the critical answers is registered the examiner makes a conclusion where he/she states that during the examination it has not been determined whether the examinee knows the circumstances of the committed crime. When a polygraph registers reactions

to critical questions and some search answers during the examination, the examiner shall name them in the examination conclusion. Sometimes psychophysiological reactions to neither question are registered. This can happen for two reasons: first, the examinee does not remember or has not taken note of the circumstances of the crime, and second, there is no critical answer among the answers because of the examiner's fault. Later, police investigators compare the data obtained from a polygraph examination with the available facts about the crime and conduct additional search or examinations if necessary. Varlamov (2000) and Krzyscin (2001) wrote that if they succeed in formation of several questions about a criminal act, this test has very high accuracy. We can check the theoretical reliability of the results according to the following formula:

$$P = 1 - \left(1 - \frac{1}{n_1 n_2 \dots n_i} \right),$$

where P – theoretical probability that the psychophysiological reactions of the examinee have not been random n_1 – number of answers to the first question (offered answer not included) n_2 – number of answers to the second question, n_i – number of answers to the last n -teen question.

The theoretical probability that psychophysiological reactions of a polygraph examinee have not been random depends on the number of questions as demonstrated in Table 1 and Figure 2. Table 1 and Figure 2 show calculations according to the provided formula, when the number of answers to each question is 5 (the minimal number). In case the number of answers is higher, accordingly the theoretical probability P will be higher, too. Calculations here are limited to five questions.

Table 1. Dependency of theoretical probability on number of questions

n_1	n_2	n_3	n_4	n_5	P
5	0	0	0	0	0.8
5	5	0	0	0	0.96

5	5	5	0	0	0.992
5	5	5	5	0	0.9984
5	5	5	5	5	0.99968

P

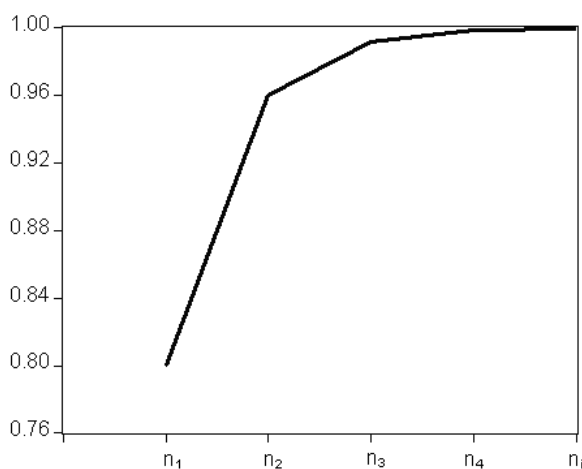


Figure 2.

Dependency of theoretical probability on number of questions

In Table 1 and Figure 2 we can see that when we get psychophysiological reactions to at least four critical questions, the theoretical probability that the latter reactions are not random is 0.9984, or 99.84 %. On choosing more questions, the probability is almost 1, or 100 %.

Summarizing what has been already described, we can distinguish the following features of EKT:

- a test of indirect questions
- questions are formulated in a non-incriminating form
- alternatives are given in the form of answers
- the questions provided may be long and with explanations

- the examined person is not familiar with the answers before the examination
- information search is conducted together with verification of information about the incident
- the examined person has difficulty in choosing tactics for contra actions.

In their further articles the authors hope to share practical experience in the application of EKT for criminal investigations.

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Alibi Testing Potential in Polygraphic Examination

Elliot Aronson's *Social Psychology* reads: "It would be good if there were an infallible examination to establish whether someone is lying [...]. The police could ascertain whether the suspect's claim that while the crime was being committed he was eating a sandwich at home is true."

The question of reliability of the alibi of those suspected of committing a crime is frequently a problem for officers of law enforcement and prosecution. In many cases, having that fact confirmed by the relatives of the suspect is not convincing for the officer. Polygraph examination could help to determine the actual whereabouts of a given person when the crime was being committed.

As long as the commonly shared opinion was that a condition for conducting polygraph examination is possession of specific knowledge about the crime

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being investigated by the person examined – and most importantly, the determination to conceal it – testing an alibi with the use of such examination seemed fairly improbable.

Thanks to the research on the human brain whose results have been published in the last few years we know how the mental and emotional trace, which is what is most interesting to us here, originates during the examination. We know that if we come into contact with an event that captures our attention by its singularity or significance, such an instance will be recorded in our nervous system. The event may be perpetration of a crime, contact with persons who committed the crime, or with phenomena or objects that hold traces of criminal activity, etc. Emotions present in such cases born at the time of the event, for example fear of the consequences of the committed act or a simple sense of guilt, mean that these traces record especially strongly in our nervous system. Their existence allows a later acceptance of notification of the crime, interrogation of the witness or suspect, and the occurrence of a confrontation.

Parallel to the information concerning the event itself, our nervous system also 'records' the emotions that accompanied the event. The mental and emotional trace will be 'recorded' in our nervous system both when we participate in or witness a crime, and also when we receive information related to a crime at a later time.

If, during a polygraphic examination, a question concerning a fact is asked, the person examined compares the content of the question to the resources of the memory. Should a particular mental trace ('the record of the fact') be found, the emotions accompanying it will also be 'discovered', which will result in excitation of the autonomic nervous system. Despite the fact that the mental and emotional traces are stored in different parts of the brain, they are inseparably connected.

Assuming that polygraphic research is based on revealing mental and emotional traces, independent of the fact whether the person examined tells the truth or is trying to conceal or distort the truth, it is possible to define what actual mental trace is recorded in that person's nervous system during an examination.

How can this knowledge be used for testing the alibi?

The first example concerns the disappearance of a young woman. On June 7, 2006, at about 8:35 a.m., Joanna S. (20) left her home on the outskirts of

Czechowice-Dziedzice and went to the train station in Goczałkowice Zdrój. She was to take the 9:05 train to Katowice. On that day at 11:00 a.m. she was to take her semester exams at the university. It was later discovered that Joanna S. did not reach the train station on that day. On her way to the station, at 8:46 a.m. she made a telephone call to B., her university colleague. He did not answer, but he rang her back a few minutes later. Joanna S. did not answer the phone.

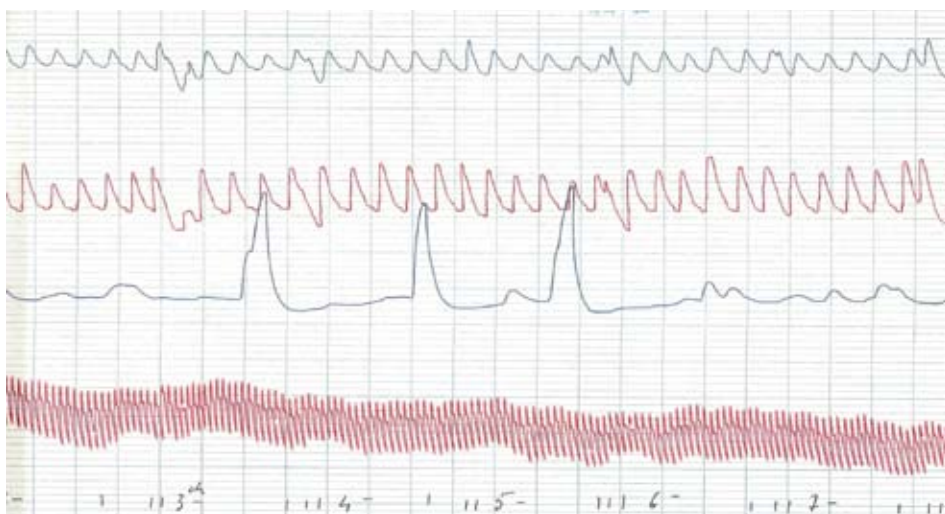
During the interview preceding the examination, B. explained that he and Joanna S. were students from the same group at university. He had seen her for the last time on Saturday, June 3. They had made an appointment to meet on June 7 at the university. On that day they were to take an exam. On the morning of June 7, when B. was still at home in Katowice, he noticed that Joanna had phoned him at 8:46 a.m. He called her back, but she did not answer the phone. When he reached the university, Joanna was not yet there. He telephoned her again, as did two of her female friends. They were also trying to establish contact with her after the exam. To no avail. On the next day, B. contacted Joanna's sister, who told him that Joanna had left for the exam the day before and had never returned home.

The examination made use of a test aimed at the potential confirmation of the version presented by B. Questions referring to his whereabouts at 8:46 a.m. on June 7, 2006 were used.

1. Are we in Kraków?
2. Is it Saturday today?
3. At 8:46 a.m. on June 7 this year were you at the university?
4. ...at the plot by the Goczałkowski Reservoir?
5. ...traveling between Czechowice-Dziedzice and Goczałkowice Zdrój?
6. ...at home in Katowice?
7. ...at the train station in Goczałkowice Zdrój?
8. ... traveling between the allotment and Goczałkowice Zdrój?
9. ... on your way to Katowice?
10. At 8:46 a.m. on June 7 this year, were you at any place other than the ones I have mentioned?

The objective of the test was to check the mental and emotional trace concerning the place where the person examined was at the time when Joanna S. disappeared that was registered in his nervous system. Following the available knowledge on the functioning of the human brain, memory, and emotions, it was assumed that if the examinee was at home in Katowice at the moment of Joanna S.'s disappearance, he would react emotionally to this particular question, as such a mental and emotional trace is recorded in his

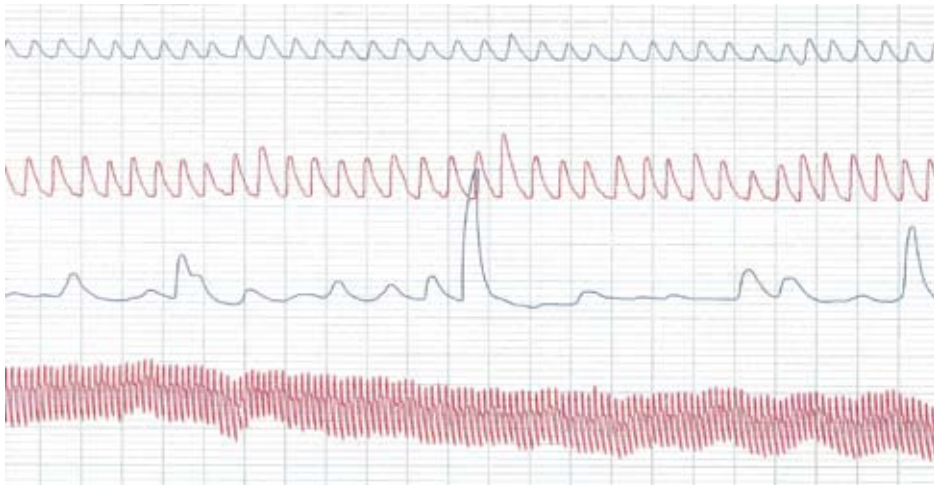
nervous system. It was assumed that under normal circumstances, Joanna S.'s telephone call would be neutral for him, but due to the circumstances, a recollection of the fact that Joanna S. phoned him at the time had to raise emotions. They should be tied to the date and the hour when Joanna S. phoned him, but also to the place where he was at the time. Confirmation of these facts could serve both to confirm his version and also to eliminate B.'s potential direct participation in Joanna S.'s disappearance. All the questions from 4 to 9 were justified by the circumstances of the case.



Polygram no. 1.

During the registration of the recording of emotional changes presented above, the examinee was to listen carefully to the questions asked and answer NO to all of them. During the first presentation of the test the examinee never knows the order in which the questions are to be asked.

As can be seen, the largest emotional changes in the galvanic skin response were present after the question no. 6 was asked. This gives grounds to assume that at around 8:46 a.m. on June 7, 2006 the examinee was, to the best of his knowledge, at home in Katowice. Practically, it is impossible that emotional changes could be present after the question no. 6 was asked and were absent after question no. 5 if, during the time mentioned in the questions, the examinee had been on the way from Joanna S.'s home to the train station in Goczałkowice Zdrój.



Polygram no. 2.

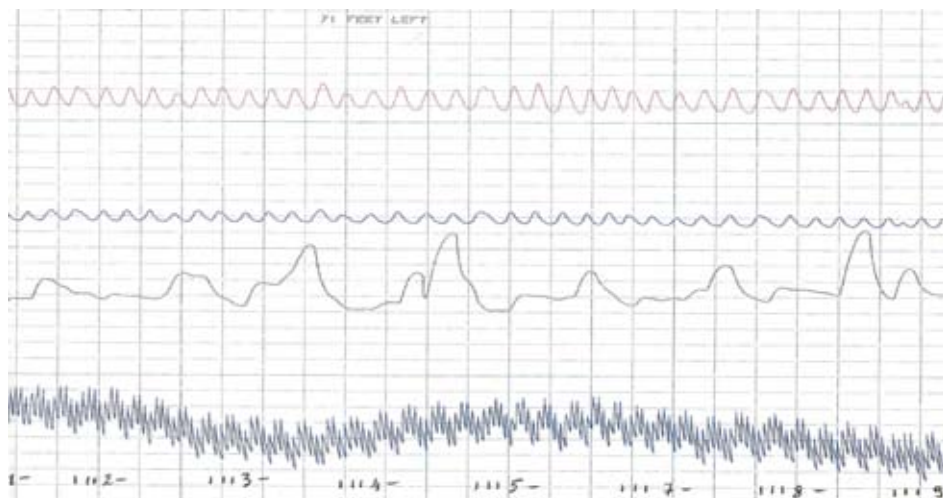
During the registration of the recording of emotional changes presented above, the examinee was to listen carefully to the questions asked and give true answers in his head. The examinee did not speak aloud. Before the second presentation of the questions, the examinee is always advised that the questions will be asked in the same order as during the first round.

In Reid's Control Question Test, during which the examinee was presented with questions referring among others to his direct connection with the disappearance of Joanna S., major emotional changes were evidently present after control questions, rather than critical questions, were asked.

The following example concerns the case of the brutal murder of an elderly married couple. The tests were conducted more than 13 years after the crime had been committed. Submitting to polygraphic examination was suggested to persons who were in the possession of keys to the house or could have been let in at any time. These criteria were suggested by the way the crime was committed. The time of murder was defined fairly precisely in the course of the investigation. All the persons examined were interrogated as witnesses within several hours of discovery of the crime. Among other things, they described where they were and what they were doing at the time.

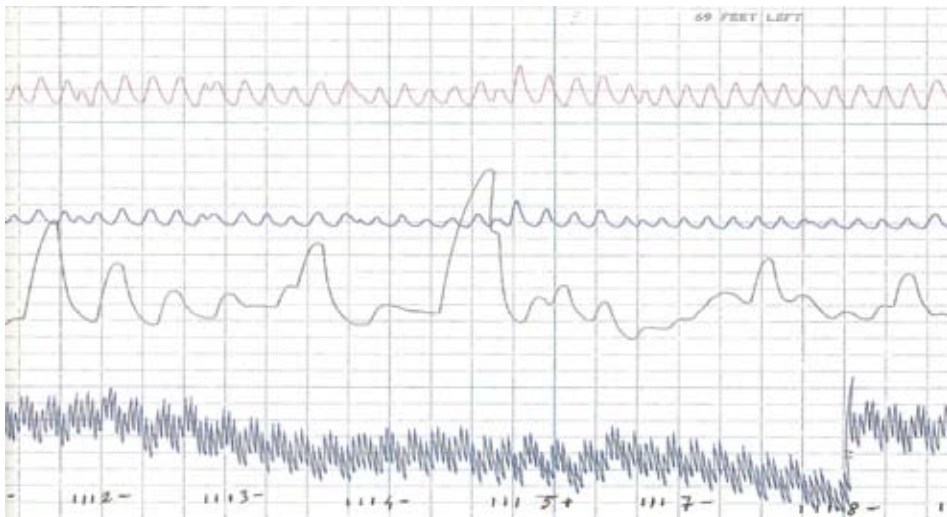
One of the tests used concerned the place where the persons examined were during the killing.

1. At the time when your parents were murdered, were you at the theatre?
2. ... at the cinema?
3. ... at your parents' house?
5. ... at home?
6. (Question no. 6 was a spare in case the person examined pointed to a different place where he/she was from the one resulting from the files of the trial and at the same time not accounted for by the examiner in the construction of the test. This was caused by the very long time span from the day of the crime to the day of the examination.)
 7. ... on a walk?
 8. ... at work?
 9. ... visiting friends?
10. At the time when your parents were murdered, were you at any place other than the ones I have mentioned?



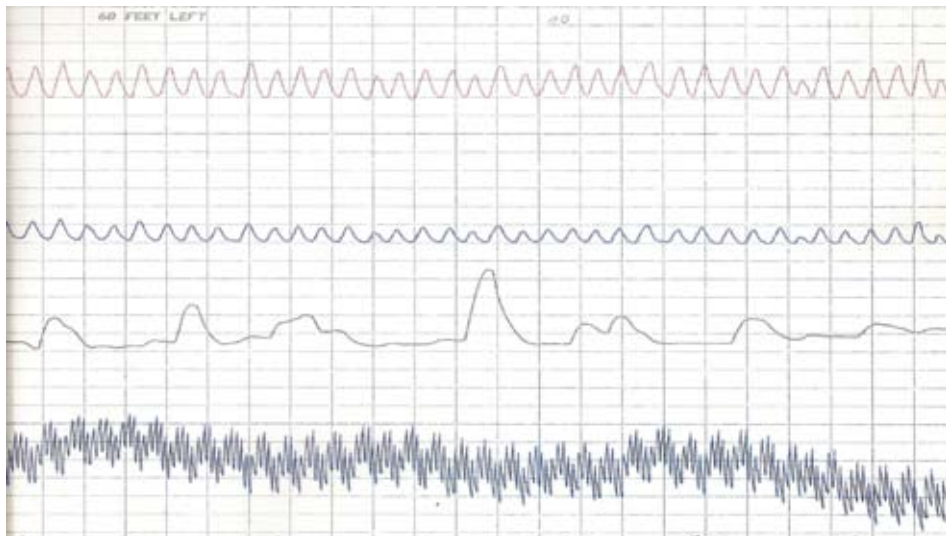
Polygram no. 3.

During the registration of the recording of emotional changes presented above, the examinee was to listen carefully to the questions asked and answer NO to all of them.



Polygram no. 4.

During the registration of the recording presented above, the examinee was to listen carefully to the questions asked and provide true answers by answering loudly YES or NO.



Polygram no. 5.

During the registration of the recording of emotional changes presented above, the examinee was to listen carefully to the questions and give true answers in his head. The examinee did not speak aloud.

After question no. 4 was asked, concerning the examinee being at the parents' house at the time of the killing, no significant emotional changes were registered. Decidedly the largest emotional changes were present after question no. 5, that is after the place that the examinee cited as the one where he was at the critical time was named. Changes in both galvanic skin response and arterial blood pressure are visible.

It is hard to imagine that there could be no mental and/or emotional traces registered in the nervous system of the examined person if he were a witness or perpetrator of the murder of his parents. The remaining questions concerned other, probable places where the examinee could have been at the time.

The examinee remembered beyond any doubt not only where he was but also what television program he was watching and on which channel, and even what news the newscaster was reading at the time when he was telephoned about the death of his parents. The statement of the examinee was compared with the witness interrogation notes made a few hours after the disclosure of the killing.

The examination proved what mental and emotional traces related to the place where the examinee was at the time of the murder were registered in his nervous system. This provides grounds to assume that the examinee, to the best of his knowledge, was at his own home when his parents were killed, and was not in their house at the time.

The following example concerns the murder of Edward F. in February 1997. The examined person was the victim's grandson and was suspected of the murder. Both the interrogation of the examinee and his statements during the examination showed that he visited his grandfather very rarely. The last of these visits had taken place many months before the case in question.

A few weeks after the killing, the officers conducting the preparatory proceedings returned the keys to the flat of the deceased to his daughter. Asked to do so by his mother, the examinee accompanied her to his grandfather's flat to help to clean it. This took place in March 1997 and, the examined claimed, it was the only time that year that he visited Edward F.'s flat. The flat had been thoroughly searched and was in an extremely messy state, with numerous traces of blood, as the assailants had behaved very brutally towards Edward F.

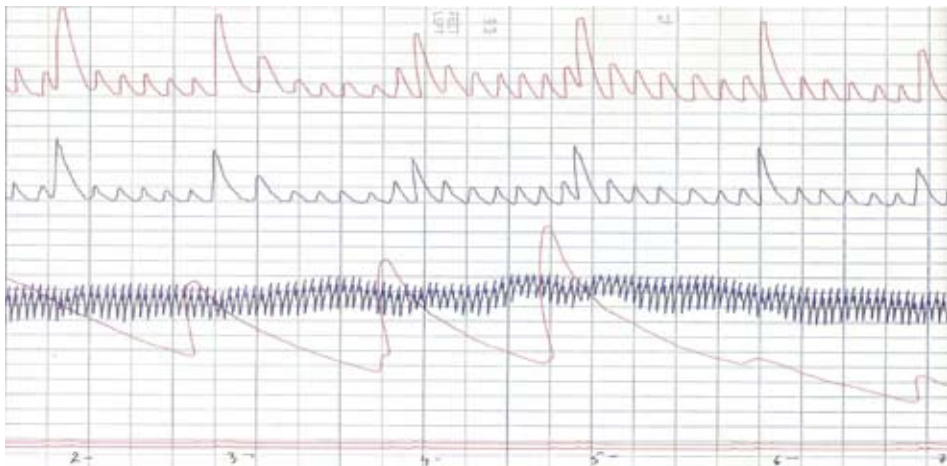
One could imagine that for a young man who remained for a few hours in such

conditions, this was a shocking experience and was recorded permanently in his nervous system.

A problem known well to law enforcement officers emerged in this examination. The person examined – accused, in this case, of perpetuating a brutal murder – denied being at the critical time at the scene of the crime, yet at the same time did not remember – due to the passage of time – where he was at the time when the murder was committed. In this case, questions referring to the place where the examinee was when the crime was committed could not be used.

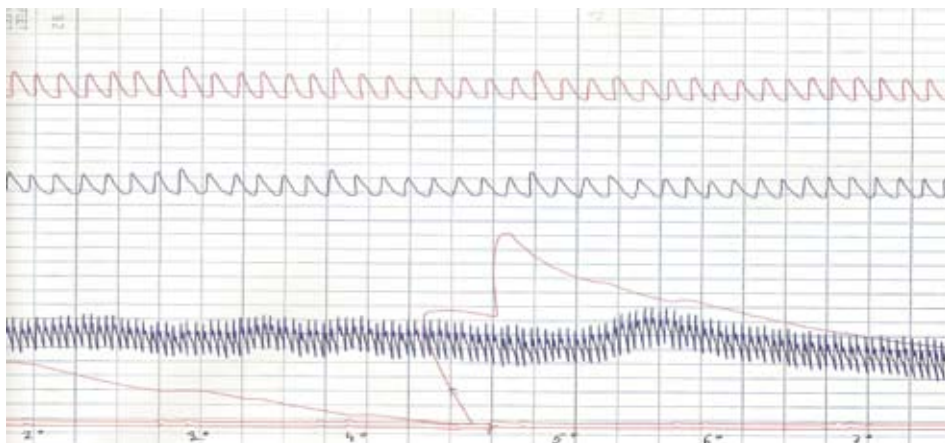
The examination made use among others of a test concerning the time, or to be more precise the month, when the victim's grandson was in the victim's flat.

1. Were you in Edward F's flat in November 1996?
2. ... in December 1996?
3. ... in January 1997?
4. ... in February 1997?
5. ... in March 1997?
6. ... in April 1997?
7. ... in May 1997?
8. Were you in Edward F's flat at times other than those I have mentioned?



Polygram no. 6.

During the registration of the recording presented above, the examinee was to listen carefully to the questions asked and answer NO to all of them.



Polygram no. 7.

During the registration of the recording of emotional changes presented above, the examinee was to listen carefully to the questions and give true answers in his head. The examinee did not speak aloud.

After question no. 4 was asked, concerning the month when Edward F. was brutally murdered, no significant emotional changes were registered. It is hard to imagine that participation in such a killing could leave no mental and/or emotional traces. After question no. 5, which concerned the period when the examinee helped his mother to clean the flat, changes in both the arterial blood pressure and galvanic skin response are clearly visible.

In this examination it was determined what mental and emotional trace related to having been in the flat of the deceased was registered in the nervous system of the examinee. This provides grounds to assume that the examinee, to the best of his knowledge, was present in Edward F.'s flat in March 1997, and was not present in the flat in February 1997, that is in the period when the murder was committed.

The following examination concerned a repeat offender and a case in which he claimed to have been wrongly accused on the grounds of the victims' testimonies.

At around 11:00 a.m. on August 13, 1997 two men entered a jeweler's shop. Its owners, Henryk and Leonarda S., were present in the shop at the time.

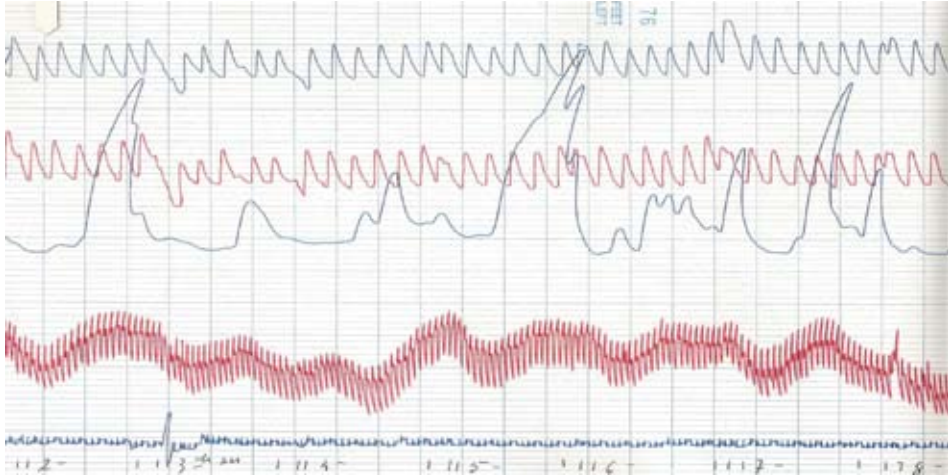
The men pulled out items which looked like firearms and demanded money. Leonarda S. tried to escape to the shop's backroom, and Henryk S. tried to activate the alarm system whose switch was situated under his desk. At that time, one of the men – Marek L. according to the testimonies of the victims – began to chase Leonarda S. and stopped her. The other assailant – Michał W. as the victims testified – hit Henryk S. on the chest with the pistol and then led him to the shop's backroom. The assailants made their victims lie on the floor. When Henryk S. tried to talk to the attackers, one of them hit him on the head with the gun. Leonarda S. was also hit repeatedly with the gun. The attackers bound the victims with plastic tape and gagged and blindfolded them. They then stole gold jewelry and other objects of value they found in the shop.

Of significance here is the information that on February 7, 2006 the regional court in Gdynia found Marek L. guilty and sentenced him to five years' imprisonment. Polygraphic examination was conducted at the request of the defendant's lawyer, after recourse to the appellate court. At the time, the examinee was on leave from the detention center.

Here, similarly to the previous examinations, the examinee – accused in this case of violent robbery – denied being at the scene of the crime at the critical time, and could not remember where he was when it was perpetrated. The examinee was arrested a few months after the robbery and was never able to reconstruct the course of the critical day. He claimed that he had met the victim for the first time in his life in court in 1999 when the trial began.

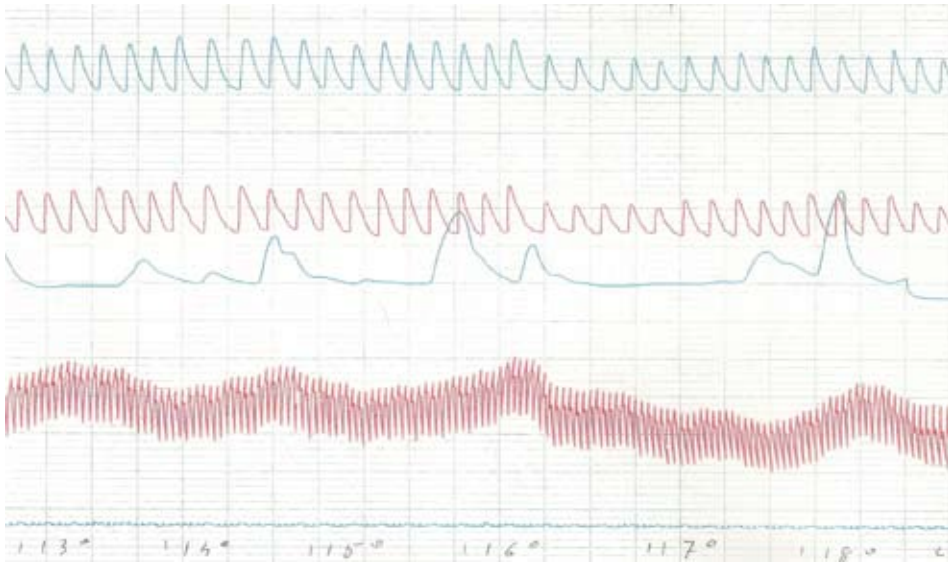
As the typical form of the test to check the alibi of the examinee could not be used in the examination, a decision was reached that the examination was to clarify when he had first seen Henryk and Leonarda S. It was assumed that participation in such a brutal robbery should leave very clear mental and emotional traces in the perpetrator. The fact that the examinee had previously been repeatedly convicted for crimes against property was of no importance here.

1. Did you see Henryk S. for the first time in 1994?
2. ... in 1995?
3. ... in 1996?
4. ... in 1997?
5. ... in 1998?
6. ... in 1999?
7. ... in the year 2000?
8. Did you see Henryk S. for the first time later than the times I mentioned?



Polygram no. 8.

During the registration of the recording of emotional changes presented above, the examinee was to listen carefully to the questions asked and answer NO to all of them.



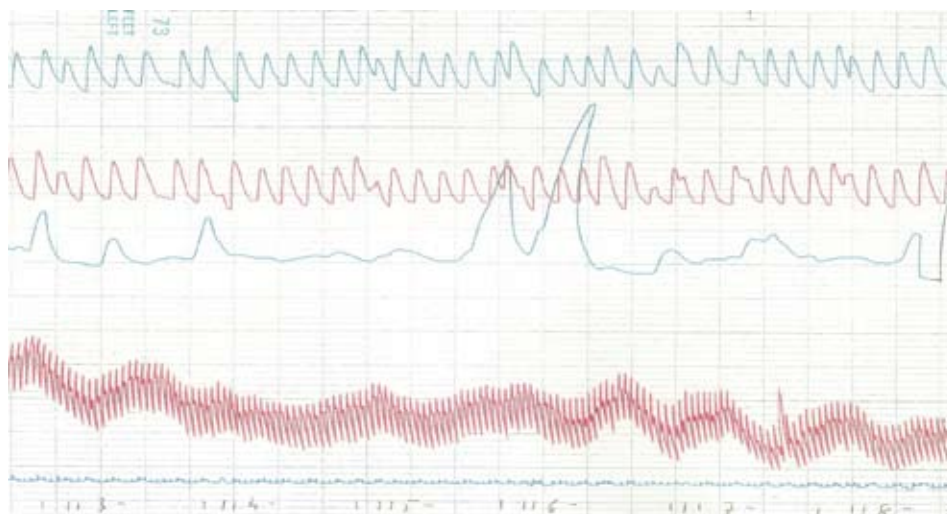
Polygram no. 9.

During the registration of the recording of emotional changes presented above, the examinee was to listen carefully to the questions and give true answers in his head. The examinee did not speak aloud.

It is perfectly visible that the largest emotional changes followed question no. 6, which gives grounds to assume that, to the best of his knowledge, the examinee saw Henryk S. for the first time in 1999.

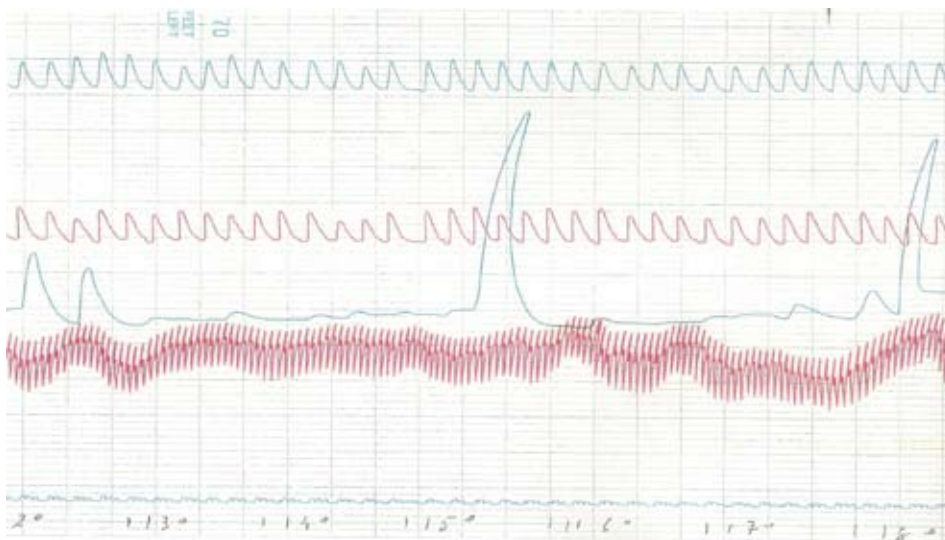
A similar set of questions was used in reference to Leonarda S.

1. Did you see Leonarda S. for the first time (the examinee saw a photograph of the victim while studying the file of his case) in 1994?
2. ... in 1995?
3. ... in 1996?
4. ... in 1997?
5. ... in 1998?
6. ... in 1999?
7. ... in the year 2000?
8. Did you see Leonarda S. in person for the first time at a later time than those I mentioned?



Polygram no. 10.

During the registration of the recording of emotional changes presented above, the examinee was to listen carefully to the questions asked and answer NO to all of them.



Polygram no. 11.

During the registration of the recording of emotional changes presented above, the examinee was to listen carefully to the questions and give true answers in his head. The examinee did not speak aloud.

The largest emotional changes in arterial blood pressure and galvanic skin response occurred after question no. 6 was asked, which gives grounds to assume that the examinee, to the best of his knowledge, saw Leonarda S. in person for the first time in 1999.

There are cases when the persons examined do not deny that they were at the scene of the crime, yet present other reasons for which they could not have committed the crime they are accused of. This was the case with the murder of Irena K., which was discovered on May 1, 1997 in the town of B.

The body of Irena K. was found in her flat by her son. Her body was lying on her bed, and was partially naked. Injuries in the form of skin abrasions and bruises were visible on the neck of the victim. At that time two men were staying in the flat: Przemysław K., the son of the deceased, and his workmate Andrzej Z. Both the men were detained. The police determined that in the evening of the previous day the detainees had consumed some alcohol with the deceased, and then gone to sleep. Irena K. slept in one room, and her son with his colleague in another. In the morning, when the two men saw the body of Irena K., they reported it to the police. The examination was

conducted several hours after they were detained, which made conducting the procedure very difficult due to the emotional state of the examinee.

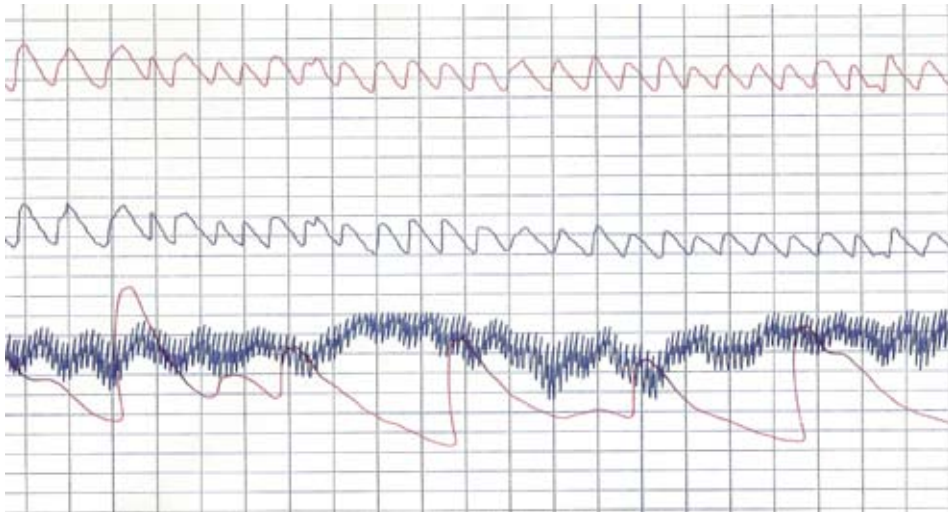
The examinee remembered at what time they had gone to sleep. Moreover, the approximate hour of the death of Irena K. was known. The following were among the questions used for the examination of Przemysław K.:

1. an irrelevant question
2. an irrelevant question
3. At the time when your mother was dying, were you eating dinner?
4. Were you sleeping in another room?
5. Were you holding her hands?
6. Were you watching her being strangled by someone else?
7. Were you holding her by the legs?
8. Were you strangling her?
9. At the time when your mother was dying, were you doing something that I have not mentioned?

It was assumed that the examinee was experiencing a strong trauma that while his mother was being strangled he had been sleeping in the room next door. Some apprehensions were caused by the fact that it had only been a matter of hours from the tragic death of a relative of the examinee, by the fact that a few of the questions were carrying a large emotional load, and by the statement made by the examinee that before the examination he had been interrogated for a few hours by policemen who were trying to persuade him to admit to killing his mother or to accuse Andrzej Z.

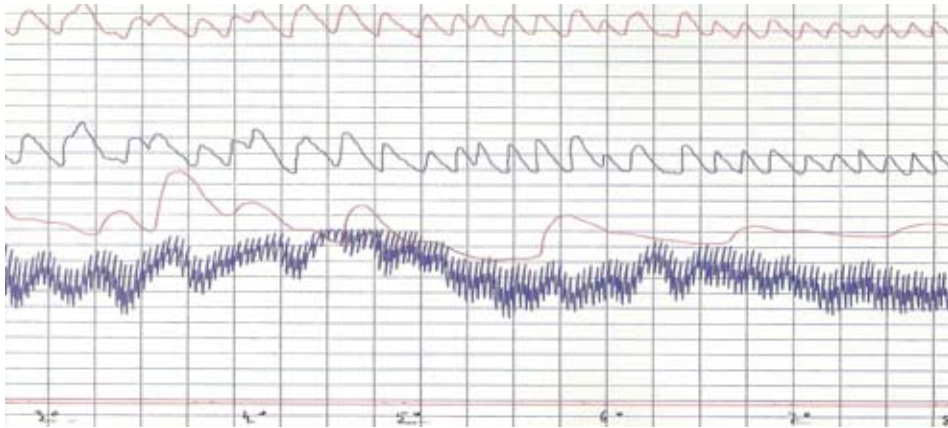
The largest emotional changes in the arterial blood pressure and the galvanic skin response were present after question no. 4 was asked, which provides grounds to assume that the examinee, to the best of his knowledge, was sleeping in the room next door while his mother was being strangled. One must at the same time be aware of the fact that the legibility of the recording of emotional changes was strongly influenced by the emotional state of the examinee and the extreme nature of many of the questions.

A few days after an opinion favorable for Przemysław K. had been issued, the police arrested the actual murderer, who admitted to strangling Irena K and stealing a few objects of value, and who described how he had managed to get into the victim's home without being noticed and subsequently leave it.



Polygram no. 12.

During the registration of the recording of emotional changes presented above, the examinee was to listen carefully to the questions asked and answer NO to all of them.



Polygram no. 13.

During the registration of the recording of emotional changes presented above, the examinee was to listen carefully to the questions and give true answers in his head. The examinee did not speak aloud.

Testing an alibi with polygraphic examination requires a number of conditions to be met. These include the high qualifications of the expert, appropriate conditions in which the examination is conducted, co-operation of the examinee with the examiner, and the satisfactory health and emotional state of the examinee during the examination.

While lack of cooperation of the examinee with the examiner actually renders conducting polygraphic examination testing an alibi impossible, the emotional state or health condition on the day of the examination is only a temporary problem. The examination may be repeated at a more suitable time with the same questions being used.

Emotional reactions that are unfavorable to the person examined need to be interpreted with the utmost care. In most of the examples quoted above, there were circumstances that might result in emotional changes unfavorable to the examinee, even when they were not connected with the acts they were suspected of.

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The Validity of Polygraph Examination of an Innocent Person and a Perpetrator Administered Several Years after a Murder

Most psychologists claim that the control question technique applied in polygraph examinations is based on erroneous assumptions, because control questions do not compensate for the emotions caused by the questions concerning the crime. They maintain that such questions cause an emotional response in an innocent person too, especially when he or she has been arrested in connection with the crime, while passage of time may result in weakening memory traces and emotions caused by relevant questions in an actual perpetrator. The same reservation is formulated by many lawyers. Some polygraphers are convinced that a polygraph examination administered several years after the event is pointless.

Does the passage of time between the event and the polygraph examination result in erasure of memory trace and emotional response in the perpetrator?

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How long after the event does administering a polygraph examination make sense? May a polygraph examination administered several years after the event be valid?

Does prolonged detention of an innocent person affect his or her emotions to an extent which undermines the validity of the examination? Does it make sense to examine an innocent person who has been unjustly detained under suspicion of murder?

The results of the polygraph examination administered in the case discussed below may contribute to a discussion of the issues mentioned above.

The District Court in Legnica, Poland, in 2003 sentenced two boys for murder with robbery of an elderly man, committed in autumn 2000. At the time of the event both of the accused were 18 years old. They denied the charges and did not confess. The court returned a verdict of 12 years of imprisonment. The only evidence was the testimony of their 14-year-old friend. Detained by the police several days after the murder, he told the officers that he had committed the crime together with his two older friends. The description of the course of events contradicted the traces revealed during the inspection (the manner of entering the building, penetration of its interior). Yet the prosecutor ignored the contradiction and the Juvenile Court sentenced the juvenile offender for murder. In 2003 the actual perpetrator confessed to the assault and recreated the course of events at a re-enactment during a visit to the scene of crime. His reconstruction was entirely concordant with the traces revealed during the inspection. Only after the re-enactment was he told that the victim had died, at which point he revoked his confession and changed his statement entirely as, obviously, he did not want to be accused of murder. A Court of Appeal considered the case of the two defendants and quashed the detention. The juvenile offender was still in prison, as the decision in his case was valid.

Faced with new evidence, in February 2004 the prosecutor ordered a polygraph examination of the three convicts and the actual perpetrator. I doubted whether the examination made sense, which I emphasised in the first part of the examination report:

“A polygraph examination during appeal proceedings is pointless:

1. The subjects have been subjected to prolonged detention (almost 3 years) and must have developed an emotional attitude to the event. Therefore, it is

quite probable that relevant questions will cause strong emotional reactions.

2. Precise knowledge of the details of the case (which they acquired familiarising themselves with the files of the case before indictment and during the course of the criminal proceedings) render it impossible to check whether the subjects display memory traces concerning the course of events.

Detention is undoubtedly more traumatic for a young person just entering adulthood and may result in permanent, excessive emotional activation (and consequently a neurosis) as well as in deformation of personality. Is it at all possible to establish now, after three years in prison, an unjustly detained person's emotional link with the event with the help of physiological correlates? No examination technique offers such a possibility. Two of the subjects were 18 years old at the time of arrest (Kazimierz P. and Krzysztof T.) and the third (Łukasz N.) was fourteen.

In this case polygraph examination should have been administered after the juvenile offender had given his testimony and before Kazimierz P. and Krzysztof T. were detained, checking whether the latter two knew the details of the event, which they obviously would have had to as perpetrators. Several examination techniques, complementing and verifying one another, could have been used. The available details of the case could have become the basis for elaborating several 'guilty knowledge' tests, e.g.:

1. material (string, cable, cloth, etc.) used to bind the victim
2. place where the perpetrators had abandoned the victim
3. position of hiding places in the building
4. objects taken by the perpetrators."

In such a situation I was forced to elaborate a concept differing from a standard test. I concluded that the test may not feature questions concerning the murder, because:

1. This element of the event may cause emotional reactions.
2. Elaborating control questions is exceptionally difficult because of the age of the subjects. Control questions should be concerned with situations qualitatively similar to the event, in this case – murder. They must be probable, possibly including an assault, use of violence, etc. The probability that very young men (when arrested they were 18 years old) had been involved in such events was not very great, and I therefore decided to restrict relevant questions to the issues concerning their presence in the flat and the theft of a metal cash box with money. The questions were sufficiently connected with the death of the owner of the flat (if they had

been in the flat and taken the box, they would have had to be involved with Karol P's death).

The basic test was identical for both subjects, with 8 questions, including relevant questions no.:

3. Have you been to the elderly man's flat?

6. Did you take the cash box from his flat?

Control questions

4. Before you were 17 years old did you steal anything valuable?

7. As an adult have you stolen anything from a car?

The physical and mental health of both subjects met the standards. The test was administered with the use of a five-channel 'Lafayette' polygraph with electronic amplification of the following parameters:

– blood pressure with pulse ('cardio')

– breathing (two channels)

– galvanic skin resistance (GSR)

– changes in blood flow in a finger (recorded by the so-called pletismograph).

Test of Kazimierz P.

During the pre-test interview Kazimierz P. denied any participation in the event. He was very reluctant to subject himself to the test; he was impatient and maintained that this was the effect of prolonged detention (2 years and 10 months). He said that during the court proceedings he and his friend had asked to be subjected to polygraph examination, but "the judge said that there was no point". He stated that his current situation adversely influenced his psychological state. He did not display external manifestations of emotions during the interview and the test.

In all three charts Kazimierz P. reacted more strongly towards control questions no. 4 and 7 than to relevant questions no. 3 and 6. The proportion was repeatable. I did not notice any attempts to interfere with the test.

I wrote in the expert opinion that the proportions of the reactions recorded by the polygraph suggested that any involvement of Kazimierz P. in the issues formulated by relevant questions no. 3 and 6 should be excluded, especially that the proportions of the reactions were repeatable. The subject also reacted to neutral questions, which proved that his current situation was the source of his emotions.

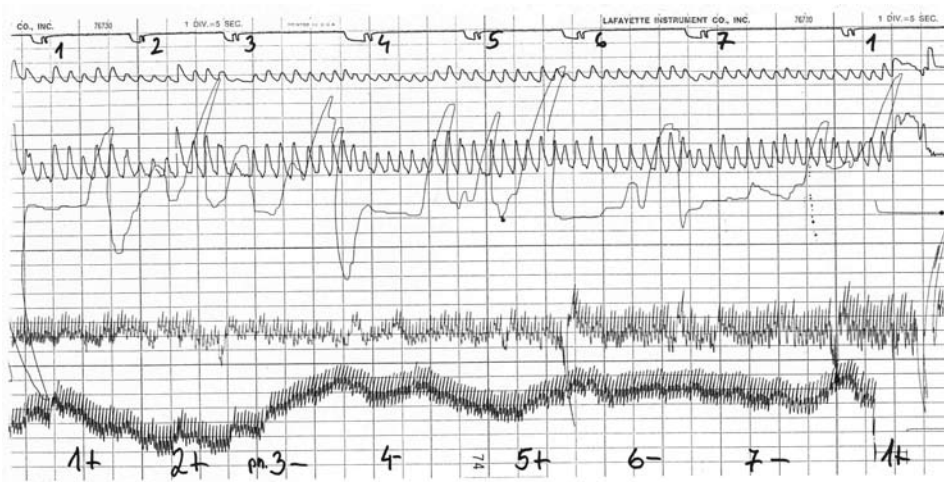


Photo 1.
Polygraph test chart of Kazimierz P.

Test of Krzysztof T.



Photo 2.
Polygraph test chart for Krzysztof T.

The test was administered three times, and in each instance control questions no. 4 and 7 caused the same physiological changes as relevant questions no.

3 and 6. I did not notice any attempts to interfere with the test. I wrote in the expert opinion that any involvement of Krzysztof T. in such stages of the event as: presence in Karol P.'s (the victim's) flat and theft of the cash box should be excluded. As these stages were correlated with how the perpetrators had treated the victim (as a result of which Karol P. died), it was justified to exclude Krzysztof T.'s involvement in the elderly man's death.

Test of Łukasz N.

At the time of administering the test Łukasz was 17 years old, while at the time of the robbery and arrest he was 14. He was still in the detention centre, because his sentence was valid. For the test he was brought handcuffed by police escort.

Łukasz N. repeated the first and the sixth grade at primary school, which might be indicative of his low intellectual potential. During the pre-test interview he said that he had confessed to participating in the robbery because he had been afraid of the police officers who had interrogated him, shouting at him and beating him. He had later revoked his confession, but no one had believed him. He could not explain why he had accused his friends. He stated that he had felt good at home and that he wanted to return to his family at any cost, and warned that he would either escape or commit suicide. He explained that on the previous day he had had a temperature of 39 degrees centigrade; on the day of the test his temperature was normal and he said that he only had a runny nose. He admitted that he was undergoing psychiatric treatment but he saw the doctor only once every fortnight. He also admitted that he did not take his prescribed medicine regularly. The subject followed and accepted the interlocutor's hints during the conversation, which proved his susceptibility to suggestion.

I withdrew from administering the test to him for the following reasons:

- he was probably susceptible to suggestion
- he was in a very emotional state due to his imprisonment and had contemplated suicide
- he had been detained for over three years
- his intellectual potential was low
- his physical and mental state did not meet the minimum standards.

He was under the influence of several additional emotional factors, and as he was very young they might have affected him especially strongly.

Test of perpetrator (Waldemar J.)

Waldemar J. was arrested for another assault and robbery, to which he had confessed. During the interrogation he also confessed to the assault in Lubin for which the District Court had sentenced the two young men. During the re-enactment he showed the building which the perpetrators entered, described the manner of entering (through a window on the roof), binding the victim, and the material used for that purpose. The details corresponded with the traces found during the inspection. When told during one of the interrogations that the victim of the robbery had died, he changed his testimony, stating that an earlier robbery of the same man had taken place in 1997, in which he had participated. He denied having participated in the robbery in 2000.

During the pre-test interview Waldemar J. stated that he had entered the elderly man's flat in Lubin in 1997 in the company of an accomplice by the name of Surmaj. He claimed that he had nothing to do with the events which took place in the same flat in 2000. Waldemar J. denied his participation in the event in 2000, introducing a similar event in which he had taken part in 1997.

I used the following questions:

1. Is your first name Waldemar?
2. When at school did you learn mathematics?
3. Were you in that house in Lubin in 2000?
4. Are you lying about the event which took place in 1997 in the same house?
5. Did you go to primary school?
6. In 2000 were you together with Surmaj in that house in Lubin?
7. In 1997 were you in that house in Lubin?
8. Have you ever had a driving licence?
9. Did anyone else assist you during the robbery in 1997?
10. Did anyone else assist you during the robbery in 2000?
11. Have you ever told a lie?
12. Is your surname Juszczuk?
13. Do you know what and how much the perpetrators took from that house in 2000?

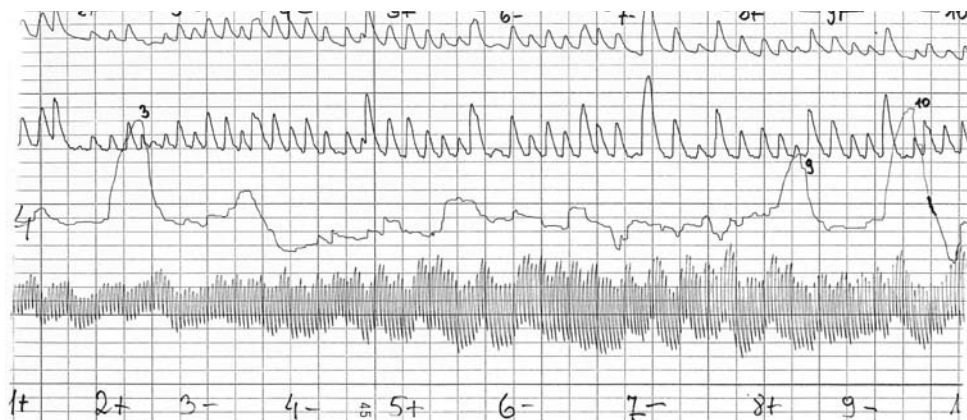


Photo 3.

Test chart of the perpetrator

Control question was no. 11 and was based on the concept of a directed lie. During the pre-test interview the subject did not display external manifestations of emotions. Several seconds after the polygraph was switched on he claimed that the cuff was too tight. I ceased recording this parameter and restricted myself to the pletismograph, recording pulse and changes in blood flow through the subject's fingers (which partially compensates for the absence of cardio line). The subject's statement concerning the cuff was not very credible because pressure in the cuff in this polygraph model is very low (maximum 60 mm) and subjects begin to feel constriction only after a few minutes. No one had ever complained about the tight cuff after such a short period of time. It is quite probable that the subject intended to interfere with the test.

The test was administered four times, with the sequence of questions changed in the last two instances.

The charts showed considerable differences between the subject's physiological reactions to the events from 1997 and 2000. The subject displayed greater reactions to the events from 2000, i.e. questions no. 3 and 10.

During the third test chart I only asked the questions concerned with the events from 2000 and control questions no. 11 and 15. The subject interfered with his breathing, refraining from inhaling for several seconds (up to 15),

which resulted in changes in blood flow, and consequently the pletismograph recording lost its analytical value. Refraining from inhaling is not a physiological reaction; on the contrary, it contradicts physiology. Despite the attempts to interfere, the GSR line displayed distinct reactions to questions no. 3 and 6, which were asked several times. Control questions following these questions caused smaller reactions despite the subject's efforts to increase them by holding his breath.

During the fourth test chart the subject moved his fingers, interfering with the GSR line. Despite these interferences, the GSR line displayed reactions to questions 3, 6 and 10. The subject also held his breath, and in the final phase of the test breathing 'blocks' lasted 15 seconds each.

I stated in the expert opinion that:

1. Waldemar J. is more activated by the questions concerned with the event from 2000 than the event from 1997, even though he answered "no" to every question. The event from 2000 induced a memory trace in the subject, whereas the events from 1997 did not.

2. Test charts provide premises for the categorical opinion that Waldemar J. is connected with the robbery from 2000:

1) Despite his attempts to interfere, Waldemar J. displays significant changes in the GSR following questions no. 3 and 6, which are greater than his reactions to the control questions. It cannot be excluded that yet another person participated in the events in 2000. The subject also reacts to question no. 13: "Do you know what and how much the perpetrators took from that house in 2000?"

2) Interferences during the test prove that Waldemar J. tried to conceal his connection with the event from 2000. A coincidental reason for interferences with the test may be excluded because:

- there was nothing unusual in the first test
- interferences intensified while the examination progressed and assumed additional forms (during test chart 3 only breathing, then during test chart 4 – apart from breathing – intensive movement of the fingers)

These manifestations do not result from Waldemar J.'s health, which is substantiated by correct charts from the first two tests.

Waldemar J. displays emotional reactions based on a memory trace to such questions as:

- Were you in that house in Lubin in 2000?

- In 2000 were you together with Surmaj in that house in Lubin?
- Did anyone else assist you during the robbery in 2000?
- Do you know what and how much the perpetrators took from that house in 2000?

The results of the polygraph examination excluded the possibility of perpetration by each of the young men, and also excluded the hypothesis of their involvement in the assault and robbery in 2000. One of the young men received money compensation in 2007 for unjustified detention in a sum equivalent to ca. 30,000 US dollars. Not conducting a polygraph examination in this case during the investigation was a serious mistake. One of the reasons was the provision introduced to the Code of Penal Procedure in 1997, which many lawyers interpreted as a ban on polygraph examination.

Conclusions

Relevant questions concerning an event from a few years before caused distinct physiological changes in the perpetrator. This may mean that passage of time does not necessarily have to result in erasing memory and emotional traces in the perpetrator. Polygraph examination based on the assumptions of control question technique may be valid even if it is administered a few years after the murder.

Prolonged detention of an innocent person does not necessarily have to deform his or her emotions. Such circumstances do not exclude the validity of polygraph examination, even if the subject has been charged with murder. In the case discussed here innocent subjects reacted more strongly to control questions than to relevant questions. It should be emphasised here that the two subjects' psyche and emotions were simultaneously affected by several factors, each of which was so significant that it might cause strong emotions after relevant questions:

1. They were innocent and the charges were unjustified.
2. They were very young, which was doubly disadvantageous because their personalities were not fully mature and therefore it was difficult to elaborate control questions.
3. They were charged with the most serious crime – murder.
4. They had been detained for almost three years.

It is my opinion that the concept of the test administered to the two young men was correct, even though it differed substantially from the pattern of control question technique.

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Jaworski, R. (2006), *Situational Sequential Tests in Polygraph Testing*, Wydawnictwo Uniwersytetu Wrocławskiego, Wrocław.

Book review



Mariusz Kulicki, Józef Wójcikiewicz
„Ekspertyza wariograficzna”
[in:] *„Ekspertyza sądowa. Zagadnienia wybrane”*
ed. Józef Wójcikiewicz
2nd edition – amended and supplemented
Oficina Wolters Kluwer Business, Warsaw 2007
pp. 267–280 critical review

A single chapter in this sizable work, encompassing 616 pages and devoted to a variety of court expertise studies and research (research methods for identification known to forensic sciences), is devoted to polygraph research. This chapter is the subject of the following review.

Polish authors use the terms ‘variograph’, ‘variographic examination’, and even ‘variography’ to define this method of research. And in fact, the term ‘variograph’ has been generally accepted in Poland as a synonym to the word ‘polygraph’. Although replacement of one foreign term of Greek origin (‘polygraph’) with another foreign one, this time of mixed Latin and Greek origin (‘variograph’) is of dubious merit, it is a fact that the Latin name has become widespread in the Polish literature and is used interchangeably with the term polygraph. It is notable here, however, that in Polish conditions using one or the other term means entering a certain tradition. The word ‘polygraph’ is used mostly by authors whose works follow the traditions born

in the United States, and who are trying to make reference to the heritage of American science. The name 'variograph', on the other hand, is predominantly used by those who do not appreciate this heritage, or who for whatever reason choose to ignore it. Nevertheless, this is a distinction of no significance and importance, other than symbolic.

The character of the work proves that the information contained therein is earmarked for practitioners: judges, prosecutors, investigation officers, who are presented here with the state of research in forensic sciences. Without referring to other parts of the book, we must conclude that the chapter devoted to polygraph research unfortunately does not fulfil such a role. Worse, it misinforms the reader.

The description of psycho-physiological grounds for polygraph examination and a short history of this method of examination are correct. Yet the information provided does not go beyond elementary course book standard. At the same time, both the description of examination methodology and the evaluation of its diagnostic value must raise major reservations.

The authors mistake examination technique with testing. They write, for example, that "a typical CQT test has five stages" (p. 271). Actually, the test is not composed of 'stages', but of questions. Reid's Control Question Tests in fact usually range from 10 to 12 questions. What the authors refer to as a 'test' is a technique of examination.

It would be advisable therefore to compare control question techniques (Reid's Backster's) with a technique based on Guilty Knowledge Tests, rather than comparing control question tests (CQTs) with GKT tests. It is to be remembered that among control question tests 'peak of tension' (POT) tests are also used. In their essence, they do not differ from Guilty Knowledge Tests, also known as Concealed Information Tests (CIT) (Nakayama 2002).

Absolutely unauthorised and misleading is the statement that "control question tests (CQT) are focused on discovering deception. They have low diagnostic value and do not meet standards of scientific proof." (p. 272)

As has been repeatedly proven during the last 30 years, the diagnostic value of a polygraph examination (conducted according to control question technique!) may not give 100% certainty, but does not go below the diagnostic value of

other methods of identification routinely applied in criminal investigations (Widacki, Horvath 1978).

This technique has been applied successfully in the US and other high-tech countries with an advanced level of science.

Nor is it true that the application of such a technique “is against the Polish criminal procedure” (p. 272). Allowing examination by polygraph, the Polish Code of Criminal Procedure does not narrow down the options of its use to a single technique, thus leaving the expert free to choose the examination methodology. Practice in Poland has for over 30 years coped perfectly well with the formulation of questions for the expert to conduct a polygraph examination, and also with the formulation of opinions after an examination conducted in CQT. Typically, the conclusion of such an opinion runs along the following lines: “following the critical questions tests, changes of physiological emotional correlates typical for persons who answer such questions deceptively, that is either consciously lie or conceal the fact of being in possession of information related to the content of the question, were found in the person examined”. As the above proves, formulating an opinion in such a way presumes neither that the examinee is lying, nor, all the more so, that he/she is guilty.

The authors correctly describe the examination technique based on GKT testing. Yet they are wrong to claim that this examination technique (determinedly referred to as a “test”) has better “scientific foundation” than the control questions technique (p. 272).

The two techniques have an identical “scientific foundation”, yet – having different properties – they serve somewhat different objectives. The technique based on GKT testing requires a whole range of detailed conditions (e.g. certainty that persons are not related to the event do not know the details, and certainty that the perpetrator knows the details of the test requirements, etc.) which makes the application of this method highly limited.

That is why it is allowed to resort both to the control questions technique and techniques based on GTK testing. The expert must make a decision which of these techniques to apply individually for each specific case.

This is also what the Standard for Polygraph Examinations in Criminal Cases, passed at the Special Convention of the Polish Polygraph Association on

January 6, 2004 (see: *European Polygraph*, 2007, 1, 1, pp. 65–77) recommends, treating both the techniques as equally justified.

In practice, for a few decades, the control questions technique has been complemented with POT test(s), which in their essence are identical to GKT tests.

Discussing the report of the National Research Council: *The Polygraph and Lie-Detection*, (National Academies Press, Washington 2003) and the report by the British Psychological Society from 2004 (*A Review of the Current Scientific Status and Fields of Application of Polygraphic Deception Detection, Final Report*), the authors deplore the fact that the reports in question do not treat the two examination techniques separately. The actual reason for that is that the authors treat them as equal – as two potential variant solutions for the same polygraph examinations.

It is a pity that such a high-ranking analysis, and one that will most likely be considered as offering the current state of knowledge and presenting a binding paradigm by numerous lawyers, was written so incompetently, and falls short of expectations. This may have a negative influence on the practice of applying polygraphs in Poland. Similarly, the choice of subject literature was surprising, appearing more haphazard than intentional.

The Polish lawyer and police officer must wait a little longer for a special guide to polygraph examinations. Unfortunately, the work reviewed cannot play such a role.

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For example (in references):

Reid J., Inbau F. (1966), *Truth and Deception: the Polygraph ("Lie-detector") Techniques*, Williams & Wilkins, Baltimore.

Abrams S. (1973), *Polygraph Validity and Reliability – a Review*, Journal of Forensic Sciences, 18, 4, 313.

and (Reid, Inbau, 1966), (Abrams, 1973) inside text.

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