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**Professor Udo Undeutsch**

(22nd December 1917 – 16th March 2013)

On February 16, 2013 in Koln (Germany) died Professor Udo Undeutsch. Psychologist and forensic psychologist, respected scholar, teacher of many generations of forensic psychologists, popularizer of polygraph examination in Europe, member of the Editorial Board of our journal.

Editors of “European Polygraph” have learned with sorrow of the death of Professor Undeutsch.

*Editor-in-Chief*  
*Prof. Jan Widacki*





**Col. Marian Józwiak**

(5th March 1930 – 21st December 2013)

Colonel Marian Józwiak, one of Polish pioneers of polygraph examination, died in Warsaw on 21st December 2013.

Col. Józwiak was a graduate (1968) of the Academy of Social Sciences in Warsaw. From 1962 to 1990 he served as an officer in the Military Police (Military Internal Service, Polish: *Wojskowa Służba Wewnętrzna*, WSW). He was one of the first Polish polygraphers and pioneers of polygraph examination in criminal cases (e.g. in 1975 he examined a serial sexual killer Zdzisław Marchwicki).

Marian Józwiak wrote a number of articles dedicated to polygraph examination in criminal cases published in Polish journals in 1976–1990.

The news of the death of our senior fellowinspires sadness.

Editors of *European Polygraph*



Jan Widacki\*

Andrzej Frycz Modrzewski Krakow University.  
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## History of Polygraph Examinations in Poland

**Key Words:** History of Polygraph, polygraph examination in Poland

The first mentions of instrumental lie detection in investigations date back to a work published in 1939 by W. K. Zielińska *Znaczenie psychologicznej diagnostyki dla celów śledczych* (literally: “Significance of psychological diagnosing for investigative purposes”, Zielińska 1939). The author first describes Gorphe’s (Gorphe 1924) and Lipmann’s (Lipmann 1911) experiments in registering the tremor of hands caused by emotions with the “automatograph” and “psychograph” devices, and Lowenstein’s experiments (described by Heindl, Heindl 1922) in which the scientist registered head and limb movements, and pulse and breathing rate during the experiments using a technique similar to today’s GKT to ascertain the name of a person that the examined knew yet preferred to deny. She also describes the pletismograph, although fails to

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mention its constructor Mosso, and also the pneumograph, which directly recorded the movements of the chest, and indirectly the progression of the breathing function. What she does mention is that Benussi used the pneumograph for lie detection (Benussi 1914), however, missing the opportunity to describe the experiments of Edward Abramovsky. She concentrates on controversies in literature that followed the publication of Benussi's works (i.e. the works by Schutz and Seelig 1929).

The author also mentions the psychogalvanometre, being a device that permits the discovery of "psychological affectations". In relation to the above, she quotes the names of Otto Veraguth, Ivan Tarkhanov, and Charles Ferre. Closing, the author devotes a fair amount of space to the works of Larson, which she knows through Ernst Seelig (Seelig 1929): "in hundreds of cases during police interrogations and in American detention centres and mental hospitals [Larson] successfully tested [the instrumental lie detection method]. As the clear proof of usefulness of the method Larson quotes the case of a house where thefts occurred repeatedly, and he revealed the thief: one of the 48 girls living there, who later admitted."

Zielińska quotes also Seelig's comment on the above: "just this one case is a sufficient proof that the method of instrumental measurement in specific conditions is fit for a forensic test, and resigning from it would basically be a mistake" (Zielińska 1939, Seelig 1929).

Therefore, it can be said that the method of polygraph testing and its American practice were known in Poland in 1939, mostly thanks to Zielińska's work, yet in a way this was second-hand knowledge via German authors, including Ernst Seelig and Robert Heindl.

In his work on the history of polygraph testing, Trovillo (Trovillo 1938) states that a polygraph (Darrow's photopolygraph) was bought by the Institute of Psychological Hygiene in Warsaw in the 1930s. Quite a probable purchase, as the Institute financially supported among others by Rockefeller Foundation, maintained contacts with America and was perfectly equipped. Nevertheless, the object of scientific interest of the Institute and its longer-term director, Kazimierz Dąbrowski, were mostly child psychiatry, generally conceived psychological hygiene, and also a field known later as "humanist psychiatry". Certainly, lie detection for the purposes of investigation and court lay beyond the scope of the Institute's research. Works on such a subject cannot be found in the publications of the Institute (*Biuletyn Instytutu Higieny Psy-*

*chicznej*) and members of its staff. Therefore, it can be assumed that Darrow's polygraph was used for diagnosing and researching emotionality.

The first mentions of the polygraph after the second world war are found in Kreutz's course book in psychology (Kreutz 1949), suggesting *odkłamywacz* as the Polish counterpart of the American "lie-detector". The name, however, did not become popular. Kreutz wrote: "lying is a psychological experience that differs from telling the truth, it contains other elements of feelings, will, etc., for which reason the physiological symptoms accompanying it are different. Benussi tried to detect lie by studying these symptoms in breath and blood circulation, and the principle served the construction of special devices, so-called *odkłamywacze* ("lie-breaker"). Thus, with the existence of a certain potential for ascertaining the truthfulness of even individual statements, it is not sufficient, however, for stating with utter certainty whether each testimony is true, yet it allows to cleanse the body of evidence gathered from more suspicious testimonies" (Kreutz 1949, 62–63).

In 1951, Jan Sehn, at the time the director and today the patron of the Institute of Forensic Research (IFR) commented on the polygraph. He believed that an investigating officer with "an established scientific worldview" will not "slip down to the positions of forensic telepathy, and pneumo-, sfigmo- and pletismographic truth detectors (*Wahrheitsendecker*)" or other psychotechnical "lie detectors" (*der Lugenendeckter*) offering the value and the level equal to that of a magician's wand or a fortune-teller's augury" (Sehn 1951). Incidentally, one may remark that in a footnote to these reflections, Sehn falls back on Sobolewski's *Psychotechnika na usługach policji* (literally "Psychotechnics in the service of the police", Sobolewski 1927), which does not make a slightest mention of any "truth detectors" or any lie detection, but only speaks about the psychotechnical tests of candidates to various professions, including for instance police officers, but yet also drivers.

Paweł Horoszowski's course book in criminal studies (Horoszowski 1958) published in 1958 contains a photograph of an old, two-channel American polygraph from the 1920s or 1930s and scanty information on the device and the examination technique, and an opinion that disqualifies the device in the end. Horoszowski believes that "there could be no mention of reliable results". and adds further that "in practice, a lie-detector is nothing more than a device helping to enhance the atmosphere of intimidating the interrogated person" (Horoszowski 1958).

Early in the 1960s, during his six-month Ford Foundation scholarship to the US, Horoszowski obtained more information about polygraphy, and even purchased a Stoelting device, which he brought to Poland. No Horoszowski's experimental works preceding his practical use of the polygraph in criminal trials are known. By the way, Horoszowski never published such a work.

In 1962, at a congress of clinical psychologists, Horoszowski delivered a paper entitled "Niektóre teoretyczne and praktyczne problemy stosowania aparatów do sprawdzania szczerości wypowiedzi" (literally: "some theoretical and practical problems in application of devices for testing the truthfulness of testimony"). The paper remained unpublished, and is also mentioned in another, later work by the same author (Horoszowski 1965).

In June 1963, following a decision of the Regional Prosecutor in Olsztyn, Professor Horoszowski conducted Poland's first polygraph examination in a manslaughter case (case reference number: II Ds. 25/63). The key of the problem that the investigators faced was the mutual accusation of two people who participated in a binge, together with their later victim, with absence of any other witnesses of the crime. Faced with that, with the decision of 22nd June 1963, the persecutor commissioned Professor Horoszowski, at the time the Head of the Chair of Criminal Studies at the University of Warsaw with performing a polygraph (referred to as *wariograficzny* in the document) examination. The exact wording of the decision is interesting. The prosecutor appoints a expert-witness in criminalistics and commissions him with "subjecting the suspects to variograph [polygraph] examination, with their consent", and later, "on the grounds of variographic examinations to issue an opinion on the following: a) what symptoms of behaviour of the suspects are determined through the examination conducted with the device according to state-of-the-art science, b) whether on the grounds of the examination conducted it is possible to state who the killer of Edward P. was, and if so, then who it was." (Widacki 1981).

Two comments on the decision are necessary. First, its content must have been consulted with Professor Horoszowski, if the prosecutor refers to the test as *wariograficzny*, a name that was not yet in use in 1963 as it was invented by the professor, who used it in literature for the first time not earlier than in 1965 (see below). Else, it would have to be assumed that an Olsztyn prosecutor invented the name *wariograf*, previously unknown in literature, which is hardly plausible. Although there are no proofs for that, it can be suspected that it was Horoszowski himself who suggested conducting the

study to the prosecutor. From today's point of view, the tasks the expert was entrusted with contained two major errors. Even if called a *wariograf*, a polygraph records only physiological correlates of emotions and not as stated in the decision "symptoms of behaviour" that can be observed without a polygraph. Moreover, the expert witness was to "ascertain which of the two examinees was the killer". This is obviously a prohibited question, as one posed in this way is to be answered by the court in the sentence, and not by any expert witness.

The commissioned test was performed on 27th June 1963, and whatever we believe today about the examination and its correctness, the event was certainly historical in a way.

In his statement, Professor Horoszowski wrote:

"In the conclusion to the variograph [polygraph] examination, no significant physiological changes, reflected in the shapes of the charts, were found in the case of Aleksander P. when asked critical questions related to the killing of Edmund P. Taking into account the changes in the shapes of these charts clearly present for this examinee in the experimental numbers test, I arrived at the conclusion that no features that would allow the assumption that Aleksander P. answered deceptively during the examination were present after the critical questions."

The conclusions from the examination of the other suspect, Wiesław S., were as follows:

"In the conclusion to the variograph [polygraph] examination to which Wiesław S. was subjected, it can be stated that significant reactions following the critical questions, especially concerning most directly the manner of killing Edmund P. are present in the shape of the registered charts. In the light of research conducted so far, such reactions are considered characteristic of the people experiencing a strong emotional state – especially related to the disclosure or a realistic threat of disclosure of significant facts that they want to conceal from other people. Anyway, it can be determined that the said charts, being the result of the variograph [polygraph] examination are not symptomatic for a person answering sincerely all the critical questions concerning the killing of Edmund P."

As far as the manner of phrasing the conclusions in the statement raises no major reservations, many objections must be made about the examination itself, as mentioned below.

The statement from the polygraph examination and the statement of the court physician, increasing the probability that Wiesław S. was the perpetrator became the grounds for the indictment that the prosecutor brought before the court. Wiesław S. and Aleksander P. continued to accusing each other. This is how the prosecutor referred to the polygraph examination in the justification of the indictment:

“Falling back on the accessory variograph [polygraph] examinations, with the consent of Wiesław S., Professor Horoszowski stated that having been asked the critical questions, and especially ones concerning the manner of the killing, Wiesław S. displayed a reaction that in the light of the previous experimental studies is considered characteristic of the people experiencing a strong emotional state, especially in relation to the disclosure of set facts that they want to conceal from other people”. Evidently, the prosecutor tried to paraphrase somewhat the conclusions from the expert witness’s opinion, yet not understanding much of it, he wrote what he did.

Both the defence and the defendant questioned the proof from polygraph examination. The defendant stressed that on the day of the examination he was woken up at 4am, transported in a stuffy car for three hours, and that he was tired, sleepy and nervous during the examination. He accused the expert that the questions he was asked compromised his and his wife’s dignity, therefore they were an additional source of his irritation. Later he compared the polygraph examination with the American third-degree interrogation, prohibited in Poland, and quoted a Soviet author V. Minaev’s *American Gestapo*, a book published in Poland by the Publishing House of the Ministry of National Defence. To the charges raised by the defendant, the defence lawyer added quotations from Horoszowski’s earlier works, especially his course book, in which the future expert persuaded to the irrelevance of polygraph examinations and concluded that in the US they only serve the enhancing the atmosphere of intimidation during interrogation.

Interrogated during the trial in the capacity of an expert witness, Professor Horoszowski both described the method of polygraph examination in detail and revoked the views he expressed in the course book.

The Regional Court in Olsztyn (case: IV K 94/63) sentenced Wiesław S. to 13 years of imprisonment, with the sentence including the following reference to the polygraph examination in its justification:

“Variograph [Polygraph] examination is a scientific method and cannot be ignored only because it had not been used in Poland. The defendant’s line of defence challenged variograph examination by referring to V. Minaev’s ‘work’. Nevertheless, the court decided that V. Minaev’s book, *American Gestapo* is by and large political and has nothing in common with scientific work. Moreover, the results of variograph studies in the specific case are coherent with other proofs quoted and must provide a part of the body of evidence.”

In the appeal from the sentence, the defence not only insisted on the inadmissibility of polygraph examinations, but it also applied for – believe it or not – completing of the expertise.

The Supreme Court that reviewed the sentences of Regional Courts according to the procedure binding at the time accepted the sentence of the Regional Court (case ref.: III K 177/64). This is how the court addressed the charge of the defence concerning the failure to complete the expertise from polygraph examination:

“Even eliminating the results of polygraph examination conducted by expert witness Professor Horoszowski from the body of evidence, it must be stated that the Regional Court had sufficient grounds for believing the accused guilty.”

This is how the Supreme Court referred to polygraph examination for the first time in the history of Poland. Evidently, the Supreme Court did not take a clear position in the question of admissibility of such examinations in criminal cases. However, the fact that – given such an opportunity – it did not censure the admission of such a proof to the first instance court proves clearly that it endorsed such evidence.

The following polygraph examination in a criminal procedure was performed by Professor Horoszowski in a case held before the Regional Court in Lublin.

After the convicting sentence in an economic crime case issued by the Regional Court in Lublin, and repealed by the Supreme Court (ref: III K 238/63), following the appeal, the case returned to the Regional Court in Lublin for re-examination.

The defence lawyers of the defendants submitted to the court evidence, including a fairly weird one: “to appoint two expert psychologists in the trial,

as far as possible an eminent expert in the field and criminologist, Professor Paweł Horoszowski, should this, however, be impossible, experts from the local academic centre". The experts mentioned in the application were supposed to "issue a statement following testing of symptoms and test examination of both the accused, which would contain the statement as to which of the accused, taking into account all the features and subjective conditions, is more likely to say-explain lie, fantasise, and state facts mechanically and uncritically".

As motioned by the defence, the court appointed the expert witness Professor Horoszowski (incidentally *not* a psychologist), who – before delivering his expert opinion – notified the court that "to the commission from the court, he could undertake a psychological examination (particularly with the use of a device – the so-called variograph)".

This shows that the defenders, describing the task of expert psychologists in quite an inept manner and demanding the presence of two psychologists, including one mentioned by name, who was no psychologist at all, wanted the court to acquire opinions about the individual predispositions of the accused, and especially to have him obtain information that would allow the court a better assessment of the credibility of the diverging explanations provided by the accused. The defence applied neither for conducting a polygraph test nor for the assessment of truthfulness of specific explanations, but only for the assessment of personalities of the accused. Thus, in a way gate-crashing the court with his polygraph examination, Professor Horoszowski misinformed both the defenders and the court. The court had the right not to know what "a device – the so-called variograph" was, as the case predated publication of literature containing any relevant information. Moreover, the court had the grounds to expect that by the decision of the court the expert witness will use his machine – at the time unknown and operating under the mysterious name of "a variograph" – to carry out the task defined in the evidence and being the effect of its acceptance.

The examination was conducted on 28th April 1964 in Lublin. On the following day, Professor Horoszowski delivered an oral opinion at the trial, and complemented it with one in writing, which he submitted to the court a few days later by mail. Appended to the written opinion were photocopies of charts from the studies.

Conclusions from the statement were as follows: "Concluding on the premises of the results of the examination, I maintain that the questions that must

be considered critical turned out answers accompanied by phenomena considered symptoms of deception.”

This was objected to by the defence. The defender of Julian K. demanded that the statement of Professor Horoszowski is removed from the body of evidence or else, if the court does not agree, he demanded that expert physicians were appointed to determine whether the defendant Julian K. was at all fit for such a test.

The other defendant, Władysław S., also applied for having the opinion of Professor Horoszowski removed from the body of evidence. In the justification of his application, the defendant wrote, among others, that he agreed to a psychological examination and not to a polygraph (variograph) one, whose essence remained unknown to him. Therefore he suggested, not without reasons, that his consent to such an examination was acquired by deceit. He also paid attention to the fact that Professor Horoszowski did not make all the charts from the examination available to the court, and specifically that he omitted a number of charts from the repeated numbers test, in which – against his earlier statements – the examiner was unable to detect the number selected by the examinee. These significant charges were bundled with others that were hardly significant if not ridiculous. For example, he stated that when he wanted to sit more comfortably on an uncomfortable chair, the pipe of the pneumograph “that he was girded with” would push him back “to the original position”. Moreover, he believed that the recording of his breath was marred by the tightly tied tie.

The Regional Court in Lublin issued the verdict on 12th June 1964 (ref.: IV K 27/64). Władysław S. was cleared of all the charges in the indictment, and the other defendant, Julian G., was recognised guilty and sentenced to 8 months of imprisonment. In the justification of its pronouncement, the Regional Court in Lublin included the following:

“The court rejects the opinion of Professor Horoszowski, submitted on the grounds of a variograph examination, for the following reasons:

1. Such examinations had not previously been applied in Poland and can currently be treated as a certain experiment, whose validity has not yet been proved.
2. Due to the methods of proceeding during the experiment unknown to the criminal trial (excessive privacy, seclusion, only the examinee and the experimenter).

3. Difficulty in testing whether the explanations of both the defendants concerning the manner of conducting the variograph experiment and the circumstances accompanying the examination are true or not, due to its privacy and inability of participation of the bench in the experiment.
4. The conclusions drawn concern psychological reactions of individual defendants to artificially created phenomena, and are based on narrow evidence of exceedingly theoretical nature that provides no grounds for drawing such far going practical conclusions.

The body of evidence thus constructed and offered to the court by expert witness Professor Horoszowski could not be used as grounds for assuming whether the defendants lie or tell the truth, even with circumstantial evidence testifying to their disadvantage.”

Assessing the examinations performed in the two cases, which literature refers to as the “Olsztyńska” and “Lubelska” (Widacki 1981) from today’s perspective and their reception by the judiciary, it must be stated that while the latter was not ready to admit a statement from the polygraph study, the expert witness, Professor Horoszowski, was not ready to perform such examinations even though he had at his disposal what at the time was the only polygraph in Poland,.

Let’s examine the mistakes of the expert. As far as the examination was concluded during the preliminary proceedings in the “Olsztyńska” case, after one month from arrested the suspects, which can still be aligned with the on time of criminal investigation principles of rules of the game, the examination in the “Lubelska” case was conducted in a late phase of the court procedure, after the case had already been adjudicated once. Following the appeal, the Supreme Court overruled the judgement and had the case re-examined. Conducting a polygraph examination in such circumstances made no sense whatsoever and drastically violated their elementary principles of rules of the game.

In both the cases, the expert witness did not agree the number in stimulation tests (with a number). In this case, the examination was pointless, as the impact of the stimulation test was opposite from the intended, and demotivated the examinees by demonstrating the unreliability of the procedure. It raised the concern of the innocent, to whom it demonstrated the unreliability of the machine and procedure of the examination, thus reassuring the culprit.

The control questions test Horoszowski conducted (under the name of “R test”) was arranged according to the Reid test of 1948. One can bear no grudge to Horoszowski about this, as Reid had not presented his new test arrangement until 1966 (Reid, Inbau 1966), therefore Horoszowski could not be familiar with it in 1963. Yet the questions were evidently mis-selected for such a test. For example, the control question to the critical one concerning manslaughter, was “Did you commit a disciplinary offence that the management does not know about?”. The gravity of these two questions – manslaughter and a disciplinary offence – cannot be compared. Therefore one can venture a statement that most examinees absolutely unconnected to the case would react more strongly to the critical question when juxtaposed with such a control question. What Horoszowski called a POT test cannot absolutely be called one. It is an oddity, containing openly critical questions (“Did you stick the knife into Edward’s head?”) And pseudo-neutral („Does Lilka love you?” which concerned the daughter of the examinee, who reacted to the question with tears) ones instead of questions that would carry uniform emotional load for an innocent person.

Telling the examinee that the examination had been completed and then asking him a critical question unawares/ z nienacka was absolutely impermissible. The recorded reaction, which Horoszowski recognised diagnostic, was a typical reaction of surprise that would probably occur in nearly 100% of examinees, whether they were in any way involved in the case or not.

In the “Lubelska” case where a polygraph examination was absolutely not to be permitted (the ethnically doubtful wheedling of consent for the examination aside) due to the advanced court trial with participation of the subjects, the test questions were misphrased. For example, the control questions were related to the case („Do the suppliers sometimes treat you to some food?”) were actually also critical, and the question for the guilt complex: “Did you go stealing from Lublin railway warehouses with a gang?” asked to a civil servant accused in an economic case was absolutely pointless, as it concerned a situation that was obviously improbable.

Therefore, the rejection of this proof by the Regional Court in Lublin was a welcome development, although it is a pity that the court did so for reasons other than content-related. The examinations performed in the “Olsztyńska” and “Lubelska” cases were the object of detailed studies, worth a reference here. They include an article by A. Krzyścina “Eksperci z własnej nominacji” (literally: “Self-nominated experts”, Krzyścin 1977), and a chapter in a book

entitled *Wprowadzenie do problematyki badań poligraficznych* (literally: "Introduction to the problems of polygraph examinations", pp. 182–194; Widacki 1981).

First use of polygraph examination as evidence in Poland and the statement of the Supreme Court on such examinations resulted in a broad discussion concerning polygraph testing, its essence, diagnostic value, and legal permissibility. Most opinions were published in 1964–1965 in *Problemy Kryminalistyki*, a magazine published at the time by the Department of Criminal Studies at the Main Headquarters of Civic Militia, yet not only there.

Majority of participants in the discussion had either little or no idea about its subject, which let them be absolutely unfettered by any objective facts and made it easier for them to express categorical judgements that were not necessarily prudent. Ignoring the few decades of scientific achievements, some proved that lie detection, being the distinction between deceptive and true statements, is simply downright impossible "as the examination is founded on registering non-specific symptoms that may be caused by various factors, also ones set in the examinee's psyche, and in his current emotional situation". Briefly speaking, a polygraph is ineffective by assumption, and the result of polygraph examination is devoid of any value (Radzicki 1965, Różycki 1965, Szerer 1965). The bibliography quoted by the authors proves that they were absolutely unfamiliar with foreign literature, especially American.

Some authors considered the legal admissibility of polygraph testing. Commanding attention here is the position of Professor M. Lipczyńska (Lipczyńska 1964) and W. Daszkiewicz (Daszkiewicz 1965). Lipczyńska rightly noted that methods used in trials do not always and not in all research turn out absolutely certain results, and that methods that provide only probable results can also be useful for the trial – as is the case with establishing paternity in group blood tests, and with handwriting analysis which the Supreme Court also believes to return only probable results – that are treated as circumstantial evidence, and as such are permissible. Lipczyńska believes that the same criteria apply also to polygraph examination. Similarly, Daszkiewicz believes that the result of polygraph examination may be treated "as an ancillary means, circumstantial evidence investigated in the context of other evidence" (Daszkiewicz 1965).

Whatever one can think about this discussion, its level, and the preparation of some of its participants, when judging it from the distance of nearly 50 years, one must say that all in all it played a very positive role. First of all, it

put an end to the application of the polygraph in a criminal trial, which neither the judiciary nor the prosecution were ready for, and the only potential expert to have a polygraph at his disposal, Professor Horoszowski, was unable to conduct such examinations.

The other advantage of the discussion was the realisation that even if such an examination does not give a 100% assurance, it can be useful for the trial as a source of circumstantial evidence, subjected to the control of other evidence. Going further, it is possible that a scientific problem capable of empirical verification was put forth at the time, namely, as far as the diagnostic value of a polygraph examination is comparable with such a value of other methods accepted in the trial, there are no obstacles in admitting such an examination in a criminal case, and treating its result as evidence.

In this way, the discussion on administrability of polygraph examination was set at an entirely different level, paving the way to an empirical solution of the controversy.

In 1965, Horoszowski published a spacious review in *Przegląd Psychologiczny*, describing the principles of operation of a polygraph and the basic testing techniques known at the time, discussed generally the control questions technique using Reid test as the example (however, without using its name, and referring to Reid's technique as "the ordinary method"), and also discussed the Peak of Tension (POT) test. He presented the course of an examination, however, skipping its very significant segment, namely the pre-test interview, in his description. He proceeded to describe in detail the two examinations that he performed in person to be used as evidence in criminal trials, that is the "Olsztyńska" and "Lubelska" cases described above. Let's disregard the fact that – being unaware of them – Horoszowski listed all the mistakes he made in the descriptions of his examinations, as for the first time in Polish literature he described what the essence of a polygraph examination actually is. In his article he promoted and justified his proposal for the name of the device, changing "polygraph" (Polish: poligraf), a name derived from Greek, to one of Latin-Greek origin: *wariograf*.

It is significant that no experimental work aimed at the verification of any claims so easily made by various authors in expert and scientific (?) magazines was published in Poland at the time. There was even no decent review that would sum up the advancement of research and the current polygraph practice worldwide, and especially in the US, Israel, and Japan.

Late in the 1960s, polygraphs were purchased by the special forces of the People's Republic of Poland – both civilian (Ministry of the Interior, in Polish: Ministerstwo Spraw Wewnętrznych, MSW) and military (Internal Military Service, in Polish: Wojskowa Służba Wewnętrzna, WSW). MSW, whose structures at the time comprised both the Department I (intelligence) and Department II (counterintelligence) purchased a 3-channel American polygraph, Keeler model 6317 While WSW, whose structures included both military counterintelligence and military police purchased a Keeler model 6308.



(Fig: Keeler polygraph model 6317)

From that time, the special forces used polygraph examinations for internal (including the training of agents) and investigation purposes, in espionage cases. The first known examination took place in 1968 and was commissioned by the office of the military prosecutor. It was performed by an MSW employee, Aleksander Krzyściń, (Knyziak 1972). In his statement, Krzyściń ascertained that changes symptomatic of deception followed the critical questions asked to an examinee accused of espionage. The Military District

Court in Bydgoszcz investigating the case later (ref.: SO 72/69) included the expert's opinion in the body of evidence.

In the 1970s, WSW experts (A. Krzyścin, Ł. Wiśniewski, and M. Józwiak) performed plenty of polygraph examinations for the needs of investigations conducted in the army. A large proportion of these cases concerned stealing weapons. Occasionally, the experts performed examinations for civil prosecutors, usually in major cases, for example concerning manslaughter. In 1969–1976, WSW experts performed polygraph examinations in altogether 223 cases (Kuboń, Wisniewski, Józwiak 1976, Krzyścin 1980).

Polygraph examinations performed by WSW experts for the use of the army were the subject of the first scientific analysis performed by A. Krzyścin in his doctoral dissertation (Krzyścin 1980). It was the first analysis of the cases of practical use of polygraph examinations in Poland to be so spacious. Experts used predominantly Reid's Control Questions Test technique (in the 1966 version) and also Peak of Tension tests that they used besides the control questions tests. Sometimes they fell back on the classical Keeler technique, yet in the version described by Harrelson and Ferguson (Kuboń, Wiśniewski, Józwiak 1976, Krzyścin 1980).

In 1976, the WSW experts examined the serial sex murderer of women Zdzisław Marchwicki, given the moniker of the Zagłębie Region Vampire.

The polygraph examination of Marchwicki deserves mentioning in the history of polygraph examinations in Poland at least for two reasons. First, it was one of the most infamous criminal cases in the days of the People's Republic, and secondly because it gave the Supreme Court an opportunity to take a position concerning polygraph examination. Investigating an appeal from the sentence of the Regional Court in Katowice, the Supreme Court declared in a sentence of 25th September 1976 that "polygraph examinations are only of ancillary nature and cannot be construed as independent evidence, giving the grounds for specific decisions" (ref.: II KR 171/76, unpublished).

In 1976, the Unit of Criminal Studies of the Jagiellonian University purchased a Lafayette polygraph and initiated a series of experimental studies, including researching the diagnostic value of a polygraph examination that provided the grounds for the higher doctoral thesis of the author of this article (Widacki 1977). After more than a year's preparation comprising experimental works, exchange of experience with practitioners, and finally a scientific internship at Charles University in Prague and cooperation with Professor

Miroslav Dufek, a psychiatrist and physician practically and scientifically involved in polygraph examinations, and finally after contacts and meetings with American specialists, notably C. Romig, F. Horvath, and G. Barland (who at that time visited the Chair of Criminal Studies of the University of Silesia twice) examinations in criminal cases began. The examinations were performed in Reid and Backster control questions techniques, and the recordings were numerically assessed in a 7-degree scale (ranging from +3 do -3) (Widacki 1982).

Beginning with the end of 1977, the Unit (and from 1980 – Chair) of Criminal Studies of the University of Silesia in Katowice performed polygraph examinations in criminal cases, mostly manslaughter and other gravest common crimes. Within less than two years, by the end of 1978, more than 350 people had been examined at the Department of Criminalistics of the University of Silesia in authentic criminal cases (Widacki 1981).

The case of serial sex murders (which turned out to be committed by Joachim Knychała) involved examining a few hundred people selected by militia as potential suspects for elimination purposes. Interestingly, Joachim Knychała was found to be the perpetrator also thanks to polygraph. Polygraph examination was one of the elements of evidence on which the accusation and later the sentence were based.

Due to its specificity and the role of the polygraph examination the Knychała case requires a wider discussion. In 1974–1982 there were 4 woman murders and 6 further attempted women murders in Silesia, or more strictly speaking in the area within the Bytom, Siemianowice Śląskie, Chorzów, and Piekary Śląskie polygon. The fifth woman was killed later, and the crime initially remained unconnected to the others. All the murders and attempted murders followed a similar *modus operandi*, suggesting sex as the perpetrator's motivation. Neither the investigation conducted at a large scale, nor the supporting operational intelligence activity resulted in singling out the perpetrator. Initially, the murders were assigned to two unknown perpetrators. The murder of one girl and attempted murder of another one in a forest near Piekary Śląskie was attributed to an unknown perpetrator, while the remaining murders and attempted murders of adult women – to another unknown criminal. The investigation in the second case was carried out under the codename “Szóstka” (i.e. six), and in the first “Frankenstein”.

Joachim Knychała was not among the aforementioned group of people selected for polygraph examinations for elimination purposes. His apprehen-

sion on 17th May 1982 was related to the death of his sister-in-law (wife's sister) Bogusława Ludyga, who he took to the coalmine heaps situated close to her place of residence. The pretext to go there was seeking for steel concrete reinforcement bars among the scrap metal, which were to be used for the construction of a bower. After some time, Knychala returned home alone, strongly agitated and saying that "something has happened to Bogusia", that she fell while climbing down the heap, hit a projection with her head, was unconscious, wheezing, and possibly dying. An ambulance was called, yet the doctor who arrived at the scene found her dead. The case was treated as an accident, and the corpse was taken to the mortuary. As yet nobody suspected murder, and especially not a sex murder. No attempts at seize any evidence were made. Investigation started only after another day, when the results of the post-mortem were delivered. The physician performing the autopsy determined that the version assuming an accident (passive trauma of the head) could not be supported by the results of the autopsy pointing to an active had trauma, caused with a hard and heavy tool applied with a large force by another person, as the cause of death. Before this information reached the prosecuting services, it was already too late to perform an inspection of the site, especially after a torrential rain that fell in the meantime. The original position of the corpse was unknown, and neither the clothing nor of the underwear of Joachim Knychala were seized. It was only following the information received from the Department of Forensic Medicine of the Silesian Medical Academy that he was apprehended. Throughout the interrogation or just initial questioning, Knychala maintained his original version. No motivation that would spark the murder of his relative, with whom he was not in conflict, could be pointed to. In such circumstances, persuaded by the militia from the criminal department, the persecutor decided to appoint the author of this article as expert witness in polygraph examinations. This is how Joachim Knychala was submitted for the first time to polygraph examination.

I performed the examination in Reid technique, with polygraph recordings assessed in a 7-point scale (ranging from +3 do -3). The statement from the examination says: "the examination was conducted in Reid technique, with the degree of reaction being assessed numerically [...]. The following tests were performed during the examination:

1. Reid Control Questions Test (RCQT)
2. Numbers Test
3. Reid Control Questions Test (RCQT II)
4. Mixed Questions Test (MQT)
5. Reid Control Questions Test in the silent answer version (SAT)

No Peak of Tension (POT) Tests were performed as the examinee knew all the details of the event, and remained in the company of the victim throughout the time, which he did not deny.

The following questions were asked in the tests:

1. Is your family name Knychała?
2. Is your first name Joachim?
3. Did you hit Bogusia on the head?
4. Is it Tuesday today?
5. Is it you who killed Bogusia?
6. Have you ever wanted to be involved in a perverse sexual intercourse?
7. Is it Tuesday today?
8. Did you intend to get at Bogusia?
9. Were you lying when you said that Bogusia fell on her own?
10. Did you commit any crime that the militia doesn't know of before 1971?

Assessment of the recordings:

In the RCQT, the examinee reacted clearly to the critical questions, not reacting to the control questions. The reactions followed all the critical questions (3, 5, 8, and 9), and were especially clear on the GSR chart and on the cardiovascular graph. The total value of reactions in this test, expressed in points amounted to 10.

In the numbers test, the examinee clearly reacted to the number he selected, with the reactions present on all the charts.

In the RCQT II, the examinee again reacted clearly to the critical questions, not reacting to the control questions. The value of these reactions – compared to the reactions from the RCQT test even insignificantly intensified. The strongest reactions were present on the GSR and cardiovascular charts. The total value of reactions in this test amounted to 18 points.

In the MQT test, the examinee reacted more clearly to the critical than to control questions again. The clearest reactions were present on the GSR and cardiovascular charts. The total value of the reactions in this test amounted to 8 points.

In the SAT test, the examinee very clearly reacted to critical questions, without reacting to control questions. The clearest reactions were present on the GSR and cardiovascular charts. The total value of the reactions in this test amounted to 14 points. [...]

Assessment of the examinee behaviour: throughout the examination, the examinee was peaceful, followed the instructions, and did not disrupt the recording.

Assessment of the entire examination: in the 4 tests (RCQT, RCQT II, MQT, and SAT), the examinee obtained 10.75 points per test on average. In the numbers test, the examinee reacted clearly. After the numbers test, reactions to critical questions intensified. All the reactions were maintained to the end of the examination (in the last test, the SAT, the examinee scored 14 points). There were no disruptions in the recordings.

Conclusions: The reactions of the examinee, Joachim Knychała, must be considered typical of a person who answers deceptively the critical questions in the tests.”

After the polygraph examination and discussing his reactions, Joachim Knychała admitted to killing his sister-in-law, Bogusława L. He explained that the motivation behind the murder was his eagerness to prevent her disclosure of their long-term affair, which Knychała believed would have had to end in disintegration of his marriage. As Knychała admitted much later, when Bogusława was already in the death throes after being hit on the head with a pickaxe, he undressed her and had a sexual intercourse with the dying woman, and later removed the semen that dropped onto her belly with a handkerchief, put her clothing on, and only then went home to inform about the alleged accident.

In the phase of the proceedings that included polygraph examination, Knychała was not suspected of other murders, especially the serial sex murders. It is obvious that if such a suspicion existed already at the time, the polygraph examination would be differently designed, especially the control question 6 could not be phrased the way it was.

The suspicion that Knychała was the perpetrator of the remaining murders appeared when a characteristic chequered jacket, identical with the one in which the killer was seen, which was included in the police descriptions, and which was worn by the dummy made in accordance with testimonies of the witnesses, was found during a search of Knychała's flat.

Moreover, objects that Knychała took from Mirosława S., one of his victims of sexual murders, were found in a basement he used. The number of these objects included her identity card. This made Knychała a suspect in the investigation under the codename “Szóstka”. Interrogated for that purpose, he

admitted to the killing of Mirosława S., Teresa R., and also to the murder of Stefania M., which was attributed to another man, who in the meantime, managed to become sentenced for it.

Only for the procedure's sake and without major conviction, Knychala was also interrogated about the murder of one girl and attempted murder of another one in Piekary Śląskie in 1979 (codename "Frankenstein"). Knychala explained that he heard about the attacks, and was even detained for 48 hours in this case, yet he was dismissed after proving his alibi. He claimed that he didn't know where exactly in the forest near Piekary the assault took place, and that he did not know any details of the crime. Yet the investigators decided to test his version. On the power of the decision of the office of the prosecutor commissioning a polygraph examination of Joachim Knychala for the events of the potential perpetration of this double assault on the girls, I performed the examination on 25th May 1982.

In the statement from the examination. I wrote: "due to the fact that a week earlier Joachim Knychala underwent an examination in another case, and the examination proved him deceptive, which he knows about, the current examination was appropriately modified. In this situation, it would be pointless to conduct the numbers test (which broke the block of 3 tests: RCQT, the numbers test, and RCQT II). As there was a danger that in the control questions tests the examinee could react also only because he did actually commit a similar crime [...] the number of such tests was limited to two, in turn, introducing two tests of the POT type, each of which was conducted in two forms (regular, and with the use of biofeedback monitor). As is known, these tests contained similar (similarly emotion-genic) questions, of which only one concerned an actual detail of the event, which the examinee is assumed not to know, unless he participated in the critical event. The examination consisted of the following tests:

1. Reid Control Questions Test (RCQT)
2. Reid Control Questions Test in the silent answer version (RCQT-SAT)
3. Peak of Tension (POT I) Test
4. The same test in a version with feedback monitor (POT I – feedback)
5. Peak of Tension II (POT II) test
6. The same test in a version with feedback monitor (POT II – feedback)

The following questions were asked to the examinee in the Reid Control Questions Tests (i.e. RCQT and RCQT-SAT):

1. Is your family name Knychala?
2. Is your first name Joachim?

3. Do you know who attacked the girls?
4. Is it Tuesday today?
5. Is it you who attacked the girls?
6. Did you wish death to anyone besides Grandmother?
7. Is it Tuesday today?
8. Where you in the forest near Wieczorka Settlement late in June 1979?
9. Did you hit a little girl?
10. Have you ever wanted to be involved in a perverse sexual intercourse?

Before conducting the tests, the questions were read out to the examinee, and the content was discussed with him.

The following questions were used in the Peak of Tension Tests:

POT I: Do you know that these girls:

1. Went sunbathing in the forest?
2. Played ball there?
3. Skipped on a skipping rope?
4. Arrived on bicycles? (critical)
5. Played badminton?
6. Played Indians?

POT II: Do you know that the perpetrator:

1. Pierced the girl's body with a knife?
2. Covered the body with branches?
3. Shattered the girl's face with a brick?
4. Undressed the body? (critical)
5. Stuck a stick into the girls anus?
6. Slashed the throat?

Before conducting the POT tests, the questions were read out to the examinee. The examinee once again confirmed that he didn't know which of the questions concerned true situations, and that he couldn't even guess it. The examinee sustained this opinion also after conducting the POT tests

Assessment of the recordings:

In the RCQT test, the examinee clearly reacted to question 3 (clear reactions were present on all the charts) and the question, 5 (clear reaction on GSR chart and the cardiovascular charts). Reactions to the questions 8 and 9 were smaller, nevertheless clear (especially on the GSR chart).

Reactions to the questions 3 and 5 in the RCQT-SAT grew visibly (as compared to the reaction in the preceding test). A clear reaction followed question 3 on the chart drawn by the bottom pneumograph and the GSR chart. After question 5 – on the GSR chart and the cardiovascular chart. Also, the reaction to the question 8 was relatively clear (GSR).

In the POT I test, the examinee reacted to question 4 (critical) with a characteristic run of the GSR and cardiovascular charts. In the POT I – feedback test, the reactions to question 4 were even greater.

In the POT II test, the examinee also reacted to the critical question with a characteristic run of the GSR chart, and also with a peak reaction on the pneumograph chart drawn by the bottom pneumograph.

In the POT II – feedback test, the examinee reacted to the critical question with a huge peak on the GSR chart (the examinee saw this reaction on the biofeedback monitor).

(...) Conclusions:

Both in Control Questions Tests and Peak of Tension (POT) tests, the examinee Joachim Knychała reacted in a manner typical of individuals who answered the critical questions contained in the tests deceitfully.

Presented with the results of polygraph examinations, Joachim Knychała admitted to attacking the girls. During the interrogation he described in detail the course of the event, and later, during the experiment, pointed to the place of the attack, and described its course referring to the actual place.

Statements from polygraph examinations were included in the body of evidence supporting the indictment. As the expert witness performing these examinations, I was summoned to a hearing before the Regional Court in Katowice. The court only required that I confirm that I performed such examinations, and the lawyer of the defence asked me if I knew how the results of polygraph examinations are treated in American trials. The results of polygraph examinations were in line with the explanations of the defendant, who admitted to the deeds he was charged with, therefore, they were of no major importance as evidence. In turn, they were of vast importance in investigation, as Joachim Knychała admitted to the killing of Bogusława Ludyga, and later – after polygraph examinations, or more precisely after being presented with the results of the examinations, also to the assault on the girls. It is doubtful that he would have admitted at all without polygraph

examinations. Issuing the sentence on 19th April 1984, the Regional Court in Katowice counted the statements from polygraph examinations (written ones and the oral delivered before the court) to the body of evidence that provided the grounds for the sentence. The court sentenced Joachim Knychala to capital punishment. In the result of an appeal submitted by the defender, the case was investigated by the Supreme Court, which accepted the sentence of Regional Court of 22nd October 1984 (ref.: II KR 174/84). In the statement, the Supreme Court did not use the opportunity to refer to the admissibility of polygraph examination in criminal trial, therefore it accepted the admissibility of such examinations. The sentence was delivered on 21st May 1985 (Widacki 2006).

It is also worth mentioning that awaiting the execution, Joachim Knychala wrote down his memories from investigation, devoting a few sentences to polygraph examinations. This is interesting inasmuch as we hardly ever have information about how polygraph examination is perceived by the examinee. Besides the purely cognitive nature, such information has a certain practical value, as it can be used, for example, for the construction of the pre-test interview (Widacki 2001).

The case of polygraph examination of Joachim Knychala, one of the most dangerous sexual killers known to the Polish case law deserves attention and a longer description for a number of reasons. The case included the elimination ("screening") examination covering a few hundred people. In Polish practice, this was unprecedented, and as far as I know elimination examinations on such a scale were never repeated, although amended in 2003 the Criminal Procedure Code provides legal grounds for such examinations in Art. 192. The examination beyond doubt played a prominent role in the case, and not – as is usually the case – an accessory or ancillary one. Besides the psychological impact of the examination and its impact on the defendant, who is hardly likely to have admitted the murder of his sister-in-law and assault on the girls without the examinations, it is worthwhile remembering that – except for his explanations and admitting to the crimes – it was the statement from the examination that was the only evidence in these part of the trial.

Moreover, both the Regional Court in Katowice and later the Supreme Court accepted the statements from the examination as evidence without reservations. The case of Joachim Knychala was beyond doubt one of the most spectacular successes of polygraph examinations before 1989.

Moreover, this case shows the level of contemporary examinations, the current technique of examination, and the manner of assessing the recordings (numerical!), and finally the way the statements were formed.

It must be remembered that, under the Criminal Procedure Code of 1969, the legal situation of polygraph examinations in criminal cases was not instantly recognizable. A fair share of specialists in criminal procedure stated that polygraph examinations in the Polish trials are not to be permitted, or – in a gentler version – that they cannot be treated as evidence. Yet such examinations were practically used, and the courts, including the Supreme Court, tolerated such practice. As a rule, evidence from the statement delivered after polygraph examination was admitted and assessed in the context of the remaining body of evidence. In the late 1970s and early 1980s, a decided majority of polygraph examinations in criminal cases were performed by academic experts (the author of this article, and later also by J. Konieczny of the University of Silesia) and also by R. Jaworski (University of Wrocław), and by M. Kulicki (Nicolas Copernicus University in Toruń).

Besides conducting practical examinations in criminal cases, the staff of the Department of Criminalistics (and from 1981 – Chair) of the University of Silesia in Katowice conducted experimental studies, and analysed practical application of the polygraph, being the only centre in Poland to remain in constant touch with US and Czechoslovak polygraphers, co-authoring scientific works as with them.

As a rule, WSW experts and their academic colleagues applied Reid's Control Questions Technique, and later began also to apply Backster technique. Only M. Kulicki used and promoted Lykken's technique (Guilty Knowledge Technique), and did so so ardently that some in Poland are convinced to this day that he is the author of the technique.

Until the end of the 1970s, the 7-grade scale (from +3 do -3) was applied at the Unit of Criminal Studies of the University of Silesia to evaluate the recordings. We were taught its use by one of the leading American polygraphers of the time, a practitioner and scientist, Dr Gordon Barland of the University of Utah, visiting us twice at the time.

After the departure of the author this article from the University of Silesia early in the 1980s, polygraph examinations were conducted until the end of the 1980s by Dr Jerzy Konieczny. The most spectacular success in this time was the discovery of the murderer of two little girls through a series of poly-

graph examinations.

A profound change occurred after 1989. New special and later also police forces began using polygraph both towards the candidates applying for being admitted to service and towards all officers before admitting them to special tasks. Contacts were established with US and Israeli polygraphers. Admissibility of polygraph examinations for candidates to service and officers was guaranteed in acts concerning such services.

At the same time, the level of polygraph examinations performed for judiciary reasons deteriorated drastically, which I believe had a number of causes. One of the most significant ones was the lack of good preparation of experts who had nobody to train them in Poland, and no decision to organise training abroad was reached. Another reason is the low level of academic criminal and forensic sciences, and as a rule their low level of authority in the prosecution and judiciary. Thus, polygraph examinations remained practically uncontrolled by the academics, while such a control plays a profound role in other fields (e.g. forensic medicine). The low level of polygraph examinations performed practically was accompanied by an absolute disappearance of experimental studies in the field, and even empirical analysis of their practical application.

Another reason was the recognition of obviously false claims that polygraph examinations performed in control questions technique are not permitted by our procedure, and that the scientific grounds of search examinations are doubtful, which the police turned into dogmas. Yet the examinations conducted in the GKT (Guilty Knowledge Test) also known as CIT (Concealed Information Test) operating frequently although without grounds in Poland as “technika Kulickiego” (literally: “Kulicki technique”) conform to the procedure and are supported by science.

It is also known that the GKT (CIT) technique has a very limited application and as the analyses conducted by the FBI proved, conducting examinations in the GKT technique was possible only in a few per cent of the cases that the Bureau performed with the control questions (CQ) technique (Podlesny 2003). Moreover, there are no grounds whatsoever to claim that the GKT technique has better scientific foundation than the CQT. Besides, from the logical and methodological point of view, a statement from an examination performed in the CQ technique in no way differs from the statement from an examination performed in the GK technique (Widacki 2011).

Thus, as far as the police experts grapple with the insufficient GKT technique enforced on them by the instruction, private experts in polygraph examinations who emerged in the 1990s (and whose qualifications were evidently unchecked) and certain experts from services other than the Police, performed their analyses, according to the already strongly dated Reid's technique, using no numerical assessment of the recordings, and only the qualitative assessment ("by instinct"). Thus, as far as evident progress was recorded by the studies conducted for the internal use of special services, and examinations were conducted to world level standards, there was a substantial regression in the forensic use of polygraph compared to the late 1970s and early 1980s. And yet the world went on. This regression in the level of polygraph examinations in criminal cases was accompanied by a complete absence of scientific studies in the area.

Thus, there is little wonder that an attempt (ineffective as it proved) to introduce a prohibition on polygraph examinations in the draft of the new Criminal Procedure Code, subsequently approved in 1997, was made. The Code of 1997 introduces Art. 171 § 4, which had no corresponding law in the Code of 1969. It read: "it is inadmissible. [...] to use hypnosis or chemical or technical means that have an impact on the psychological processes of the interrogated person, or aimed at controlling the involuntary reactions of that person's organism in relation to interrogation". According to the intention of the authors of the draft version of the code, this appallingly phrased regulation, which was to forbid the use of polygraph, hypnosis, and narcoanalysis at one go, became the object of various interpretations.

A decided majority of specialists in criminal procedure discussing the matter interpreted this regulation as a prohibition on polygraph examinations. The different view was decidedly a minority opinion, represented notably by S. Waltoś (Waltoś 1998) who claimed that the Code forbade only the application of polygraph as part of the interrogation, at the same time not preventing its use for expert witness evidence. The same line of argumentation was used by the Supreme Court and the Court of Appeals in Kraków in their statements from the period, which recognised a proof of polygraph examination as permissible (Widacki 1999).

In 2003, the Criminal Procedure Code was amended again, retaining the prohibition expressed in Art. 171, and introducing Art. 192a and Art. 199a, which referred *expressis verbis* to polygraph examinations. This is corroborated the interpretation that the prohibition contained in Art. 171 did not concern polygraph examinations performed by professional experts.

Art.192a allows applying eliminating polygraph examinations on the people (at their consent) who still have no status assigned in the continuing investigation, and who in future may equally well prove to be suspects, witnesses, or even people with no status in the trial, as they are neither suspects nor witnesses.

The acts concerning the police and special forces allow the application of polygraph in the pre-employment procedure, and also in various control procedures within the services.

The view that polygraph examinations may be applied also to the staff of private businesses, obviously with their consent, is prevalent (Cempura, Władcki 2013).

Although incomparable in size with that of Russia or Ukraine, a market of polygraph examination services developed in Poland, many usually one-man-strong private businesses providing commercial polygraph examination services began to emerge beginning with the 1990s. Examiners calling themselves experts and advertising e.g. online are people who previously served in police and special forces where they had an opportunity to become more or less familiar with polygraph examinations. They usually perform examinations in private business and family cases (so-called prenuptial examinations, investigations of faithlessness, etc.) to private commissions. Yet it happens that they stand up, luckily very rarely, as expert witnesses in prosecution offices or in courts, show off in the media, presenting frequently warped images of the essence of polygraph examination.

The level of the services they provide is very low. Generally, and at times downright scandalous.

To prevent the spreading pathology, polygraph operators from the academic environment and special services set up the Polish Polygraph Association (Polish: Stowarzyszenie Poligraferów Polskich) in 1994 and in 2013 Polish Association of Polygraph Examination. The body never managed to acquire on the local stage a position compared to that enjoyed in America and in the world by the American Polygraph Association. It neither developed a code of ethics, nor a method of expert certification, nor principles of control of the level of the examinations conducted. For long periods of time, the Association showed no activity, and the recent attempts to have it reactivated failed for formal reasons. One of the few activities of the Association was the approval of the "Standard for polygraph examination in criminal cases" in 2004.

The development of a similar “standard” for private business procedures was announced, yet even a preliminary version of the draft could not be prepared. The initiative of developing the aforementioned standards started among the despairing members of the Association, who – seeing the deteriorating level of polygraph examinations performed and the development of “a wild market” of such services – undertook what finally proved to be an attempt at slowing down this process.

In the 1990s the Polish Police purchased a voice analyser (Psychological Stress Evaluator) which seems not to have been used practically even once, and put to use only in experimental studies. Similar experiments were conducted in the capture of Department of Criminalistics of the University of Silesia.

In 2012, an experiment with a thermal vision camera was conducted to observe and register face temperature changes treated as an indicator of emotions accompanying deception (Polakowski, Kastek, Pilski 2012), yet the study may be considered no more than an introductory pilot project. Of similar nature is the research conducted by the doctoral students of the Andrzej Frycz-Modrzewski Kraków University (Staszek, Wojtarowicz, Zając 2013).

Of major significance for the level of polygraph examinations in Poland, providing at a certain hope for withholding bad tendencies, was the establishment of contacts with American services and their experts by certain Polish special forces. In the result of training conducted in Poland, the polygraphers of the Internal Security Agency (Polish acronym ABW) and some other services were trained by American and Israeli instructors, acquired American Polygraph Association examination certificates, and even membership in the organisation. The problem lies in the fact that, while best preparation in Poland, these experts use their skills in examinations performed for the internal needs of the services, and are appointed as expert witnesses in criminal cases only occasionally. The people who perform polygraph examinations in this capacity most often are police and private experts with uncertified and uncorroborated qualifications.

As the analysis of practical application of polygraph examinations in 2003–2012 (i.e. in the period when the polygraph examinations is allowed *expressis verbis* on the power of the Polish procedure) proves, the Art. 192 a remains practically dead. One polygraph examination is performed per more than 6000 criminal cases (Widacki 2012). The practical, screening examinations mentioned in Art. 192a of the Code are practically never conducted. The reasons for such a status quo must be sought both in the low level of the exami-

nations and the resultant low utility in the trial, and in the lack of preparation of investigation officers and prosecutors who do not know how to make use of such examinations and do not commission them.

Beginning with 2007, Andrzej Frycz-Modrzewski Kraków University has published the English-language *European Polygraph* quarterly, whose Editorial Board consists of most eminent polygraphers and scientists dealing with the questions of polygraph examinations from nearly all around the globe.

Military Police organises annual polygraph conferences with participation of practitioner polygraphers and scientists from all over Poland. This seems to be the only forum that allows mutual contacts and exchange of experience. Attempts to set up a new Polygraph Association have also been made.

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## fMRI Lie Detection Validity and Admissibility as Evidence in Court and Applicability of the Court's Ruling to Polygraph Testing

**Key Words:** fMRI, evidence, detection of deception, forensic neurophysiology

### Background

On 18 June 2008, a federal grand jury returned an indictment against Dr. Lorne Allan Semrau, a clinical psychologist, and in a Second Superseding Indictment filed later that year charged him with sixty counts of healthcare fraud in violation of *18 U.S.C & 1347*, twelve counts of money laundering in violation of *18 U.S.C & 1956 and 1957*, and one count of criminal forfeiture. After a twelve-day jury trial Dr. Semrau was convicted of three counts of healthcare fraud, and was acquitted on the remaining counts. Dr. Semrau appealed his conviction in *United States Court of Appeals for the Sixth Circuit, U.S. v. Semrau, 693 F.3d 510 (6<sup>th</sup> Cir. 2012)*.

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In Dr. Lorne Semrau's appeal of his conviction, he argues, on a matter of first impression in any jurisdiction in the country, that results from a functional magnetic resonance imaging (fMRI) lie detection test should have been admitted to prove the veracity of his denials of wrongdoing. Dr. Semrau's conviction was affirmed.

### Explanation of the Court's Decision:

The United States Court of Appeals concluded, after carefully reviewing the scientific and factual evidence, that the district court did not abuse its discretion in excluding the fMRI evidence under Federal Rule of Evidence 702 because the technology had not been fully examined in "real world" settings and the testing administered to Dr. Semrau was not consistent with tests done in research studies. The Court also ruled that the testimony was independently inadmissible under Rule 403 because the prosecution did not know about the test before it was conducted, constitutional concerns caution against admitting lie detection tests to bolster witness credibility, and the test results do not purport to indicate whether Dr. Semrau was truthful about any single statement.

Dr. Steven J. Laken, President and CEO of Cephos Corporation who administered the fMRI lie detection test to Dr. Semrau, testified at the *Daubert* hearing that to his knowledge, fMRI based lie detection testimony had only been presented in court on one prior occasion, a post-conviction relief case in South Carolina.

At the heart of Dr. Laken's lie detection method is fMRI imaging. An fMRI enables researchers to assess brain function "in a rapid, non-invasive manner with a high degree of both spatial and temporal accuracy." When undergoing an fMRI scan, a subject lies down on a bed that slides into the center of a donut-shaped magnet core. As the subject remains still, he is asked to perform a task while magnetic coils in the scanner receive electric current and the device gathers information about the subject's Blood Oxygen Level Dependent (BOLD) response. By comparing the subject's BOLD response signals with the control state, small changes in signal intensity are detectable and can provide information about brain activity.

Dr. Laken agreed during cross-examination that he had only conducted laboratory studies using mock scenarios and was not aware of any research in a "real life setting" in which people are accused of "real crimes." Dr. Laken

testified that fMRI lie detection has “a huge false positive problem” in which people who are telling the truth are deemed to be lying around sixty to seventy percent of the time. Dr. Laken conceded that his 2009 mock crime study was able to identify a “truthteller as a truth teller” just six percent of the time, meaning that about “nineteen out of twenty people that were telling the truth we would call liars.” Another study expressed concern that “accuracy rates drop by almost twenty-five percentage points when a person starts becoming fatigued.” Dr. Laken also explained that a person can become sufficiently fatigued during testing such that results are impacted after about two “scans” because “their brain starts kind of going to sleep.” Similarly, inadequate sleep the night before a test could cause such fatigue.

During his cross-examination, Dr. Laken agreed that the test results do not indicate whether Dr. Semrau responded truthfully as to any specific question but rather shows only whether he was generally truthful as to all of his answers collectively. Accordingly, Dr. Laken conceded that it is certainly possible that Dr. Semrau was lying on some of the particularly significant questions. Dr. Laken was unable to state the percentage of questions on which Dr. Semrau could have lied while still producing the same result.

The magistrate judge had determined that Dr. Semrau could not satisfy the rate of error and controlling standards factor. “While it is unclear from the testimony what the error rates are or how valid they may be in the laboratory setting, there are no known error rates for fMRI-based lie detection outside the laboratory setting, i.e., in the ‘real-world’ or ‘real-life’ setting.” *2010 U.S./Dist. LEXIS 143402. (WL) at \*11*. Also problematic was Dr. Semrau’s participation in a third study (test) after the first two yielded different results, a tactic that does not appear to have been followed in any of the studies performed or cited by Dr. Laken. As the magistrate judge observed, Dr. Laken’s “decision to conduct a third test begs the question whether a fourth scan would have revealed Dr. Semrau to be deceptive again.” *Semrau, 2010 U.S. Dist. LEXIS 143402, 2010 WL 6845092, at \*13*. The decision to conduct an fMRI “best two out of three re-test” as to the AIMS charges suggests testing on Dr. Semrau was itself part of Dr. Laken’s research to refine and better understand how the brain can reveal deception and truthfulness. Particularly troubling was Dr. Laken’s explanation of why the initial “deceptive” result was untrustworthy “the chances of calling a truth teller a truth teller was only roughly six percent” because this “huge false positive problem” could potentially justify continual re-testing on anyone until a “not deceptive” result is obtained.

## Decision of Supreme Court of New York on fMRI:

It should be noted that on 14 May 2010, the Court in *Wilson v. Corestaff Services*, 900 N.Y.S.2d 629 (2010) decided that the defendant's motion in limine to exclude the testimony of the fMRI expert Dr. Stephen Laken is granted and plaintiff's motion for a Frye hearing was denied. The court in *Wilson v. Corestaff* stated that the opinion to be offered by Dr. Laken is of a collateral matter, i.e. the credibility of a fact witness. Since credibility is a matter solely for the jury and is clearly within the ken of the jury, plaintiff has failed to meet this key prong of the *Frye* test and no other inquiry is required. However, even a cursory review of the scientific literature demonstrates that the plaintiff is unable to establish that the use of the fMRI test to determine truthfulness or deceit is accepted as reliable in the relevant scientific community. The scientific literature raises serious issues about the lack of acceptance of the fMRI test in the scientific community to show a person's past mental state or to gauge credibility.

## Other Studies and Conclusions on fMRI Lie Detection:

Dr. Nancy Kanwisher, a professor at the Massachusetts Institute of Technology (MIT) discusses papers that present supposedly direct evidence of the efficacy of detecting deceit with fMRI in Chapter 2, *The Use of fMRI in Lie Detection: What Has Been Shown and What Has Not*, but dismisses their conclusions. (Bizzi E, Hyuman SE, Raianchle ME, Kanwisher N, Phelps EA, Morse SN, Sinnot-Armstrong W, Rakoff JS, Greely HTG. (2009). Chapter 2 reflects "Kanwisher notes that there is an insurmountable problem with the experimental design of the studies she analyzes. She points out that by necessity the tested population in the studies consisted of volunteers, usually cooperative students who were asked to lie. For Kanwisher this experimental paradigm bears no relationship to the real-world situation of somebody brought to court and accused of a serious crime. Kanwisher's conclusions are shared by Elizabeth Phelps, a professor at New York University. Phelps points out that two cortical regions – the parahippocampal cortex and the fusiform gyrus – display different activity in relation to familiarity. The parahippocampal cortex shows more activity for less familiar faces, whereas the fusiform gyrus is more active for familiar faces. However these neat distinctions can unravel when imagined memories are generated by subjects involved in emotionally charged situations. Phelps points out that the brain regions important to memory do not differentiate between imagined memories and those based

on events in the real world. In addition, the perceptual details of memories are affected by emotional states.”

Professor Kanwisher stated “But there is a much more fundamental question. What does any of this have to do with real-world lie detection? Let’s consider how lie detection in the lab differs from any situation where you might want to use these methods in the real world. The first thing I want to point out is that making a false response when you are instructed to do so isn’t a lie, and it’s not deception. It’s simply doing what you are told. We could call it an ‘instructed falsehood.’ Second, the kind of situation where you can imagine wanting to use fMRI for lie detection differs in many respects from the lab paradigms that have been used in the published studies. For one thing, the stakes are incomparably higher. We are not talking about \$20.00 or \$50.00, we are talking about prison, or life, or life in prison. Further, the subject is suspected of a very serious crime, and they believe while they are being scanned that the scan may determine the outcome of their trial. All of this should be expected to produce extreme anxiety. Importantly, *it should be expected to produce extreme anxiety, whether the subject is guilty or not guilty of the crime.* The anxiety does not result from guilt per se, but rather simply from being a suspect.” (See Matte 2010 regarding Lab v. Field studies, and Matte 1998 and Matte, Reuss 1999 regarding the Directed-Lie Control Question.)

### Application of U.S. Court of Appeals Ruling on fMRI Lie Detection to Polygraph Tests:

The United States Court of Appeals for the Sixth Circuit in its rejection of the fMRI Lie Detection test placed particular emphasis on the fact that Dr. Laken’s fMRI lie detection test was based on laboratory studies using mock scenarios and the existing technology had not been fully examined in “real world” settings. This opinion raises serious questions regarding the use of laboratory studies to validate polygraph techniques. A lengthy discussion supported by published research studies regarding the value of laboratory versus field studies is found in “Guiding Principles and Benchmarks for the Conduct of Validity Studies of Psychophysiological Veracity Examinations Using the Polygraph” (Matte 2010). As stated in aforesaid Guiding Principles, “Laboratory studies which are based on *non-emotional orienting responses* definitely fail to replicate the field conditions that elicit *emotional defensive responses* where both the guilty and innocent examinee’s *primary emotion* is “fear” of the consequences if found deceptive, which in criminal cases could

result in the horror of imprisonment.” As stated by Iacono (2001); “These mock crime studies are too unlike real life to offer any realistic insight to how polygraph tests work in the field.”

The Court further stated that “There was simply no formal research presented at the *Daubert* hearing demonstrating how the brain might respond to fMRI lie detection testing examining potential deception about real world, long-term conduct occurring several years before testing in which the subject faces extremely dire consequences (such as prison sentence) if his answers are not believed. See Fed. R. Evid. 702(c) (requiring expert testimony to be the ‘product of reliable principles and methods.’)” The above statement by the Court raises the “Fear of Error” also known as the “Othello Error” issue mentioned in the NRC of the National Academies 2003 report on The Polygraph and Lie Detection. (Ekman 1985; Matte 1978, 1996, 2011; NRC 2003).

The Court also faulted the fMRI Lie Detection method for a lack of known error rates for fMRI-based lie detection outside the laboratory setting, i.e., in the ‘real-world’ or ‘real-life’ setting. Federal courts have long appreciated that certain kinds of analyses may have different rates of error depending on the setting because of the difficulties of simulating realistic conditions. See *United States v. Crisp*, 324 F.3d 261, 2870 (4th Cir. 2003) (Handwriting analysis); *United States v. Cordoba*, 194 F.3d 1053, 1059-60 (9th Cir. 1999) (polygraph testing). Hence, a polygraph technique that is not supported by published *field* studies showing an error rate may suffer the same fate as the fMRI Lie Detection method.

A list of validated “evidentiary” polygraph techniques and their supportive research studies with sample size and accuracy rates can be reviewed and downloaded at [www.mattepolygraph.com](http://www.mattepolygraph.com) under the heading of “List of Validated Polygraph Techniques with Accuracy Data.”

The Court found that Dr. Laken’s exclusion of the first scan that indicated Deception in favor of the second and third scan that indicated truthfulness was not scientifically and judicially acceptable. The court stated that Dr. Laken’s “decision to conduct a third test begs the question whether a fourth scan would have revealed Dr. Semrau to be deceptive again.” Dr. Laken’s explanation for the exclusion of the first scan was that the fMRI has a “Huge false Positive Problem” and the Court countered that this false positive problem could potentially justify continual re-testing on anyone until a “not deceptive” result is obtained. Analogous to polygraph testing, the exclusion of a scan or chart should not be permitted unless there is excessive artifact that

impedes the production of sufficient physiological data for analysis within the framework of the technique's protocol. Furthermore, the Court's concern regarding the continual re-testing until the desired result is obtained is reminiscent of polygraph techniques that use a fixed score threshold that permits the successive collection of additional charts to reach the fixed score threshold. Especially vulnerable to attack by opposing counsel and rejection by the Courts are those techniques with a low fixed score threshold below +/-6. (Matte 1996, 2000, 2011). Conversely, those polygraph techniques that employ an increasing score threshold with each chart collected are not vulnerable to such attack and rejection. (Matte 2013).

The failure of Dr. Laken's fMRI Lie Detection method to identify Dr. Semrau's truthfulness or deception to specific test questions further diminished the diagnostic value of the fMRI Lie Detection method. Dr. Laken could only generalize truthfulness to all of Dr. Semrau's answers collectively. This is analogous to multiple-issue polygraph screening tests which have a bias against truthful examinees and thus require the use of a successive hurdle approach with a validated single-issue test to address unresolved autonomic responses.

It becomes evident that fMRI Lie Detection suffers from a serious problem of false positives where the truthful examinee is erroneously found to be deceptive. This author believes that field research studies using real-life incidents with significant consequences must be done before fMRI Lie Detection can be accurately evaluated and perfected to the extent that it would be competitive with polygraph testing. The criticisms levied against the fMRI Lie Detection method by the Court of Appeals and cited scientists should serve notice to the polygraph profession as to what is expected and accepted as evidence in court.

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Book reviews





*Effective Interviewing and Interrogation Techniques*  
– Third Edition,  
by Nathan J. Gordon and William L. Fleisher,  
Academic Press 2011

In 2011 Academic Press published the third edition of a book written by Nathan J. Gordon (Director of the Academy for Scientific Investigative Training) and William L. Fleisher (Director of Keystone Intelligence Network) entitled *Effective Interviewing and Interrogation Techniques*.

The book presents information on non-instrumental and instrumental lie detection.

In fact, only the final section of the book, consisting of two chapters (Instrumental detection of deception, pp. 297–312 and The search for truth. Future instrumentation, pp. 313–324), is devoted to instrumental lie detection.

This section contains basically course book information on routine polygraph examinations based on the observation of physiological emotion correlates registered in routine polygraph examinations and also information on physiological emotion correlates other than those routinely used that may prove useful in instrumental lie detection, which encompass eyeball movements, body temperature changes, and changes in the function-related currents in the brain that can be observed in EEG recordings.

Yet the major part of the book, consisting of chapters from 1 to 20 (pp. 1–297) is devoted to instrumental lie detection.

Science has long known the diagnostic value of routine polygraph examinations quite well; it has been thoroughly examined and described in scientific literature (see e.g. S. Abrams: Polygraph validity and reliability: a review, *Journal of Forensic Sciences* 1973, 18, 4, pp. 313–326, Widacki J., Horvath F., An experimental investigation of the relative validity and utility of the polygraph examination and three other common methods of criminal identification, *Journal of Forensic Sciences* 1978, 23, 3, pp. 596–601), and also in numerous reports, notably the Report of the American Polygraph Association (2011).

The diagnostic value of a polygraph examination is not lesser than that of other identification methods used generally for investigation purposes. That is why polygraph examination may be used not only in investigations but also as circumstantial evidence in proceedings before the court; a practice accepted among others in Poland and many other countries.

The situation of non-instrumental lie detection is entirely different: its diagnostic value is incomparably lower than that of a polygraph examination, for which reason its practical application is currently highly doubtful. Unfortunately, referring to these questions, the authors of the book ignored a wealth of scientific achievements, especially hailing from Europe.

The book suffers from the failure to use seminal works of fundamental authors, including Aldert Vrij, Paul Ekman, and the recently deceased Udo Undeutsch.

The accuracy of non-instrumental methods of lie detection achieved so far (52%, slightly above the statistical probability), proves that results obtained in this way are not random (vulnerable to chance), yet at the same time the error level (close to 50%) disallows practical use of such methods of lie detection. Nonetheless, with the current advancement of knowledge, this is more than doubtful, and certainly does not allow using this method as evidence in court, and may even question its applicability in the process of investigation. Moreover, a mistaken interpretation of verbal and/or behavioural symptoms may lead the interrogator astray, resulting in an incorrect assessments of the interviewee's credibility.

Nonetheless, even as low number of correct results as so far achieved by non-instrumental lie detection, yet exceeding the statistical probability (50%), proves that further studies are justified. Possibly, accounting for the personality of the interrogated and keen on a complex array of verbal and/or behavioural symptoms, yet not of universal nature, but ones typical of people with specific personality types will greatly help to increase the diagnostic value of such non-instrumental methods of lie detection, which will allow their more extensive and better use for investigation purposes and in placement and job interviews.

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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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