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The Search for Truth by “Registration of Expression” – Polygraph Experiments in Graz in the 1920s

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In the year 1912, Hans Gross (1847–1915) founded the Criminological Institute at the Karl-Franzens-University Graz, thus contributing decisively to the institutionalisation of Criminology at university level and so becoming one of the ‘fathers of modern scientific criminology’. Gross developed an encyclopaedic concept of criminology, unifying practical investigation work and theoretical reflection under one epistemological roof. Before his academic career, Gross had served for decades as an investigating judge, public prosecutor and criminal judge, and so he knew about the precarious epistemologi-

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cal status of the depositions of witnesses and statements of suspects. In his methodology, Gross was inspired by the exact natural sciences: the standards of his criminological thinking were shaped by (classical) physics and Darwinian evolutionary biology – sometimes with dubious results, since his confidence in methodical exactness caused a blindness to ideological and political matters (for a detailed analysis of Gross' epistemology, see: Bachhiesl 2012).



Fig. 1. Hans Gross (1847–1915)

In general, Gross understood human beings as realities that should be examined like any given object related to a criminal case. But unlike the mere material character of any object that served as piece of evidence, the uncertainty characterizing the testimony of human beings caused problems in terms of exact objectification. Since the natural sciences did not offer reliable and broadly accepted methods of measuring the amount of truth in a person's statement, Hans Gross had to concentrate on rather general psychological devices. In his major works, the *Manual for Investigating Judges* (Gross 1894) and the *Criminal Psychology* (Gross 1898), he gives some instructions for separating true from false testimony: the investigator should study and prepare their case well; they should interrogate as exhaustively as possible and always be aware of the uncertainty and possible falseness of a witness' or suspect's deposition. The interrogator should pay attention to minor details

and, especially, to impossibilities and contradictions. Thus the interrogator should always have an eye on protocols and should imagine the witness' or suspect's story vividly for the sake of the discovery of contradictions (Gross 1894, p. 95). In this regard, says Hans Gross, "we can learn a lot from novelists" (Gross 1894, p. 93). And it is important to pay attention to the behaviour of people, to their gestures and actions and affects – the blushing of a person can be instructive, for example (Gross 1898, pp. 61–65, 660–666). But Hans Gross knew that these epistemological expedients were not sufficiently exact and reliable from the point of view of natural science – there was a lot of research work left to do.

After Hans Gross' death in December 1915, Adolf Lenz (1868–1959) took over the Criminological Institute. In contrast to Gross, Lenz was not a votary of natural science. Lenz believed in holism and intuition: because people are not just rational, but also irrational to a considerable degree, they should be analysed by irrational means. Lenz was convinced that he was able to put himself inside the mind and soul of another person by intuition, thus seeing through his or her personality and detecting his or her "personality guilt". Lenz called this form of irrational and intuitive science "Criminal Biology" (see Lenz 1927, Bachhiesl 2005, Bachhiesl 2010).



Fig. 2. Adolf Lenz (1868–1959)

Adolf Lenz tried to approach criminology from a holistic standpoint. Lenz referred to the psychological concepts of C. G. Jung (1875–1961) and Karl Jaspers (1883–1969) and to the Constitutional Biology of Ernst Kretschmer (1888–1964), but the central method of his Criminal Biology was irrational intuition, as taught by the philosophers Richard Müller-Freienfels (1882–1949) and Ludwig Klages (1872–1956). If one can see the inside of a person by mere intuition, it is of course easy to find out which part of a testimony is true and which is not. This was of course not the natural-scientific exactness and precision Hans Gross had in mind. However, natural-scientific exactness was not a criterion for Adolf Lenz, although he was an internationally respected scientist: Lenz became president of the International Criminal-Biological Society in 1927. And Lenz was also politically active – as a member of the “Federal Culture Council” (Bundeskulturrat), he was a representative of the Austrofascist regime from 1934 to 1938. But Lenz could not completely replace the natural-scientific longing for exactness as a leitmotiv of criminology. It was his assistant Ernst Seelig (1895–1955) who, while Lenz developed his holistic concept, kept alive the ideal of precise measuring and exact research relying on rationally understandable, standardized and verifiable experiments.



Fig. 3. Ernst Seelig (1895–1955)

Seelig was in search of up-to-date empirical research that could be adapted for the purposes of forensic testimony analysis. He did not have to look far – the Psychological Laboratory had existed at the University of Graz since 1894, founded by Alexius Meinong (1853–1920). Meinong was a philosopher who elaborated a theory of objects (“Gegenstandstheorie”), but he was also a founding father of experimental psychology. At the Psychological Laboratory, Meinong and his disciples tried to measure human perception, experience and emotions with the help of “experimental-psychological apparatus” – instruments that were supposed to “materialize” the psychic (mental) life of humans. Experiments were carried out, for instance, with an instrument for time sense, a stroboscope, a chronoscope and a memory-apparatus – the experimental-psychologists tried to measure many human senses and psychological capacities (Huber 2012, Meinong 1904). Hans Gross had already been in contact with Alexius Meinong; he attended his lectures and tried to apply both Meinong’s epistemology and his psychology to criminology. Ernst Seelig maintained these contacts. He too attended Meinong’s lectures (S. Bachhiesl 2011) and kept in touch with the newest experimental-psychological research work. One of Meinong’s disciples, Vittorio Benussi (1878–1927), was convinced he had found a way to detect lies by the measuring of respiration – a method that seemed to be of immediate forensic importance (Widacki 2012, pp. 140 ff.).

Benussi’s respiration analysis, which was carried out in 1913 (see in detail Benussi 1914), took into account the fact that human observers were not sufficiently sensitive to register changes in breathing activity. Therefore he replaced the human observer with a mechanical apparatus: The examinee sat on a comfortable deck-chair, having their pulse and respiration registered by a sphygmograph and a pneumograph, with the data being transcribed onto soot-blackened paper with the help of a kymograph. Cards (10 x 10 cm) showing drawings, numbers and letters were given to the examinee, who had to say what was drawn and written on the card; some of the cards were marked with a star, and then the examinee had to convey information other than that written on the card – he had to lie. What was measured with this experiment was the relation between the inspiration and expiration of the examinee. The inspiration-expiration quotient was calculated before and after the statement of the examinee, and a comparison of these quotients showed a characteristic result: after telling the truth, the expiration was slower; after lying, the expiration was faster. Benussi was convinced he had found an exact method of detecting lies as well as a method of measuring a person’s ability to dissimulate. And: the relation of the quotients was constant, even if the

examinee tried to change their breathing behaviour deliberately. In theory, this method of mechanical respiration analysis was completely successful; its practical importance still had to be tested.

Ernst Seelig tested Benussi's method – and, in modification of a critical, but positive earlier position (Seelig 1925) – he found that it was not suitable for forensic praxis: Benussi's testing situation was an essential condition for its success. This testing situation forced the examinee to be intellectually rather active: he had to invent and state things that were not written on the cards. But in forensic interrogations, many questions can be answered with a simple yes or no, and in these situations the respiration quotients did not exhibit a significant difference. Seelig thus concluded that "it was not insincerity per se that caused Benussi's respiration symptom but just the intellectual performance produced by the testing situation" (Seelig 1927, p. 56). So this method could not help.

However, Ernst Seelig found another experimental method that could help to detect lies: the registration of expression with the help of registration apparatus that had been developed by the German psychiatrist Otto Lowenstein (Löwenstein, 1889–1965). Lowenstein originally invented this apparatus in order to document the difference between organic and psychogenic tremor in shell-shocked soldiers (Thompson 2005, Fig. 2). Experiments carried out with this apparatus in Bonn in the early 1920s enabled Lowenstein to develop a method of diagnosis of the mental elements of an offence (according to Lowenstein, a diagnosis of the physical elements of an offence was not possible) and of the mental reasons for the exclusion of responsibility (for details see Lowenstein 1922). Seelig adapted Lowenstein's experimental method and technique for the purpose of the forensic registration of involuntary expression. According to Lowenstein's instructions, Seelig was not content with the registration of single physiological items but demanded the extensive registration of thoracic breathing, abdominal breathing, and the relative position and movements of the hands, the feet and the head (Seelig 1927, p. 55). Later on, he abandoned the registration of movements of the head, as still existing strips of soot-blackened paper used with these experiments show, but the other items were still registered (see Fig. 5, 6, 7). The examinee sat in a wooden chair, their arms hanging suspended by leather strips; leather strips around the thorax and the abdomen allowed respiration to be recorded, and the movements of the hands and feet were registered and pneumatically transmitted to a kymograph located on a table behind the chair. The kymograph inscribed six curves caused by the breathing and by the movements of the extremities onto soot-blackened paper; a seventh curve (or line) monitored the occurrence of externally caused movements.

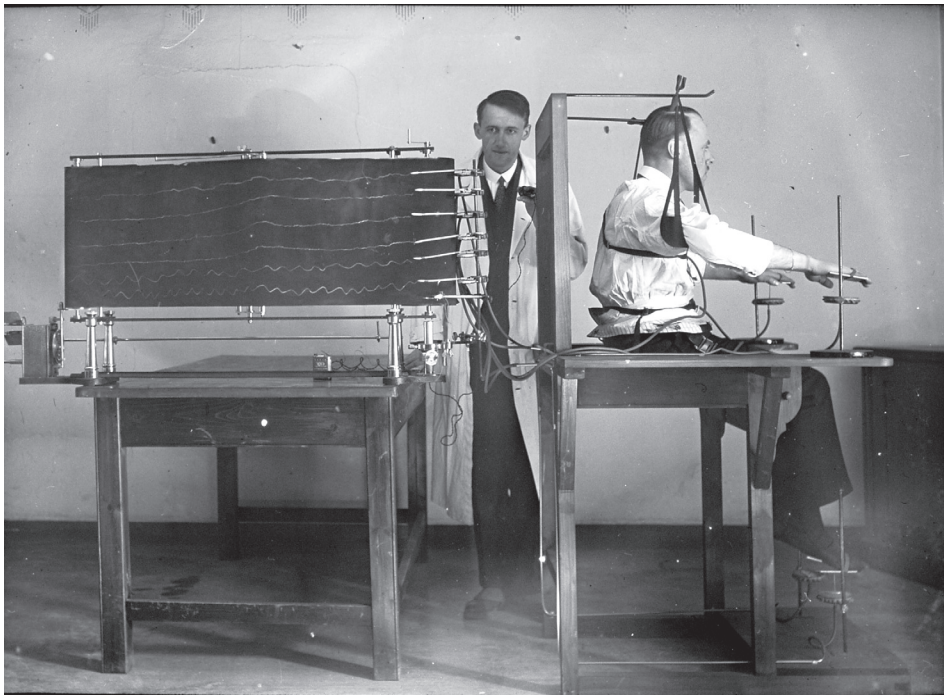


Fig. 4. Ernst Seelig (standing) and the apparatus for the registration of expression, originally designed by Otto Lowenstein

The apparatus was used for the purpose of the “registration of the motions of expression in the broadest sense”, meaning “all physiological changes related to a psychical process in the way that they occur at the earliest at the same time as it and therefore are qualified to reveal this psychical process – except such movements that are directed by an act of volition” (Seelig 1927, p. 47). This registration of expression was aimed at four possible forensic applications:

Finding out whether an emotional experience had existed or not in the past; this was, in other words, a diagnosis of the mental elements of an offence. The examinee was confronted with a verbal or optical stimulus for the purpose of, e.g., finding out if they knew a certain situation, person or object. Seelig pointed out that the registration of expression alone should never constitute proof of the guilt or innocence of a person, but it should provide clues that could be indicative for the criminal procedure (Seelig 1927, p. 75).

The analysis of honesty – here Seelig only discussed the method developed by Benussi; he stated that Benussi’s method was “of little use for forensic praxis” (see above; Seelig 1927, p. 76).

The analysis of predispositions – for example, the capability of hearing, perceptive faculty, affective irritability, sensitivity to pain, and susceptibility to suggestion. A practical example: Seelig considered the verbal or optical presentation of various styles of sexual performances for the purpose of drawing a conclusion about the examinee's homosexual inclinations on the basis of their reaction (Seelig 1927, p. 60). Although Seelig warned against jumping to conclusions, he thought that this method could be of practical use for general personality analysis and for the psychological analysis of witnesses, especially their suggestibility (Seelig 1927, p. 80).

The analysis of amnesia, in cases of suspicion of malingering. In a footnote, Seelig stated that it was very difficult to make a distinction between simulation and hysteria, but that with a carefully prepared experimental set, the error probability could be minimized (Seelig 1927, pp. 80 ff.).

Summing up, it may be said that Ernst Seelig considered the registration of expression as a method that was scientifically effective in many respects. In regard to its admissibility in criminal proceeding, Seelig made a clear statement: “[I]t has to be absolutely affirmed, even by a person sceptical of its evidential quality because of psychological-methodological reasons” (Seelig 1927, p. 81). Its status in criminal procedure did not have to be classified as an examination, but as a “specialist's expertise, in the course of which the body of the examinee is the object and the psychical life of the examinee is the aim of the analysis” (Seelig 1927, p. 82). Because of the lack of an explicit legal provision in German and Austrian criminal law in the 1920s, neither suspects nor witnesses could be forced to undergo a registration of expression, since an accused could not be urged to take part in the finding of the truth, and it was not part of a witness' duties to tolerate bodily examination. But if an accused or a witness agreed to participate in the registration of expression, then “none of the general principles of criminal trial is violated” (Seelig 1927, p. 82). The same was true for investigations carried out by the police.

Ernst Seelig's and Otto Lowenstein's interest in this apparatus for registration of expression was very high in the 1920s, but it diminished in the following years and decades. The paths of these two scientists led in completely different directions: Otto Lowenstein focussed on studying pupil function and contributed standard literature to this research area (Lowenstein 1933). Lowenstein had to flee from Germany after the Nazis took power in 1933. He relocated to Switzerland and, in 1939, emigrated to the United States, where

he introduced pupillography to American ophthalmology (Thompson 2005). Otto Lowenstein died in 1965.

Ernst Seelig remained in Graz. In the 1930s and later on, he continued to work on testimony research (Seelig 1955, pp. 99–199), but concentrated on other fields of criminology, for example on the definition of a typology of criminals (Seelig/Weindler 1949). After the annexation of Austria by Nazi Germany, Seelig became a member of the NSDAP and transformed the intuitive Criminal Biology developed by Adolf Lenz into an instrument of Nazi race biology. However, he remained an important person in criminology even after World War II; in 1954 he moved to Saarbrücken in Germany, where he was one of the founders of the still existing Institute of Criminology at the Saarland University (Bachhiesl 2005, pp. 180–222). Ernst Seelig died in 1955.

The institute of Criminology at the University of Graz was closed in 1978. The Hans Gross Museum of Criminology is a scientific-historical *lieu de mémoire* of the biological-anthropological criminology that dominated criminal science for long periods of the 20th century. The apparatus for registration of expression does not exist anymore; according to hearsay, it was destroyed in 1945 by Russian troops marching into Styria. Some strips of soot-blackened paper showing registered curves of movements of the extremities and of thoracic and abdominal breathing are the only remaining objects that document the experiments of registration of expression carried out by criminologists in Graz.

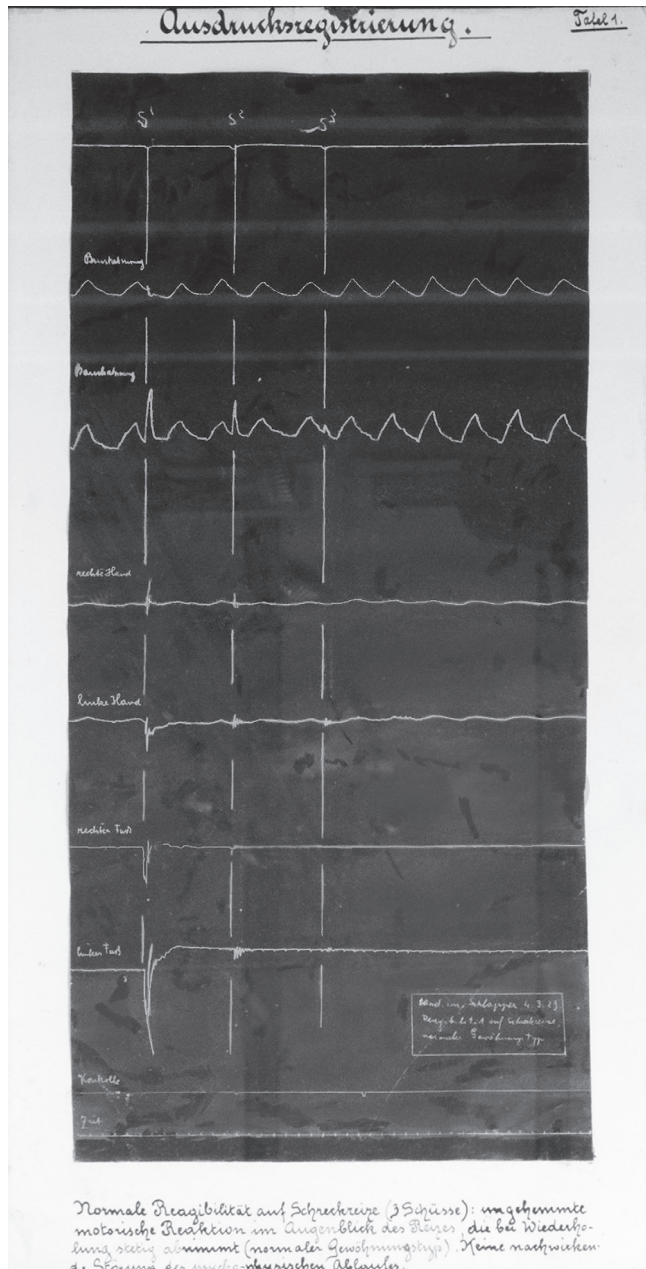


Fig. 5. "Table 1. Normal reaction to a shock stimulus (3 shots): uninhibited motor reaction at the moment of the stimulus, decreasing constantly by repetition (normal type of habituation). No disorder of the psycho-physical process afterwards."

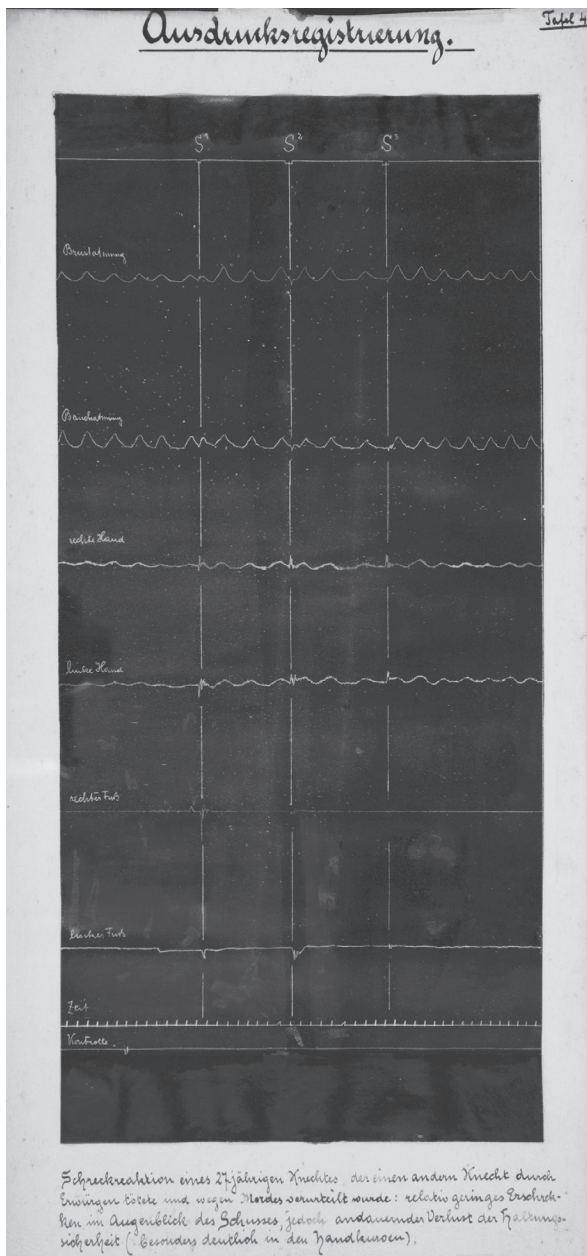


Fig. 6. "Table 4. Shock reaction of a 27 year old farm-hand who had killed another farm-hand by strangulation and was convicted of murder: relatively little shock at the moment the shot was fired, but lasting loss of composure of bearing (especially visible in the hand curves)."

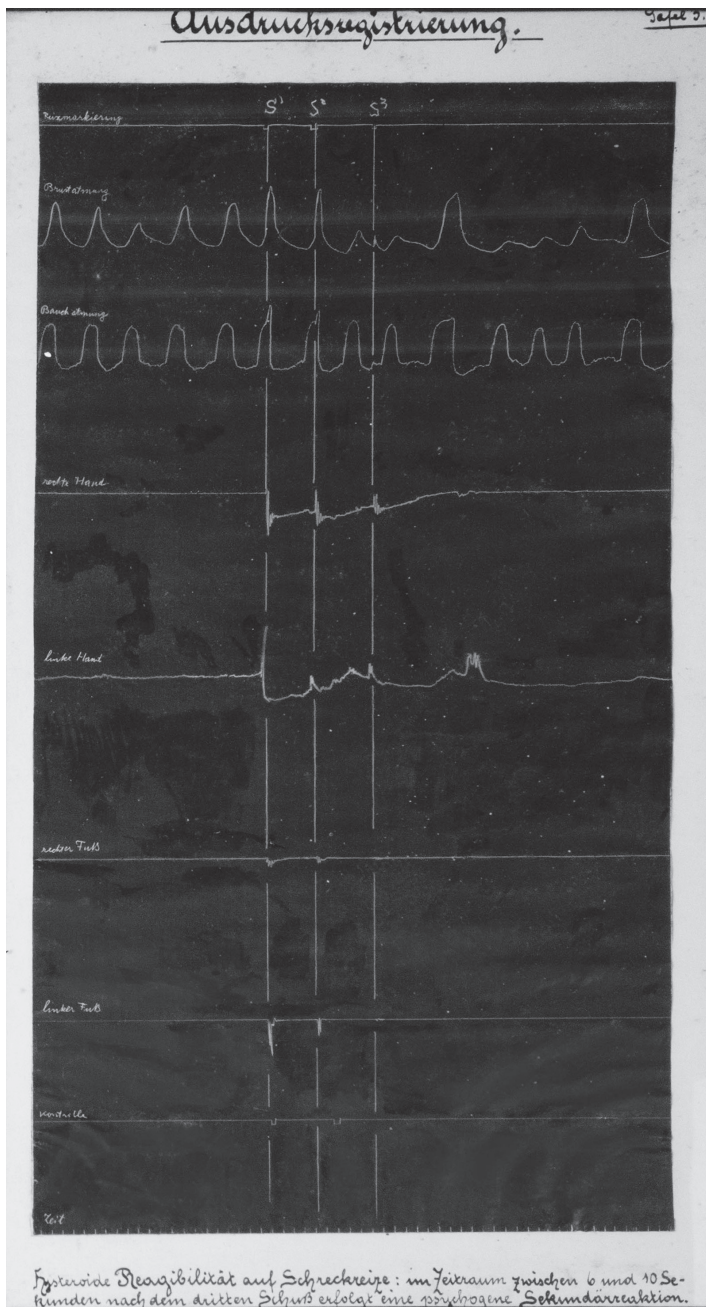


Fig. 7. "Table 5. Hysteroid reaction to shock stimulus: a secondary psychogenic reaction occurs in the period between 6 and 10 seconds after the third shot."

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