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# TRUTH IN THE SKIN, AND BEYOND

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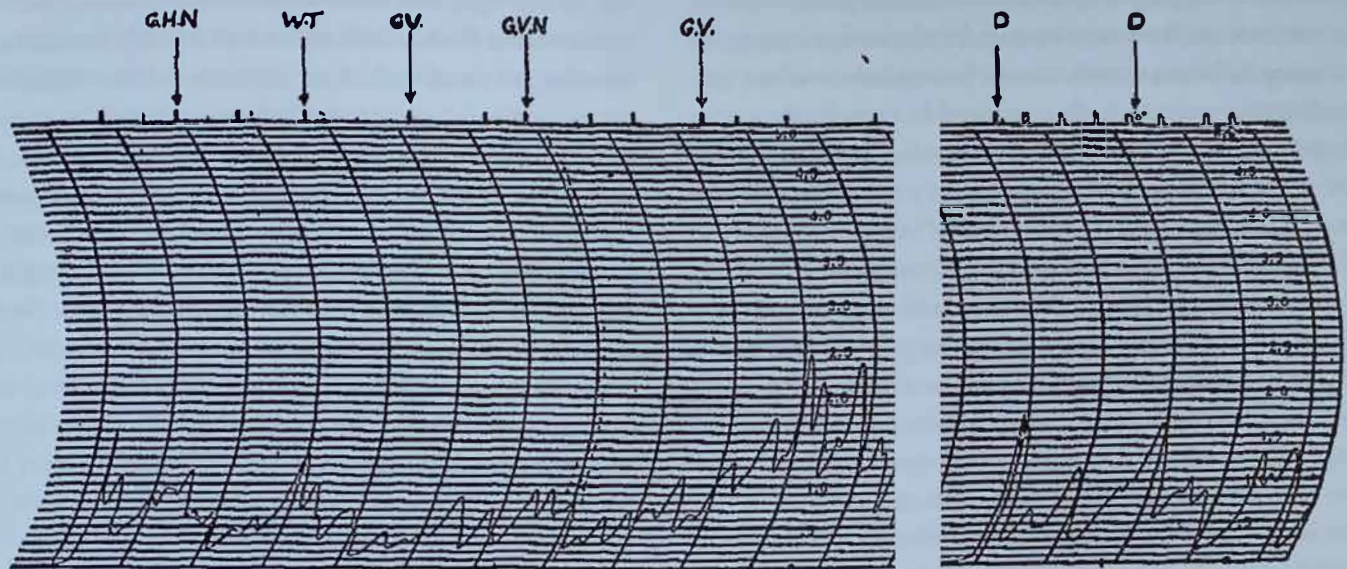


FIGURE VII

Shortly after 10:20 pm on 12 July 1937, a white male of average height and weight stepped into Frey's Delicatessen, just off 128th street in Ozone Park, Queens, and trained the barrel of a revolver on the proprietor, Robert Frey, and his wife, Frieda, both behind the counter. He threatened them with death if they failed to convey to him the contents of the till. They handed him thirty-five dollars. Pocketing his gun and their money, the perpetrator exited, sprinting up Liberty Avenue and disappearing into the muggy darkness of a Monday night.

Police promptly rounded up a set of suspects, including twenty-four-year-old Raymond Kenny, who lived nearby and had only recently been paroled, following conviction on a very similar charge. The Freys made a positive identification, though Kenny and his wife both swore he had been home and in bed at the time of the incident. (The recently married couple had an infant and were living with his parents.) The case went to trial before the end of the year, and Kenny was briskly convicted. The mandatory minimum sentence was a full thirty years in prison, and the maximum (of sixty years) left open a real possibility that Kenny would spend the rest of his life behind bars. Before sentencing could proceed, however, two women

from the neighborhood surfaced, alleging that they had caught a clear view of the escaping criminal on that fateful night, and that he was both taller and of a larger build than Kenny—whose lawyer promptly petitioned for a new trial.

By the time that new case went to the jury, on the afternoon of 29 March 1938, *The People v. Kenny* had become a controversial and closely watched legal show-down. Reporters haunted the judge's chambers, and kept vigil outside the jury room, where sequestered deliberations ran for more than nine hours. Finally, at 2:30 in the morning, the foreman emerged to announce the verdict: an acquittal.

*The New York Herald Tribune's* headline the next morning, like headlines across the country, broke the news: "Lie Detector 'Testifies' and Jury Acquits: Robbery Suspect Is Freed in Queens after Colden Permits First Use of Device in a City Court."<sup>1</sup>

It was indeed an unprecedented development. While the use of various instruments for monitoring respiration and blood pressure and other biometric

Above: Figure VII of Walter G. Summers's "Science Can Get the Confession," published posthumously in 1939 in *Fordham Law Review*.



indices had played a role in law enforcement for decades (being used to elicit confessions, or deployed probatively, under conditions of cooperation between suspects and investigators), the introduction of machine testimony over the strenuous objection of a prosecutor marked new terrain for the techno-scientific scrutiny of human inwardness. Journalists reached for exclamation points as they worked to express the sense that the legal system stood at a significant watershed: "A defendant was freed almost solely because of the mute testimony of the graph sheets!" exclaimed an illustrated Sunday feature in the *Minneapolis Tribune*. One photo spread there showed a pair of open hands, the middle of each palm bearing the peg-like stigmata of a wired electrode; balanced in the midst of this cyborg-supplication sat a gridded strip of indicator paper upon which a narrow stylus was scratching the hills and valleys of veracity. The caption told the real story that lay under the national fascination with the Kenny case: "This is the Graph Section of the Pathometer Invented by Father Summers, S.J., of Fordham University. A Line of Demarcation Chosen by the Priest during the Preliminary Questioning Separates Falsehood from Truth."<sup>2</sup> Another prominent photo depicted the man of the hour—Father Walter G. Summers himself, S.J., PhD, the founding chairman of the Fordham University Department of Psychology, wearing studious gold-rimmed glasses and a clerical collar—adjusting the dials on a pair of black boxes that look a little like a shortwave radio.

*Newsweek* found the scene of the clerical boffin and his mysterious truth-device sufficiently irresistible that it published a full transcript of the crucial interrogation:

*A month ago Kenny sat in a laboratory chair at Fordham and answered Father Summers' questions. In the palms of Kenny's hands nestled two German-silver electrodes connected with the pathometer. A pen on the device traced an even line on a graph attached to cylindrical drums. Only changes in Kenny's body currents could affect the line. According to Father Summers, it would move up if Kenny lied, down if he spoke the truth.*

*"Is your name Raymond Kenny?" Father Summers asked.*

*"Yes," replied the prisoner. The line dipped.*

*"Are you 25 years old?"*

*"Yes." The line dipped again.*

*"Did you hold up Frey's delicatessen store?"*

*"No." The line dropped again.<sup>3</sup>*

. . .

For all the legal and electromechanical drama of this moment, the Kenny case did not ultimately become a meaningful precedent in US law, which has remained interestingly resistant to technologies that claim to be able to see into the souls of defendants and witnesses.<sup>4</sup> And while I am going to suggest that Father Summers and his Pathometer merit a closer look, it is necessary to state from the outset that he and his device, despite their moment of fame in the late 1930s, occupy little more than footnote status in the standard histories of lie detection, which are dominated by the intersecting careers of the four major figures to push for widespread acceptance of the polygraph lie detector in America: Hugo Münsterberg, William Marston, John Larson, and Leonarde Keeler.<sup>5</sup>

It is a remarkable history of trust and truth and showmanship, of private interests and public debate, one that sheds much light on American faith in technology and anxiety about experts. No sooner had the century dawned than a publicity-hungry parade of more-and-less qualified persons emerged from psychology laboratories and forensics institutes touting their ability to tell truth-tellers from deceivers. Most carried some sort of elaborate instrument in their luggage, which, in general (and worryingly), could only be operated by the guru in question. The balance of physiological expertise, psychological training, paracriminal con-man acuity, and electrical engineering knack varied widely across this field of inventors, as did the skills required to navigating the intersecting social worlds of police investigators, lawyers, and journalists. This, in broad strokes, is the larger history of the lie detectors, some of whom, like Münsterberg and Keeler, became modest celebrities (and even made a little money here and there), but none of whom ever succeeded in securing stable cultural acceptance of the polygraph as a reliable instrument for discovering truth in legal settings.<sup>6</sup>

The *poly of polygraph* speaks to a central feature of this tradition, which focused on analyzing multiple physiological indices of the emotional/psychological state of the subject. Heartbeat, respiration, and blood pressure were the standard elements, though individual inventor-promoters integrated and weighed



these elements differently, and had divergent techniques for norming their subjects, establishing baseline observations, and creating the interrogatory patterns that best highlighted the physical manifestations of emotional distress that could be interpreted as evidence of a lie. In this sense, Walter G. Summers's Pathometer was not a polygraph. It only measured one thing: the electrical conductivity of the human skin.

The skin of human beings is electrically active in a number of peculiar ways, none of which is perfectly understood. Tiny currents are actively generated by the body and are manifest in the corneum, the upper layer of the epidermis. More significant to the history of reading the body for information about the mind is the fact that the electrical resistance of the skin fluctuates notably in ways that can be shown to correlate (if imperfectly, and variably) with, among other things, psychological states—especially anxiety or fear. Basically, this means that the skin functions a little like the dimmer switch on your chandelier, which is itself a variable resistor: turn it one way, more electrons go to the bulb and the light is brighter; turn it the other way and you increase the resistance, making it harder for the electrons to flow and correspondingly reducing the number reaching the bulb, which then glows more faintly as a result. Wire an interval of the skin of a human being into that circuit and go “BOO!” really loud, and if you have everything set up just right, and the person is not an icy psychopath (and, further, doesn't have any of a handful of highly unusual conditions that can interfere with the relevant neurological reactions), the light should get a little brighter.

This is a considerable oversimplification. The changes in resistance in the human skin that can be seen to correspond to shifts in emotional state are measured in *millionths* of an ohm (the standard unit of electrical resistance). These are *tiny* changes in conductivity, and they are very hard to detect. What causes them? There has been much work on this problem over the years, and the mechanics are complicated, but in a general sense, the answer has to do with the way the autonomic nervous system (the part of our neurological wiring that is beyond our conscious control) responds to stress stimuli—and, generally, “arousal”—by communicating with the sweat glands; minute changes in the presence of ion-rich perspiration in and on the skin change its conductivity. There is more to it than that, but for our purposes, this is right enough.<sup>7</sup>

Already in the second half of the nineteenth century, several clinically oriented physiologists working with different forms of “electrotherapy” (practices of magnetic and electrical stimulation/manipulation that had their roots in Luigi Galvani's original discovery of “animal electricity” in the late eighteenth century; techniques that stood in uneasy relation to the craze for mesmeric detection of life flows and life forces) had noticed changing electrical resistance in the skin of hysterics and seizure sufferers.<sup>8</sup> These observations remained relatively marginal, debated only among a small cohort of specialists working on clinical electromagnetism, until the early twentieth century, when a Swiss neurologist named Otto Veraguth, who had published several articles on the problem, came to the attention of his Zurich neighbor Carl Jung, then working in the Burghölzli psychiatric hospital (and already in communication with Freud about the use of word association in the diagnosis of mental disorders). Struck by the idea that what Veraguth had called the “Psychogalvanic Reflex” might serve as a useful physical index of inner states of arousal, Jung and his assistant, Otto Binswanger, set up the equipment necessary to monitor skin resistance, and used the device to striking results. Jung's 1907 paper “On the Psychophysical Relations of the Associate Experiment” gave strong evidence that monitoring skin conductivity could afford otherwise inaccessible insights into the emotional disposition of patients, and his subsequent *Studies in Word-Association* essentially argued that the electrodynamics of skin conductivity provided something like direct clinical access to the unconscious. A patient might present, visibly, as unmoved by a particular word or word association, but the recording needle of a properly configured galvanometer told otherwise.

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In the early 1910s, when American physiologists and psychologists following up on Jung and Binswanger were just beginning to investigate the electrical behavior of the skin as a way of seeing into the mind, Walter G. Summers was a young physics instructor at a Catholic college in Baltimore. The place was small, and Walter was capable, so he soon found himself seconded to the biology department. By the outbreak of World War I, he had been appointed professor of physics at Georgetown University, and from that post



he was commissioned as a civilian technical assistant at the military aviation school set up just outside Washington—a new institution created to address the rise of air combat in Europe. Shortly after the war, he completed his theological training and took holy orders as a Jesuit priest. With advanced degrees in theology and the physical sciences, he returned to Georgetown, where he covered physiology classes at the medical school for several years and saw his administrative talents quickly rewarded: he was appointed dean of the medical sciences. Hands-on work with engines, gauges, and monitoring systems in aviation; experience with medical physiology; research exposure to the physics of electromagnetism—by 1930, Summers possessed a rare conjunction of skills essential to innovative work in experimental physiology. In addition, his Jesuit formation in philosophy and education (subjects he taught for several years at St. Joseph's College in Philadelphia) inclined him to research in psychology. In the early 1930s, when Fordham decided to create a formal Department of Psychology, the position of director was offered to Summers, who accepted. Back in New York City, the place of his birth, he immediately set up a laboratory for experimental psychophysics, and began hiring faculty and recruiting graduate students.<sup>9</sup>

While a great deal of Summers's energies across the mid-1930s went to institution building, there can be little doubt that his sensitive and reliable recording galvanometer (the Pathometer) was his most notable scientific achievement. He began work on it with a group of graduate students in 1933, and after several years of tweaking and refinement, he succeeded in creating an instrument that, upon its first application to forensic determinations of guilt and innocence (starting in 1936), immediately drew national attention. Well before the Kenny case, Summers had been invited to participate in the police investigation of a theft in Rhode Island. The performance of the Pathometer sufficiently impressed the investigators (who were already using a Keeler-type polygraph) that they agreed to participate in a series of experiments that put their device in a head-to-head paragone with the Pathometer. Summers announced the results, highly favorable to his device (which appeared to perform nearly twice as effectively as the Keeler system), at the 1936 meeting of the American Psychological Association, and they were widely reported thereafter.<sup>10</sup> Requests for sessions with the device came pouring in, and Summers and

his associates were rapidly swamped with high-profile opportunities to show what the Pathometer could do—opportunities that brought with them the hurly-burly of press attention, not to mention a few tête-à-têtes within the fractious world of the lie detectors. Within a year, Summers and his Pathometer had been involved in about fifty criminal cases (including murder), and he could boast that altogether he and his Fordham colleagues had conducted more than six thousand laboratory experiments—which he insisted established an accuracy rate well above 98 percent.<sup>11</sup>

The flurry was short-lived, in that, in the thick of the drama and attention, Summers's health took a rapid dive. A first heart attack in the autumn of 1937 drove him to seek respite in a vacation to tropical climes in the winter of that year. But he was soon back before the bench and in the public eye: in May 1938, just two months after his much-discussed appearance in *The People v. Kenny*, a second heart attack struck, and by September he was dead.

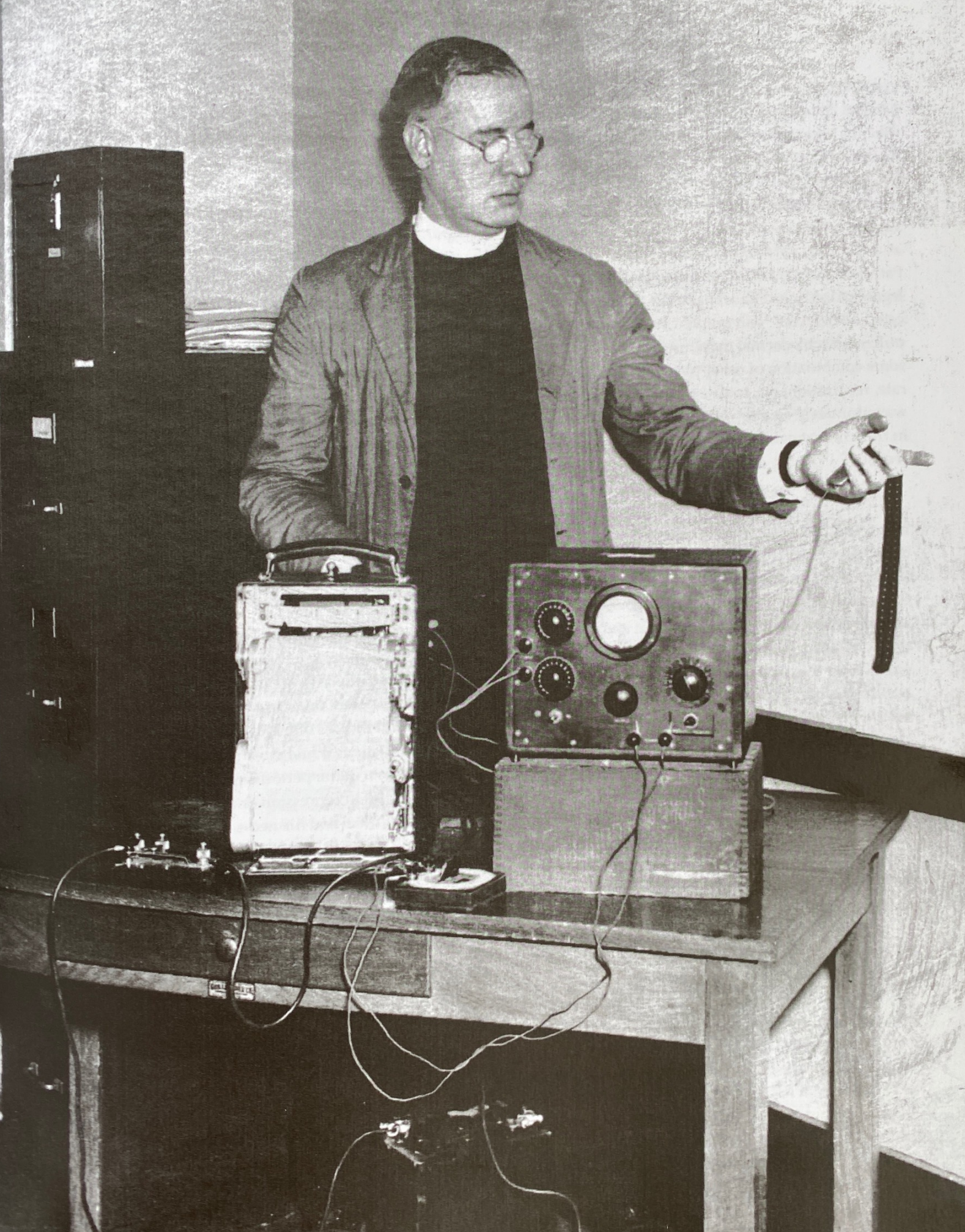
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It might be argued that Summers has not received the attention he perhaps merits in the crowded (if anyway somewhat questionable) field of scientific lie detection. Had he lived for another decade, he likely would have won for himself a larger piece of real estate in the histories of the subject. As it is, it seems fair to say that the prominent successes of the Pathometer played a major role in establishing a durable place for the monitoring of electrodermal activity in the modern lie-detector polygraph. Several of Summers's colleagues (including Jacques Bril, who developed the "Brilograph" version of the Pathometer and went on to a long career as a criminologist and polygraph operator, and Joseph F. Kubis, who took over Pathometer research at Fordham in 1938) went on to careers promoting and commercializing psychogalvanometers for forensic use. Soon, the widespread availability of increasingly sophisticated off-the-shelf electronic components made it easier and cheaper to reproduce the filtered, stable, sensitive circuitry that made the Pathometer more effective than earlier galvanometers applied to human skin. By the late 1940s, these developments in vacuum tubes and power sources brought

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Opposite: Walter Summers taking stock of his psychogalvanometer.







to market a number of relatively easy-to-use and inexpensive “lie detectors” based on the Summers design (like the widespread B&W brand “Psychometer”). By the 1970s, even RadioShack was marketing a lie-detector electronics kit that worked exclusively on electrodermal principles, and today a USB-driven version of an electrodermal lie detector is on the market as a party toy. While these down-market versions of the Pathometer might be taken to suggest a rather marginal legacy, it is also the case that all of the most sophisticated lie detector “polygraphs” have, since the 1950s, utilized electrodermal monitoring in conjunction with some combination of other physiological indices: heart rate, respiration, etc. In this sense, the Pathometer was ultimately swallowed by the competition—which in this context can be taken as a grudging index of respect.

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But in the end, what kind of legacy is it to have been “successfully” incorporated into so suspect and idiosyncratic a technology as the polygraph? A device that many continue to contend has no more value as an instrument for determining truth and falsehood than well-informed guesses? A largely discredited technology that lives, to the extent it lives at all, in the backrooms of corporate integrity consultants and the vetting process for secret agents?

And it is here we come to the really interesting and wholly forgotten history of Father Summers’s Pathometer. The truth of the matter is that, while the device became famous as a lie detector, that was not the purpose for which Father Summers developed it. This was, rather, a showy repurposing of a sensitive recording galvanometer that Summers and his associates had built and refined to serve a very different aim: he wanted to use the device to *establish empirical evidence for the soul*.

To understand how requires a quick review of the basic paradigms operating in experimental psychology in the early decades of the twentieth century. While Freudian analytics had attracted many adherents in therapeutic and interpretive settings, the basic work of experimental psychologists was predicated on a thoroughgoing and committedly reductive mechanical materialism: the brain was the organ responsible for psychological phenomena, and studying it meant identifying and understanding the physical phenomena

that created the effects we recognize as the sensory and cognitive life of the human organism. Steeped in the intellectual tradition of neo-scholasticism, and a principled defender of a radical distinction between the “spirit” and the “flesh,” Summers, like other dualists, rejected the wholesale ascription of mental life (particularly volition, but also aspects of human reason and feeling) to the chain of cause-and-effect relations manifest in the realm of corporal substance. Drawing on Aristotle and Aquinas, and on the extended tradition of scholastic commentary (and sometimes reaching over to potentially sympathetic modern anti-reductionists like William James), neo-scholastic psychologists argued that the mental life of human beings could not be adequately accounted for by the stuff of the flesh.<sup>12</sup>

It was the experimental delving of this deepest of deep problems that set Summers and his colleagues on the trail of a hypersensitive recording galvanometer in the early 1930s. As he put it, the first program of research was an effort to distinguish between “emotion” and “sentiment,” his terms for the somatic and mental components of the general phenomenon of “feeling.” Across a series of experiments that created heightened feeling-states in subjects while simultaneously recording galvanometer responses and self-reported affective states, Summers endeavored to show persistent failures of correlation between the physical indices of feeling and the conscious accounts thereof. While most practicing experimental psychologists in the period would have ascribed such discrepancies to repression or deception (of self or other), Summers and his neo-scholastic contemporaries wished to see in such disconformities empirical evidence of the distinction between the realm of the mind/spirit/soul and that of body.<sup>13</sup>

So this was the deeper calling of the Pathometer, and Summers claimed to have been satisfied that his device was opening the way to considerable advances in this area—before the ever-so-worldly world of true-crime detection obtruded on a spiritual research program.

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Not that the theological questions ever went away. In a final, posthumously published paper entitled “Science Can Get the Confession,” Father Summers painstakingly reviewed all the latest work of the Pathometer, focusing on the sudden burst of legal applications.<sup>14</sup>

But his closing examples circle back to a metaphysical/theological question of some poignancy. The text makes reference to the graph reproduced here. "Figure VII," Summers explains, "represents the test of a subject who claimed to hear God's voice." Was he lying? The results were interesting. Each of the deflections marked "D" reflected test questions on which the patient was definitely deceiving his examiner. These "standardizing" diagnostic questions set the benchmark for analyzing the self-conceived veracity of the responses.<sup>15</sup> There Summers turned to crucial interrogatories, eye always on the needle-scratch line spooling out on the thin paper strip:

*At GV the subject was asked if he heard God's voice, at GVN and GHN he was asked if he heard God's voice now.*

The results were interesting. Not only did the subject reply in the affirmative, the Pathometer gave no indication that he was lying. Indeed, the only question on which he seems to have gotten tripped up was the one marked WT, which "shows the subject's response when

he was asked if he believed there was anything wrong with his thinking." He said no. But there seems to be some evidence that he may have been fibbing—or at least that he wasn't sure he was telling the truth. Summers ascribed this response to his having been on so many occasions "treated like a lunatic." But it didn't change Summers's view that "this subject really believed, and the record substantiated his belief, that he was receiving direct communication from God."

Was he? Probably not. But the Pathometer could not touch his actual soul.

Indeed, that had always been the whole point.

<sup>1</sup> *The New York Herald Tribune*, 30 March 1938.

<sup>2</sup> "The Lie Detector Comes to Court," *The Minneapolis Sunday Tribune*, 15 May 1938.

<sup>3</sup> "Lie Detection: Device Invented by Priest Wins First Court Recognition," *Newsweek*, vol. 11, no. 15 (11 April 1938), p. 26.

<sup>4</sup> For an interesting historical argument about the resistance of the American legal establishment to technical systems for assessing veracity, see Ken Alder, "A Social History of Untruth: Lie Detection and Trust in Twentieth-Century America," *Representations*, vol. 80, no. 1 (Fall 2002). For a recent legal review of the state of scanning and monitoring technologies in relation to legal process, see Joëlle Anne Moreno "The Future of Neuroimaged Lie Detection and the Law," *Akron Law Review* vol. 42 (2009).

<sup>5</sup> The best general source on the history of lie detection is Geoffrey C. Bunn, *The Truth Machine: A Social History of the Lie Detector* (Baltimore: The Johns Hopkins University Press, 2012). Also of great value: Ken Alder, *The Lie Detectors: The History of an American Obsession* (New York: Free Press, 2007). Both works discuss

Summers and his innovations in passing. Neither book, however, is especially focused on the technical minutiae of the many devices promoted by competing operators and fortune-seekers across the twentieth century. (Taken together, all of this is rightly assessed to be diagnostic of larger cultural preoccupations with science and truth.) In this context, the broader significance of Summers's focus on electrodermal activity is not explored.

<sup>6</sup> Private use by employers was a different matter, as Alder shows, and the security establishment has always had a soft spot for the devices. It is important to note that polygraphic monitoring of human physiology preceded the application of the polygraph to the problem of lie detection. That the term "polygraph" has come in common parlance to be synonymous with a "lie detector" represents a displacement of the earlier use of the term (which retains currency among non-lie-detecting experimental physiologists).

<sup>7</sup> For a full treatment, consider: Wolfram Boucsein, *Electrodermal Activity*, 2nd ed. (New York: Springer, 2012).

<sup>8</sup> For a detailed history of the early work of Romain Vigouroux, Charles Féré, and others, see Eva Neumann and Richard Blanton, "The Early History of Electrodermal Research," *Psychophysiology*, vol. 6, no. 4 (January 1970).

<sup>9</sup> Useful on Summers's early life is his obituary in *Woodstock Letters*, vol. 68, no. 3 (1 October 1939).

<sup>10</sup> Walter G. Summers, "Recording Galvanometer," *The Linacre Quarterly*, vol. 5, no. 2 (April 1937).

<sup>11</sup> Paul V. Trovillo, "A History of Lie Detection (Concluded)," *The Journal of Criminal Law and Criminology*, vol. 30, no. 1 (May–June 1939), p. 108.

<sup>12</sup> For a rich recent review, see Robert Kugelmann, "Neoscholastic Psychology Revisited," *History of Psychology*, vol. 8, no. 2 (May 2005).

<sup>13</sup> Summers reported some of this work at a meeting of the New York branch of the American Psychological Association in April 1936. Some of it was done by his students, e.g., Richard Ritzel's 1935 thesis "An Experimental Study of Feeling and of the Relation of Imagery to Feeling." See

also Summers, "The Psychology of Sensation," *Proceedings of the American Catholic Philosophical Association*, vol. 10 (1934).

<sup>14</sup> Walter G. Summers, "Science Can Get the Confession," *Fordham Law Review*, vol. 8, no. 3 (November 1939).

<sup>15</sup> Establishing subject-specific calibration was (and remains) an important part of all lie-detection systems. Techniques vary, and such variation constitutes a component of the "soft" skills that make some operators apparently more successful than others. Summers often used charged questions ("Are you living with your wife?" or "Do you own a revolver?") to set "emotional standards" against which to assess the electrodermal activity of possible deception. Getting Pathometer readings for actual lies from a cooperating subject (as Summers has done here, though he does not explain how he did so in this instance) could be achieved by means of a kind of parlor game in which the subject, having written preferences and aversions on a set of cards, tried to persuade the experimenter that he or she in fact liked one of the listed aversions.