KEN ALDER

A Social History of Untruth: Lie Detection and Trust in Twentieth-Century America

In the winter of 2000, shortly before the release of the nuclear scientist Wen Ho Lee—the Los Alamos employee accused of having sold atom bomb secrets to the Chinese government—it emerged that agents of the Federal Bureau of Investigation had lied to Lee when they told him he had failed a polygraph test.[1] This article suggests how such lies have become standard procedure in the use of the polygraph machine, an instrument that measures four basic physiological parameters (blood pressure, galvanic skin resistance, heart rate, and breathing depth) while the subject is interrogated about his or her activities. By the time Lee regained his freedom—his prosecutors, it turned out, had misrepresented many other facts in the charges against him—thousands of other American scientists in the national weapons labs were being systematically subjected to polygraph exams for lie detection.[2] Not long after, in the wake of the Robert Hanssen spy case, the FBI began to test its own agents with a polygraph, even though years of annual polygraph examinations had failed to catch the double agent Aldridge Ames at the CIA.[3] Most recently, the various agencies that will soon comprise the Department of Homeland Security have begun to polygraph detainees held in connection with terrorism on U.S. soil. The use of the polygraph in these circumstances does not seem to strike most Americans as either surprising or objectionable. Nor is it new. What is surprising is the history of how we got to this point: why Americans look to a lie detector machine to ferret out the truth, even though there is abundant evidence that the machine itself depends on lies.

In *A Social History of Truth* Steven Shapin focuses on the conditions that prompted seventeenth-century English gentlemen to speak the truth on behalf of recalcitrant nature.[4] This paper will focus on the efforts of twentieth-century American experts to oblige recalcitrant men and women to tell the truth about themselves. How different are these two enterprises? When Albert Einstein inscribed above his fireplace the motto, "Nature's God is subtle, but He is not malicious," he surely acknowledged as a corollary the possibility that *people* might be malicious, if also sometimes subtle. It is this latter corollary that has inspired the proponents of an Ameri-

Representations 80 • Fall 2002 © the regents of the university of california
issn 0734-6018 pages 1–33.

can science of lie detection. Their premise is that while a human being may tell a conscious lie, that person's body will "honestly" betray his or her awareness of this falsehood. By the middle of the twentieth century, some two million lie detector tests were being administered each year to criminal suspects, members of the national security apparatus, and ordinary citizens as a routine part of employment.

This proliferation of lie detector tests in twentieth-century America could not have occurred, of course, had not their expert proponents persuaded their co-citizens that the tests served some purpose. No novel technology can succeed unless someone believes the claims made on its behalf. But, in the case of the lie detector, something additional was required. There, the claims made on behalf of the technology were themselves integral to the operation of the technology. As several of its proponents acknowledged, the lie detector would not "work" (that is, determine the fates of its human subjects) unless its subjects *believed* it "worked" (that is, distinguished true utterances from false ones). In other words, the machine could not catch liars unless they believed they might be caught. To that extent, the history of the lie detector offers a dramatic example of the degree to which the transformative power of technology may reside in what medical science has dismissively termed the "placebo effect": the residual potency produced by the "merely social" confidence that medical technology inspires in its lay subjects—and in its purveyors too.[5] The machinery for catching liars, then, is an illuminating example of technology's dependence on the social imaginary. As such, it may serve as an ideal probe into the American popular imagination.

Indeed, as an instrument designed to assess the confidence that one citizen may place in the utterances of another, the lie detector directly engages the problem of trust and mistrust that governs daily life in a large, anonymous society. During the course of the nineteenth century Americans became increasingly immersed in the exchanges of marketplace commerce; yet they still largely encountered one another in face-to-face interactions. As Karen Halttunen has shown, the ability to read appearances was one of the acquired skills in the repertoire of Victorian sociability, enabling citizens to distinguish the con man from the legitimate salesman.[6] Twentieth-century Americans, by contrast, increasingly found themselves operating within large hierarchical organizations—both within corporate capitalism and state institutions—organizations whose main rationale was the substitution of bureaucratic predictability for the (expensive) uncertainties of the marketplace. But could the managers of these new bureaucratic hierarchies trust their subordinates any more than Victorians had trusted traveling salesmen? This paper argues that the lie detector was one of the principal tools by which twentieth-century American society tried to solve the problem of trust. Designed to draw a sharp line between lawful and unlawful behavior, to privilege expert insight over lay assessment, and to regulate life within hierarchical institutions, the history of the lie detector is part of the history of how America coped with the rise of a mass public, on the one hand, and the rise of new large-scale organizations on the other.

A Brief History of Dissembling

Of course, all Yahoo societies thrive by speaking what Jonathan Swift called "the thing which is not." Despite philosophical injunctions against falsehood from St. Augustine to Immanuel Kant, dissembling is a sufficiently advantageous practice to be found among all peoples at all times. There are Machiavellian lies disseminated by the strong and defensive lies woven by the weak. And of course there are the many falsehoods we individually and collectively tell ourselves—what one might call "Basic Lies."[7] Perhaps for that very reason there is a good case to be made, as Joseph Brodsky has done, that consciousness does not begin until one tells one's first *deliberate* lie.[8]

But if dissembling is something of a human universal, the measures taken to root it out may be treated historically. Every Yahoo society possesses its own individuals and institutions whose authority depends on their presumed ability to unmask certain kinds of petty falsehoods—if only to better preserve the big ones. One venerable approach to this problem (sanctioned already in classical times by physiognomy) has been to read morals by appearances: shifty eyes or a rosy blush may be signs of deceit.[9] But confidence men can master their faces, and women may paint. So, more probing tests have often been thought necessary.

The justice system has long wrestled with such tests because criminal activity, almost by definition, cloaks itself in the sort of falsehood that society wishes to uncover. We can identify (roughly) three phases in the development of such tests in the West. In the medieval trial by ordeal, the alleged criminal's innocence was interrogated by a physical challenge so that God might determine the outcome. In one such test, presumed liars were asked to lick a burning hot poker. If God wanted to commend their honesty, their tongues would not be burned.

By the twelfth century, a second phase emerged on the European Continent: an inquisitorial system of justice. In the pursuit of certainty of judgment, magistrates were authorized to order the use of judicial torture to obtain a confession, then considered the "Queen of Proof." The problem here (as the jurists understood full well) was that forced confessions might be unreliable. Hence, magistrates could only authorize torture on the basis of strong circumstantial evidence; the examiners were forbidden to ask overly suggestive questions; the confessor had to supply corroborative information; and the confession had to be repeated after the torture had ceased. Still, jurists recognized how easily this system could be abused: that potentially innocent suspects suffered pain worse than any possible sanction and that even reiterated confessions might be false. Although the campaign to end torture would ultimately triumph under the banner of Enlightenment humanism, the practice already was giving way in the seventeenth century to a new probabilistic appraisal of the trustworthiness of human testimony.[10]

It was under this probabilistic banner that the third phase took shape in early modern Europe. Increasingly, statements of witnesses were probed in cross-exami-

nation by lawyers and judges, with ultimate judgment on their veracity—and the guilt of the accused—depending on the *intime conviction* of the magistrate (or in England, on the "moral certainty" of the jury). At the same time, however, a variety of experts also began to take a prominent role in speaking on behalf of circumstantial evidence, evidence that lay beyond the ability of the laity (or the magistrate) to assess *and* beyond the power of the accused to dissemble—and that therefore could be used to corroborate (or not) human testimony. It is this form of courtroom investigation that, in all its manifold permutations, has persisted down to the present day in Western Europe and the United States.[11]

Yet, as the cultural authority of science expanded in the nineteenth-century, many social thinkers began to hope that experts speaking on behalf of circumstantial evidence would at last come to supplant entirely these merely probabilistic assessments of human testimony. The problem here (at least in jurisdictions subject to Anglo-American law) was that the state had increasingly delegated the gathering of evidence to the two adversarial parties, and those parties had proved themselves adept at finding adversarial experts to make diametrically opposite arguments. By the end of the nineteenth century, expert quarreling had become a scandal in American courts.[12]

In spite of this, there emerged in early twentieth-century America, a set of reform-minded experts who tried to inaugurate what they hoped would be a new (fourth) phase in the investigation of accused persons and other witnesses: scientific interrogation by means of a "polygraph" lie detector. Their goal was to circumvent human dissembling by directly probing the thoughts of their subjects. By measuring the subject's basic physiological parameters while he or she was under interrogation, polygraph operators believed they could transform the subject's body into a piece of counterfeit-proof circumstantial evidence that could corroborate (or not) the assertions of the legal person hooked up to the apparatus. They hoped to return certainty to the operation of modern American justice—much as it had existed in the days of judicial torture.[13]

Why America?

By the middle of the twentieth century nearly two million polygraph tests were being administered each year in the United States by five to ten thousand operators.[14] The polygraph was used in investigative police work, to screen business employees, for national security checks, and as a publicity stunt. Its use continues, even though many studies have documented the machine's fallacies and limitations. In the mid-1980s, when the Reagan administration tried to impose routine polygraph examinations on civilian federal employees, the U.S. Congress ordered its Office of Technology Assessment (OTA) to assemble a meta-study. The results of the study accorded the method an 80 percent success rate, an achievement signifi-

cantly less impressive than the 98 percent success rate regularly touted by polygraph examiners.[15] And even the OTA's study was considered optimistic by the noted psychologist David Lykken, who pointed out that in field studies conducted under "true double-blind conditions," the number of false positives jumped to 47 percent (that is, the innocent were called truthful only 53 percent of the time).[16]

In this paper, I will address two proximate historical questions about the lie detector so as to get at one larger question about trust in American public life. First, Why was the polygraph developed at the time and place and in the manner it was? And how did it achieve such a phenomenal success? Here it is worth keeping in mind that no country outside the United States uses the technique.[17] Second, Why has the polygraph test been consistently banned from U.S. courts? For despite their grand amibition to promote certainty in American justice, the reform-minded experts repeatedly failed to introduce lie detector evidence into criminal trials. Ever since the Frye ruling of 1923—a ruling that governed the admissibility of all forms of scientific testimony until the 1990s—American courts have excluded polygraph evidence for having "failed to gain general acceptance in the particular field in which it belongs."[18] That is, the courts have asserted in their guise as sociologists of science that the relevant experts have rejected the technique as "bad science." This paper shows that this characterization is not so much inaccurate as hopelessly insufficient. Only in the last decade—since the Daubert ruling of 1993—have trial judges been given a broader set of criteria to allow scientific testimony, prompting some courts to reconsider their ban on the polygraph.[19] When a reconsideration of the ban on polygraph evidence recently came before the U.S. Supreme Court, several justices confessed their discomfort with this apparent contradiction between the law's self-proscription and its toleration elsewhere of the practice of lie detection.[20] In oral arguments before the U.S. Supreme Court they posed the question at the heart of this paper: Why does the U.S. government permit the use of the lie detector in so many arenas, but forbid its admission into the courtroom?[21]

My argument here is that the answer to this question is fundamentally historical. That is, I will argue that the mixed reception of the polygraph in America turned on the *sort* of lie detection that emerged over the course of the twentieth century, and that this particular practice of lie detection was the outcome of intense campaigning among the various interested parties. I will demonstrate this by examining the career strategies of the four creators of the modern science of lie detection between 1900 and 1950: Hugo Münsterberg, William Marston, John Larson, and Leonarde Keeler. Their shared assumptions point to what was particularly American about the lie detector. And their conscious disagreements tell us much about the selective acceptance of the lie detector. Indeed, it was the interaction of two distinct strategies for validating expertise—one that sought to make its reputation by publicly disclosing knowledge, and another that sought to make a profit by holding knowledge as proprietary—that together generated our current political economy of lie detection. With this epistemological groundwork, we may then examine

the career of the polygraph for what it tells us about the changing culture of trust in America: about trust in science, trust in our social institutions, trust in our fellow citizens.

American Emotionology

The polygraph was assembled out of various physiological instruments that came into use in Europe and the United States at the end of the nineteenth century. In France, in the 1860s, Etienne-Jules Marey first began to use his automatic apparatus to produce permanent, continuous, and graphical records of changes in blood pressure, respiration, and pulse rates while his patients experienced nausea, sharp noises, and "tension."[22] Meanwhile, in America in the 1870s, the psychologist William James used techniques of introspection to *define* emotion as those bodily changes that occur in response to the cognition of an exciting "fact."[23] But if James half retracted his own claim in the years to follow, his successors were more brazen.

Hugo Münsterberg—lured from Germany to Harvard by James, and despised by him in later years—founded the first major American program of "brass instrument" psychology, as well as the schools of applied psychology and industrial psychology. In his Harvard lab, Münsterberg and his students hooked their subjects up to a physiological apparatus in an attempt to translate the ephemera of private, interior affective experience onto a public, universal grid. They then classified, quantified, compared, and aggregated these physiological records to make visible the normal and deviant psychological states of their volunteer subjects. The body, as an instrument upon which "emotions" played, was then examined for signs of adjustment to the modern rhythms of work and play, anxiety and ease, stress and pleasure. Emotional bodies were black or white, male or female, and honest or deceptive.[24]

This scientific program directly challenged the law's venerable methods for assessing human beliefs and desires. Münsterberg denounced the courts' archaic procedures of adversarial cross-examination conducted by lawyers unschooled in the new science of psychology. In its place, he offered to introduce into American jurisprudence a modern, mechanized version of the thriving European research program in the psychology of courtroom testimony.[25]

In 1907, Münsterberg took a train to Boise, Idaho, to examine Harry Orchard, who had confessed to assassinating the governor of the state, but had laid the blame on a conspiracy of socialists, led by Charles Haywood, head of the radical Western Mining Union. Haywood accused Orchard of lying, and the Haywood conspiracy trial quickly became a political cause célèbre, pitting organized labor against the corporate trusts and the state. At the invitation of the prosecution, Münsterberg subjected Orchard to psychological tests and publicly declared the man a truth-

teller. By allowing this opinion to be published before the jury had rendered its judgment, he infuriated those who saw expertise as an attempt to usurp lay justice.[26] But Münsterberg was not one to retreat from a good *Kulturkampf*. The next year, in his book entitled *On the Witness Stand*, he accused the justice system of willfully spurning the scientific analysis of testimony and, hence, of a callow disregard for modern techniques of sorting truth from falsehood.[27] And Münsterberg found a sympathetic audience for his views. A 1911 editorial in the *New York Times* proclaimed, "Soon there will be no jury, no horde of detectives and witnesses, no charges and countercharges, and no attorney for the defense. These impedimenta of our courts will be unnecessary. The State will merely submit all suspects in a case to the tests of scientific instruments, and as these instruments cannot be made to make mistakes nor tell lies, their evidence would be conclusive of guilt or innocence."[28]

William Moulton Marston was a Harvard lawyer and student of Münsterberg who carried on his program after his death. In 1915, Marston continuously monitored changes in a witness's blood pressure for signs of stress caused by the guilty knowledge of deception, thereby creating the first modern polygraph. He then went on to improve his instrument under the auspices of the National Research Council, testing it on soldiers at a Georgia army base during World War I.[29] Marston is perhaps more famous today as the creator of the cartoon character of Wonder Woman (which, as we will see later, was no coincidence). But long before he invented the feminist Amazonian and her truth-lasso, Marston recognized that the polygraph did *not* offer an objective measure of lying. At best, it measured whether the subject was distressed when she knowingly told a falsehood, such that her physiology was altered in ways she could not suppress. And furthermore, that these changes could be distinguished from the signs of other emotions, such as the fear produced by the exam itself. That is, the test assumed that while the lie was a conscious choice, the body was a slave to habits shaped by an extended social training (a conscience?) allowing interrogators to access the withheld knowledge. Marston admitted, for instance, that a pathological liar could never be caught by the polygraph.[30] The challenge then, was twofold: first, to design a standardized piece of "hardware" to measure the relevant physiological parameters, and second (and more elusive), to design the "software": an interrogation technique that could calibrate lie-producing stress against other forms of stress.

In 1922, Marston was invited to polygraph James Alphonse Frye, an African American from Washington, D.C., who had confessed to murder and then retracted his confession. Marston's test cleared Frye, but the judge stubbornly refused to allow Marston to testify to this fact in court, despite his ample expert credentials as a psychologist. According to the judge, Marston's polygraph exam seemed to invade the province of the jury, whose prerogative it was to "size up" the defendant. He acknowledged that the defendant had had the bad luck to appear before an old judge unwilling to discard traditional methods for newfangled science, but he stood

by his refusal to admit evidence until "it is established that [a] scientific development has reached such a point as to become a matter of common knowledge as to its results." Apparently, the court of appeals bench was also dominated by old-timers, because the judge's decision was sustained in the famous Frye ruling of 1923, which rejected the lie detector and advised judges henceforth to admit the scientific testimony of only those experts whose judgments were derived from principles in line with the consensus of the relevant scientific community.[31] For the next fifty years this ruling dictated the admission of all forms of scientific evidence to U.S. courts.

Sex, Lies, and Polygraphs

Paradoxically, the Frye rule's ban on the polygraph in court coincided with a vast expansion in the use of the lie detector. The second phase of my story begins in the wake of the Frye ruling, when two disciples of August Vollmer, Police Chief of Berkeley, California, adapted Marston's methods for use on criminal suspects in police custody, a use that lay outside the purview of the Frye ruling. One disciple, the self-righteous "college-cop" John Larson, had a Ph.D. in physiology from Berkeley with an M.D. from Rush to follow. The other disciple was the man-about-town and entrepreneur Leonarde Keeler, named after Leonardo Da Vinci, though known less grandly as "Nard." In the 1920s these men worked collaboratively in Berkeley under Vollmer, but after both moved to Chicago in the 1930s, they went their separate ways, soon becoming rivals, and ending up something akin to enemies. Larson joined the Institute for Juvenile Research and thence migrated into psychiatry (with a degree from Johns Hopkins); Keeler briefly got a job with Northwestern University's Scientific Crime Laboratory (the nation's first such lab), and then went to work as a private consultant.

The main progenitors of the lie detector all shared certain features. To begin with, all three men—Keeler, Larson, and Marston—met their wives through the lie detector. Marston's wife was his co-author and collaborator. Keeler met his future wife in the psych lab at Stanford University when he was back on campus to finish his B. A. And Larson's first success with lie detection came in 1922, when he investigated a petty theft at a Berkeley sorority. Over the course of several days he strapped down fifty sorority sisters one by one in a chair, hooked them up to his apparatus, and interrogated them about the missing $500. The guilty party turned out to be the richest young woman in the house. Larson married one of the others. The record does not indicate what questions he asked her.[32]

Contemporary descriptions of the lie detector often played off gender stereotypes, with the interrogating examiner invariably coded as male, and the evasive subject as female. Newspaper photos typically showed tight-sweatered women strapped into the machine.[33] And the technical manuals also printed striking photos of women submitting to mock interrogations. Both the American lay and scien-

tific cultures have long typed women as emotional, secretive, and deceitful, identifying them with "nature" and as the subjects of scientific investigations. Those same lay and scientific worldviews have, by contrast, portrayed men as rational, forthright, and frank, holding them up as the ideal objective investigators. Hence, it is hardly surprising that the pioneers of the polygraph (and newspaper editors quick to sense the "hot" angle to a story) used gender-typing to convey the "objective" nature of lie detection techniques and dramatize the ability of polygraph operators to ferret out hidden thoughts.[34]

On the surface at least, William Marston's texts for Wonder Woman—a self-proclaimed feminist hero—subverted these stereotypes. For instance, one of Wonder Woman's arch enemies (in those first numbers of the early 1940s) is Dr. Psycho, a scientist who has been spurned by women all his life because of his stunted body, but who masters psychological powers that enable him to mesmerize vast crowds. A kind of Mario the Magician, he transforms himself first into Benito Mussolini, and then, before his audience's eyes, into George Washington, and then finally—to evade Wonder Woman—into her square-jawed lover, Steve. Yet Wonder Woman fights Dr. Psycho with tactics that hardly differ from the dissembler's own fascist propaganda. Although she espouses liberal rhetoric and is a fierce advocate of feminist equality, when she ties up Dr. Psycho with her truth lasso, he is *obliged* to tell the truth. Bound by her lasso, Wonder Woman's adversaries are "forced to be free."

Revealingly, Wonder Woman's own Amazonian powers are based on her willing submission to a higher authority: the power of love. Her strength derives from obedience. Almost every episode shows her (or some other woman) being bound, manacled, and enslaved—only to be liberated by submission to a greater good. For Marston, this pop mythologizing was meant to tap deep psychological truths about contemporary relations between men and women. His psychological theories posited dominance and submission as the polarities that underlie such garden-variety emotions as "fear" or "love." For his part, Marston believed that women, because of their submission, *ought* be the dominant sex, and he wanted to teach his adolescent male readers to respect female power.[35] The lie detector similarly produced truth through submission. The device—featured in many of the early numbers of *Wonder Woman*—extracted from its subjects their deepest desires, whatever their conscious will.[36]

True Crime

For Keeler and Larson, immersed in the world of crime-fighting, the polygraph offered insight into a different sort of evasive individual. But the two reformers did not just train their machine on criminals. Keeler and Larson also shared an equal mistrust of old-time cops and municipal corruption and a corresponding respect for August Vollmer, leader of America's interwar program of police professionalization.

Municipal police forces had grown in the early-twentieth-century to become a paramilitary presence in large American cities like Chicago. With the expansion of urban centers and their growing diversity and inequalities, the law courts increasingly had permitted city police to conduct their investigations and interrogations without according suspects the full range of Constitutional protections granted by the Bill of Rights. In doing so, the magistrates had freed the police to operate in a twilight zone of quasi legality.[37] The result? By the time of Prohibition, a broad segment of the American public had begun to despair of clearly distinguishing between law-abiding citizens and scofflaws, as well as between cops and criminals.[38] Vollmer's program of police professionalization was intended to restore public order and public respect for the law by making the police themselves law-abiding.

On the basis of this program, Vollmer was brought down from Berkeley in 1924 to be chief of police in Los Angeles and clean up corruption there. He tried to institute various reforms. He implemented standards for police recruitment (including IQ tests), promotion on the basis of exams (with civil service protection for officers), and specialization of police tasks (including a large forensic science unit). But these reforms conjured up a passionate resistance among rank-and-file cops and their political patrons, and Vollmer did not remain in Los Angeles long. Back in Berkeley he continued his campaign for police reform on a public stage. In his chapter on the Chicago Police for the influential *Illinois Crime Survey*, he wrote that "the fundamental cause of the demoralization of the police department is corrupt political influence."[39] Vollmer's program belonged to a larger progressive movement that appealed to public respect for the rule of law by attacking the graft, patronage, and strong-arm tactics that dominated municipal "machine" politics.[40]

At the heart of this "old system" was a pattern of brutal interrogation. Early-twentieth-century police were notorious for their brutality toward suspects. When Larson arrived in Chicago in the late 1920s, he wrote to Vollmer that the local method of "eliciting evidence is with rubber hose, black jack, and boot, and I have seen some first-hand examples." At a lecture for police recruits, he heard a chief detective justify the beating of suspects.[41] Vollmer and his fellow reformers viewed such practices as both ineffectual and likely to erode the public's trust in law enforcement personnel. The national Wickersham report of 1931—co-authored by Vollmer—condemned this quasi-official "third degree," and proposed that the judicial branch reassert its authority over pretrial interrogation.[42] Larson's study of the polygraph, published that same year, likewise built a case against the use of "third degree" methods using the classic Enlightenment arguments against judicial torture as a punishment worse than any official sanction *and* as likely to elicit unreliable confessions. For these abuses, however, Larson offered a different solution. The use of the lie detector, Larson suggested, would put an end to such abuses and place the gathering of testimony on a scientific basis.[43] It did not go unnoticed that, should the police themselves learn to master the new machine, they would maintain their monopoly on the interrogation of suspects.

Keeler shared Larson's disdain for the nexus of politics and police work. According to Keeler, the link between police appointments and the spoils system of municipal government explained why the "human material" on the force was corrupt "up and down the line."[44] Into this world of corruption, the lie detector shone the bright light of truth. Noting the underhanded doings at the Illinois State Penitentiary, Keeler boasted to his father that "[thanks to the lie detector], all this is about to change. I am the first shot from the gun of destruction of political graft and the construction of orderly scientific management. More and more of the administration of this penitentiary will be from this office."[45]

No wonder, then, that most police resisted the lie detector—at least initially. First, police resented outsiders stealing their role as guardians of the public order. Even in Berkeley, old-style cops resented Larson's collegiate do-gooder attitude and his "infallible" machine.[46] And when Northwestern University sold its scientific crime lab to the Chicago Police Department, the police refused to let Keeler take the helm, lest his mania for publicity drive him to steal all the credit for solving crimes.[47] Second, police wielded authority on the streets and in the station-house through their discretionary power over the bodies of subjects. Where police had formerly covered for one another and for their patrons, they now faced a threat to their autonomy. Hence, even FBI director J. Edgar Hoover was skeptical about the lie detector. As he put it: "I personally would not want to accept solely what the operator of a lie detector says the instrument shows in proving that a man was or was not a sex deviate."[48] (And given what we now know about Hoover's sexual predilections, no wonder.) And third, cops were the first group of Americans to be routinely *subjected* to the test. In the famous "canary murder case," Keeler used his polygraph to extract a confession from a cop who had stolen a $100 "trick canary" from an estate he was supposed to be guarding. The presiding judge Henry Horner predicted that routine polygraph examination of police officers would soon follow.[49] Indeed, in towns such as Evanston and Wichita, whenever disciples of Vollmer were named police chief, they immediately subjected their subordinate officers to routine polygraph testing.[50] By 1933, Keeler was subjecting Evanston's mayor and police chief to lie detector tests on charges of municipal corruption.[51]

In short, the lie detector belongs to that particular American strain of the Enlightenment project which seeks to replace personal discretion with objective measures, and politics with science. This is not a project that appeals to politicians who want to make patronage appointments or police officers who seek to selectively enforce their authority on the streets. By contrast, Vollmer, Larson, and Keeler campaigned for the polygraph by appealing to a public sentiment that justice depended on a dispassionate search for truth conducted by impersonal rules.

This logic places the lie detector squarely in the current of the early-twentieth-century American push for intelligence testing and post-Taylorist industrial management—techniques offered by the newly emergent discipline of professional psychologists eager to sell their services to their patrons in the state and corporate

administration. To take the former parallel first: the democratic appeal of these multiple-choice intelligence tests (from the IQ test to the SATs) resides in the way they ostensibly treat all subjects alike.[52] The "mechanical" way such tests can be graded is particularly appealing in a country like the United States that does not trust its elites to distinguish among its citizens and, therefore, insists on publicly verifiable and quantifiable standards for judgment—even if this means that these tests are shockingly remote from any functional test of real ability. Taylorism too follows a similar logic, in which a scientifically calculated "one best way" supposedly precludes subjective judgments about the value of labor—while, of course, standardizing a more profitable degree of exertion. All of which explains one of the central appeals of the lie detector in the United States: the charade that it is the polygraph *machine* and not the examiner that assesses the veracity of the subject. Yet it is important to understand that neither Vollmer's program of police professionalization *nor* the lie detector *necessarily* restricted the discretion of examiners.

Two Strategies for Expertise

And it was here that Larson and Keeler parted company. Larson pursued the strategy of "open science," and Keeler, the strategy of proprietary knowledge. But I wish to emphasize that each strategy depended on the other, and each was wracked by internal tensions not easily overcome.[53]

The strategy of open science asserts that objective knowledge is produced when the scientist's "disinterestedness" is guaranteed by a set of interlaced social mechanisms: (1) norms that denounce venality and reward priority of discovery, (2) the public dissemination of those discoveries in journals vetted by expert peers, and (3) meritocratic institutions that translate those assessments into a livelihood and the resources to continue research. Under such a system, a scientist's reputation is his or her most prized possession. The question is: why would any society sponsor such knowledge? Princely states or private universities might do so to enhance their prestige, but this hardly accounts for the ratio of funding awarded to the National Science Foundation versus the National Endowment for the Arts. In fact, the difference in funding is largely due to the additional claim (often advanced by scientists themselves) that scientific knowledge is useful—if not immediately, then over the long haul. This, of course, begs the question of useful to whom and in what way. The answer to these questions has long implicated scientists in pointing their research in directions that serve their political and economic sponsors. We may call this the "utility" dilemma of objective knowledge.

The strategy for proprietary knowledge-making takes this social utility as its starting point. Here, the aim is to extract rents (or coercive power) from knowledge as it is substantiated in products or services, and this means holding that knowledge as private, so as not to dilute its market value. One way to do so is to keep the knowl-

edge secret, like the early modern guilds, the Coca-Cola Corporation, or the Manhattan Project. The problem here is that the holder of private knowledge knows it is not easy to keep a secret. And, for its part, society worries that valuable secrets will die with their possessor, and will never be used to generate additional useful knowledge. That is why modern states have created patent systems for technical knowledge. For the holder of private knowledge, the challenge then becomes deciding when to keep the information secret, when to apply for a patent (which requires publication), and when to rely on the licensing of expertise. Behind this problem of timing lies the problem of showing that this knowledge (or its substantiated technologies) can be applied by strangers, but this may mean giving much of the secret game away. Moreover, the licensing of proprietary knowledge, such as the fees that expert witnesses demand, give auditors good reason to doubt the impartiality of their testimony, leading experts to demonstrate the extent to which their knowledge is widely assented to. We may call this the "publicity" dilemma of useful knowledge.

The point of this all-too-brief analysis is *not* that these types of knowledge-making exist in these ideal forms. Rather, it is the uneasy hybridization of these two strategies—and the resulting regime of intellectual property—that has produced our contradictory political economy of expertise. So let us now see how Keeler and Larson pursued their respective strategies, first with regard to the hardware of the polygraph, and second with regard to the software of interrogation.

Hardware: Profits and Publicity, Priority and Reputation

Keeler chose the strategy of proprietary knowledge. For him, success meant seeing his lie detector widely employed—and counting the remuneration in his pocket. That is why he sought a patent. During his five-year struggle to secure a patent for his machine, he oscillated between providing Larson with reports on his progress (under Vollmer's scolding), and jealously guarding his methods.[54] After being repeatedly forced by the Patent Office to moderate his claims (his machine incorporated few new principles), he finally secured a patent in January 1931.[55] He then enlisted Western Electro-Mechanical Company to manufacture the instrument. But Keeler insisted on retaining veto rights on every sale. He realized that the machine itself could not guarantee reliable results and that the reputation of his machine (and hence its long-term sales prospects) might be damaged if he "turn[ed] out machines promiscuously to untrained individuals."[56] For its part, the manufacturer complained the lie detection would never be accepted widely until Keeler sold a standardized instrument—and standardization was difficult to achieve in small production runs.

Behind Keeler's moves was a delicate balancing act. He needed to have a reliable machine and have it accepted as the industry standard. But he understood that

the best way for him to make money from the device was, as he put it, to "control the instrument and lease his services." When the Walgreens department-store company wanted to buy several of his machines and set up their own in-house security team, he refused to sell them any detectors and offered to consult for them instead. As he confided to a close colleague, he made only $125 from each machine sold, and each one he sold created a competitor. Worst of all, each of these inadequately trained operators would damage the "reputation of the field" and thereby hurt his own ability to sell his services.[57]

Then, when his patent expired in the postwar period, Keeler switched strategies. Now he abandoned the restrictions on sales and services, and told his manufacturing company to "go ahead and sell to anybody."[58] He shifted the focus of his business from services to training. Over the next few years he trained large numbers of operators in short two-week courses to run a standardized machine.[59] His school, Keeler Associates, was the first to turn out polygraph operators in bulk, and though Keeler proved an inadequate businessman, his younger associates, like John Reid, successfully expanded on Keeler's formula after he died suddenly in 1951.

Throughout this period, however, Keeler had great success in publicizing his services. He scored write-ups in *Readers' Digest*, rode celebrity cases, and fed the press titillating stories about the machine's ability to ferret out marital infidelities. And one of Keeler's early students—Chester Gould—went on to invent the comic strip character Dick Tracy, the personification of scientific crime-fighting and a tireless advocate for the polygraph. But if popular notoriety was crucial to the polygraph's effectiveness in the marketplace (as we will see), it also proved its undoing in the courtroom.

By contrast, Larson took the route of open science. He published his results in journals of criminology and psychology. As he noted, it was priority "which matters in science."[60] And he prided himself on having refused the "unethical" route of patenting his own (earlier) device.[61] He worried that Keeler's policy of selling machines and training operators "superficially" would "mess things up," and that Keeler's mania for publicity would give the new science a "bad reputation."[62] Yet Larson also recognized that Keeler had produced a standard polygraph instrument without which researchers like himself could not hope for a science of lie detection. That is why he wrote to Keeler in 1927, saying "I wanted you to handle the apparatus end of it and derive whatever compensation might be. I could then devote my time to clinical experimentation."[63]

This pattern of mutual reinforcement and subversion emerged even more starkly when it came to the "software" of interrogation.

The Discretionary Expert

Keeler used the relevant-irrelevant technique. Its goal was to calibrate the polygraph machine for the individual body by comparing a presumably honest

answer ("Yes, I did have a cigarette this morning") with a possible lie ("No, I did not commit the murder last Thursday"). But, of course, a subject's strong reaction to a question about murder, say, might simply indicate that this topic was more stressful than the topic of morning cigarettes. One partial solution was to calibrate the machine by obliging the subject to tell a lie. One of Keeler's favorite ways to do this was the "card trick." In this ruse, Keeler asked the monitored subject to select a playing card from a deck and, without naming the card, deny that every card was the correct one as the subject reviewed the entire deck card by card—including the correct one. Keeler then examined the polygraph record and by reading the squiggly traces that measured the reactions of the subject's body, identified the selected card. This game had two purposes: (1) it induced the subject to tell a lie (and thereby establish a base-line of mendacity to compare with other possible lies), and (2) it convinced the subject that the operator could *catch* him or her telling a lie (and thereby heighten the *fear* of being caught, and hence the *chances* of being caught). In actuality, Keeler was able to pull off the card trick only by himself deceiving the subject—usually by marking the deck. The more general version of this same technique (still in use today as the "control question test") is to trick the subject into telling a falsehood by asking a deliberately ambiguous question like "Have you ever committed a crime?" about which the subject will presumably lie to a police officer.[64]

In short, Keeler's polygraph technique depended on a disingenuous form of interrogation designed to *create* stress and an atmosphere of intimidation—and this with a definite purpose in mind. For starters, many subjects feel compelled to comply with a request for a polygraph test even though the agreement to submit must by law be "voluntary." For instance, prosecutors promise to release pretrial detainees from jail if they take and pass the exam. And many job applicants and employees understandably fear retribution if they refuse to take the test—even when state or federal law formally prohibits employers from requiring one.[65] And then, after the exam is over, the examiner confronts the subject with the inky, graphical traces of what the examiner asserts to be the subject's body's supposed betrayal (which, of course, the subject is unable to read), and advises the subject to confess. Under the circumstances, many subjects do self-incriminate.

In 1939 Keeler privately surveyed thirteen municipal and state police units using his polygraph machine across the country. This survey remains the largest and most thorough study we have of the results of polygraph examinations of criminal suspects. And as the respondents never expected their data would be made public—indeed, they remain safely stored in the archives to date—the results have a certain credibility, especially since the respondents seemed unaware that their methods might be considered objectionable. Of the nearly nine thousand subjects examined, the police reported, 97 percent had "voluntarily" agreed to take the test, only 1 percent had refused, and 2 percent had confessed before even being strapped down. About one-third of the subjects were labeled deceptive, of whom a stunning

average of 60 percent were then persuaded to confess to the crime—with the dramatic exception of a mere 6 percent at the hands of the Indiana State Police (an exception I explain later). Among all these confessions, only 1 percent turned out to be false—at least according to the police. As for those labeled deceptive who did *not* confess, roughly half were convicted and half had their cases dismissed. Contrariwise, of the two-thirds found not deceptive, only a tiny percentage (0.3 percent) went on to be found guilty. Of course, such statistics are not meant be taken at face value. But these privately gathered and unpublished data are far and away the best portrait we are ever likely to have of how the police used the polygraph. And they do tell a tale. For instance, the examiner in Madison, Wisconsin, counted four subjects who had confessed to a crime simply upon being threatened with the machine—or five, he noted in the margin, if you counted the one who committed suicide.[66]

So, despite having issued a formal prohibition on the use of the lie detector in courtroom trials, the judiciary allowed police to use the technique to screen suspects, determine their suitability for trial, and extract confessions. In this sense, Keeler devised the lie detector to operate according to the *same* logic as ancien régime judicial torture. August Vollmer candidly called the lie detector "a modified, simplified and humane third degree."[67] And that is why the police have ultimately welcomed the technique. Keeler not only made the lie detector into an instrument almost anyone could operate, even a minimally trained police officer, but because of the way he conceived of its *operation*, he also actually enhanced the discretionary power of the examiner, who was less interested in the polygraph record per se than in using it to intimidate the subject into confessing—which was (please recall) the only sort of lie detector evidence acceptable in court during the post-Frye era.

This is the reason the hardware of the polygraph machine has changed so little since the development of Keeler's first device in the 1930s, despite the tremendous progress of physiological and psychological knowledge since then. Given the nature of the ruse, the internal working of the machinery was almost beside the point. This is an example of opening the technological black box and finding it empty. Indeed, police examiners have sometimes gone so far as to wring confessions from suspects by having them place their hands on a photocopy machine, which they fill with paper printed with the word "LIAR!"[68] And the one major technical innovation since the 1930s is the exception that proves the rule. In the 1990s new computer algorithms were developed that could mechanically amalgamate and assess the subject's physiological responses, and data processors able to do just that have been incorporated into the newest generation of machines. But, because these algorithms might preclude operators from accusing subjects of lying (whether the machine says they are being truthful or not), the top examiners at the Defense Department Polygraph Institute tell me they usually turn the computer off.[69]

The continued hold of what Michel Foucault called the *culture de l'aveu*—the culture of confession—shows the extent to which our justice system is still in thrall

to the social resolution provided by the drama of confession, long after the demise of the ancien régime and the abolition of judicial torture. In part, this can interpreted as part of the modern drive for efficiency: confessions are said by law-and-economy rationalists to save the police, the prosecution, and judiciary considerable time and expense. Indeed, as some 90 percent of criminal convictions in the United States are not won in a formal trial, but with confessions or plea bargains extracted prior to courtroom trial (bargains that are themselves, almost by definition, false confessions by accused individuals to lesser crimes in the interests of mutual expediency), the lie detector plays a crucial sorting role in American justice even though it has been banned from the courtroom. At the same time, however, the fact that the polygraph operates beyond strict legal scrutiny (and outside of many of the protections of the Constitution) allows the legal system to willfully ignore the social and institutional context in which these confessions take place. Suspects face tremendous pressure to take a polygraph test and have little control over who administers the test or how. Indeed, this willful blindness on the part of the courts is part of a larger license that allows the police to employ dissembling to ferret out the truth.[70] Away from the public scrutiny afforded by the strict application of the mechanical rules of justice, then, the machinery of American law thrives on the (potentially) coercive exercise of discretionary power.

Trust in America

As Keeler soon discovered, these same principles could be applied in contemporary relations between employers and employees. During the Great Depression, Keeler inaugurated a new phase in the use of the polygraph when he sold his interrogation techniques to corporate managers, a vast new market for deception testing that he was the first to cultivate. In 1931, the Chicago representative of Lloyd's Insurance Company approached Keeler in the hope of cutting back on the $337 million that American businesses lost each year due to employee pilfering. The Lloyd's representative offered to reduce the insurance rates for those banks that allowed Keeler to routinely test employees. There, in the supposed pursuit of a specific bank fraud, Keeler went on fishing expeditions that typically revealed that 20 to 30 percent of bank tellers had taken petty sums of money at some point in their careers. Bank managers wanted to fire these employees—criminalizing what had been, in effect, the customary practice of pocketing the occasional twenty-dollar bill—but Keeler urged that they be retained and retested every year. He assured the managers they would henceforth be the most trustworthy employees the bank had. This also brought Keeler back for another round of remunerative testing.[71]

Using the same sales pitch, Keeler also got the U.S. government to use the exam to screen security risks in the 1940s, another market he was the first to exploit. In

1945, he examined German prisoners of war being trained in Rhode Island to serve as policemen for occupied Germany. Keeler found that 36 percent harbored Nazi sympathies—or more to the point, found it stressful to be asked about their politics. The administrators of the program denied that asking POWs to rat out hidden Nazis (and Communists) among their comrades would give these future German policemen a false impression of American democratic values.[72]

Keeler's largest effort began in 1946 at the Oak Ridge nuclear facilities, where he initiated a program that would eventually lead to the routine examination of some six thousand scientists, engineers, and laborers—all employees of the Carbon Carbide Corporation, a subcontractor to the Atomic Energy Commission (AEC). Again, the goal was less to uncover specific instances of fraud than to enforce a new form of employee behavior. Out of the 690 exams Keeler conducted in February 1946, he found that nine persons (or 1 percent) admitted to having "stolen product material." In each case, however, the infraction proved minor: in one case a tiny chip of uranium had been removed from the site intentionally, and in another, some workers had planted a tiny chip in the pocket of one of their comrades as a joke. Far more prevalent were the customary practices that always surround work sites; Keeler found that 10 percent of employees had lied on their job application, 12 percent had stolen tools, 3 percent had used an alias at some point in their life, and so on. From there it was a short jump to a still broader test of reliability. A set of 6,058 exams taken during a six-month period in 1952 (under Russell Chatham, Keeler's successor) showed that the focus had expanded to include political loyalty. Of those subjects whose results were labeled "derogatory," one-third were found to have "friends or relatives associated with organizations considered un-American." Yet on closer examination, those who "sympathized with the Communist movement" turned out to include individuals who supported federally subsidized housing projects and the Tennessee Valley Authority.[73]

But even as this AEC program ended in 1953 amid charges of coercion and pseudoscience, the same McCarthyite period saw a tremendous expansion in the use of lie detectors. It was at this time that the State Department began to use the machine to screen civil servants suspected of homosexuality. Of seventy-six polygraph cases investigated there in the early 1950s, seventy-four were "morals" cases, nearly half of which resulted in confession, followed by either dismissal or resignation. As David Johnson has pointed out, contemporary anxiety about the collusion between internal and external enemies led the state to try to regulate deviance of thought and deed in the entwined ways—sexual and political—in which Cold War America defined "normalcy."[74]

Already at the time Edward Shils had offered the classic analysis of this period when the state's public mechanisms of regulation overwhelmed the citizen's private autonomy—all in the name of rooting out secret conspiracies and protecting all-important state secrets.[75] But Shils considered this period an exceptional breakdown in the balance between legitimate state power and private interests, whereas,

by 1950 there was no longer anything exceptional about the use of the lie detector. By the middle of the twentieth century, the polygraph had become a routine part of American life, defining a new national normalcy. The polygraph's very ubiquity suggests that we must search for a more systematic source of this pervasive new emphasis on surveillance in American institutional life.

The first half of the twentieth century saw the rise of vast new bureaucracies in managerial capitalism and the national-security state. As economic and institutional historians since R. H. Coase and Alfred Chandler have noted, these new hierarchical structures emerged as a substitute for the information costs associated with risky market relations.[76] But could managers really trust their salaried subordinates any better than they trusted sellers on the open market? Here is where the lie detector stepped in. No longer need managers rely on the sort of sentimental avowals that passed for sincerity in Victorian times.[77] The two million annual polygraph exams being conducted by midcentury suggests that managers expected the lie detector—or its intimidating shadow—to ensure the reliability of this new white collar work force.

Indeed, the lie detector was yet another armament in the new industrial psychology developed by Münsterberg and his followers. Münsterberg was among the progenitors of this explicit post-Taylorist attempt to suppress deviance in the workplace, especially social conflict and public displays of anger.[78] As part of this broader program, the lie detector belongs to a régime of emotional suppression, characterized by Peter Stearns as the new "American cool," and epitomized by the stereotypical "organization man" of mid-twentieth-century America, trained in emotional opacity, yet always eager to exhibit his command of "positive thinking."[79]

The question was not just one of enforcing employee loyalty, but of the management and ownership of knowledge. The Keeler polygraph, which thrived on the exercise of a private and proprietary skill, proved a valuable tool to remind technical workers that the knowledge they created was the property of their corporate or state employers. As its champions acknowledged, the main value of the lie detector was that it "kept security uppermost in a man's mind" and acted as a "psychological deterrent to the disclosure of classified information."[80] This form of employee secrecy was the same intellectual property regime that fueled both the Second Industrial Revolution and the Manhattan Project.

Lying on the Couch

Opposition to the lie detector came from several quarters. Libertarians like Dwight Macdonald and the American Civil Liberties Union spoke out against the coercive powers of the test. And the AFL-CIO and other unions protested against employers' right to polygraph their workers at will. But decades of congressional hearings and complaints made no headway until the late 1980s, when Presi-

dent Reagan, furious at regular leaks of government information to the press, tried to expand the systematic use of the lie detector so that it might be used, at will, on all civil servants. A congressional backlash led to the Employee Polygraph Protection Act of 1988. This law has somewhat curbed the number of tests performed in recent years, although significant exceptions permit the testing of suspects in police custody, all federal employees, and any corporate employee suspected of malfeasance.[81]

But for now, let us return to the 1930s to examine the response of John Larson. Larson was infuriated by Keeler's trickery. In letters to Vollmer, he bitterly denounced Keeler as the "high school boy in short pants" he had trained, but who had never gone to medical school and had instead been lured by money.[82] He directly wrote to Keeler to insist that he cease an exam the moment the subject "had any objection to the test."[83] He admonished Keeler to always ask specific questions, such as: "Did you take $160,000?" not "Have you ever stolen anything from this bank?"[84] And he condemned the "unethical commercialization" Keeler had cultivated and exploited.[85]

For a time in the 1920s, Larson had himself hoped that the polygraph could be successfully subjected to a "standardized scientific controlled objective evaluation of validity."[86] For Larson this meant first of all that a conclusive polygraph exam could be verified by a genuine double-blind analysis of the graphical record, without making use of unrecorded clues obtained during the examination. But in 1927 he wrote sourly to Vollmer that under those conditions "no five of us who have done the most work in this field can agree on the interpretation of a record."[87] And second it meant securing independent corroborative proof of whether or not each suspect in a field study had been lying, information that could be obtained only for cases that had been "positively cleared up," usually by an independent confession. Yet Larson recognized the rarity of such cases and that even independent confessions might be false.[88] By the early 1930s he had acknowledged that "all scientists become suspicious of the technique and method of investigation if [the technique] shows up 100 percent when dealing with such factors as human emotions."[89]

This did not mean, however, that Larson considered the polygraph useless. After all, no disease had a sure-fire diagnosis, yet physicians had a profound understanding of many illnesses. In the early 1930s at Chicago's Institute for Juvenile Research, Larson inaugurated a noncoercive clinical approach to the use of the polygraph, using a team that consisted of a polygraph expert, a psychologist, a physician, and a lawyer.[90] In tests of juvenile delinquents who had been referred to the Institute for apparently withholding information, Larson noted that his team-based polygraph exams had cleared 20 percent of cases and elicited confessions from 33 percent of the youths. These confessions, Larson assured his readers, were secured without accusing the subject of lying, nor of misrepresenting the effectiveness of the polygraph. As for the remaining 47 percent of tests, Larson marked

them "disturbed," and sent them back to the juvenile courts with a notice that the polygraph test not be used as evidence in the case.[91] And Larson persisted with this team-clinical approach in mental and correctional facilities through the 1940s and 1950s.[92] He insisted that the polygraph remain a tool of psychiatric diagnosis. After all, in many psychiatric traditions, a lie is no less revelatory than a true utterance—to the extent that distinguishing truth from falsity matters at all in such cases.[93] After his rebuke in the Frye case, Marston, too, primarily used the device as part of a therapeutic, psychological practice: to promote "healthy love adjustment" by uncovering the lies that men and women told themselves, thereby freeing them from "twists, repression and emotional conflicts."[94] But aside from the occasional use of physiological instruments in biofeedback therapy, this is not the sort of lie detector technique that has flourished in America.

In any case, Larson insisted the polygraph must not become a green light for criminal prosecution, nor a tool to force a confession. Indeed, the anomalous low confession rate among the Indiana State Police (found in Keeler's survey of 1939) can be directly attributed to Larson, who had himself trained the examiner there.[95] Throughout his career, Larson both publicly and privately opposed Keeler's ongoing efforts to introduce lie detector evidence in the courtroom.[96]

Selective Acceptance

This brings us to America's selective acceptance of the lie detector—and to what this selective acceptance tells us about the political economy of trust in the twentieth-century United States. The 1923 Frye ruling declared that scientific evidence "must be sufficiently established to have gained general acceptance in the particular field in which it belongs."[97] This, of course, begs the question of *who* can claim to be the relevant experts. Polygraph examiners have long claimed that mantle, and have argued vehemently that the polygraph is sufficiently reliable for use in court: 98 percent reliable according to some of their studies. But the courts have generally looked to academic psychologists as the relevant experts to judge polygraph techniques.[98] And in surveys of the field conducted at both ends of the Keeler-Larson era (in 1926 and again in 1952), these academic psychologists pronounced themselves skeptical about the reliability of the technique.[99] In the 1980s and 1990s, these surveys themselves became controversial as the two sides jockeyed for the right to speak in the name of the "relevant" experts.[100]

The fact is, however, that the courts have accepted many dubious forensic sciences—such as handwriting analysis, ballistic identification, and forensic psychology—all of which are treated with considerable skepticism outside the immediate circle of practitioners. Yet the polygraph alone has been denied admission into the courtroom. This continues even though the Frye rule has ceased to hold sway. The Federal Rules of Evidence (1977) and the recent Daubert decision (1993) indicate

the courts' willingness to grant trial judges a gatekeeping role in admitting testimony that might provide probative evidence for the trier of fact. But the polygraph expert is still generally barred, and the Scheffer case, heard by the Supreme Court in 1999, failed to clarify this issue.[101]

Some courts and commentators have hinted that the "real reason" the lie detector has been rejected by the courts is not its failings, but its power. Because the lie detector goes to the heart of the assessing a defendant's innocence or guilt, they argue, the polygraph expert—were he or she to be believed—would become a super-expert, overshadowing all other testifiers, and unduly influencing—or even supplanting—the jury.[102] Keeler, of course, hoped that juries *would* be convinced by the polygraph. Indeed (like the *New York Times* of 1911), he hoped to see the jury system abolished. He wanted criminal cases tried by expert criminologists wielding a polygraph, with a judge to rule on legal technicalities.[103] In short, he subscribed to that strain in the Western system of justice that sought to achieve certainty of judgment by setting aside human testimony as inherently untrustworthy (especially as assessed by lay citizens) in favor of reliable circumstantial evidence (as it is made to speak by disinterested experts). This, even though the instrument—even in the hands of the best operator—was far from infallible.

Perhaps we should not find it so surprising, then, that American courts have continued to reject the polygraph exam and to call it "unreliable." Remember, however, that this repudiation followed not simply from Larson's assertion that lie detection was "unscientific," but from the *success* of Keeler's brand of salesmanship. That is, this paper has made a *historical* argument. It does not deny that judges may have behaved rationally in deciding that the probative value of polygraph results has been outweighed by the possibility that such results might mislead the jury. It does suggest, however, that one cannot understand the basis for this repudiation without coming to terms with the *sort* of lie detector—and examiner—that emerged in the United States.

First, everyone agrees that the main obstacle to credible polygraph tests is the large number of incompetent examiners: 80 percent of them, according to advocates of the polygraph.[104] But it was Keeler and his students who initiated the quick commercial training of polygraph operators and cultivated a vast marketplace for the kind of expertise that thrives on enhancing the discretion of the examiner (and his or her employer).[105] That is, the polygraph only succeeds at its principle task of extracting confessions and intimidating subjects because polygraph operators have deliberately shied away from even the most basic self-regulating norms and standards. They are the consummate antiprofessionals. And second, the fact that the general public gives credence to the lie detector means that judges wish to shield impressionable juries from lie detector evidence. But it was Keeler and his fellow pioneers who had deliberately cultivated the public myth of the lie detector's effectiveness, not only to increase the demand for their services, but also to make the lie detector that much more effective by enhancing its power to intimidate subjects—

and thereby to extract confessions, deter petty crimes, and enforce political loyalty. Hence, jurists banned the lie detector from the courtroom precisely because of the manner in which it has thrived in the commercial marketplace. Indeed, the lie detector is that paradoxical techno-science that works to the extent the popular culture has been convinced that it works—even though it works only because its operators lie.

Conclusion

This paper has provided a historical explanation for a uniquely American social practice: the polygraph technique for lie detection. It has also tried to show how this practice exemplifies the way modern expertise emerges from the uneasy hybridization of two strategies for producing and validating knowledge. It should be noted that the institutions of Anglo-American justice are themselves the historical outcome of a tension between this hybridized "republic of expertise" and other social practices. The jury system is one of the most visible democratic practices that still values citizen participation as a good in itself, as well as an extension of the claim that justice depends on popular assent. The judgments of citizen-jurors are understood to be subjective both about matters of fact and culpability; indeed, the system acknowledges that their decision-making is collective, consensual, unarticulated, unjustified, and shielded from public view.

To be sure, the supposed vulnerability of lay judgments to demagogic appeals (as Keeler and many others feared) has meant that Anglo-American law has generated elaborate rules of evidence to filter what jurors may hear at trial, including expert testimony. Nor should we overlook the ways in which the demographic "representativeness" of the jury and the forensic strategies of advocates have been increasingly shaped by lawyers wielding psychological and social-scientific theories assembled by the same disciplines that gave us the lie detector. And finally, we should not forget that the lie detector—though banned from the courtroom—itself permitted a vast expansion in the number of cases that could be settled without trial, substituting the supposed certainty of a confession extracted by techno-science for the lengthy, expensive, and unpredictable judgment of a lay jury.

Is it possible that the era described in this article is coming to a fitful close? On the one hand, the courts are feeling a growing pressure to allow polygraph evidence into the courtroom, and, on the other, the use of the lie detector in the corporate setting would seem to be diminishing. The Daubert ruling of 1993 has been read by some lower courts to mean that defendants may use the polygraph to exonerate themselves (an appealing strategy since the polygraph machine is generally more prone to false positives, meaning that the machine's bill of innocence can be touted as "extra reliable"). Some believe that prosecutors should be able to introduce inculpating polygraph evidence as well. In the process, some advocates of admitting

polygraph evidence, seeking to mollify the courts' anxieties that the lie detector will supplant the jury, have found themselves in the paradoxical position of arguing that the general public's growing skepticism about results dressed up in the patina of science means that lay juries are less likely to take the word of the polygraph operator as gospel and, hence, that such expert testimony will not overly persuade a jury's decision. It would be ironic indeed if judges finally admitted the polygraph into their courtroom because they were convinced that no one believed its results anymore.

At the same time, there has been a decline in the number of examinations conducted by private corporations. In part, this may be due to the same general skepticism about scientific claims. More directly, it is due to the 1988 Polygraph Act, which generally restricted the ability of private employers to polygraph their employees without cause (although they may still insist on a polygraph as a condition of hiring, and the justification for a round of polygraph testing is still fairly easy to trump up). This double-switch—a growing acceptance of the polygraph in the courts and a decrease in its use in the private sector—does not invalidate the general thesis of this article, as it might first appear. Rather, it underlines the article's most general claim: that the rise of the lie detector in twentieth-century America was a historical response to a specific set of imperatives. These included the popular demand that the state draw a sharp line between lawful and unlawful behavior (among both cops and criminals), the ongoing negotiations that produced a particular regime of intellectual property, and the need for reliability in new hierarchical institutions. Binding these imperatives together has been the penchant for American institutions to prefer to present to the public a face of objectivity and rule-bound fairness, even as the distribution of power and social rewards are handled, offstage, through informal and unregulated arrangements. The resulting culture of (mis)-trust is increasingly under new pressures. The rules of intellectual property are being rewritten. The hierarchical institutions of the twentieth century are giving way to corporate organizations that allow for quasi-market relations *within* the firm, so that some employees—especially those with the ability to withhold or resell their skills or intellectual property—are entitled to act with relative autonomy. In such a universe, the lie detector seems a terribly crude instrument with which to enforce loyalty. Indeed, the very notion of loyalty has something anachronistic about it.

Only in the realm of law enforcement does the use of the lie detector seem to be growing. Public officials (including prosecutors, spy-catchers, and antiterrorism experts) rush to reassure the public that no effort will be spared to sift truth from lies. And as proof of their diligence, they announce that the lie detector will be copiously administered. Despite highly publicized exposés of the polygraph's failures (in the Wen Ho Lee case, and in the Aldridge Ames case), the instrument is still trotted out as the gold standard in high-profile criminal cases, as a way to plug security leaks, and as an instrument to extract the truth from those suspected of threatening America's safety. The history of untruth is a never-ending tale.

Notes

An earlier version of this paper appeared in print as Ken Alder, "The Honest Body: The Polygraph Exam and the Marketing of American Expertise," *Historical Reflections/Réflexions Historiques* 24 (1998): 487–525. Permission to reprint previously published material from that article has been granted by the journal. Research for this paper has also been generously supported by the National Science Foundation and by a visiting fellowship at the American Bar Foundation.

1. *Washington Post*, 8 January 2000, A2.
2. Protests from Livermore scientists have somewhat limited the scope of the polygraph testing there; see *Department of Energy Public Hearing on Polygraph Examination Proposed Rule*, Livermore, California (14 September 1999). Available *http://www.spse.org/Polygraph_comments_Livermo.html*.
3. Eric Schmitt, "Security Moves Means Lie Test for 500 at F. B. I.," *New York Times*, 25 March 2001, A19. Aldridge Ames has taken to speaking out from prison against the efficacy of the lie detector test.
4. Steven Shapin, *A Social History of Truth: Civility and Science in Seventeenth-Century England* (Chicago, 1994).
5. For the literature on the moral complications of the administration of placebos, see John Forrester, *Truth Games: Lies, Money, and Psychoanalysis* (Cambridge, Mass., 1997).
6. Karen Halttunen, *Confidence Men and Painted Ladies: A Study of Middle-Class Culture in America, 1830–1870* (New Haven, 1982).
7. Saint Augustine, "Lying," trans. Mary Sarah Muldowney, and "Against Lying," trans. Harold B. Jaffee, in *Treatises on Various Subjects*, ed. Roy J. Deferrari (New York, 1952), 47–179. Immanuel Kant, *The Groundwork of the Metaphysics of Morals*, trans. and ed., Mary Gregor (Cambridge, 1998). For a survey of current moral philosophizing about lying, see Sissela Bok, *Lying: Moral Choice in Public and Private Life* (New York, 1989). For an anthropological account of lying, see F. G. Bailey, *The Prevalence of Deceit* (Ithaca, N.Y., 1991). For a sociological account, see J. A. Barnes, *A Pack of Lies: Toward a Sociology of Lying* (Cambridge, 1994).
8. Joseph Brodsky, *Less Than One: Selected Essays* (New York, 1986), 7.
9. Caspar Lavater, *Règles physiognomiques, ou observations sur quelques traits caractéristiques* (The Hague, 1803). On the history of physiognomy, see Phillip Proger, "Illustration as Strategy in Charles Darwin's 'The Expression of Emotions in Man and Animals,' " in *Inscribing Science: Scientific Texts and the Materiality of Communication*, ed. Timothy Lenoir (Stanford, 1998), 140–81.
10. On the theory of judicial torture in the ancien régime, see John H. Langbein, *Torture and the Law of Proof: Europe and England in the Ancien Régime* (Chicago, 1977); on its practice in eighteenth-century France, see Richard Mowery Andrews, *Law, Magistracy, and Crime in Old Regime Paris, 1735–1789* (Cambridge, 1994). On the rise of probabilistic thinking and its impact on legal analysis, see Ian Hacking, *The Emergence of Probability: A Philosophical Study of Early Ideas About Probability, Induction, and Statistical Inference* (Cambridge, 1975), and Lorraine J. Daston, *Classical Probability in the Enlightenment* (Princeton, N.J., 1988).
11. Barbara J. Shapiro, *Beyond Reasonable Doubt and Probable Cause: Historical Perspectives on the Anglo-American Law of Evidence* (Berkeley, 1991).
12. Tal Golan, "Scientific Expert Testimony in Anglo-American Courts, 1782–1923" (Ph.D. diss., University of California, Berkeley, 1997).

13. On the relationship between the legal person and his/her body, see Alan Hyde, *Bodies of Law* (Princeton, N.J., 1997).
14. Anthony Gale, "Introduction: The Polygraph Test, More than Scientific Investigation," in *The Polygraph Test: Lies, Truth, and Science*, ed. Anthony Gale (London, 1988), 7. The American Polygraph Association boasts roughly three thousand members, trained in some thirty accredited, privately owned schools offering fourteen-week courses. Gordon H. Barland, "The Polygraph Test in the USA and Elsewhere," in *Polygraph Test*, 75.
15. Office of Technology Assessment (OTA), U.S. Congress, *Scientific Validity of Polygraph Testing: A Research Review and Evaluation—A Technical Memorandum* (Washington, D.C.: GPO, 1983). The background to this OTA study can be found in Jack Brooks, "Polygraph Testing: Thoughts of a Skeptical Legislator," and Leonard Saxe, Denise Dougherty, and Theodore Cross, "The Validity of Polygraph Testing: Scientific Analysis and Public Controversy," *American Psychologist* 40 (1985): 348–66.
16. David Thoreson Lykken, "The Case Against Polygraph Testing," in *Polygraph Test*, 117. See also David Thoreson Lykken, *A Tremor in the Blood: Uses and Abuses of the Lie Detector* (New York, 1981).
17. The few countries outside the United States that make limited use of polygraph tests have a disproportionately small number of examiners, have intimate security ties with the United States, and have only taken an interest in the technique in the last decade. Barland estimates that there are approximately 110–120 examiners in Canada, 90–120 in Japan, 90–110 in Turkey, 40–50 in South Korea, and 40–45 in Israel; Barland, "Polygraph Test in the USA," 77. A review by the British government in 1985 repudiated the polygraph test; Gale, introduction to *Polygraph Test*, 1.
18. *Frye v. United States*, 293 Fed. 1013 (1923). The Frye ruling came from a district court and so did not legally bind state or most federal jurisdictions. However, many courts cited Frye in their decisions on scientific testimony and especially on polygraph evidence. The sole exception to the general ban on polygraph evidence (under the Frye rule) is when prosecution and defense stipulate in advance that they will be bound by a test and specify carefully the terms under which it will be carried out; see Lawrence Taylor, *Scientific Interrogation: Hypnosis, Polygraphy, Narcoanalysis, Voice Stress, and Pupillometrics* (Charlottesville, Va., 1984), 247–92.
19. *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993). The interpretation of Daubert is still being worked out. Some recent federal circuit court decisions have cited Daubert in ordering trial judges to set aside the per se exclusion of polygraph evidence; see *United States v. Posado*, 57 F.3d 428 (5th Cir. 1995); *United States v. Galbreth*, 908 F. Supp. 877 (D. N. M. 1995); and *United States v. Crumby*, 895 F. Supp. 1354 (D. Ariz. 1995). However, other jurisdictions have repudiated this stand and affirmed the per se exclusion; see *United States v. Kwong*, 69 F.3d 336 (2d Cir. 1995).
20. The case of *United States v. Edward G. Scheffer* began when a military officer (Scheffer) tried to introduce a polygraph exam—conducted at the military's own insistence—to exonerate himself in a court martial. While the court martial was willing to hear evidence that Scheffer's urine had tested positive for drug use, it refused to allow testimony by the polygraph examiner indicating that Scheffer had not been deceptive when he denied using drugs. On appeal, the top military court called this an unconstitutional infringement on the right of the accused to present a defense, and cited Daubert; see *United States v. Scheffer*, 44 M.J. 442 (1996).
21. *United States v. Scheffer*, 96 U.S. 1133 (1998), see Stevens's dissent. For oral arguments, see Joan Biskupic, "Justices Voice Concerns About Polygraphs," *Washington Post*, 4

November 1997, A5; and Linda Greenhouse, "Justices Grapple with Merits of Polygraphs at Trials," *New York Times*, 4 November 1997, A14.

22. Etienne-Jules Marey, "Etudes graphiques des movements respiratoire," *Journal de l'anatomie et de la physiologie* 2 (1865): 276–301, 425–53; 3 (1866): 225–42, 403–16. For the sphygmograph, see Robert G. Frank Jr., "The Telltale Heart: Physiological Instruments, Graphic Methods, and Clinical Hopes, 1854–1914," in *The Investigative Enterprise: Experimental Physiology in Nineteenth-Century Medicine*, ed. William Coleman and Fredric L. Holmes (Berkeley, 1988), 211–90. American physicians only began to tentatively employ quantitative measures of blood pressure in the early twentieth century, and the value and interpretation of this new information was still controversial; see Hughes Evans, "Losing Touch: The Controversy over the Introduction of Blood Pressure Instruments into Medicine," *Technology & Culture* 34 (1993): 784–807.
23. William James, "What Is an Emotion?" *Mind* 9 (1884): 188–205; William James, *Principles of Psychology* (1890; reprint, New York, 1950), 2:442–87.
24. On Hugo Münsterberg's laboratory, see the output of his *Harvard Psychological Studies*, 5 vols. (Lancaster, Pa., 1903–22). On Münsterberg's program, see Deborah Coon, "Standardizing the Subject: Experimental Psychologists, Introspection, and the Quest for a Technoscientific Ideal," *Technology & Culture* 34 (1993): 757–83; and Jutta Spillman and Lothar Spillman, "The Rise and Fall of Hugo Münsterberg," *Journal of the History of the Behavioral Sciences* 29 (1993): 329–30. On the science of emotionology in the early twentieth century, see Otner E. Dror, "Creating the Emotional Body: Confusion, Possibilities, and Knowledge," in *An Emotional History of the United States*, ed. Peter N. Stearns and Jan Lewis (New York, 1998), 173–96.
25. For one overview of the application of psychological science to the credibility of testimony in Europe, see Matt K. Matsuda, *The Memory of the Modern* (New York, 1996). In the 1890s and early 1900s, some prominent European criminologists and psychologists—among them Cesare Lombroso and C. G. Jung—deployed physiological instruments to verify the veracity of human testimony, with an eye on introducing the results as evidence into the courtroom. Not only were their efforts rebuffed by the European courts (much as were the efforts of their American counterparts), but their techniques also failed to find acceptance among police administrators and governmental and industrial elites (quite unlike the case in America). For use of the blood pressure gauge, see Dot. Cougnet and Cesare Lombroso, "Sfigmografia di delinquenti ed alienati," *Archivio di psichiatria, scienze penali ed antropologia criminale* 2 (1881): 234–35, 472. Vittorio Benussi later followed up on the work of his mentor, Lombroso, and made similar observations about the effect of deceitfulness on breathing patterns; see Vittorio Benussi, "Die Atmungsymptome der Luge," *Archiv für die gesampte Psychologie* 31 (1914): 244–73. Finally, the method of skin resistance was used by C. G. Jung; see Frederick Peterson and C. G. Jung, "Psychological Investigations with the Galvanometer and Pneumograph in Normal and Insane Individuals," *Brain: A Journal of Neurology* 30 (1907): 153–218.
26. Hugo Münsterberg, "Experiments with Harry Orchard," in Hugo Münsterberg Papers, Boston Public Library, Boston, Mass. (hereafter HMP), 2450. On the publicity that followed Münsterberg's declaration, see *Boston Herald*, 3 July 1907, 1. *New York Times*, 5 July 1907, 6. For an account of the Orchard/Haywood trial, see J. Anthony Lukas, *Big Trouble: A Murder in a Small Western Town Sets Off a Struggle for the Soul of America* (New York, 1997).
27. Hugo Münsterberg, *On the Witness Stand: Essays on Psychology and Crime* (New York,

1908). See also John Henry Wigmore's witty defense of judicial caution in the face of new science; John Henry Wigmore, "Professor Muensterberg and the Psychology of Testimony," *Northwestern University Law Review* 3 (1909): 399–445.

28. "Electric Machines," *New York Times*, 10 September 1911, 6.
29. William M. Marston, "Systolic Blood Pressure Symptoms of Deception," *Journal of Experimental Psychology* 2 (1917): 117–63. For Marston's work under the Army's National Research Council during World War I, see William M. Marston, "Reaction-Time Symptoms of Deception," *Journal of Experimental Psychology* 3 (1920): 72–87.
30. Marston, "Symptoms of Deception," 162.
31. National Archives and Records Administration, Washington, D.C. (hereafter NARA), RG 21 Case file 38325: *United States v. Frye*, U.S. District Court for the District of Columbia, 17–20 July 1922, 11–18. See also NARA RG 276 U.S. Court of Appeals for the District of Columbia, Case file 3968; and RG 204 U.S. Pardon Attorney Case file 56–386. For a summary of the Frye case, see J. E. Starrs, " 'A Still-Life Watercolor': Frye v. United States," *Journal of Forensic Evidence* 27 (1982): 684–94; and Golan, "Scientific Expert Testimony," 358–82.
32. For Larson's retrospective account, see John Augustus Larson Papers, Bancroft Library, University of California, Berkeley (hereafter JLP), c. 2, f. misc.: Larson, "Taken by the Dip Mob," n.d. A cleaned-up version of the case was reported in John A. Larson, "Cardio-Pneumo-Pyschogram in Deception," *Journal of Experimental Psychology* 6 (1923): 436–40.
33. Alva Johnson, "The Magic Lie Detector," *Saturday Evening Post*, 15 April 1944, 9–11, 72; 22 April 1944, 26–27, 63; 29 April 1944, 20, 101–2.
34. See Geoff Bunn, "Constructing the Suspect: A Brief History of the Lie Detector," *BorderLines* 40 (1996): 5–9. For a historical treatment of the gendered division between nature and its investigators, see L. J. Jordanova, *Sexual Visions: Images of Gender in Science and Medicine Between the Eighteenth and the Twentieth Centuries* (Madison, Wisc., 1989). Though such gender dualities are largely social conventions, many modern scientists, such as sociobiologists, still invoke them.
35. William Marston, *Wonder Woman* 5 (April/May 1943); reproduced in William Moulton Marston, *Wonder Woman*, intro. Gloria Steinem (New York, 1972). For Marston's psychology, see William Moulton Marston, *Emotions of Normal People* (New York, 1928); and William Moulton Marston, C. Daly King, and Elizabeth H. Marston, *Integrative Psychology: A Study of Unit Response* (New York, 1931). For an analysis of *Wonder Woman* and Marston, see Geoff Bunn, "The Lie Detector, *Wonder Woman*, and Liberty: The Life and Work of William Moulton Marston," *History of the Human Sciences* 10 (1997): 91–119.
36. William Moulton Marston, *The Lie Detector Test* (New York, 1938).
37. Akhil Reed Amar, *The Constitution and Criminal Procedure: First Principles* (New Haven, 1997).
38. Claire Bond Potter, *War on Crime: Bandits, G-Men, and the Politics of Mass Culture* (New Brunswick, N.J., 1998).
39. Berkeley Police Department Papers, Bancroft Library, University of California, Berkeley (hereafter BPP), c. 8, f. Police Training School: [Vollmer], "Outline of Courses of Instruction for a School for Police Officers, 1916–1917," December 1916. For Vollmer's blueprint for Los Angeles, see August Vollmer, *Law Enforcement in Los Angeles*, intro. Joseph G. Woods (1924; reprint, New York, 1974). August Vollmer, "The Chicago Police," in *The Illinois Crime Survey*, ed. John Henry Wigmore (Chicago, 1929), 372. Over the years, Vollmer's many students took up managerial positions in

many of the leading police forces in the nation; e.g., O. W. Wilson, who served as police chief in Chicago 1960–69.

40. Gene E. Carte and Elaine H. Carte, *Police Reform in the United States: The Era of August Vollmer, 1905–1932* (Berkeley, 1975). Samuel Walker, *A Critical History of Police Reform: The Emergence of Professionalism* (Lexington, Mass., 1977). Eric H. Monkkonen, *Police in Urban America, 1860–1920* (Cambridge, 1981).
41. BPP b. 10, f. Larson: Larson to Vollmer, 17 October 1924.
42. Wickersham Commission, *Report on Police*, Fourteenth Report of the National Commission on Law Observance and Enforcement . . . Under the Direction of August Vollmer (Washington, D.C.: GPO, 1931). See also the popular condemnation in Emanuel H. Lavine, *The Third Degree: A Detailed and Appalling Exposé of Police Brutality* (Garden City, N.Y., 1930).
43. John Augustus Larson, *Lying and Its Detection: A Study of Deception and Deception Tests*, with George W. Haney and Leonarde Keeler; intro. by August Vollmar [*sic*] (Chicago, 1932), 65–121.
44. Leonarde Keeler Papers, Bancroft Library, University of California, Berkeley (hereafter LKP), c. 2, f. Original: Keeler, "Police Systems Should Be Divorced from Politics," [1930]. This undergraduate paper was written in the 1930s when Keeler was already employed by Northwestern's Scientific Crime Lab, was a national figure for his lie detector work, and had returned to Stanford to pick up a few last credits for his degree.
45. Charles Keeler Papers, Bancroft Library, University of California, Berkeley (hereafter CKP), b. 7, f. L. Keeler: L. Keeler to C. Keeler, 18 July 1929.
46. JLP c. 2, f. misc.: Larson, "Taken by the Dip Mob," n.d.
47. Author's interview with Fred Inbau, 5 September 1996. See also the corroborating letter of Inbau to Charles M. Wilson, 9 June 1938 (from the personal files of Inbau, copy in author's possession).
48. Quoted in Dwight Macdonald, "The Lie Detector Era," *The Reporter*, 8 June 1954, 10–18; 22 June 1954, 22–29, here 26.
49. Leonarde Keeler, "The Canary Murder Case," *American Journal of Police Science* 4 (1930): 381–86; reprinted in *Polygraph* 23 (1994): 145–48. "Science Solves Canary Death," *Chicago Tribune*, 24 May 1930. BPP b. 10, f. L. Keeler: Keeler to Vollmer, 17 August 1930.
50. Leonarde Keeler, "The Lie-Detector Proves Its Usefulness," *Public Management* 22 (1940): 163–66; reprinted in *Polygraph* 23 (1994): 185. BPP b. 16, f. Wiltberger: Wiltberger to Vollmer, 17 June 1924; 26 October 1926; 13 December 1926.
51. CKP b. 7, f. L. Keeler: L. Keeler to C. Keeler, 20 April 1933; L. Keeler to his mother, 11 May 1933.
52. For intelligence testing and applied psychology in this period, see F. Allan Hanson, *Testing Testing: Social Consequences of the Examined Life* (Berkeley, 1993); John Carson, "Army Alpha, Army Brass, and the Search for Army Intelligence," *Isis* 84 (1993): 278–309; Michael M. Sokal, ed. *Psychological Testing and American Society, 1890–1930* (New Brunswick, N.J., 1987); Nicolas Lemann, *The Big Test: The Secret History of the American Meritocracy* (New York, 1999). The democratic appeal of such a test does *not* preclude the possibility that the test itself favors certain kinds of subjects over others, nor that the test does not measure any relevant quality or talent. See Ken Alder, "Engineers Become Professionals, or, How Meritocracy Made Knowledge Objective," in *The Sciences in Enlightened Europe*, ed. William Clark, Jan Golinski, and Simon Schaffer (Chicago, 1999), 94–125.

53. The following discussion represents my own blend of recent scholarship in the history of objectivity. See Theodore Porter, *Trust in Numbers: Quantification in Science and Public Life* (Princeton, N.J., 1995); Lorraine Daston, "Objectivity and the Escape from Perspective," *Social Studies of Science* 22 (1992): 597–618"; Ken Alder, *Engineering the Revolution: Arms and Enlightenment in France, 1765–1815* (Princeton, N.J., 1997); and P. A. David, "Common Agent Contracting and the Emergence of an 'Open Science' Institution," *American Economic Review* 88 (1998): 15–21.
54. JLP c. 7, f. corr. misc.: Keeler to Larson, 1 May 1927; 19 April 1928. Keeler cut out his coworker, Dr. Edwards of UCLA, when he learned that Edwards wanted to go into partnership to manufacture the machine; JLP c. 7: Keeler to Larson, 29 April 1924.
55. Leonarde Keeler, "Apparatus," U.S. Patent, No. 1,788,434; filed 30 July 1925; granted 31 January 1931.
56. LKP c. 1: Keeler to W. J. Foster (Western Electro-Mechanical Company), 23 April 1931. Keeler aggressively blocked Associated Research (his second supplier) from manufacturing polygraph machines designed by his rival inventors; LKP c. 2, f. business: Inman to Keeler, with notes by Keeler, 13 August 1948; Inman to Reid, 17 August 1948; Inman to Keeler, 25 August 1948.
57. LKP c. 2, f. technique: Keeler to Wilson, 20 July 1931.
58. LKP c. 2, f. business: Inman to Keeler, with notes by Keeler, 13 August 1948.
59. Between 1947 and his death in 1950, Keeler's income from casework dropped from $32,000/year to $20,000/year, while training fees rose from a negligible sum to $45,000/year; LKP c. 2, f. business: Leonarde Keeler, Inc., "Balance Sheet," 31 March 1950.
60. JLP c. 7, f. corr. misc.: Larson to Charles DeLacy, 5 February 1941.
61. Ibid.
62. JLP c. 7, f. corr. misc.: Larson to Keeler, 21 December 1931.
63. JLP c. 7, f. corr. misc.: Larson to Keeler, 23 March 1927.
64. The Controlled Question Technique (CQT) was developed by John Reid in the mid-1940s. John E. Reid, "A Revised Questioning Technique in Lie-Detection Tests," *Journal of Criminal Law, Criminology, and Police Science* 44 (1947): 542–47.
65. These restrictions have increased significantly since the federal 1988 Employee Polygraph Protection Act.
66. Keeler Papers, Department of Defense Polygraph Institute, Ft. Jackson, S. C. (hereafter DoDLKP). Keeler survey of 1938–40, responses from the police departments in East Cleveland, Toledo, Indiana State, Indianapolis, Kansas City, Buffalo, Honolulu, Madison, Michigan State, St. Louis, North Dakota State, Cincinnati, Wichita.
67. "Police Try Machine to Detect Lies," *Los Angeles Times*, 25 January 1924.
68. David Simon, *Homicide: A Year on the Killing Streets* (Boston, 1991).
69. Personal communication, DoD polygraph operator, June 1998.
70. This continues despite the famous Miranda ruling of the mid-1960s. Fred E. Inbau, John E. Reid, and Joseph P. Buckley, *Criminal Interrogation and Confessions*, 3d ed. (Baltimore, 1986).
71. LKP c. 2, f. technique: Keeler to Newman Baker, 21 July 1933. LKP c. 1, f. research: Keeler to Henry Scarborough Jr. (Lloyd's of London), 10 June 1931, 10 February 1934; Keeler to Nagle, n.d. For an advocate of the use of the polygraph in business, see the popular write-up of Keeler's work in J. McEvoy, "Lie Detector Goes into Business," *Readers' Digest* 38 (1941): 69–72. For an article opposing the use of the polygraph in business, but written in 1962, see Richard A. Sternbach, Lawrence A. Gustafson,

and Ronald L. Colier, "Don't Trust the Lie Detector," *Harvard Business Review* 40 (1962): 127–34.

72. NARA RG 389 (1941–58), box 40, file Lie Detector Tests: "Memorandum to Col. Franklin W. Reese," 30 August 1945. For Keeler's account of these state-sponsored examinations, see LKP c. 1, f. training: Keeler, "Training," 1949.
73. NARA RG 326, box 48 631, 4/8/8: USAEC, "Use of Lie Detector at AEC Installations," 24 March 1953, Keeler data, 2; 1952 data, 70–77. For an explanation for the "thefts," see NARA RG 326, box 149 631 4/8/4: USAEC, In the Matter of "Lie-Detector" Panel Meeting, 24 January 1952: Hardie, 42. For the deeper investigation of the political views, see South East Regional Office of the National Archives and Records Administration, East Point, Ga. (hereafter SE-NARA), RG 326: F. P. Callaghan to J. S. Denton, "Interview of Joseph E. Deye Concerning His Polygraph Exam," 28 May 1951. For an exposé of the Oak Ridge program, see Anthony Leviero, "U.S. Tests Staffs by Lie Detectors," *New York Times*, 20 December 1951, 1, 20. For the decision to end the program, see USAEC Doc. #708937 "Advisory Council for Biology and Medicine," 4–5 April 1952. For a partial history of Oak Ridge, see John G. Linehan, "The Oak Ridge Polygraph Program, 1946–53," *Polygraph* 19 (1990): 131–37. Keeler initiated the program, but he was forced aside by a rival polygraph operator, Russell Chatham, in the late 1940s.
74. NARA RG 59 (1953–60), box 12, file Bureau of Security: Thurston Morton (Asst. Sec. of State) to Sen. Olin Johnston, 30 June 1955, "Polygraph," [1955]. David K. Johnson, "The Lavender Scare: Gays and Lesbians in the Federal Civil Service, 1945–1975" (Ph.D. diss., Northwestern University, 2000).
75. Edward A. Shils, *The Torment of Secrecy: The Background and Consequences of American Security Policies*, intro. Daniel P. Moynihan (1956; reprint, Chicago, 1996). See also Daniel P. Moynihan, *Secrecy: The American Experience*, intro. Richard Gid Powers (New Haven, 1998).
76. R. H. Coase, "The Nature of the Firm," in *The Firm, the Market, and the Law* (1937; reprint, Chicago, 1988). Alfred Chandler, *The Visible Hand: The Managerial Revolution in American Business* (Cambridge, Mass., 1977).
77. Halttunen, *Confidence Men*, 198–210.
78. Hugo Münsterberg, *Psychology and Industrial Efficiency* (1913; reprint, Easton, Pa., 1973).
79. Peter N. Stearns and Carol Z. Stearns, "Emotionology: Clarifying the History of Emotions and Emotional Standards," *American Historical Review* 90 (1985): 813–36. See also Christopher Lasch, *The Culture of Narcissism: American Life in an Age of Diminishing Expectations* (New York, 1978).
80. NARA RG 326 Box 48 631 4/8/8: USAEC, "Use of Lie Detector at AEC Installations"; "deterrent" quote: 19.
81. Civil libertarians began to object to the test in the McCarthy era when it was decried as an effort to subvert Fifth Amendment guarantees against self-incrimination; Macdonald, "Lie Detector Era." More recently, labor lawyers have challenged the coercive and intimidating atmosphere created by polygraph exams in the workplace; Edgar A. Jones Jr., "American Individual Rights and an Abusive Technology: The Torts of Polygraphing," in *Polygraph Test*, 159–87. Until the federal Employee Polygraph Protection Act was enacted in 1988, thirty states still allowed the use of polygraph testing "at will" in business settings (for preemployment screening, investigations into alleged wrongdoing, and routine checks).

82. BPP b. 10, f. Larson: Larson to Vollmer, 28 April 1931. August Vollmer Papers, Bancroft Library, University of California, Berkeley (hereafter AVP), b. 18, f. Larson: Larson to Vollmer, 2 June 1951.
83. JLP c. 7, f. corr. misc.: Larson to Keeler, 31 October 1930.
84. Ibid.
85. JLP c. 1: Larson to Douglas Kelley, 26 December 1950.
86. Ibid.
87. BPP b. 10, f. Larson: Larson to Vollmer, 28 April 1931.
88. BPP b. 10, f. Larson: Larson to Vollmer, 20 April 1927.
89. BPP b. 10, f. Larson: Larson to Vollmer, 9 October 1931.
90. John A. Larson and G. W. Haney, "Cardio-Respiratory Variations in Personality Studies," *The American Journal of Psychiatry* 11 (1932): 1035–81. Larson had already cooperated with the institute's director, Herman Adler, see Herman M. Adler and John A. Larson, "Deception and Self-Deception," *Journal of Abnormal Psychology* 22 (1928): 364–71.
91. Verne W. Lyon, "Deception Tests with Juvenile Delinquents," *Journal of Genetic Psychology* 48 (1936): 494–97. Previous studies at the institute had examined lying in children without specifying how they could tell whether the children were lying or not; Luton Ackerson, *Children's Behavior Problems: A Statistical Study Based upon 5000 Children Examined Consecutively at the Illinois Institute for Juvenile Research*, 2 vols. (Chicago, 1931–), 1:57, 175–77; 2:357–65.
92. John A. Larson, Alan Canty, and Claude Broom, "Lie Detectors Rashly Operated and Oversold," *Police Journal* 25 (Nov.–Dec. 1939): 13, 24–25; 26 (Jan.–Feb. 1940): 4, 20. R. F. Borkstein and John A. Larson, "The Clinical Team Approach," in *Academy Lectures on Lie Detection*, ed. V. A. Leonard (Springfield, Ill., 1957), 1:11–20.
93. Forrester, *Truth Games*.
94. See Marston, *Lie Detector*, 119, 138.
95. DoDLKP Don L. Kooken (Indiana State Police) to Keeler, 24 August 1939.
96. BPP b. 10, f. Larson: Larson to Vollmer, 9 October 1931. Larson, Canty, and Bloom, "Oversold."
97. *Frye v. United States* 293 Fed. 1013 (1923): 46–47, decided by the Court of Appeals of the District of Columbia, opinion by F. Van Orsdel; annotated in *American Law Reports* 34 (1923): 147–48.
98. For the judicial debate over who are the relevant experts, see Paul G. Giannelli and Edward J. Imwinkelried, *Scientific Evidence*, 2d ed. (Charlottesville, Va., 1993), 1:232–35.
99. Jurists have conducted various surveys of psychologists. In 1926 a lawyer surveyed 88 members of the American Psychological Association, selected for their presumed interest in the field of lie detection, and found that of the 38 who responded, 18 thought the method was "of sufficient accuracy as to warrant consideration by judges and jurors" (though most expressed some qualifications); 13 answered no; and 7 answers were too mixed to classify. Tests conducted for McCormick by J. F. Dasheill (University of North Carolina), reported in C. T. McCormick, "Deception Tests and the Law of Evidence," *California Law Review* 15 (1926–27): 495–98. In 1952, when the University of Tennessee polled 1,682 criminologists, polygraphers, and psychologists, it found that of the 719 responses, twice as many polygraphers (75 percent) as psychologists (36 percent) believed that the main reactions to the instrument were caused by deception or the attempt to conceal it; see Edward E. Cureton, "A Consensus as to the Validity of Polygraph Procedures," *Tennessee Law Review* 22 (1953): 728–

42. This survey was proposed by the Chatham Company, then conducting its systematic polygraph examinations of employees at Oak Ridge, and the company helped select the respondents. For the background to the examination, see Paul V. Trovillo, "Scientific Proof of Credibility," *Tennessee Law Review* 22 (1953): 760–61.

100. At the behest of the Society for Psychophysiology Research (SPR), the Gallup Organization conducted a poll of members in 1984 and found very few willing to see polygraph results used in court, though 62 percent believed the polygraph was a useful diagnostic tool. Gallup Organization, "Survey of the Membership of the Society for Psychological [*sic*] Research." *Polygraph* (1984): 153–65. A rephrased questionnaire sent out in 1994 to members of the SPR by propolygraph advocates found that 61 percent said the method was "useful for legal proceedings"; see Susan Amato and Charles Honts, "What Do Psychophysiologists Think About Polygraph Tests? A Survey of the Membership of S.P.R.," *Psychophysiology* 31 (1994): S22.

101. The majority opinion in Scheffer by Justice Clarence Thomas turned on the narrower question of whether the president's executive power was used "arbitrarily" when he imposed a per se exclusion of the polygraph. It explicitly put off any judgment about whether in the absence of a clear ruling by the legislature or executive power the courts ought to admit or deny polygraph evidence, taking note instead of the distinct rulings emerging in the various district courts under the new Daubert rule. *United States v. Scheffer* 96 US 1133 (1998).

102. A district attorney in Appleton, Wisconsin expressed this view in 1930. LKP Scrapbook: *Appleton Post*, 8 April 1930. The courts expressed this fear most eloquently in *United States v. Alexander* 526 F.2d 161 (8th Cir. 1975), which excluded polygraph evidence because it was "shrouded with an aura of near infallibility, akin to the ancient oracle of Delphi."

103. LKP c. 2, f. original: Keeler, "The Jury System Should Be Abolished," [1930]; also c. 1: Keeler, "Talk to Sigma [Xi]," Mayo Clinic, Rochester, Minn., 18 January 1934.

104. Fred E. Inbau, "Case Against the Polygraph," *American Bar Association Journal* 51 (1965): 857.

105. In light of this problem, some have suggested obliging all operators to pass through a rigorous training program and meet strict licensing requirements. Keeler himself advocated state licensing for examiners, though he also believed that "in the meantime it rests with the honor and integrity of each member of a profession to keep the profession purged of incompetency and dishonesty." On the few and feeble attempts by polygraph operators to police themselves, see Charles R. Honts and Mary V. Perry, "Polygraph Admissibility: Changes and Challenges," *Law and Human Behavior* 16 (1992): 369–73. Currently, the American Polygraph Association accredits schools, and it, along with the American Association of Police Polygraphers, sets standards for the use of the polygraph. But the standards are voluntary and there is no enforcement mechanism. Moreover, some two thousand operators are not members of either organization; Giannelli and Imwinkelried, *Scientific Evidence*, 218–19.