

... And Nothing but the Truth, So Help Me Science

LAWRENCE LIANG

Posters, placards, signs, symbols must be distributed, so that everyone may learn their significations. The publicity of punishment must not have the physical effect of terror; it must open up a book to be read...

Michel Foucault (1979)

Truth technologies at the service of law, from the lie detector to narco-analysis, have made a sudden reappearance in the world after 9/11. In the Indian context, high-profile cases (including those of Abu Salem and Telgi) have centred on clearly performative extractions of the truth. This essay attempts to provide a philosophical and cultural history of technologies of lie detection. It looks at the ways in which truth and lies were rendered technologically accessible, and how the body simultaneously becomes the archive of the soul and in turn produces a new regime of physiological truth; it also locates the re-emergence of lie detectors within the dynamics of secrets and lies in the hyper-mediatised world that we live in.

Whereas conventional lie detectors rely on changes in respiration, blood pressure and heart rate, the new devices depend on differences in blood flow and electrical activity within certain areas of the brain. While brain-imaging technologies such as fMRI (functional magnetic resonance imaging) and brain fingerprinting promise to exorcise the messy autonomic body foundational to the polygraph mechanism, both continue to rely on psycho-physiological principles. They maintain that there is a connection between body and mind; that physiological changes are indicative of mental states and emotions; and that information about an individual's subjectivity and identity can be derived from these physiological and physiological measures of deception.

In the US, each advance that has replaced polygraph technology has proved it to be pseudo-science; but in India, with our different temporalities, we invoke all three tests just to make sure¹...

With regard to the application of the technologies, some key questions continue to assert themselves:

- > How did truth and the world of interiority become mechanically accessible?
- > In what ways is the question of access to interiority configured and realised?
- > How do technologies of physiological truth define the human body's boundaries, and shape our understanding of verifiable identity?
- > What is the role of popular culture and public discourse in construing these technologies as objects/techniques of science?

Nor can we ignore the current political interest in lie detection, including the proposed draft of a DNA profiling bill providing for an interface between law and forensic science.² For instance, as stated by Dr M.S. Rao, Chief Forensic Scientist, Government of India:

Forensic psychology plays a vital role in detecting terrorist cases. Narco-analysis and brainwave fingerprinting can reveal future plans of terrorists and can be deciphered to prevent terror activities... Preventive forensics will play a key role in countering terror acts. Forensic potentials must be harnessed to detect and nullify their plans. Traditional methods have proved to be a failure to handle them. Forensic facilities should be brought to the doorstep of the common man... Forensic activism is the solution for better crime management.³

Feminist scholar Melissa Littlefield argues that technologies of truth have always depended on a central paradox: that individuals can be represented through disembodied informational patterns, even as detection remains an embodied phenomenon detectable through physiological processes. The human body is somehow expected to function both as a measurable machine and as a fluctuating manifold of flesh, and the lie detector serves as a compelling case study of the "porous boundaries between bodies, minds, machines and the law"⁴.

The three primary lie-detection technologies⁵ may be usefully summed up here:

The lie detector test (polygraph) is an examination, conducted by various probes attached to the body of the person who is interrogated by an 'expert'. The heart rate and skin conductance is measured. The underlying theory is that when people lie, they also get nervous about lying: their heartbeat increases, blood pressure rises, breathing rhythm changes, perspiration intensifies, etc. A baseline for these physiological characteristics is established by asking the subject such questions whose answers the investigator knows. Deviation from the baseline for truthfulness is taken as a sign of a lie. Polygraph analysis may be sought to be rendered as evidence in court, if and when required.

The narco-analysis (truth serum) test is conducted by injecting 3 grams of sodium pentothal dissolved in 3000 millilitres of distilled water. This solution is administered intravenously along with a 10% solution of dextrose over a period of 3 hours, with the help of an anaesthetist. The rate of administration is so controlled as to push the suspect slowly into the state of hypnotic trance. Blood pressure and heart rate are monitored continuously throughout the testing procedure. Statements made during the hypnotic trance are recorded both on video and audio. The questions are designed carefully and repeated

persistently in order to reduce the ambiguities during such interrogation. The report prepared by 'experts' is seen as a useful item of evidence within the law.

The brain mapping/brain fingerprinting (P-300) test measures the activity of the brain while an individual is exposed to stimuli. Specifically, it relies on the P-300 brain wave, one that spikes 300-800 milliseconds after the subject recognises and processes an incoming stimulus that is significant or noteworthy. The suspect is first interviewed and interrogated to find out whether he is concealing any information. The activation of the brain with regard to the associated memory is carried out by presenting to the accused a list of words, images, phone numbers, locations or names. The response is acquired through a 32-channel Neuro Scan Recording system. The suspect is asked to sit down and close his eyes; the recording electrodes are placed directly on the scalp. No oral response is expected. Following the recording, 'experts' analyse the test results for possible evidence of suppressed information.

A judgement of the Bombay High Court, *Ramchandra Ram Reddy v. State of Maharashtra* (2004), upheld the validity of administering all three tests, arguing that they do not violate the right against self-incrimination provided in Article 20 (3) of the Constitution of India. This judgement asserts that "No person accused of any offence shall be compelled to be a witness against himself"; i.e., provides against testimonial compulsion.

The court raised a technical distinction between a statement and a testimony:

It will thus be seen that what is required to be made under compulsion by an accused is a statement... In our opinion, the tests of brain mapping and lie detector, in which the map of the brain is the result, or polygraph, then either cannot be said to be a statement. As we have seen from the description of the tests noted above and the end result of brain mapping tests, it is a map showing reactions of the brain to certain target questions, and the conclusion that can be drawn by an expert after such treatment is that the person undergoing the tests does possess certain knowledge of the crime, in relation to which target questions were put to the accused. In both these tests there is no way to find out what the lie is or what is the information stored in the brain of the person concerned. That being the end result of the tests, it cannot be said by any stretch of imagination that the end result is a statement made by the witness. At the most it can be called the information received or taken out from the witness. Whatever is the information, it has to be established that it is incriminating for the person who makes it, for invoking the protection under Article (20) 3. In our opinion therefore there is no reason why these two tests be not administered.⁶

The prehistory of the lie detector lies in the period 1907-1920 which saw the emergence of a whole series of different machines, each in their own way linked to the persona of the criminal. These were variously named "the soul machine", "machines for the cure of liars", "truth-compelling machines". But from the 1920s onwards, the lie detector emerged as a "discourse-object" which is a culmination of these various predecessor

technologies.⁷ Prior to this, Carl Jung had been experimenting with the idea of a “psychometer” which would be able to assist in the detection of the emotional state of individuals. While “indifferent words” produced no effect on the “finger of light” of the psychometer, others which struck “some emotional complex deep in the soul of the individual” would “light up the machine”, and send the light along the scale “for a distance of one centimetre up to six, or eight, or more, in proportion to the intensity and actuality of the emotion”⁸. Another technology was created by psychologist Hugo Münsterberg, again with its roots in psychoanalysis. Accounts of both technologies were reported in the press.

However, the discourse soon began to move towards the possible uses of these technologies towards crime detection/forensics. The scholar Geoffrey Bunn demonstrates that the most significant shift that enabled the coming into being of the lie detector was not a matter of apparatus or technology; nor was it a change in the locus of guilt from the skin to the heart and lungs. It was, instead, a change in the *object of knowledge*. Rather than focusing on analysing the criminal, the technology was realigned towards the detection of the lie.⁹

This is also the period of the rise of statistics, and the emergence of the tyranny of numbers. Thus, the field of criminalistics, rooted in positivism and instrumental rationality, developed at great speed. The assumption was that emotions could also be reduced to a set of measurable principles. The body was seen as both empirically knowable and in need of externally imposed principles of order and control. Accordingly, forensic science was configured on the principles of transference, individuation, identification, association and reconstruction, which inform the intersection between information systems and embodiment.¹⁰

It is also worth noting another shift in thinking from the late 19th to early 20th century, with regard to the human mind, emotion and ideas of selfhood. These had been considered the domain of philosophers; but a newly emergent discipline, psychology, had now taken them as its central concern. Littlefield brilliantly traces the emergence of this ‘new’ or ‘experimental’ psychology which transformed emotional interiority into a visually present, quantifiable, controllable and rationalised object of knowledge; and the science of emotions signified the breakdown of the epistemic boundaries that separated inside from outside and subject from nature. As she puts it: “[...] it depended on the modernist mechanisation of the body, by defining interiority as the manifestation of the brain displayed via various verbal and instrumental examinations. According to this schema, character, personality, guilt, innocence and accountability are determined not by actions, but by reactions; not by intuition, but by methodology”¹¹.

The production and interpretation of these new scientific images of emotion resonated with and mediated broader historical, epistemological and cultural transformations of the late 19th and early 20th centuries. The latter include the predominance of the graphic method, the emergence of modern forms of knowledge, and in particular, changing definitions of objectivity and of the ‘image’ of objectivity. It also takes into account the modern appropriation of subjectivity, and the shifting representation of the body from a spiritualised Victorian to an emotionalised modern, and the shifting boundaries between art

and science within the broad frame of a late 19th-century evidential paradigm.¹²

Three basic techniques enabled the scientific rendering of emotional experience into visual images:

- > monitoring the body during emotion
- > sampling from the body during emotion
- > examining the 'post-emotional' body

Within this science, all the corporeal elements mapped themselves onto visual representations, including graphs, diagrams and charts, as emotional experience in its pure form. Once the somatic interventions were concluded, the technology disappeared and blood pressures, changing blood glucose levels and the undulating measures of blood lymphocytes revealed emotion as information. These representations relied on the creation of a new mode of seeing and a new language to support the visual data. Simultaneously, there was a reliance on familiar language of emotions and familiar emotional phenomena, such as the blush. Older signs were thus re-signified into new interpretative parameters. The patterns that had earlier indicated completely different processes came to be seen as representing emotion. For instance, the same physiological pattern of white blood cells that signified 'infection' could now be read as 'excitement'; cardiac sounds that signified valvular disease could now be read as 'apprehension'...¹³

While the experiments conducted through these "soul machines" configured themselves as raw scientific data, they also revealed a lot about contextual racial and administrative insecurities, and their status as cultural narratives. The Chinese were found to be more intellectually efficient than their Western counterparts; women more emotional than men; blacks more emotional than whites, etc.

Michel Foucault's work has shown how the desire to fix truth in objective and universally rational systems of thought, such as law, medicine and social sciences, extends the power of knowledge over the self. Lie-detection technologies were similarly providing the way for a new articulation of the self through technologies of visual representations. Private, machine-mediated dialogues with/of the self were now on public display, and transcriptions of subjectivity, thus materialised, promoted these narratives of the mind – the struggles between will and emotion; the self as an active and ontologically existing agent; and the mind as a space into which emotions intruded.

The experiments, which encased the subject in a system of knowledge, sanctioned a new form of public confession: not in the church or the clinic,



but in the laboratory or the public sphere. As stated by Foucault: “The examination that places individuals in a field of surveillance also situates them in a fixed network of writing; it engages them in a whole mass of documents that capture and fix them”¹⁴.

In addition, the lie detector also intervened in the domain of moral life by promising to improve and substantially change the power and utility of ethics. William Marston, comic-book author, writer of essays in popular psychology, and creator of the systolic blood-pressure test used to detect deception, which became a key component of the modern polygraph, remarked poetically in 1938 that in the Garden of Eden, “God’s method was wholly scientific. He observed the suspects’ behaviour and reasoned logically that this behaviour was an outward, visible expression of hidden emotions and ideas of guilt that the man and woman were attempting to conceal. This was the true principle of lie detecting”¹⁵.

In some senses, the subjectivity that is produced by the lie detector is the verbal equivalent of the panopticon – the idea of a certain will to truth as a result of being watched and scrutinised by technologies of truth-telling. As philosopher Ian Hacking has reminded us, the emergence of modes of classifications produces new ways of thinking of the self, identity and memory.¹⁶ This creates a looping effect, a form of labelling that has consequences for selfhood. As persons come to behave in accordance with the category, so the category changes.

The genesis of lie-detection technologies, as of other forensic technologies, was embedded in the world of public culture and popular science, particularly 19th-century detective fiction, in which the depiction of criminalistics blurred the divisions between literature and science. Arthur Conan Doyle’s character Sherlock Holmes was a classic figure in this regard. The law-enforcement machine, the detective (literary hero) and the scientific discipline were all embedded in the same configuration of cultural needs and anxieties. As a technology, the lie detector had to be legitimised in science and popular culture long before it was accepted in courts of law.¹⁷ In 1923, William Münsterberg tried admitting the results of a polygraph test as admissible evidence in a court of law, but it was refused. A disappointed Münsterberg noted: “...it therefore seems necessary not to rely simply on the technical statements of scholarly treatises, but to carry the discussion in the most popular form possible before the wider tribunal of the general reader...”¹⁸

According to Melissa Littlefield, the technology also relied on a mode of performance: “the meeting of the Latourian laboratory and the Foucauldian examination” in an acutely “ritualised” domain that contained “the ceremony of power, the form of the experiment, the deployment of



force and the establishment of truth". In this context, as claimed by Latour, "reality cannot be used to explain why a statement becomes a fact, since it is only after it has become a fact that the effect of reality is obtained..."¹⁹

Each development in the field has attempted to legitimise itself by proving the preceding one to be a pseudo science. Thus the movement from the polygraph to telepathic energy; and the current pride of place goes to advanced 'scientific' brain mapping or brain fingerprinting technology.

In *The Truth Machine* (1996), novelist James Halperin predicted that an altruistic child prodigy would design a foolproof and widely deployable lie detector by 2024. The Armstrong Cerebral Image Processor (ACIP) will be based on a "combination of physiologically enhanced MRI (magnetic resonance imaging) and cerebral image reconstruction". This "Truth Machine" would be a far cry, technologically speaking, from traditional polygraphs that detect deception by monitoring various physiological processes (including heart rate, blood pressure and respiration) and equating changes in these processes to emotional stress and therefore deception.

This futuristic projection has come true in the contemporary, via the development of brain-mapping technologies. Instead of relying on changes in autonomic function and their inferred emotional correlates, this method uses both MRI and brain fingerprinting to measure activity in the brain, the organ that is *actually* doing the lying. Rather than moving beyond the mind-body divide, brain mapping mirrors contemporary neurophysiology, which feminist scientist Elizabeth Wilson alleges "rescues only the central nervous system from Cartesianism; the rest of the body is readily abandoned to brute, non-cognitive mechanisation"²⁰.

In the 1940s and '50s, the portable lie detector was used to screen 'security risks' to the US, and included Senator Eugene McCarthy's attempts at screening those suspected to be 'anti-national', particularly Communist sympathisers and homosexuals. The latest lie detection technology is predictably being mobilised in the name of the global war against terror. But the latest technology is also being mobilised as something that is finally 'trustworthy', and predictably also sets out to prove the pseudo-science of earlier technologies such as the polygraph.

Lawrence Farwell, the inventor of brain-mapping technologies, argues that that brain fingerprinting has nothing to do with lie detection. His claim is that a person's brain responds unconsciously to sounds, images or words that it recognises. Since this takes place at the unconscious level, a person cannot control any response to a stimulus, and hence the technology cannot be manipulated in the way a polygraph test might be. Littlefield, however, argues that despite these claims of difference, both polygraphy and brain-based techniques share crucial aspects. Polygraphy assumes a correspondence between physiology and emotion, while brain-based techniques rely on the localist assumption that the brain behaves mechanistically; that there is a one-to-one mapping between human thinking and the computation of a machine.

In other words, brain fingerprinting enables scientific access to unseen information 'stored' in a subject's brain.

According to a 2001 statement by Seattle-based Brain Fingerprinting Laboratories,²¹ the technology can be utilised to:

- > aid in the determination of who has participated in terrorist acts, directly or indirectly
- > aid in identifying trained terrorists with the potential to commit future terrorist acts, even if they are in a 'sleeper' cell and have not been active for years
- > help to identify people who have knowledge/training in banking, finance or communications, and who are associated with terrorist teams/acts
- > help to determine which individual is in a leadership role within a terrorist organisation

Farwell states that that a trained terrorist posing as an innocent Afghani student *will* have information regarding terrorist training, procedures, contacts, operations and plans stored in his brain; the technology of brain fingerprinting can detect the presence or absence of this information, and thus distinguish the terrorist from the innocent person.

This statement indicates a significant shift in focus – i.e., brain fingerprinting tests no longer merely *detect knowledge*; they *assess activity*, and even *potential* actions. The move from latent to active knowledge is, in part, fuelled by our post-9/11 'risk society'.²² Farwell's technique not only describes knowledges, intentions and activities, but also helps to produce and name them by redefining terrorism as perpetually latent, as physiologically measurable.

The ability to distinguish between knowledges becomes a crucial element in the war on terrorism, not because knowledge is a new hazard in and of itself, but because it is a new – and ostensibly productive – risk indicator.

This is illustrated in parallel rhetoric by state forensic expert Dr M. S. Rao:

The human brain stores all information acquired through experience as well as other forms of learning. Knowledge of crime perpetuated by the individual is also stored in the brain of the perpetrator. Though the perpetrator usually denies his involvement in the crime, he is aware of his action of participation in the act. By presenting appropriate probes, the awareness about the experience can be activated. This activation gets reflected in the electrical oscillation in the brain. The oscillation associated with the retrieved awareness of the experience may be considered as a signature of the experience in the brain. There would be no such associated response or signature if the person has not committed the act in question and hence does not have experiential knowledge of the act, as the individual under investigation has not in reality participated in the crime in the act under investigation. The presence of electrical activation of specific changes in electrical oscillation patterns of the brain, in this context, indicates the presence of experiential knowledge in a person about a crime or incident under investigation.²³

Moreover, in his keynote address at the Forensic Science Forum at the National Police Academy, Dr Rao stated:

This technique of using electromagnetic radiation can control the mind of the suicide bomber and make him leave his target place silently without making any effort to explode the bomb at the given area. We don't have this technique available right now. We have to adopt the technology. It will show the effect on the brain. Nowadays, suicide attacks by terrorist outfits demand innovative planning and rethinking on forensic research. A suicide bomber has to be tackled properly by detecting explosives from safe, stand-off distances...²⁴

Francis Galton, who helped bring fingerprinting from colonial India to Scotland Yard in 1901, argued that these ridged markings are unique indicators of an individual's identity, which neither fade nor change over time. Similarly, Farwell's premise is that each brain contains unique information that is attached to different memories; thus, the term "brain fingerprinting" implies that each brain represents a unique map of life experiences – including any crimes or wrongdoings committed.²⁵

Brain-based detection promises to quantify and more accurately record the secret interiority and intentionality of individuals by bypassing the body. Littlefield argues that this mode "abandons the autonomic body of traditional polygraphy to focus only on brain-as-mind, or the 'biological mind' – a hybrid of physiology and psychology, a mass of quantifiable data, a fleshy and obliging organ that is compatible with techniques of scientific measurement; it is the final fragment of matter between science and subjectivity. In other words, brain-based detection has shifted the site of access to consciousness without re-evaluating the body-mind-brain hierarchy"²⁶.

Moreover, there was a distinct difference between the 1920s when popular discourse was created around the lie detector, and the contemporary cultural response to 'truth-enabling' technologies. Today the performative space of the laboratory extends via the media, and *everyone* is an expert at decoding the results. The perfect ally of the lie detector is global media – the greatest lie-producing machine that produces a regime of 'truth' from which there is little escape.

Roland Barthes' 1957 essay "The Brain of Einstein"²⁷ meditates on how the great scientist's brain became a focus of fetishistic display and marvel after his death – on the one hand, it had once been the repository of a most brilliant mind; and on the other, it was simply organic material the size of a walnut. Einstein's brain was a *mythic* object, a machine of genius, symbolising the power of thought and embodying the most contradictory dreams; Einstein was simultaneously magician and machine, eternal researcher and unfulfilled discoverer...

Einstein's brain subscribes to all the conditions of myth, which is indifferent to contradictions as long as it is able to establish a mode of euphoric security. Unleashing the best and the worst, brain and conscience, this mythic object reconciles the infinite power of man over nature with the fatality of the sacrosanct, which man cannot yet do without...

Lie detection is a similarly mythic and ambivalent enterprise, a manifestation of apparently contradictory notions such as science and magic, freedom and coercion – all of which remain in blissful support of the ‘euphoric security’ that it provides.

Editors' Note

This text is an edited transcript of a presentation made the author at ‘Sensor-Census-Censor: Investigating Regimes of Information, Registering Changes of State’, an international colloquium on information, society, history and politics, held at Sarai from 30 November – 2 December 2006. The colloquium was organised by the initiative Towards A Culture Of Open Networks (Sarai-CSDS, Delhi; Waag Society, Amsterdam; t0, Vienna), and supported by the EU-India Economic and Cross-Cultural Programme under its Media, Communication and Culture dimension.

Notes

1. The year 2006 witnessed the flourishing of lie-detection technologies in India, and almost every accused in cases from stamp-paper scams to terrorist attacks were subject to the deadly threesome of the polygraph, narco-analysis and brain mapping.
2. The Centre for DNA Fingerprinting and Diagnostics at the National Academy of Legal and Juridical Sciences in Hyderabad have proposed a DNA profiling bill, providing for an interface between law and forensic science.
3. Keynote address given to the 93rd Indian Science Congress. See <http://mindjustice.org/india2-06.htm>
4. Melissa Monique Littlefield. “Technologies of Truth: The Embodiment of Deception Detection”. Doctoral dissertation, p. 3, Pennsylvania State University (2005). My argument in this essay relies on the excellent work done in this area by scholars Melissa Littlefield, Geoffrey Bunn and Tal Golan.
5. Summarised in Ramchandra Ram Reddy v. State of Maharashtra, MANU/MH/0067/2004. See also Supriya Rai, “Narcoanalysis Tests and Constitutional Imperatives”, http://symlaw.ac.in/doc/supriya_rai.pdf
6. See Para 18 of Ramchandra Ram Reddy v. State of Maharashtra, op. cit.
7. Geoffrey Bunn. “The Hazards of the Will to Truth”. Doctoral dissertation, York University (1997).
8. Ibid., p. 30.
9. Ibid., p. 69.
10. Ian Hacking. *The Taming for Chance* (Cambridge University Press, 1990, Cambridge).
11. Melissa Littlefield, op. cit., p. 3.
12. Tal Golan. *Laws of Man and Laws of Nature: A History of Scientific Expert Testimony in England and America* (Harvard University Press, 2004, Cambridge).
13. Otnel Dror. “The Scientific Images of Emotion: Experience and Technologies of Inscription”. In *Configurations* 7(3), pp. 35-41 (1999).
14. Michel Foucault. *Discipline and Punish: The Birth of the Prison*. Trans. Alan Sheridan (Vintage Books Inc., 1995, New York).
15. William Marston. “The Lie Detector Test”. Quoted in Geoffrey Bunn, op. cit., p. 192.
16. See for instance Ian Hacking, *Rewriting the Soul* (Princeton University. Press, 1998, Princeton).

17. Ronald Thomas. *Detective Fiction and the Rise of Forensic Science* (Cambridge University Press, 1999, Cambridge).
18. Quoted in Melissa Littlefield, op. cit., p. 39.
19. Ibid., p. 75.
20. Elizabeth Wilson. *Neural Geographies*. Quoted in Melissa Littlefield, op. cit., p. 159.
21. See Report of Brain Fingerprinting Laboratories, available at:
<http://www.brainwavescience.com/ExecutiveSummary.php>
22. To describe the emergence of lie-detection technologies in the contemporary, Littlefield invokes Ulrich Beck's idea of a risk society as one that creates, defines (through various scientific media) and works to mitigate various hazards in a perpetual cycle that ultimately maintains risk production by affirming "the scientific monopoly on rationalisation".
23. <http://mindjustice.org/india2-06.htm>
24. <http://mindjustice.org/raokeynote.htm>
25. Simon Cole. *Suspect Identities: A History of Fingerprinting and Criminal Identification* (Harvard University Press, 2001, Cambridge).
26. Melissa Littlefield, op. cit., p. 175.
27. Roland Barthes. *Mythologies* (Noonday Press, 1957, New York).