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## MINDBOARDING

### *Is brain scanning the new polygraph?*

*By Julius (Jay) Wachtel.* Hey, Dick Tracy: don't knock yourself out pounding the pavement! There's a far easier way to solve a whodunit. Have a suspect put on a helmet full of electrodes. Then show him a series of photos, including some neutral pictures and some of the crime scene. Looking at the photos will stimulate brain activity, sending electrical signals through the helmet to an EEG machine. You'll wind up with an electroencephalogram, a chart that identifies the precise regions of the brain that the images stimulated.

Now look closely: if "experiential" areas of the brain "light up" for the crime scene photos, but not for the others, you've got your man. Hook him, book him and reward yourself with a trip to Winchell's! If not, move on to the next chump.

According to an emerging technology known as BEOS, for "Brain Electrical Oscillations Signature," there are places in the brain that store memories of events that one actively *experienced*, not just passively observed. Proponents claim that's what makes it possible to distinguish between a killer and someone who merely discovered a body. Peddled in the U.S. by companies including [No Lie MRI](#) and [Cephos](#) for use in everything from commercial disputes to intelligence, the technology supposedly far surpasses polygraphy in accuracy. In fact, it was recently used by prosecutors as evidence in a [murder case](#) in Mumbai, India. To clear herself, a woman charged of poisoning her husband volunteered for a BEOS test. It wasn't a wise choice -- the test said she did it. Oopsie!

No Lie and Cephos aren't alone. A competing technology known as [Brain Fingerprinting](#) also gauges the brain's electrical reaction to visual and aural stimuli, but in a fundamentally different way. Developed by neuroscientist Larry Farwell, it relies on a well-established neurological phenomenon, the so-called "P300 wave," an involuntary electrical impulse that our brains generate whenever we recognize (have an existing memory of) something, be it an object or a piece of information.

For example, tell a suspect that they're about to see a picture of the murder weapon, but don't say what it is. Strap on the helmet (on them, not you) and run a series of slides, say, a gun, a knife, a baseball bat, and what was actually used, Auntie's embroidery needle. If he emits a P300 wave when the needle comes up, and *only* when it comes up, have a scrumptious jelly-filled gut buster on us! If not, move on. To his credit, Farwell readily admits that the process has limitations; it won't

work, for example, if word of the needle got out to the public, since everyone would then react to its image. But he claims that when investigators come up with something only the real perp knows, the technology is virtually foolproof.

Alas, neither BEOS nor Brain Fingerprinting have made it into the judicial mainstream. (Brain Fingerprinting claims otherwise, but the episodes cited in its website hardly set a precedent.) According to the landmark [Frye](#) decision, before expert scientific testimony can come into court its validity must be widely acknowledged. But the kingdom of the nerds remains highly skeptical. As J. Peter Rosenfeld, a pioneer of using brain waves in lie detection [points out](#), there's a lack of peer review and replication, the sine qua non of scientific acceptance. Other neuroscientists feel likewise. "Well, the experts all agree," says Michael Gazzaniga, director of a UCSB mind-research center, referring to BEOS. "This work is shaky at best."

Unlike the [polygraph](#), which records physiological changes supposedly brought on by the stress of lying, neither BEOS nor Brain Fingerprinting directly measure deception. They're also far more passive, as no interaction is required between tester and subject. Keeping the two apart prevents contaminating the results, but it also means that EEG technicians won't get what polygraphers really aim for. It's the lie detector's dirty little secret that its real worth isn't in the squiggles it produces -- the [National Academy of Sciences](#) considers those close to worthless -- but on the incriminating statements, admissions and full-blown, tearful confessions that scared, stressed-out subjects occasionally make while in the chair.

But it's not just about ends -- *means* are also important. The privacy and liberty implications of brain-wave technology are (pardon the pun) mind-boggling. Just to mention one issue, polygraph subjects are free to clarify and challenge each question before answering. In contrast, EEG screening is purely passive, allowing sneaky administrators to venture into areas far afield of their manifest purpose without the test subject realizing or having a realistic opportunity to refuse.

What's more, we might not even know that we're being checked out. [Technology now in development](#) allows the remote detection of "anxious" people. FAST, an acronym for "Future Attribute Scanning Technology" (how's that for an Orwellian nightmare) uses cameras and sensors to screen passers-by for hostile thoughts and intentions, assessing characteristics such as facial expressions and pulse rate. Imagine the false positives that a gaggle of ACLU lawyers would produce!

Well, we've got a label for these precious new techniques: *Mindboarding*. Feel free to use it, but be sure to say that you saw it first on [PoliceIssues.com](#)!