Scientific Consensus and Expert Testimony: Lessons from the Judas Priest Trial

Can a subliminal message induce someone to commit suicide? This was the central question at the Judas Priest trial.

TIMOTHY E. MOORE

The face of Jesus was "discovered" in a forkful of spaghetti in a Pizza Hut billboard advertisement in DeKalb County, Georgia, in May of 1991. Joyce Simpson said she was debating whether to quit her church choir as she was leaving a gas station when she felt compelled to look up. "And I saw Christ's face," she said (Guevara-Castro and Viele 1991). Subsequently, dozens of motorists claimed to have seen Jesus shrouded in spaghetti and tomato sauce on the chain's billboard. God works in mysterious ways, but this tactic seems unnecessarily convoluted. On the other hand, compared to being abducted by aliens, seeing a face in a blob of spaghetti is small potatoes.

Sometimes perceptual illusions or faulty reasoning can have more pernicious consequences. For example, in 1986 a

Philadelphia jury awarded a woman more than $900,000 in damages because she claimed her psychic powers had been damaged during a CAT scan conducted at Temple University Medical School (*New York Times*, March 29, 1986). Her complaint was supported by the "expert" testimony of a doctor. Unfounded fears are not unusual, but when they are accorded further esteem by a credulous judge or jury we risk surrender to the irrational. What the courts take seriously is believed to *be* serious by the common citizen. While science can supposedly provide some protection against litigious foolishness, sometimes science itself seems to be part of the problem.

How do scientific beliefs influence courtroom deliberations? More specifically, what happens to an extraordinary claim when it plays a pivotal role in a high-stakes criminal trial? Within the scientific community there are accepted methods and procedures for establishing the truth or falsity of an extravagant claim (Gardner 1981), but the courtroom is a different kind of forum. It is adversarial in nature. What happens to scientific consensus in court, especially if scientific information is distorted, misrepresented, or perhaps not science at all? Peter Huber has described what he calls "junk science" (Huber 1991), and according to Huber junk science may (and often *does*) wreak havoc with scientific integrity and with justice.

Cover of Judas Priest's 1978 album *Stained Class*. (Cover design: R. Szaybo. Photography: R. Kass.)

This article explores the issue of junk science in the context of a specific trial—the Judas Priest trial that unfolded in Reno, Nevada, in the summer of 1990. Two teenage boys, James Vance and Ray Belknap, had attempted suicide. At the time of the shootings, Belknap died instantly. Vance was severely injured but he lived, only to die of drug complications three years later. The plaintiffs (the boys' parents) alleged that subliminal messages hidden in the heavy metal rock music that Vance and Belknap listened to contributed to their suicidal impulse. This trial is interesting for a number of reasons. First, it provides a classic example of junk science. Second, the trial established a legal precedent that has already influenced the ruling in a similar subsequent suit. Third, it provides a good forum for illustrating some important and often misunderstood aspects of subliminal perception.

Judas Priest was a British heavy metal rock band—one of the first of that genre. Their popularity peaked in the mid-70s. The album in question (*Stained Class*) was produced in 1978; the shootings took place in December 1985. It was alleged that a particular subliminal phrase in one of their songs ("Better by You Better Than Me") on the album triggered a suicidal impulse. The phrase at issue was "Do It." In isolation, this phrase has little meaning unless there is some antecedent to which the "It" refers. Moreover, the antecedent could not have been anything that was audible on the record (or visible on the album cover), because such material would have been protected by the First Amendment. Consequently the plaintiffs were in the difficult position of having to acknowledge that the boys were suicidal to begin with, and that the subliminal phrase "Do It" triggered the already existing disposition.

First Amendment Protection and the Denial of Summary Judgment

The defendants denied any and all knowledge of subliminal messages, and they denied having engaged in any tricks or mischief during production of the record. Nevertheless, the case went to trial. The defense was unsuccessful in arguing that any and all speech (including subliminal speech) should enjoy First Amendment protection. In a pre-trial motion, Justice Jerry Carr Whitehead ruled that subliminal speech does *not* deserve protection because it does not perform any of the functions that free speech accomplishes. Since the recipient of a subliminal message is unaware of it, the message can't contribute to dialogue, the pursuit of truth, the marketplace of ideas, or personal autonomy. There is no information exchange. No arguments are possible if recipients are unaware of the message's presence. People also have a right, the judge added, to be free from unwanted speech. Since subliminal materials cannot be avoided, they constitute an invasion of privacy. For all these reasons, subliminals were not afforded First Amendment protection (*Vance v. Judas Priest* 1989b). This ruling makes logical sense *if* a subliminal message *could* have the power attributed to it by the plaintiffs. The plaintiffs thus achieved a major victory in getting the case to trial in the first place.

Timothy E. Moore is in the Psychology Department, Glendon College, York University, 2275 Bayview Ave., Toronto, Ont. M4N 3M6. E-mail: timmoore@erda.glendon.yorku.ca.

While First Amendment protection has never been absolute, the exceptions have been narrow and carefully limited. Speech that is obscene, libelous, or an incitement to lawlessness is not protected by the First Amendment. Justice Whitehead's ruling provided another exception—subliminal speech. We may not have seen the last of trials concerning allegations about subliminal influences (Dee 1994). A few months after Judas Priest's acquittal, Michael Waller, the son of a Georgia minister, shot himself in the head while listening to Ozzy Osbourne's record *Suicide Solution*. His parents claimed that subliminal messages may have influenced his actions. The judge in that trial granted the summary judgment because the plaintiffs could not show that there was any subliminal material on the record. He noted, however, that if the plaintiffs had shown that subliminal content was present, the messages would *not* have received protection under the First Amendment because subliminal messages are, in principle, false, misleading or extremely limited in their social value (*Waller v. Osbourne* 1991). Justice Whitehead's ruling in the Judas Priest trial was cited to support his position.

Liability 'Science'

If a car accident causes severe injury or death, it may be more appealing and more comforting to the driver if the cause of the accident can be attributed to a mechanical defect rather than to operator error. It may also be more appealing and more lucrative to lawyers interested in liability. Liability science often assumes that every ill has a distant cause—often a technological cause. Food additives, environmental toxins, and mechanical defects have all been alleged culprits in liability suits within the last two decades. The Judas Priest suit was a product liability case. An allegedly defective product was placed on the market and it caused harm. According to Timothy Post, one of the plaintiffs' lawyers, the subliminal message triggered the suicides. The defense denied placing any subliminal messages, and further contended that subliminal stimuli are not capable of compelling any behaviors, let alone suicidal ones.

One of the threats to scientific integrity mentioned by Huber (1991) has to do with abandoning the usual scientific meaning of the term *causality*. From a scientific perspective, we typically want to understand a phenomenon by discovering all the causal factors that contribute to it. According to Huber, however, liability science has its own rules. Liability science likes to simplify matters. A specific potential cause is selected and other contributing factors are ignored. It is assumed that no other variables were operating except the one of interest. The standard scientific approach is abandoned. Multiple risks are disregarded—especially obvious, ubiquitous, taken-for-granted risks—and all attention is focused on remote and (perhaps) implausible causes that implicate negligence on the part of someone else.

There was some evidence of this approach—the tendency to subvert the meaning of causality—at the Judas Priest trial. In his final ruling, the judge explicitly stated "the deceased and their parents are not on trial. The court is not to judge the lives of the decedents or evaluate their families." (*Vance v. Judas Priest* 1990, 2–3). The plaintiffs were obliged, however, to acknowledge some degree of risk, otherwise the "Do It's" would have been meaningless. What were some of these risk factors? According to the clinical psychologist who testified for the defense, both boys had serious, long-term adjustment problems. Both were violent and abusive in their relationships. They felt socially alienated; they were emotionally distressed, often depressed, and impulsive. Vance once broke another student's jaw in a fight at school. Both had a history of drug abuse, petty crime, school failure, and unemployment. Family backgrounds were violent and punitive. Belknap had attempted suicide before and had expressed suicidal intentions. Just prior to the shootings, Belknap gave out some of his Christmas presents early and indicated a desire for his sister to name her baby after him if anything happened to him. Most of these factors were mentioned by the judge in his final ruling. They were included "reluctantly" to show that the deceased were at high suicide risk (see Litman and Farberow 1994). Was this a reasoned departure from the "subverted causality" that often typifies liability cases? Who can say? The concession may simply have been an artifact of the logical necessity for the plaintiffs to recognize the high-risk status of the boys. At any rate, multiple causes *were* recognized, albeit somewhat grudgingly. The judge stated that "[t]here exist other factors which explain the conduct of the deceased independent of the subliminal stimuli. . . . [t]he deceased had propensities which made them a high suicide risk" (*Vance v. Judas Priest* 1990, 31–32).

The Plaintiffs' Experts

The pursuit of isolated, distant, and mysterious causes for various mishaps sometimes results in a search for distant and mysterious experts. Experts are invited to provide support for the contentious claim. When courts are tolerant of a subverted sense of the meaning of causality, they may also be tolerant of fringe experts. There were several at this trial. One of them was Wilson Key. He is the man who pretty much single-handedly popularized the myth of subliminal advertising. He sees subliminal conspiracies everywhere (Key 1973, 1976, 1980, 1989), so it was not surprising that he was present to support the plaintiffs' claims. While Key provided extensive pre-trial testimony, his contribution to the actual trial was negligible. It is possible that he undermined his own credibility with the court by opining that subliminal messages could be found on Ritz crackers, the Sistine Chapel, Sears catalogues, and the NBC evening news. He also asserted that "science is pretty much what you can get away with at any point in time."

The most influential expert to testify for the plaintiffs was Howard Shevrin, whose credentials were unassailable. He has conducted research on subliminal influences for over twenty years and has a respectable track record of publications in peer-reviewed books and journals (e.g., Shevrin 1988). Shevrin's argument was that subliminal commands are especially potent because the recipient is unaware of their source and attributes the directive or the imperative to himself—to his own inner motivational state. While there is a certain logic to this, Shevrin was hard-pressed to describe any research that supported his

opinion. The argument also presupposes that a command or directive is *inherently compelling*—that because it is an imperative in a linguistic or syntactic sense, it compels compliance in a psychological sense. According to Shevrin, when we consciously experience a command, we can ignore or comply with commands as we see fit, but if the command is subliminal, it may become part of our ongoing stream of motives, feelings, and inner promptings. It can therefore add an increment to any current predisposition that may be present, such as suicide. The fallacy lies in assuming that an imperative message has some inherently motivating effect. His position also required the assumption that a suicidal disposition requires a trigger or precipitant in order to be acted on. This assumption does not square with the research literature on adolescent suicide (Maris 1981). Shevrin was nevertheless persuasive. He provided an apparently respectable conceptual framework for explaining how such a mysterious and almost magical force could operate.

The Defendants' Experts

Three experts were called by the defense: myself, Anthony Pratkanis (a professor of social psychology from the University of California at Santa Cruz), and Don Read (a cognitive psychologist from the University of Lethbridge). I testified about methodological and interpretational flaws in some specific investigations of subliminal auditory stimuli (e.g., Borgeat and Chaloult 1985; Borgeat, Elie, Chaloult, and Chabot 1985; Henley 1975) and about the dubious empirical foundation underlying psychodynamic constructs. It was my opinion that there was no scientific support for the proposition that subliminal directives could induce behaviors of any kind, let alone suicide. Pratkanis reiterated some of the main points of my testimony regarding the history of research on subliminal influence, and described a recently conducted experiment (since published) showing that subliminal self-help tapes were ineffective (Pratkanis, Eskenazi, and Greenwald 1994). He also expressed additional misgivings about the validity of the Borgeat studies—studies Shevrin had cited as supportive of his position. Pratkanis resisted the intimation by the plaintiffs' lawyers that scientific findings were not of an enduring nature—that what is known today may be abandoned and replaced by a new opinion tomorrow. Finally, Don Read provided an eloquent description of research on the comprehension and retention of reversed speech (see Vokey and Read 1985).

Scientific Opinion vs. Scientific Evidence

The judge may have been seduced by psychodynamics, but perhaps not entirely convinced. Although Shevrin was successful in helping obtain the exception to First Amendment protection, he did not prevail during the actual trial. The ruling about subliminal effects stated: "The scientific research presented does not establish that subliminal stimuli, even if perceived, may precipitate conduct of this magnitude. . . . [t]he strongest evidence presented at the trial showed no behavioral effects other than anxiety, distress or tension" (*Vance v. Judas Priest* 1990, 31). The judge's conclusion about subliminal effects is not too far from the consensus to be found among most cognitive psychologists. Well-established subliminal effects are rather modest in their magnitude and nature—semantic activation of single words under highly constrained conditions (see Holender 1986). To quote from a recent influential review: ". . . unconscious cognition is severely limited in its analytic capability" (Greenwald *1992, 775*).

At one point during pre-trial testimony, Bill Peterson (one of the defense counsels) asked Shevrin to describe the empirical basis for his opinion: "What experiments are you referring to when you say you're referring to a body of literature, experiments on which you base your conclusion that subliminal messages may be sufficient to induce suicidal behavior?"

"I'm basing my opinion, my expert judgment, on a corpus of literature, on hundreds of experiments," said Shevrin.

"Name one," said Mr. Peterson (*Vance v. Judas Priest* 1989a, 138-139).

Shevrin eventually alluded to three or four studies (e.g., Kupper and Gerard 1990; Silverman 1982; Smith, Spence, and Klein 1959)—none of which demonstrated anything remotely close to subliminal commands influencing motives. In fact, very few published studies have attempted to use subliminal directives, and those that have used them produced singularly uncompelling evidence for subliminal influences on intentionality (e.g., Zuckerman 1960; see Moore [1982] for commentary).

The argument also presupposes that a command or directive is *inherently compelling*—that because it is an imperative in a linguistic or syntactic sense, it compels compliance in a psychological sense.

Shevrin's position was supportive of the plaintiffs' claims. Moreover, if logically extended, it constitutes an endorsement of auditory subliminal self-help tapes. If Shevrin's position were valid, subliminal self-help tapes should be effective for a substantial number of people. Users are predisposed and some may even be preoccupied with changing their behavior in the direction of the affirmations on the tapes. Those messages should, therefore, according to Shevrin's logic, alter and increase the listeners' inner motives. There is ample evidence, however, that subliminal self-help tapes are therapeutically useless (Greenwald, Spangenberg, Pratkanis, and Eskenazi 1991; Merikle 1988; Merikle and Skanes 1992; Moore 1988; Pratkanis, Eskenazi, and Greenwald 1994; Russell, Rowe, and Smouse 1991).

While Shevrin's testimony may have been logical, it was not good science. The judge, to his credit, appears to have made a distinction between a scientific opinion based on personal conviction and the logic of psychodynamics, and one based on empirical support.

Pseudoscience

Up to this point, science has not fared badly. With respect to causality, the judge found that there were factors independent of the subliminal stimuli that made the decedents a high suicide risk. With respect to the scientific literature, he found that the research had not established that subliminal stimuli could have the sorts of effects postulated by the plaintiffs. There were other aspects of the case, however, in which scientific thinking fared less well. Pseudoscience sometimes plays a role in court because of dubious "experts" who are willing to attest to just about anything. In these situations, junk science appears in court because experts have been invited to educate the judge or jury. Another reason that junk science gets into court is because it *already resides* in court in the form of pre-existing beliefs about the phenomenon at issue.

With respect to the scientific literature, [the judge] found that the research had not established that subliminal stimuli could have the sorts of effects postulated by the plaintiffs.

The judge's beliefs about subliminal perception are reflected in his ruling that denied summary judgment and in his final judgment. In the latter he provided what he called a "history of subliminal stimuli." The title itself reveals some confusion. It is not the history of subliminal perception, nor the history of subliminal influences, but rather the history of subliminal stimuli. The difference is not irrelevant. Determining the subliminality of a stimulus requires some labor-intensive scientific analysis. The arbitrary and capricious use of the phrase "subliminal stimuli" by journalists (and some social scientists) has resulted in frequent reports of "subliminal" effects in the absence of any demonstration of subliminality.

What information formed the basis of the judge's beliefs about subliminal perception? The references contained in his history essay consisted of several articles or book chapters from law journals, written by lawyers. He also cited information obtained from: *Saturday Review, New York Times, Omni, Time, High Times,* and *TV Guide.* The law articles, plus many of the magazine articles, contain numerous references to James Vicary and Wilson Key. Key's expertise has already been described. Who was James Vicary? In September of 1957, James Vicary claimed to have conducted a study in Fort Lee, New Jersey, in which he projected the subliminal messages "Eat Popcorn" and "Drink Coke" onto a movie screen during movie showings to audiences (see Moore 1982; Pratkanis 1992; Rogers 1993). Initial press releases reported that over 45,000 people had been tested in this way and that on-site sales had increased dramatically. Five years later Vicary acknowledged that he had had only a small amount of data—too small to be meaningful. Soon after that he dropped out of sight completely. At best this so-called study was a shallow and meaningless empirical exercise. At worst, it was a complete fabrication (Rogers 1993). Media coverage was nevertheless heavy and continues to this day. Surveys have demonstrated that there is widespread belief in subliminal manipulation and that the techniques are "taught" in high school and college courses (Block and Vanden Bergh 1985; Synodinos 1988; Zanot, Pincus, and Lamp 1983).

Implicit, if not explicit, in both Vicary's alleged demonstration, as well as media descriptions of the phenomenon, is the assumption that invisible or inaudible stimuli are inevitably unconsciously perceived. Portions of the judge's ruling reflect this assumption. His historical review of subliminal stimuli is more a review of media coverage of the topic rather than a scientific history, let alone a recent scientific appraisal. This popular, simplified, and exaggerated notion of subliminal persuasion is reflected in some of the other rulings, and it is in these rulings that scientific truth fared less well. Here is what needed to be demonstrated by the plaintiffs:

1. An inaudible (but technically identifiable) "message" was physically present on the recording.
2. The message was deliberately placed there.
3. The message was subliminal.
4. The message contributed to the suicides.

As we have already seen, the judge rejected the fourth proposition, but what of the other three? The judge assumed that the technical presence of a "message" (item 1) was synonymous with its being subliminal (item 3). This assumption is the result of the mythological heritage of Vicary and all the media coverage since then. The judge's ruling stated that ". . . the 'Do It's' on the record were subliminal because they were only discernible after their location had been identified and after the sounds were isolated and amplified. The sounds would not be consciously discernible to the ordinary listener under normal listening conditions" (*Vance v. Judas Priest* 1990, 18). The problem is that sounds that are not consciously discernible are not necessarily unconsciously discernible either. Many stimuli are not consciously discernible because they fall outside the range of our sensory apparatus. Consequently they do not initiate *any* neurological activity—conscious *or* unconscious. The error consists of equating the physical presence of the signal with subliminality.

Physical Presence vs. Psychological Consequence

Empirical studies of subliminal perception indicate that, with rare exceptions, the phenomenon appears to be confined to a certain range of stimulus intensities (Cheesman and Merikle 1986). This range places the stimulus below a threshold of subjective or phenomenal awareness, but *above* an objective detection or discrimination threshold. In other words, subliminal perception is not perception in the absence of stimulus detection. It occurs when our introspective reports are at odds with or discrepant with objective measures of detection. It is not unusual for subjects to profess to be guessing or to claim ignorance of a stimulus' identity when they are nevertheless making use of stimulus information. What this means is that no amount of expensive hardware or analyses of the signal can tell us if a signal is subliminal. Subliminality can only be

determined by an analysis of the perceptual consequences of stimulation. Signal detection methods in which the human perceptual system is used as the measuring instrument might have provided a clearer picture of whether the recording in question actually contained a detectable message that could conceivably have influenced behavior (e.g., Merikle 1988; Moore 1995).

A physical analysis of the signal is not necessarily completely uninformative. Such an analysis could help determine the presence of a signal which might, after further analysis, turn out to be subliminal. The judge assumed that if an inaudible signal was present, that signal was therefore subliminal even though neither the plaintiffs nor the defense presented evidence establishing subliminality. It should be emphasized that even if subliminality had been established, it would not necessarily follow that the message would have the influence attributed to it by Shevrin. His claim, however, could have been obviated by the finding that the signal was not, in fact, subliminal.

Was the signal deliberately placed there? Who can say? The judge's opinion was that the signal at issue was simply a coincidental convergence of a guitar chord with an exhalation pattern. Under what circumstances could one confidently infer purposeful deception? Conceivably, the length and complexity of an inaudible signal might guide decisions about whether its placement was accidental or deliberate. Walt Disney Inc. was recently accused of inserting the "subliminal" directive "All good teenagers take off your clothes" into the animated family film *Aladdin*. At around the same time the letters S-E-X were alleged to have been surreptitiously embedded in a scene from *The Lion King* (*Globe & Mail*, Nov. 7, 1995). Walt Disney Inc. has emphatically denied attempting any kind of subliminal titillation.

In March of 1994, someone discovered that Jessica Rabbit had no underwear for a very short time during the animated movie *Who Framed Roger Rabbit?* (*Globe & Mail*, March 17, 1994). In this example, there were at least three offending frames—unnoticeable unless the tape is advanced frame by frame. Were they deliberately planted there for some nefarious reason, or were the artists just saving some ink or playing a practical joke? It's hard to know, but the physical presence of an uncovered Jessica tells us nothing about the perceptual or psychological consequences of her undressed state. It is probable that under normal viewing conditions the contents of the frames are completely and thoroughly masked by the subsequent material. In the absence of the appropriate tests, however, one cannot simply assert that stimuli are (or are not) subliminal. In none of these examples is it possible to know definitively if the signal or image was subliminal, nor if it was deliberately planted.

Perception is an active, constructive process. Consequently, people often see or hear what they are predisposed (or encouraged) to perceive (Vokey and Read 1985). A diligent search entailing the isolation and amplification of dozens of snippets from a three-minute heavy metal rock recording would probably yield some intelligible words or phrases that would not be intelligible under normal listening conditions. In fact, it would be surprising if a few such "discoveries" were not made. The fact that the signal in question on the *Stained Class* album was not contained on any particular track of the 24-track tape argues further against the possibility of deliberate chicanery.

Further Confusion

The two most credible witnesses testifying for the plaintiffs were, in the judge's opinion, Shevrin and Mrs. Rusk. Mrs. Rusk was a guidance counselor at Vance's school. Vance, the boy who survived the suicide attempt, was questioned about the circumstances of the shootings by Mrs. Rusk in the spring of 1986. Mrs. Rusk's testimony was that Vance said, "We got a message. It told us just Do It . . . It [the record] was giving us the message to just Do It." This statement reflects conscious awareness on Vance's part of the presence and nature of the "Do It" message. Recall that Shevrin's position was that the subliminal message "Do It" was influential precisely because it was subliminal. The boys were *unaware* of receiving the prompt from an external source and, therefore, misattributed its source or origin to their own inner motivation. These two pieces of testimony are logically contradictory. They cannot both be correct. If, as Shevrin claimed, the message was subliminal, the boys should have been oblivious to its presence and its meaning. It is the unconscious nature of the message which, according to Shevrin, affords it the exceptional influence he ascribed to it. On the other hand, if they could actually hear it, as Vance indicated to Mrs. Rusk, then the message was not, by definition, subliminal, and was thus (a) protected by the First Amendment, and (b) not especially influential. The judge seemed unaware of this logical conundrum: "This testimony [Mrs. Rusk's] gives support to the premise that both James and Raymond subliminally perceived 'Do It' from the record" (*Vance v. Judas Priest* 1990, 30). In fact, Mrs. Rusk's testimony *refutes* the notion that the signal was subliminal. Shevrin was well aware of this difficulty. When the plaintiffs' lawyers suggested to him that Mrs. Rusk's testimony supported the notion that the "message" had been retained in the boys' memories, he expressed concern that Mrs. Rusk may have been influenced by media reports, and/or that she was having trouble recalling what Vance had reported to her. Apparently, the plaintiffs' lawyers did not understand the logic of their own expert's testimony. At this point one wonders who was minding the store.

Defining 'Expertise'

At issue in this trial was the claim that a subliminal directive incited suicide. From a scientific perspective, this is an extraordinary and *prima facie* implausible proposition. There is not now, nor has there ever been, any reliable empirical evidence that subliminal stimulation can produce anything other than fairly brief and relatively inconsequential reactions. Further, there is no evidence whatsoever that subliminal directives can compel compliance, and no such evidence was presented at the trial. Perhaps with the help of the defendants' experts, the judge came to realize that subliminal directives do not have the influence attributed to them by the plaintiffs. A more thorough

grasp of the issue might have yielded a summary judgment, thereby precluding a long and expensive trial. By denying summary judgment, Justice Whitehead assumed the validity of the plaintiffs' central claim—namely, that subliminal messages can influence human motivation.

There have been numerous legal commentaries on the Judas Priest ruling. Most of the post-trial controversy has concerned the question of First Amendment protection for subliminal messages. If such surreptitious manipulation is ineffective, then First Amendment protection from it becomes moot. Judging from legal scholars' commentary on Justice Whitehead's rulings, his understanding of the scientific issues was no worse than the rest of the legal community's (cf. Blen 1992; Dee 1994; Locke 1991). Similar to the judge's description of subliminal stimulation, legal commentators' reviews contain copious references to Key, Vicary, and other nonscientists whose backgrounds are anything but scientific. Key's books constitute quintessential pseudoscience; they contain no citations, no references, and no documentation for any of his proclamations. While Key's testimony *per se* does not appear to have been of much significance at the trial, his extravagant and well-publicized claims had had twenty years to infiltrate the North American psyche (including the legal profession's), where scientific literacy is not a dominant feature (Burnham 1987).

In the final analysis, however, it was not the obvious pseudoscience that misled the court as much as the misleading opinions of the well-qualified expert—Shevrin. His views, while imaginative and logical, were anomalous with prevailing scientific understanding of the phenomenon at hand. A long résumé and a prestigious affiliation are no guarantee of a scientifically valid opinion. An expert whose testimony is unique, idiosyncratic, and unconfirmed by the broader scientific community is not educating the court in the way that *Frye v. United States* (1923) intended or that more recent rulings have encouraged (*Daubert v. Merrell Dow Pharmaceuticals* 1993; *R. v. Mohan* 1994). These recent rulings have emphasized the need for expert testimony to be reasonably well grounded in theories, methods, and procedures that have been accepted and validated by other scientists in the same field. It is not at all clear that Shevrin's testimony met this standard. It *is* clear, however, that the courts are generally ill-prepared to meet the challenge of evaluating the scientific validity of expert evidence (Miller, Rein, and Baily 1994), especially in the social sciences (Richardson, Ginsburg, Gatowski, and Dobbin 1995). A rigorous application of *Daubert*'s admissibility criteria might well disallow *any* testimony based on Freudian principles because of its inherently unfalsifiable nature (Crews 1995). The need for systematic judicial education on scientific principles is now a recognized priority. Eventually, improved scientific understanding will result in more equitable court rulings. In the meantime, as long as the legal community's scientific literacy skills are so little able to permit distinctions between sense and nonsense, the public will continue to be entertained by (and foot the bill for) trials like that of *Vance v. Judas Priest*.

References

Blen, B. 1992. To hear or not to hear: A legal analysis of subliminal communication technology in the arts. *Rutgers Law Review* 44: 871–921.

Block, M. P., and B. G. Vanden Bergh. 1985. Can you sell subliminal messages to consumers? *Journal of Advertising* 14: 59–62.

Borgeat, F., and L. Chaloult. 1985. A relaxation experiment using radio broadcasts. *Canada's Mental Health* 33: 11–13.

Borgeat, F., R. Elie, L. Chaloult, and R. Chabot. 1985. Psychophysiological responses to masked auditory stimuli. *Canadian Journal of Psychiatry* 30: 22–27.

Burnham, J. C. 1987. *How superstition won and science lost: Popularizing science and health in the United States.* New Brunswick, N.J.: Rutgers University Press.

Cheesman, J., and P. M. Merikle. 1986. Distinguishing conscious from unconscious perceptual processes. *Canadian Journal of Psychology* 40: 343–367.

Crews, F. 1995. *The memory wars: Freud's legacy in dispute.* New York: New York Review imprints.

Daubert v. Merrell Dow Pharmaceuticals, Inc. 1993. 113B S, Ct, 2786, 2792–93.

Dee, J. 1994. Subliminal lyrics in heavy metal music: More litigation anyone? *Communications and the Law* (September): 3–24.

Frye v. United States. 1923. 293 F. 1013 (D.C. Cir. 1923).

Gardner, M. 1981. *Science: Good, bad, and bogus.* Buffalo, N.Y.: Prometheus.

Globe & Mail. 1994. Who undressed Jessica Rabbit? March 17: E2.

Globe & Mail. 1995. Tracing the winding trails of Disney obscenity rumors. November 7: C5.

Greenwald, A. G. 1992. New look 3: Unconscious cognition reclaimed. *American Psychologist* 47: 766–779.

Greenwald, A. G., E. R. Spangenberg, A. R. Pratkanis, and J. Eskenazi. 1991. Double-blind tests of subliminal self-help audio tapes. *Psychological Science* 2: 119–122.

Guevara-Castro, L., and L. Viele. 1991. Dozens say they have seen Christ on a pizza chain billboard. *The Atlanta Journal/Constitution,* May 21: D1.

Henley, S. 1975. Cross-modal effects of subliminal verbal stimuli. *Scandinavian Journal of Psychology* 16: 30–36.

Holender, D. 1986. Semantic activation without conscious identification in dichotic listening, parafoveal vision, and visual masking: a survey and appraisal. *The Behavioral and Brain Sciences* 9: 1–23.

Huber, P. 1991. *Galileo's revenge: Junk science in the courtroom.* New York: Basic Books.

Key, W. B. 1973. *Subliminal seduction.* Englewood Cliffs, N.J.: Signet.

———. 1976. *Media sexploitation.* Englewood Cliffs, N.J.: Prentice-Hall.

———. 1980. *The clam-plate orgy.* Englewood Cliffs, N.J.: Prentice-Hall.

———. 1989. *The age of manipulation: The con in confidence, the sin in sincere.* Englewood Cliffs, N.J.: Prentice-Hall.

Kupper, D., and H. Gerard. 1990. Anaclitic depression and bulimia. Paper presented at the meeting of the Western Psychological Association, Los Angeles, CA. April.

Litman, R. E., and N. L. Farberow. 1994. Pop-rock music as precipitating cause in youth suicide. *Journal of Forensic Sciences* 39: 494–499.

Locke, E. L. 1991. The Vance decision: The future of subliminal communication. *Law and Psychology Review* 15: 375–394.

Maris, R. 1981. *Pathways to suicide: A survey of self-destructive behaviors.* Baltimore: Johns Hopkins University Press.

Merikle, P. M. 1988. Subliminal auditory tapes: An evaluation. *Psychology and Marketing* 46: 355–372.

Merikle, P. M., and H. Skanes. 1992. Subliminal self-help audio tapes: A search for placebo effects. *Journal of Applied Psychology* 77: 772–776.

Miller, P. S., B. W. Rein, and E. O. Bailey. 1994. *Daubert* and the need for judicial scientific literacy. *Judicature* 77: 254–260.

Moore, T. E. 1982. Subliminal advertising: What you see is what you get. *Journal of Marketing* 46: 38–47.

———. 1988. The case against subliminal manipulation. *Psychology and Marketing* 46: 297–316.

———. 1992. Subliminal perception: Facts and fallacies. SKEPTICAL INQUIRER 16: 273–281.

———. 1992. *Subliminal messages in recorded auditory tapes, and other 'unconscious learning' phenomena.* Leicester, England: British Psychological Society.

———. 1995. Subliminal self-help auditory tapes: An empirical test of perceptual consequences. *Canadian Journal of Behavioral Science* 27: 9–20.

Judas Priest continued on page 60

CD-ROM *from page 22*

creature's existence"; but the encyclopedia nonetheless mentions the discovery of "hundreds of alleged" footprints, visual signs, and photographs, and it quotes a Soviet scientist as saying the creature could be a Neanderthal man. Compton's gives a nine-word definition.

Creationism: *All* four CD-ROM encyclopedias have extensive sections on evolution, but the creationism debate has special characteristics. Grolier raises scientific issues, but then it gives no indication of why the Earth-created-in-six-days hypothesis is flawed or how evolution is misstated by the creationists. Britannica and Encarta bill the controversy as a religious-political debate, with Encarta comparing the Genesis accounts with "other Middle Eastern myths." Compton's simply states competing ideas.

Ghosts: With the exception of Grolier, all the encyclopedias talk about belief in ghosts with nary a hint of skepticism. Britannica gives a pseudoscientific description of hauntings, including "apparitions, the displacement of objects, or the appearance of strange lights"; only when you go to the section on poltergeists is there a suggestion that "in many instances, the activities attributed to poltergeists have been explained as natural phenomena." Encarta defines various types of ghosts. However, Grolier flatly states: "There is no scientifically accepted evidence of the existence of ghosts."

Graphology: The pseudoscientific idea that personality can be assessed by a person's handwriting gets its biggest boost from Encarta, which explains how "responsible graphologists" do their work and says that, although it "has still not been fully accepted as a branch of psychology," results from handwriting analysis "sometimes correspond impressively with experimental evidence." Britannica's entry is much shorter, but just as bad.

Homeopathy: Britannica's only criticism of this highly questionable medical system is that it focuses on the symptoms—but so does a lot of medicine. Grolier says it's "disdained" by most physicians. Encarta says it's "discounted" by most physicians. This suggests that doctors don't want to believe it, not that there's evidence for disbelief. Britannica's and Compton's installments are strikingly similar, as are Encarta's and Grolier's.

Loch Ness Monster: Grolier mentions that many purported photographs of the creature "have turned out to be inconclusive or outright hoaxes." Britannica says nothing about past hoaxes, cites some positive findings, and says the issue is "inconclusive." Encarta says the existence of the monster "has never been proven" and mentions no hoaxes.

Parapsychology, ESP, etc.: Grolier gives a good discussion of pros and cons, including information about allegations of fraud and shoddy experimental design. There's no information about tests of individual psychics. Britannica's discussion of the issue is downright snooty. It mentions inconclusive results, and it reasons, in effect, that because scientists are fighting about it so passionately, it remains unproven and the issue may still be an open one. Encarta's section on psychical research is infuriating. Although it notes how difficult it has been to replicate positive findings, it talks about "reputable psychics" and "persons with apparently outstanding ESP abilities." Compton's article is short and uninformative, saying that "most scientists vigorously dispute the existence of ESP" without explaining why.

UFOs: This is virtually the only pseudoscience topic where the encyclopedias offer good, sound scientific coverage. Ironically, the only product to fall down on the job is Grolier. Its article by David M. Jacobs gives little indication that the weight of the scientific evidence is against an extraterrestrial origin for UFO accounts. □

Judas Priest *from page 38*

New York Times. 1986. Woman wins $1 million in psychic power suit. March 29: 6.

Pratkanis, A. R. 1992. The cargo-cult science of subliminal persuasion. SKEPTICAL INQUIRER 16: 260–272.

Pratkanis, A. R., and A. G. Greenwald. 1988. Recent perspectives on unconscious processing: Still no marketing applications. *Psychology and Marketing* 5: 337–353.

Pratkanis, A. R., J. Eskenazi, and A. G. Greenwald. 1994. What you expect is what you believe (but not necessarily what you get): A test of the effectiveness of subliminal self-help audiotapes. *Basic and Applied Social Psychology* 15: 251–276.

R. v. Mohan. 1994. 89 C.C.C.(3d) 402 (S.C.C.).

Richardson, J. T., G. P. Ginsburg, S. Gatowski, and S. Dobbin. 1995. The problems of applying *Daubert* to psychological syndrome evidence. *Judicature* 79: 10–16.

Rogers, S. 1993. How a publicity blitz created the myth of subliminal advertising. *Public Relations Quarterly* (Winter 1992–1993).

Russell, T. G., W. Rowe, and A. Smouse. 1991. Subliminal self-help tapes and academic achievement: An evaluation. *Journal of Counseling and Development* 69: 359–362.

Shevrin, H. 1988. Unconscious conflict: A convergent psychodynamic and electrophysiological approach. In *Psychodynamics and Cognition*, edited by M. J. Horowitz. Chicago: University of Chicago Press.

Silverman, L. 1982. *The search for oneness*. New York: International Universities Press.

Smith, G. J. W., D. P. Spence, and G. S. Klein. 1959. Subliminal effects of verbal stimuli. *Journal of Abnormal Social Psychology* 59: 167–176.

Synodinos, N. E. 1988. Subliminal stimulation: What does the public think about it? *Current Issues and Research in Advertising* 11: 157–158.

Vance/Roberson v. CBS Inc./Judas Priest. 1989a. No. 86–5844 and 86–3939 (Washoe County, 2nd Judicial District Court of Nevada, motion for summary judgment, testimony of Howard Shevrin, June 2, 1989).

———. 1989b. No. 86–5844 and 86–3939 (Washoe County, 2nd Judicial District Court of Nevada, filed Aug. 23, 1989, order denying summary judgment).

———. 1990. No. 86–5844 and 86–3939 (Washoe County, 2nd Judicial District Court of Nevada, August 24, 1990).

Vokey, J. R., and J. D. Read. 1985. Subliminal messages: Between the devil and the media. *American Psychologist* 40: 1231–1239.

Waller v. Osbourne. 1991. 763 F. Supp. 1144, 1149 (M.D. Ga. 1991).

Zanot, E. J., D. Pincus, and E. J. Lamp. 1983. Public perceptions of subliminal advertising. *Journal of Advertising* 12: 37–45.

Zuckerman, M. 1960. The effects of subliminal and supraliminal suggestions on verbal productivity. *Journal of Abnormal and Social Personality* 60: 404–11.

Note

1. This paper is based, in part, on presentations at the annual conference of the Committee for the Scientific Investigation of Claims of the Paranormal, held in Seattle, Wash., June 25, 1994. (Symposium title: Influencing Beliefs in the Courtroom: Rules of Law, Expert Testimony, and Science), and at the Ontario Criminal Lawyers Association annual conference, Toronto, October 27, 1995 (Session title: Deceptive Research: Good Science/Bad Science). □