

equal in strength to natural variations previously seen in the microwave background across the entire sky. So either it (the microwave background) isn't coming from behind the clusters, which means the Big Bang is blown away, or ... there is something else going on. Maybe the clusters themselves are microwave emitting sources. But based on all that we know about radiation sources and halos around clusters, this kind of emission is not expected, and it would be implausible to suggest that several clusters could all emit microwaves at just the right frequency and intensity to match the cosmic background radiation.

The shadow effect is better known as the Sunyaev-Zel'dovich effect, or "S-Z effect" for short. Just over a year ago, published results of another study using WMAP data looked for evidence of "lensing" effects that should have been seen (but weren't) if the microwave background was a Big Bang remnant. So evidence continues to mount that the microwave radiation is a relatively local effect, such as Eddington's "temperature of space".

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Both of the above pieces were excerpted from Meta Research Bulletin 15:41-42 (2006).

"Stimulating Illusory Own-Body Perceptions" by Olaf Blanke, Stephanie Ortigue, Theodor Landis, and Margitta Seeck, *Nature*, 419, 2002, 269-270.

"Does the Arousal System Contribute to Near Death Experience?" by Kevin R. Nelson, Michelle Mattingly, Sherman A. Lee, and Frederick A. Schmitt. *Neurology*, 66, 2006, 1003-1009.

The first article, which has been widely reported in the lay press, described an epileptic patient in whom out-of-body experiences (OBEs) were repeatedly elicited by temporal lobe stimulation, confirming a similar report almost a half century ago by Canadian neurosurgeon Wilder Penfield. The authors of this paper demonstrated that an illusion of being out of the body could result from electrical stimulation of the right temporal lobe, and they speculated about the role of vestibular processing in the experience of feeling dissociated from the body.

Many of the lay accounts of this research, however, have made the unwarranted jump from this observation to the assumption that *spontaneous* out-of-body experiences must also be illusions due to temporal lobe activity. That is

a reasonable hypothesis, particularly in light of evidence linking spontaneous OBEs to absorption, hypnotizability, and dissociation, but it remains at this point an untested hypothesis.

On empirical grounds, the induced out-of-body sensations elicited by temporal lobe stimulation resemble spontaneous OBEs, but are not identical to them. For example, OBEs induced by electrical stimulation are accompanied (in Blanke's patient and in Penfield's) by vestibular and complex somatosensory responses, such as bizarre distortions of one's body image, which do not occur in spontaneous OBEs. On the other hand, OBEs induced by electrical stimulation do not include accurate perceptions of the environment from a spatial perspective distant from the body, which *are* reported in some spontaneous OBEs. Given the phenomenological differences (and the differences in psychological aftereffects for the experiencer), it is premature to assume that the mechanism of electrically induced OBEs also applies to spontaneous experiences.

Logical argument does not require that all OBEs be caused by temporal lobe activity just because some are. In Penfield's patient, electrical stimulation of the right temporal lobe also elicited the illusion of hearing an orchestra playing. However, we do not conclude that all sensations of hearing an orchestra are illusions due to temporal lobe activity; rather, we allow that some such sensations may be accurate perceptions of a real orchestra that exists outside the patient's brain. By the same reasoning, we cannot conclude, from the fact that electrical stimulation of the temporal lobe can induce OBE-like illusions, that *all* OBEs are illusions due to temporal lobe activity.

The second article, also widely reported in the lay press, suggested an association between near-death experiences (NDEs) and rapid eye movement (REM) intrusion—the intrusion into waking consciousness of mentation typical of REM sleep. The authors conducted a brief survey of an NDE group and a comparison group that asked four questions about symptoms of REM intrusion: visual or auditory hypnagogic or hypnopompic hallucinations (seeing or hearing things as you fall asleep or wake up), sleep paralysis (finding yourself partially awake but unable to move), and cataplexy (sudden buckling of the legs). Their hypothesis was creative, but it is premature to draw etiological conclusions from their correlational study.

Their NDE sample, drawn from volunteers who shared their NDE on the Internet, may be atypical of most NDE experiencers in their willingness to acknowledge unusual experiences publicly. Moreover, it is plausible that sleep paralysis questions imbedded for the NDE sample in an Internet survey of unusual experiences would elicit more positive responses than identical questions presented in face-to-face interviews to the control sample. Furthermore, the control group, "recruited from medical center personnel or their contacts," may have had reservations about endorsing hallucinations and related symptoms they would likely identify as pathological. This suspicion is bolstered

by the control group's endorsement rate of only 7% for hypnagogic hallucinations, about one-fourth of that in the general population.

Data arguing against the contribution of REM intrusion to NDE include many features, such as fear, typical in sleep paralysis but rare in NDE, and the occurrence of typical NDE under general anesthesia and other drugs that inhibit REM.

Finally, a correlation between REM intrusion and NDE would not establish that REM intrusion contributes to NDE. This study did not explore REM intrusion that had occurred prior to the NDE. It is equally plausible that NDE enhances subsequent REM intrusion. REM intrusion is increased in post-traumatic stress disorder (PTSD), and PTSD symptoms are increased following NDE. In light of these concerns, the association of REM intrusion and NDE is still speculative, and any causal role of REM intrusion in NDEs debatable.

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DVD REVIEW

The PEAR Proposition: Scientific Study of Consciousness-Related Physical Phenomena: A Quarter Century of Princeton Engineering Anomalies Research produced by Strip Mind Media, 2005. 2 DVD and 1 Audio CD multimedia set; approximately 520 minutes; \$50, plus \$12 shipping and handling, www.icrl.org/contributions.php

Robert Jahn, Brenda J. Dunne, and all who have been involved in the programs of Princeton Engineering Anomalies Research (PEAR) are to be commended for making the effort to provide the rest of us with an account of their work. In anticipation of the closing of their laboratory after its greater than 27-year career, Jahn and Dunne have collaborated with independent filmmaker Aaron Michels of Strip Mind Media to produce this comprehensive video tribute and retrospective. But this multimedia set (2 DVDs, 1 CD) is less about nostalgia and anecdote than it is about getting their message out to as many people as possible: PEAR needs people to pick up the torch and continue its lines of research. On this point, the set is a success. It is not for a night of popcorn and escape; it may not even merit the label of "edutainment." But it has many uses for the classroom, lab and conference and as a model for those who wish to pursue similar scientific research.

Since 1979, PEAR has been involved in three projects: 1) experiments in human-machine interaction; 2) experiments in remote perception and 3) the