ESP findings send controversial message

Psychologists who study telepathy rejoiced when a 1994 study in a major scientific journal supported the existence of extrasensory perception (ESP), also known as psi. Now, an analysis of other studies using the same rigorous technique as in the earlier work suggests that the celebration may have been premature.

Both believers and skeptics agree that the most stringent method for studying psi is the one dubbed the ganzfeld (German for whole field) procedure. In this technique, researchers remove sensory distractions with the aim of promoting telepathic communication between subjects, called senders and receivers.

In ganzfeld studies, a receiver who's unaware of participating in a psi experiment describes his or her thoughts for 30 minutes. In a separate room, a sender who can hear the receiver views a video or still photo. The sender tries to telepathically coach the receiver into imagining the same scene. Afterwards, the receiver chooses from a set of four images the one that most closely resembles his or her earlier thoughts.

In 1994, psychologist Daryl J. Bem of Cornell University and his colleague, the late Charles Honorton of the University of Edinburgh in Scotland, described surprising results from Honorton's series of 11 ganzfeld experiments. They found that more often than could be explained by chance, receivers chose the image that matched the one seen by senders (SN: 1/29/94, p. 68).

Mort Engel

Experiments remove sensory interference to investigate telepathic communication.

Now, psychologists Julie Milton of the University of Edinburgh and Richard Wiseman of the University of Hertfordshire in Hatfield, England, have pooled the results of 30 ganzfeld experiments using a statistical method called metanalysis. In the July PSYCHOLOGICAL BULLETIN, the same journal in which Bem and Honorton presented their results, the researchers report that their analysis shows no consistent evidence for psi.

"Although the new studies failed to replicate the effects of earlier studies, it is not clear why they did so," Milton says.

"This has been the history of parapsychology for about 150 years," remarks psychologist Ray Hyman of the University of Oregon in Eugene. "Procedures look good at the beginning, and then they fizzle out. Whether or not this is different is hard to say, but this metanalysis suggests that on the average it doesn't look like there's much going on."

The metanalysis has generated heated discussion among psychologists. Some argue that Milton and Wiseman were unjustified in lumping all 30 studies together because their results were so disparate. Milton contends that a standard statistical test of variation among the results showed that they could treat the studies as a uniform set.

Bem says, however, "The reason the effect isn't significant is that there are three studies that are pulling down the average, and those studies are very nonstandard." Further, 6 of the 30 studies showed significant psi effects—more than would be expected by chance, he adds.

Since the metanalysis was completed, nine more ganzfeld studies have been published. Milton acknowledges that the psi effect would be statistically significant if the analysis were updated to include these studies. However, she observes, a single study had an especially strong result, but no clear-cut effect spans the broad range of investigations. "That will be a crucial thing to demonstrate in order to make a strong claim that the studies show a genuine anomaly," she says.

"My hope is that some of the proponents of the ganzfeld procedure will try to use [the new report] as a springboard to develop something replicable," says psychologist Scott O. Lilienfeld of Emory University in Atlanta. "The ball is now in their court." —*S. Carpenter*

Gene-altered wood may yield more paper

It's not pulp fiction. Wood harvested from genetically engineered trees might make paper and some fuels easier and less costly to produce.

A team of researchers has genetically engineered aspens to reduce their content of lignin, a tough polymer that glues together the cells in trees and that the papermaking process must chemically extract. What's more, the engineered trees actually grow faster and have a higher proportion of cellulose, the raw material for paper, than normal aspens do.

Vincent L. Chiang of the Michigan Technological University in Houghton and his colleagues targeted a gene that the aspen uses in lignin biosynthesis. By blocking this gene with so-called antisense molecules (SN: 2/16/91, p. 108), the researchers cut lignin production in half.

The paper industry "spends a lot of time thinking about sustainability," says Kenneth Munson, director of forest research and biotechnology at the International Paper Co. in Dallas. "Anything that can be done to make lignin easier to extract or to have less of it to extract will have some very important implications" by lowering energy costs and the amount of chemicals used.

Other groups have successfully reduced the lignin content of tobacco and the much-studied laboratory plant *Arabidopsis*, but those attempts softened the cell walls and stunted the growth of the plants.

In the current study on aspens, a 15 percent increase in cellulose accompanied the drop in lignin, providing enough plant material to maintain the trees' structural integrity. The ratio of cellulose to lignin in the genetically engineered aspens is twice the ratio in the normal tree. Chiang and his colleagues describe their work in the August NATURE BIOTECHNOLOGY.

The shift from lignin to cellulose production is not unexpected, says Tom Jeffries, director of the Department of Agriculture Forest Service's Forest Products Laboratory in Madison, Wis. However, "the most shocking thing was the sustained growth of the plants," he adds. "The [engineered] plants were a good 25 to 30 percent taller." Chiang speculates that blocking the lignin gene changes other compounds that stimulate growth of the tree.

Cutting the lignin content of trees could also make it more practical to produce ethanol and other biofuels from wood, says Jeffries. Oil companies add ethanol, usually fermented from corn, to gasoline to help it burn cleanly.

Chiang says he chose aspens to study because they grow fast and are popular in the Great Lakes region for wood pulping. He and his colleagues are now testing their methods in trees used worldwide, such as eucalyptus. —*C. Wu*

Chiang *et al.*/NATURE BIOTECHNOLOGY

Aspens engineered to produce less lignin dwarf their normal counterpart (far left). Ruler shows 25 centimeters.