RANDOM SAMPLES

edited by CONSTANCE HOLDEN

A Special Place for Faces in the Brain

A series of experiments on a man who suffered accidental brain damage dramatically demonstrates the specialized nature of the brain's face-recognition system, according to a report in the September *Journal of Cognitive Neuroscience*. The team, headed by psychologist Morris Moscovitch of the University of Toronto in Mississauga, Ontario, says this may be the strongest evidence yet that facial recognition is a highly specific brain function separate from that used for object recognition.

The subject of the experiment was a man, now 36, who in 1988 received head injuries in an auto accident that left him with normal visual acuity and cognition but without the ability to recognize objects. They often just look like "blobs"—however, he has no problem with faces.

His condition gave researchers a chance to help resolve a long-standing debate over whether facial recognition is a special system or relies on neural mechanisms that are also involved in object recognition. They put him through 19 experiments which included showing him inverted faces, cartoon faces, partial faces, animal faces, and faces made out of vegetables. They found that he performed as well as or better than controls did in most cases. Indeed, he did much better than the controls in picking out faces hidden in a drawing of a landscape, presumably because he wasn't being distracted by his (disabled) object-recognition system. But his performance plummeted when he looked at an upside-down face or a photograph that had been "fractured." The authors conclude that facial recognition is activated when the image is upright and the spatial relationship between two of three key features—eyes, nose, and mouth—is preserved.

ERICH LESSING/ART RESOURCE

Lids, not pods. Subject couldn't see the vegetables in face, "Rudolfo," by Giuseppi Arcimboldo.

The next challenge is to find the neural substrate for face recognition. Observations in patients whose brain lobes have been separated have shown that the right hemisphere handles this job. And electrophysiological studies have shown particular brain waves associated with facial perception.

It's a "gorgeous" case, says Dartmouth University neuroscientist Michael Gazzaniga of Moscovitch's study. "It shows how incredibly selective this face selector must be."

Dolphin-Inspired Robot

A Yale University researcher has developed a robot that uses a "biomimetic" sonar system based on tips from the animal kingdom. Electrical engineer Roman Kuc, director of the Intelligent Sensors Lab, says his "Rodolph" should be particularly useful for undersea chores.

"Researchers prefer vision because they think they understand vision," says Kuc. But this sonar is so sophisticated that it is capable of identifying a small rubber O-ring and telling heads from tails on a dime. Engineer John Leonard of the Massachusetts Institute of Technology says Kuc's robot is "a big step because it's adaptive," which means that, like an animal, it can bob around, positioning itself to get an optimal look at its target.

The robot, described in the August issue of the *Journal of the Acoustical Society of America*, deploys features found on both bats and dolphins. The "mouth," which sends out high-pitched, dolphinlike clicks, is flanked by two "ears" that rotate like a bat's to point toward the source of echoes. Going by observations of how dolphins detect buried objects, Kuc positioned the transducers on a robotic arm, at a 45-degree angle and at a constant distance—in this case, 15 centimeters—from the object. Kuc keeps refining his creation. Recently, he says, "we have introduced a barn owl aspect" to the robot. Owls have one ear that points higher than the other. This helps them pinpoint the elevation of a sound.

Kuc says his robot should be able to detect production flaws in manufactured items. But its main value is expected to be displayed underwater—finding buried objects and locating things too far away for a camera to see. He plans to add a sonar-guided camera to the system.

"The number of true believers in sonar in robotics is actually fairly small," says Leonard. He is one of them—he would like to use Kuc's device to "perform experiments that mimic dolphin echolocation," for developing better ways of navigating and locating objects underwater.

Design in Limburg

A piece of stone found last month in the southern province of Limburg, Netherlands, is being called "the oldest Dutch drawing." Archaeologists think it dates back to the Federmesser culture, existing in Northwest Europe 12,000 to 13,000 years ago, which produced no known art. The only prehistoric drawings found in this area are from the Ahrensburgian period, some 1000 years later.

The drawing, found on 3 September among the remnants of a Late Paleolithic campsite, is no Rembrandt. Carved into a broken piece of a hand tool used to fashion flint, it's a triangle shape enclosing parallel lines. As with similar drawings from the same era in France, archaeologists don't know what it means, says Leo Verhart of the National Museum of Antiquities in Leiden, who led the excavations. "It could simply be a picture of a tent ... but it could also be some sort of a symbol, or even a reference to the female pubic area."

RIJKSMUSEUM VAN OUDHEDEN

Early Dutch art. Symbol or just doodling?

Marc De Bie, an archaeologist at the Institute for the Archaeological Heritage of the Flemish Community in Leuven, Belgium, questions the dating of the stone, because it was found in a ploughed field and not in a well-defined stratum. But he says it would indeed be "exceptional" if it could be firmly linked to the Federmesser era.

Name That Boat

When the Navy builds a new ship, it customarily asks its historians to come up with a suitable name. But for its newest oceanographic survey vessel, to be launched next year, it also wants to hear from U.S. schoolchildren.

The Navy says anything suggestive of science, discovery, adventure, and derring-do may be suitable for naming the 100-meter-long ship, which will accommodate 27 scientists. Other survey vessels of the same class are named after people or earlier ships: *Pathfinder*, *Henson*, *Bowditch*, and *Sumner*. More on the contest can be found on the Web at oceanographer.navy.mil.