Biology

The brain gets a (new) earful

Few people pay attention to what their ears look like, but ear shapes can be as distinctive as fingerprints. The ridges and folds of the outer ear, the pinnae, even play an important role in hearing. By amplifying or weakening certain frequencies of the sounds that bounce off them, pinnae help the brain discern where sounds are coming from.

Since pinnae vary from person to person, each human brain must gradually learn the shape of its body's ears in order to process auditory information, scientists have theorized. Studies of people wearing plastic molds that alter the shapes of their ears have confirmed that theory, but participants needed no learning time to readapt to their original pinnae.

A. John Van Opstal of the University of Nijmegen in the Netherlands and his colleagues equipped volunteers with ear molds and found that it took several weeks for them to regain the ability to tell the height of a sound source. The researchers report their results in the September NATURE NEUROSCIENCE.

Curiously, whereas people need time to see correctly after lenses that have distorted their vision are removed, the volunteers who wore ear molds were able to normally localize sounds as soon as the molds were taken out. "It's as if the listeners had learned a new 'language' and now had two sets of ears with which they were proficient," note Fred Wightman and Doris Kistler of the University of Wisconsin-Madison in an accompanying NATURE NEUROSCIENCE commentary. —*J.T.*

Pollen for the prosecution?

Sherlock Holmes would be proud. Reinhard Szibor of the Otto-von-Guericke University in Magdeburg, Germany, and his colleagues suggest that pollen may offer a clue to a gruesome murder mystery. In 1994, a grave with 32 skeletons was found in Magdeburg. One theory holds that the Gestapo performed a mass execution in the spring of 1945 as World War II ended. A second theory proposes that the Soviet secret police killed Soviet soldiers in the summer of 1953 for refusing to put down a German revolt. In the Oct. 1 NATURE, Szibor's group reports that the pollen species found in the skulls' nasal cavities best match those of summer-blooming plants, which implicates the Soviet secret police as the murderers. —*J.T.*

Taking a bite out of the plague

In the mid-14th century, the Black Death hit Europe, ultimately killing about 75 percent of its population over the next 100 years. From descriptions of the disease, researchers have concluded that the responsible agent was *Yersinia pestis*, the bacterium that causes what is now called bubonic plague. Although many historical epidemics have been pinned on the microbe, the evidence has always been circumstantial. Scientists have now probed the dental remains of victims whose disease resembled bubonic plague and died as far back as 408 years ago. They found DNA sequences belonging to the bacterium *Y. pestis*.

In the study, Didier Raoult of the Université de la Mediteranée in Marseille, France, and his colleagues recently gathered skulls from two mass graves—one dug in 1590 and one in 1722—in which plague victims from nearby hospitals were buried. They removed unerupted teeth from jawbones and, carefully guarding against contamination, looked for genetic material in the preserved dental pulp, the soft tissue in a tooth's central cavity. While ancient teeth from people who died of nonplague causes had no signs of a gene specific to *Y. pestis*, 6 of the 12 teeth from presumed plague victims did contain the DNA, Raoult's team reports in the Oct. 27 PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES. The scientists suggest that examining ancient dental pulp for bacterial and viral DNA may help resolve the causes of other epidemics in history. —*J.T.*

Biomedicine

From Denver at the annual meeting of the American Society of Human Genetics

Cancer tests can heighten anxiety

When a woman learns that she harbors a mutation in one of the so-called breast cancer genes, or *BRCA* genes, she understandably feels stressed. Now, researchers find that uneasiness traceable to such genetic test results can linger up to 6 months.

In one study, researchers tested 66 women for the BRCA mutations. The subjects' average age was 45, and three-fourths were Ashkenazi Jews and so at increased risk of having the mutation called BRCA1. About half had had ovarian or breast cancer or both. All were also given an initial psychological test. The women showed little mood difference from each other in this test.

In a second psychological evaluation, 3 months later, those who had been found to carry the mutation recorded higher anxiety and depression scores, says Kristen E. Shannon, a genetic counselor at Massachusetts General Hospital and the Dana-Farber Cancer Institute in Boston. Women testing negative for the mutation showed lower anxiety and improved mood.

A study led by researchers from the University of Utah in Salt Lake City revealed similar results. They tested 113 women and 69 men in a related group of Utah families known to carry the *BRCA1* mutation and to have many occurrences of breast cancer. The participants' distress levels were measured once before the tests and twice after.

The researchers then compared the results of BRCA1 carriers with those of noncarriers. Women with the mutation showed moderately higher distress even 4 to 6 months after they received the *BRCA* test results. Men who tested positive—who rarely get breast cancer but can pass on the mutation—showed some extra distress shortly afterward but not after 4 to 6 months.

More puzzling, among the women in the study who were due for an annual mammogram, only 14 of the 36 who tested positive for the mutations obtained one, a follow-up study showed.

Jeffrey R. Botkin, a pediatrician and medical ethicist at the University of Utah, says that while the distress scores don't indicate psychological harm, the mammogram data do raise questions. Some people with the mutation might not want to know their health status, he acknowledges. "Whether that is in fact what we're seeing, it is too early to tell. But we're concerned." — *N.S.*

Prostate cancer genetic region mapped

While no one has yet identified a specific genetic defect that causes prostate cancer, scientists have mapped three locations on chromosomes that probably harbor mutations predisposing a man to the malignancy. A fourth such location was unveiled at the meeting, and it contains a twist. Having a genetic defect in a specific area on chromosome 1 seems to boost the risk not only of prostate cancer but of brain cancer, too.

Researchers in the Seattle Prostate Cancer Genetics Consortium studied 141 extended families that each had three or more members with prostate cancer. Twelve of the families included a blood relative who had brain cancer. Members of those 12 families who had either form of cancer displayed the genetic marker much more often than does the general population.

While there is apparently a prostate-cancer mutation at work in this region, such linkage doesn't mean that someone with prostate cancer is necessarily predisposed to brain cancer, says Gail P. Jarvik, a statistical geneticist at the University of Washington Medical Center in Seattle.

"There's not an obvious connection between prostate and brain cancers, not like breast and ovarian cancer," says Elaine A. Ostrander, a molecular biologist at the Fred Hutchinson Cancer Research Center in Seattle. However, the findings hint at disruption of a cancer-suppressor gene in this region of chromosome 1, Ostrander says.

Whatever this gene is, its effects appear to be much more important for prostate cancer then brain cancer, Jarvik says. — *N.S.*