BEHAVIOR

Ignorance is paranoia

The paranoid thoughts and behavior that sometimes arise following a hearing loss in an elderly person have been well documented (SN: 11/2/74, p. 280), but the triggers of the paranoia have not been clear. By using hypnosis to induce a temporary hearing loss in healthy college students, psychologists reporting in the June 26 SCIENCE suggest that a lack of awareness of the deafness and the pressures of social situations may push frustrations and anger to paranoia.

Philip G. Zimbardo and Susan M. Andersen of Stanford University, and Loren G. Kabat of the State University of New York at Stony Brook divided 18 easily hypnotized male students into three groups. The test group was given a posthypnotic suggestion of partial deafness without knowledge of the source. One control group was given the same suggestion, but was told to remember how the deafness was induced. The second control group was given a compulsion to scratch an itchy ear, in order to see whether merely carrying out a posthypnotic suggestion with amnesia might irritate subjects enough to induce paranoid behavior. Each subject was then encouraged to cooperate on several tasks with two confederates (students who had full knowledge of the experiment and had not been hypnotized).

"As predicted, the experience of being partially deaf, without being aware of its source, created significant changes in cognitive, emotional and behavioral functioning," the authors report. In addition to scoring significantly higher than controls on several scales used in judging chronic paranoia, subjects in the "deafness-without-awareness" group used significantly more evaluative language (e.g. right and wrong, good and bad) during the experiment, a hallmark of paranoia.

Despite the artificiality of the laboratory test, analogous predicaments occur in daily life, the authors insist. "People's hearing does deteriorate without their realizing it," they say. "Indeed, the onset of deafness among the elderly is sometimes actively denied because recognizing a hearing deficit may be tantamount to acknowledging a greater defect — old age."

Barbiturates and fetal brain cells

What happens to the fetus when a pregnant woman takes barbiturates? While little is known about the consequences in humans, the drugs directly affect the brains of unborn mice, producing long-term behavioral defects, according to investigators from the Hebrew University-Hadassah Medical School.

The research team, headed by Joseph Yanai of the Department of Anatomy and Embryology, found that barbiturates given to pregnant mice kill some developing brain cells in the fetus and damage many that survive. Because the drugs pass into the milk of the lactating mother, the neonate remains vulnerable to the damage as long as it nurses. Those mice exposed to barbiturates perinatally also show an increased susceptibility to barbiturates and alcohol addiction later in life, the researchers say.

These findings could have implications for humans, because barbiturates, a class of drugs that has fallen from favor as a remedy for insomnia (SN: 2/25/78, p. 119), have been given to women late in pregnancy to prevent neonatal jaundice. They are also sometimes administered to epileptic mothers to inhibit seizures and are given to their newborns as treatment for neonatal convulsions. Because of the drugs' therapeutic value, the researchers are now working to pinpoint the mechanisms of damage, hoping to prevent harm to the newborn without hampering drug effectiveness. "We are following up initial findings that barbiturates depress hormone levels, which may be one source of the brain cell damage and a clue to its prevention," says Rachelle H. B. Fishman, of the Albert Einstein College of Medicine in New York, who recently joined the group.

ASTRONOMY

Dietrick E. Thomsen reports from Calgary, Alta., Canada, at the meeting of the American Astronomical Society

Investigating QSO fuzz

Are quasars aka QSO's (that is, quasi-stellar objects) somehow related to the centers of galaxies? This question, still without a final answer, was raised shortly after the first quasars were discovered. Quasars are compact, like galactic centers, and, also like certain active galactic centers, they radiate large amounts of energy from this condensed volume. Quasars might be centers that had never developed galaxies or whose galaxies were invisible for one reason or another.

The discovery of "fuzz" or extended luminosity around several quasars in recent years has heightened the importance of the question. At the meeting J. B. Hutchings of the Dominion Astronomical Observatory in Victoria, B.C., Canada, reported a study of quasar fuzz done by himself, David Crampton of the DAO and Bruce Campbell of the Canada-France-Hawaii Telescope, located on Mauna Kea in Hawaii. They used the prime focus camera of the CFHT to make images of about 25 quasars with redshifts below 0.3 (that is, quasars fairly near to the earth).

Extended luminosity could be distinguished around all of them. The images were good enough to permit the observers to draw profiles of the fall-off of brightness from the centers outward and brightness contours around the centers. It turns out that the brightness profiles for images taken in blue light have a different shape from those in red. The significance of this has not yet been figured out.

In both colors the contour lines have cusps or points at various places. Connecting corresponding cusps from one contour line to the next draws a series of lines curving outward from the center that are shaped like the arms of a spiral galaxy. This geometry is highly suggestive, but what it means exactly is for the moment unclear.

A planetary nebula may be forming

Knowledge of the evolution of stars depends on being able to observe large numbers of them, some of them at each important stage along the path or paths of development. The times involved are too long to follow a single star along. Inevitably there are gaps in a picture drawn this way.

The possible filling of one of those gaps by a star called GL 618 was reported by Sun Kwok and Paul Feldman of the Herzberg Institute of Astrophysics of the National Research Council of Canada. On the basis of studies of this star's radio emission that they did at the Algonquin Radio Observatory in Ontario and the Very Large Array in New Mexico, they believe GL 618 is on the point of ejecting a planetary nebula, as had been proposed by Ben Zuckerman of the University of Maryland.

Theorists believe that this stage is part of the end of the line for old red giant stars. (The sun is expected to become one some day.) At such a moment the star ejects its atmosphere to form a nebula revolving around it and collapses its core to a small, hot white dwarf.

A flare taken with a flair

Most changes in stars come very slowly, but some varieties happen very fast. Flares, for example. Astronomers are always trying to catch flare stars flaring. It can take luck. Bernard M. Haisch of the Lockheed Palo Alto Research Laboratory reported a very complete observation of an X-ray flare on the nearest star to us, Proxima Centauri, that he and Jeffrey Linsky of the Joint Institute for Laboratory Astrophysics at Boulder, Colo., managed to catch simultaneously with the late Einstein Observatory satellite and the International Ultraviolet Explorer. At its peak the flare was 35 times brighter than the star's corona as a whole, and a peak temperature of 20 million degrees was calculated.