

behavioral sciences

Thinking the opposite

"You get an input, you contrast it, you get an output." This process of thinking is really a process of relatedness, says James A. Dinnan of the University of Georgia in Athens. And people who are able to make the proper contrasts, he says, are likely to be successful in life.

Drawing from a list of 110 of the most frequently used words in the English language, Dinnan prepared a free-association word test and administered it orally to equal numbers of high-school dropouts and college graduates. The successful graduates took the individual words, such as "in," "over" and "poor" and gave their opposites—"out," "under" and "rich." The dropouts usually responded with personal associations—"indoors," "over-hill" and "poor-skinny."

Dinnan correlated these results with achievement test scores and confirmed his findings. The students with the worst scores made what Dinnan calls "closures" from personal experience. Prison inmates and preschool children followed the same pattern. "I came to the conclusion," says Dinnan, "that the secret of successful learning must have something to do with the mind's ability to make contrasts. Somewhere in the early years of formal schooling, a developmental shift occurs from syntagmatic (closures) to paradigmatic (contrasting) responses. Some people apparently never make this shift . . . they are not prepared to receive the communications which the educated world sends."

Exorcising 'The Exorcist'

"If you remind people that demonical possession, that ancient scapegoat, provides an easy interpretation for unusual and bizarre goings-on, they will quickly discover the malevolent presence in cousins, brothers-in-law and every oddball member of the family." And that is just what is happening, says James L. Foy, a psychiatrist at Georgetown University School of Medicine. Since the release of "The Exorcist," the literally and visually shocking movie that depicts the religious rites involved in expelling or exorcising an evil spirit from a young child, an unusually high number of people have been requesting exorcisms. Across the country, people have been calling on priests when they should be seeking the help of psychiatrists, according to Foy.

"Freud and Jung, where are you when we really need you?" asks Foy. For 400 years, he says, psychiatry has been trying to persuade troubled persons that the devil hypothesis is hokum and that they had better examine more closely the hidden motivations and consequences of irrational acts. Foy believes that most cases of possession will find explanations in hysterical phenomena, disassociated mental states and just plain psychoses.

Brain surgery for addiction

A team of researchers at Gottingen University in Germany has come up with a surefire, if drastic, cure for alcoholism and drug addiction. According to Fritz Roeder and his associates: "Our research has revealed that dependence on drugs or alcohol assumes the proportions of a natural urge after a certain period and, like the sexual drive or the urge to eat, is controlled by a certain brain center. Neutralizing this center, which is no more than 50 cubic millimeters in volume, will cure the patient for all time." The researchers report no undesired side effects after 22 such operations.

natural sciences

Friends among the ferns

Nature still holds many secrets for scientists to unravel—one of which is the ability of certain plants to assimilate atmospheric nitrogen. So far, scientists exploring nature's way have learned to identify nitrogen-fixing plants, and have discovered that the plants cannot do the job alone but need the aid of certain smaller organisms. This mutual, beneficial relationship is called symbiosis.

A blue-green alga called *Anabaena azolla* and a group of small water ferns known as *Azolla* live together in a primitive symbiotic relationship. Their relationship has been studied in the past, but until recently no one knew whether one partner is the sole nitrogen-fixing agent or whether both are necessary for fixation to take place.

Gerald Peters and his associates at the Kettering Research Laboratory in Ohio have undertaken a detailed study of the fern-alga relationship. They have found that the alga, which occupies a cavity within the fern's leaves, can fix nitrogen (at a reduced rate) for up to 12 hours after separation from the fern, but does not continue to grow. The fronds, free from algae, do not fix nitrogen.

Having identified the nitrogen-fixing agent, the researchers plan to investigate the role of the fern's nutrients, the extent of cross-feeding between the partners and the interaction of the photosynthetic systems.

U.S.-U.S.S.R. marine biology meeting

Soviet and American marine biologists exchanged data and opinions concerning marine mammals and agreed to increase scientific cooperation and research, following a December meeting sponsored by the National Oceanic and Atmospheric Administration in Washington. Among topics discussed were the need to improve methods to record biological observations and sightings of seals, sea lions, whales and porpoises.

Both countries agreed to continue their separate research programs on bowhead, gray and Beluga whales. The United States suggested that Russian scientists take part in gray whale studies carried on under the direction of the National Marine Fisheries Service, tentatively planned for 1975 in Baja California breeding grounds. A Soviet scientist has also been invited to participate in the U.S. research on the relationship between the northern fur seal and the northern sea lion, to take place in the Pribilof Islands this year.

Both countries discussed the contribution Soviet scientists might make to a proposed U.S. study of the incidence and metabolism of heavy metals in marine mammals.

A similar meeting of U.S.-U.S.S.R. marine biologists is planned later this year in Moscow or Leningrad.

Superfish in Africa

Tilapia grahami, a freshwater fish resembling the American sunfish, can be found in lagoons and alkaline volcanic springs surrounding Lake Magadi in Kenya. A team of scientists from the University of Aarhus in Denmark and the University of Nairobi in Kenya transferred the fish from lagoons (pH 9.8 to 10.1) to tanks of tap water with pH values as high as 11. The *T. grahami* showed no ill effects after being in the tanks for 24 hours. The researchers report in the Feb. 1 NATURE that the fish's "ability to survive in alkaline waters is superior to that known for any other fish." In addition, its tolerance for acid water (pH 5) and changes in salinity is equal to that of several freshwater and euryhaline species.