behavioral sciences

The organic side of mental illness

Finding a cure for mental illness is very much dependent on finding a cause for it. Because social and psychological causes are hard to pin down, much research is focusing on possible organic reasons. European investigators have reported elevated levels of two enzymes, aldolase and creatine phosphokinase, in the bloodstreams of acute schizophrenic patients. They suggested that the enzymes were leaking from the brain and causing the psychotic state. Herbert Y. Meltzer and John W. Crayton of the University of Chicago found that the enzyme release is not confined to schizophrenics but is evident in all acute and some chronic psychotic patients. They also found that the leakage was not from the brain but from skeletal muscle.

This has led the researchers to study the nerve endings in muscle fibers. Muscle biopsies from psychotic patients have revealed a variety of abnormalities indicating that nerves had died or become nonfunctional in some muscle fibers. In 16 of 24 patients there were abnormalities in the nerves connecting skeletal muscle to the spinal cord. Says Meltzer: "Changes comparable to these found in the skeletal muscle motor nerves might also be occurring in the brain and spinal cord and be related to the cause of psychosis itself. This work demonstrates conclusively that the psychoses are diseases with organic changes, not just psychological states."

Schizophrenia and the slow virus

If organic changes can explain mental illness, then viruses can explain the organic changes. A virus, for example, could cause the functional damage that results in increases of certain enzymes in the blood. This is only one example cited by E. Fuller Torrey of the National Institute of Mental Health and Michael R. Peterson of the Langley Porter Neuropsychiatric Institute in San Francisco. They hypothesize in the July 7 LANCET that "recent developments in virology require a reexamination of the suggestion that schizophrenia may be caused by infectious agents." The infectious agents they are talking about are slow viruses—agents that have recently been shown to cause symptoms only months or years after infection (SN: 4/17/73, p. 245).

Several slow viruses are known to attack the human nervous system. Kuru, a fatal degenerative disease of the central nervous system, has been shown to be a slow-virus disease. Some types of encephalitis and multiple sclerosis are suspected of being slow-virus diseases. They produce schizophrenic symptoms. A viral cause for schizophrenia, the researchers say, might also shed some light on the epidemiological aspects of the disease. Schizophrenia, like polio and multiple sclerosis, seems to occur in epidemic-like patterns. It has a seasonal occurrence, with a disproportionate number of patients born in the first quarter of the year. It occurs most often in countries with a high standard of living. Such a pattern could indicate that schizophrenia is caused by a virus against which the body can form antibodies if exposed early in life, but not if exposed late in life.

"Our hypothesis," the researchers say, "will be very difficult to establish if, as seems possible, a virus can cause functional damage to brain cells early in life and then disappear from the brain." They suggest, among other things, examination of epidemiological information to determine which virus or viruses may be involved, studies of the immune response of cells from schizophrenics and attempts to elicit viruses from brain tissue.

biomedical sciences

The cold touch

Colds have long been thought to be transmitted by coughing, sneezing, kissing and other oral sources. But new evidence, reported in the June 28 NEW ENGLAND JOURNAL OF MEDICINE, suggests that colds are more likely to be spread by fingers or hands.

J. Owen Hendley and his colleagues at the University of Virginia School of Medicine studied the transmission of rhinovirus colds in various groups of volunteers. Surprisingly, there was little rhinovirus in the saliva of 25 infected persons, and only two of them expelled virus in a cough or sneeze. On the other hand, rhinovirus dried on plastic was transferred to fingers touching the contaminated area in 15 out of 16 trials. Rhinovirus dried on skin was transferred to fingers in three out of five trials. Four out of 11 persons got colds after touching their nasal mucosa with fingers that had been contaminated by rubbing a dried drop of the virus.

Conclude the group of internists and pediatricians:

"The conditions conducive to spread in the way we have proposed are present in families, particularly those with children."

Contraceptive rat traps

Acute poisons that fail to completely eradicate colonies of rats and mice cause them to accelerate breeding, thereby restoring their populations to their original sizes. Rodents are becoming resistant to other chemical controls. Clearly new means of rodent control are needed.

One approach that shows promise is feeding rodents bait that contains estrogen. The estrogen works in female rodents as a birth control pill. Experience with the approach is reported in the July 13 NATURE by K. E. Kendle and his colleagues at BDH (Research) Ltd. and at the Pest Infestation Control Laboratory in Surrey, England.

The British scientists fed a synthetic estrogen called BDH 10131 to rats under both pen and field conditions. The compound drastically reduced rat populations in both situations. Control populations remained the same. The compound also proved to be long-acting. Three weeks of prebaiting with a cereal mixture followed by six days of baiting with the mixture plus estrogen led to a 75 percent reduction in a rat colony in six months and to its virtual extinction a year later.

The compound also holds promise for reducing pigeon populations. When female pigeons were fed the compound under pen conditions, they laid 75 percent fewer eggs than control pigeons did.

Intercourse and cancer of the cervix

Various studies have suggested that sexual intercourse can heighten the risk of cervical cancer. More evidence was presented last week at a European assembly on cytology and cancer prevention by Pentti Leppaluoto of the Cancer Society of Tampere, Finland.

Leppaluoto took Pap smears of a thousand women at different intervals after intercourse. He found altered bacteria, known as haemophilus, more often in smears taken soon after intercourse than in smears taken later. Often linked with haemophilus were organisms called mycoplasmas. These organisms can invade cervical cells and induce genetic changes that spur malignant growth.

The bacterial changes might explain why virgins seem to be much better protected against cervical cancer than women who have intercourse.