'Deficit' schizophrenia follows unique path

Schizophrenia usually gets treated as a single disease that spawns several variations on its theme of fragmented thought and emotion. But some psychiatrists view schizophrenia as a shifting mix of psychotic symptoms, such as hallucinations and delusions, and a "deficit syndrome" that reflects disengagement from oneself and others. A longitudinal study now suggests that cases of deficit schizophrenia display a distinct natural history that features an ironic twist.

Over the long haul, patients hospitalized for schizophrenia stand a greater chance of returning to the hospital and sinking into social isolation if they suffer from deficit symptoms, assert Wayne S. Fenton of Chestnut Lodge Research Institute in Rockville, Md., and Thomas H. McGlashan of Yale University. Yet the deficit syndrome also appears to shield its bearers from suicide, they note.

The two psychiatrists present their findings in the March AMERICAN JOURNAL OF PSYCHIATRY.

Researchers have observed a limited ability to experience depression in many people with deficit schizophrenia, which may contribute to their low suicide rate, asserts William T. Carpenter Jr., a psychiatrist at the University of Maryland in Baltimore, in an accompanying comment.

"If [depression] mediates suicide, then patients with restricted emotional experience may be protected from self-destruction," Carpenter writes.

Fenton and McGlashan's data derive from an ongoing assessment of 187 schizophrenic patients an average of 19 years after their admission to Chestnut Lodge, a private psychiatric hospital (SN: 3/21/92, p.181).

At admission, 46 patients displayed an enduring deficit syndrome, which includes lack of emotion, absence of interest in social activities, sparse communication with others, and little sense of purpose in life. These symptoms did not stem from the use of antipsychotic medication, depression, demoralization, or social isolation resulting from psychosis, the researchers hold.

Two-thirds of the deficit patients received initial clinical ratings of substantial thought disorganization or bizarre behavior, compared with one-third of their nondeficit counterparts, Fenton and McGlashan contend.

The deficit syndrome usually worsened in the 5 years after its appearance, with few remissions, they note. After that, it remained largely unchanged.

The large majority of deficit patients spent most of the follow-up period in psychiatric hospitals and rarely landed jobs; patients without deficit symptoms spent less than half the follow-up period in psychiatric hospitals and held jobs for one-third of that time.

No confirmed suicides occurred among deficit patients, compared to 10 suicides in the nondeficit group.

Unlike most people currently suffering from schizophrenia, the Chestnut Lodge patients rarely received antipsychotic medication early in the course of their illness. However, their drug free status made possible a relatively clear look at cases of deficit syndrome, the researchers maintain. *—B. Bower*

A bee and how it sees, that is the question

Sunshine, the shimmer of warm air, and the low drone of bees buzzing from flower to flower all convey the lazy feeling of summer. For bees, however, foraging is serious business and their path is far from haphazard.

Bees use visual landmarks to guide their return to a familiar place. Unlike humans, who can usually recognize a traffic intersection from any corner, bees remember places retinotopically—if they learn a shape with one part of their eye, they can only recognize it again with that same part.

To simplify storage and retrieval of these retinotopic memories, says Thomas S. Collett of the University of Sussex in Brighton, England, bees take their bearings while facing in one direction — magnetic south. Collett trained groups of honeybees to collect sugar from a bowl placed north, south, east, or west of a cylindrical landmark. Most bees looked south when approaching and leaving the food, Collett reports in the March 10 NATURE.

Bees trained to find a sugar bowl located south of the cylinder, however, proved a revealing exception, says Collett. The landmark shows the bees which direction to head in as they search for food. But south-flying honeybees lose sight of the cylinder as they fly. So they look northwest instead—Collett's not sure why they pick northwest—to keep their reference point in view. This shift suggests that bees store memories of landmarks from a preferred orientation, Collett adds, and adopt the same viewing position when using their memory to search for a goal.

Cloudy skies and depolarized light didn't affect the bees' orientation. However, bees placed in an artificial magnetic field looked toward the imposed magnetic south, regardless of Earth directions. "Bees have magnetite in their abdomens," says Collett, which works "as a sort of compass." When the same bees were tested without the artificial field, they simply turned until the scene took up its accustomed retinal position.

"This has been one of the big puzzles about how bees, insects, and even vertebrates learn spatial information," says Fred C. Dyer, an entomologist at Michigan State University in East Lansing. Collett's work confirms that bees are not limited to chance recognition of objects seen exactly as they were before.

More important, adds Dyer, it shows that bees cannot mentally manipulate and identify such spatial relationships. Rather, bees function somewhere in between. "Instead of rotating their minds' eyes, they simply rotate their actual eyes." *—D. Christensen*

New viruses sprout in high-tech plants

From limited experiments, plant pathologists and virologists know that inserting segments of a virus' genes into plants will boost the plants' ability to resist future infection by that virus. However, some researchers argue that, if carried out widely, this practice may pose a risk: The gene segments may recombine with intact pathogens introduced into the plant by insects or other carriers, producing new disease-causing microbes.

To test the likelihood of this, Ann E. Greene and Richard F. Allison of Michigan State University in East Lansing decided to see whether a viral segment inserted into a plant can exist in the proper concentration and location to recombine. It can, they find; what's more, recombination produces several mutant forms of the virus, they report in the March 11 SCIENCE. Additional data suggest that the new form is as pathogenic as the original, says Allison.

The team concludes that "RNA recombination should be considered when analyzing the risk posed by virus-resistant transgenic plants." Not all scientists agree with that assessment, however.

Greene and Allison began their experiment by inserting into *Nicotiana benthamiana* plants DNA replicas of the RNA that codes for the cowpea chlorotic mottle virus' (CCMV) capsid protein. The DNA, however, represented only two-thirds of the protein gene, they report.

They then inoculated these tobacco plants with CCMV that lacked only a small portion of the capsid protein gene, the same portion that they had already injected into the plants. Four of the 125 plants became infected with a recombined form of the virus.

In addition, the researchers spotted in the new pathogen a "marker" mutation that they had introduced into the tobacco plants' RNA. The marker provides "absolute proof the new virus contains portions of the genome from the plant itself," Allison says.