

Strange bedfellows for toxin cleanup

Environmentalists and the chemical industry last week formed Clean Sites, Inc. (CSI), a non-profit coalition that hopes to augment federal efforts to get private industry to clean up their own hazardous waste sites.

Executives from the Conservation Foundation, the National Wildlife Federation, Exxon Chemical Co., Monsanto Co., the Chemical Manufacturers Association and E.I. duPont de Nemours & Co. worked 10 months to plan CSI with the encouragement of Environmental Protection Agency chief William Ruckelshaus.

The Chemical Manufacturers Association promises to foot half the \$4 million budgeted for CSI's first year, during which plans to clean 20 sites will be drawn up, says Louis Fernandez, CSI board member and Monsanto chairman. Unspecified private donations will fund the rest of the kitty, earmarked for cleanup studies and administrative costs, he adds.

Former EPA head Russell Train, now president of the World Wildlife Fund's U.S. division, will chair CSI. Fernandez says that in the coalition's first year of life, environmentalists like Train lend a needed integrity until CSI has a track record of its own for helping the EPA Superfund in investigating site cleanup.

"Clean Sites is not a substitute for Superfund. It represents another breakthrough in relations between environmental and industry groups which have frequently been at loggerheads," Ruckelshaus said at a press conference last week.

There are up to 22,000 potentially dangerous waste dumps in the United States, and 546 waste sites deemed hazardous enough to merit placement on the Superfund priority cleaning list, Ruckelshaus says. But the Superfund lacks resources to attack all these sites, and the EPA chief says he welcomes any help he can get.

Some environmental groups say they wish CSI well, but also charge that a union of such strange bedfellows may not be fruitful. In question is whether CSI will allow companies quick and dirty cleanups that are below EPA standards. Also, the very creation of CSI may endanger current congressional efforts to beef up the \$1.6 billion Superfund, say representatives of the National Audubon Society, Natural Resources Defense Council and the Environmental Policy Institute.

However, these groups also say they support CSI goals especially because Superfund has cleaned up only six waste sites since its 1980 inception.

CSI supporters predict success. "Judge by performance. Give it a chance," says Douglas Costle, a Washington, D.C., lawyer and another former EPA chief.

—A. Rowand

Light delay by gravity

Einstein's general relativity theory predicts that a strong gravitational field will deflect the path of light moving through it and will also slow the passage of the light. Deflection can produce the phenomenon known as gravitational lensing, the formation of multiple images of a distant object (usually a quasar) by the field of some black hole or compact galaxy that lies between us and the quasar in just the right position to make the geometry work. Now in one such lens two astronomers from Copenhagen believe they have measured the light delay. Confirmation could lead to calculation of the distance to the quasar and a new way to measure the Hubble constant, the still disputed number that determines the rate at which the universe is expanding.

Astronomers know five examples of double quasar images that they believe are gravitational lens effects (SN: 3/10/84, p. 154). The one in question here is catalogued as 0957+561. It is two seem-

ingly identical images, A and B. If the light forming the two images passes through different parts of the gravitational field of the lens, the amount of retardation over the two paths could be different.

R. Florentin-Nielsen and K. Augustesen of Copenhagen University Observatory report in a telex to the Central Bureau for Astronomical Telegrams in Cambridge, Mass., that they have measured this difference by noticing a recent brightening of image B that seems to correspond to one undergone by image A in 1982, yielding a difference in light travel time of 1.6 years. They ask that other astronomers do further photometry of the object over the rest of this year to improve the accuracy of the finding so that an accurate distance to the quasar can be calculated as well as the Hubble constant. The present value would make the Hubble constant no more than 125 kilometers per second per megaparsec. The figures now most used by astronomers are 50 or 100.

—D.E. Thomsen

Tracking the brain messengers behind TD

Scientists have known for some time that antipsychotic drugs, also called neuroleptics, block receptors of the neurotransmitter dopamine but can eventually cause these receptors to become supersensitive, overdosing their cells with dopamine. However, the roles that dopamine and other brain neurotransmitter systems play in causing the severe movement disorders known as tardive dyskinesia (TD) that can occur with long-term neuroleptic use are unclear.

Researchers in the United States and Sweden report in the May 24 NATURE that the neurotransmitters neurotensin and gamma aminobutyric acid (GABA) also appear to influence these persistent side effects.

Neurologists George R. Uhl and Michael J. Kuhar of Johns Hopkins University in Baltimore find that neurotensin receptors are substantially increased in the brains of neuroleptic-treated rats and humans. The neurotensin receptors are densely concentrated in dopamine-containing cells of the substantia nigra, a small area in the middle of the brain.

Increased neurotensin receptor density may exaggerate the sensitivity of dopamine receptors by somehow interacting with them, leading to the involuntary twitching of facial areas and other parts of the body associated with TD, say the researchers.

Uhl and Kuhar examined frozen brain slices taken from the bodies of nine normal humans, six drug-treated schizophrenic patients, five rats injected with saline every day for four weeks, and five rats injected with a neuroleptic for the

same period. Neurotensin receptor densities almost doubled in the brains of both species treated with drugs.

"We've shown that other brain neurotransmitter systems are altered by chronic dopamine receptor blockade," Uhl told SCIENCE NEWS. "This may explain some movement disorders and provide a target for new neuroleptics aimed at neurotensin receptors."

Adds Solomon Snyder, a psychiatrist at Hopkins, "This is the most dramatic neurotransmitter alteration yet observed related to TD." If neurotensin does affect movement disorders, he adds, drugs to counteract its influence are still years away from being introduced.

In another finding, Lars-M. Gunne and co-workers at the Psychiatric Research Centre in Uppsala, Sweden, report that levels of GABA and an enzyme involved in its production were reduced in the brains of six monkeys treated with neuroleptics for several years who developed movement disorders. GABA function remained stable among seven drug-treated monkeys who did not suffer from TD and six untreated monkeys.

The results suggest that alterations in transmission of GABA are involved in neuroleptic-induced TD, according to the investigators.

While both research teams provide clues to the processes behind TD, their findings are not surprising, says Yale University psychiatrist Steven Bunney. "It has been assumed that dopamine neurons don't act in a vacuum after neuroleptics are administered," he explains.

—B. Bower