BEHAVIOR

Joel Greenberg reports from San Francisco at the annual meeting of the American Psychiatric Association

Manic-depressive children

Although relatively new, lithium treatment of manic-depression is among the most successful of all psychotropic drug therapies for emotional disturbances. Now it appears that the effectiveness of lithium with certain emotionally disturbed youngsters has enabled researchers to pinpoint the existence of manic-depression in children.

Neurologist G. Robert DeLong of Massachusetts General Hospital reports that after clinical trials with 120 children over five years "we have delineated a syndrome which can most reasonably be called childhood manic-depressive disease." The disorder in youngsters includes the characteristic mood swings found in affected adults. But based on extensive follow up of 36 cases, DeLong and his colleagues have also devised several other diagnostic characteristics: explosive, violent behavior, marked distractibility, intense thirst, acute overeating, salt craving, sleep disorder and excess sweating.

While some of these symptoms might also be characteristic of hyperactivity, retardation or a variety of other disorders, there are two additional criteria that point to a form of manic-depression: family history of major affective disorder (depression or manic-depression) and response to lithium carbonate. Of the 36 youngsters studied, "there was a clear history of affective disorder in a parent or first-order relative in 33," DeLong says. And in a double-blind, placebo-controlled study of 44 children, "two-thirds of the patients diagnosed as having childhood manic-depressive disease have managed to benefit over an extended period of time," he says. "...[P]arents or other observers can indeed detect a clear-cut and striking improvement in a wide range of behavioral parameters, on lithium treatment."

The ups and downs of drinking

Alcohol has long been recognized as a depressant — somewhat of a paradox considering that many people drink to "get happy." But a study by William T. McKinney and his colleagues at the University of Wisconsin indicates that in low doses, alcohol may actually work as an antidepressant. In studies involving social separation of monkeys, the researchers found that low doses of alcohol "reduced the despair response" to the separations but increased doses augmented despair, characterized by huddling and decreased activity. "In humans," they suggest, "a salutory influence on mood at low doses may reinforce additional consumption of the drug. Dysphoria resulting from continued administration could provoke additional consumption in an unsuccessful effort to recreate the antidepressant effect of the initial doses."

Physical illness can be real

Not infrequently, someone suffering from emotional problems will complain of physical symptoms. Some contend that in reaction to this "cry wolf" situation, physicians might dismiss real physical problems in psychiatric patients on the grounds that the complaints are fabricated. Now, psychiatrists at Bronx Municipal Hospital Center and Albert Einstein College in New York suggest that this may be happening with psychiatric outpatients as well. Based on a study of 200 outpatients, the researchers report that "most major physical illnesses in psychiatric patients remain undiagnosed by psychiatrists.... The high rate of depression in this group also suggests that their medical illnesses may be significant in the etiology of this disorder.... These patients are thus in double jeopardy both for the successful treatment of their medical and their psychiatric disorders," they report. "This highlights the need for a comprehensive medical evaluation of psychiatric patients."

TECHNOLOGY

Urea boosts ultraviolet optics

Urea, a common and inexpensive organic chemical used in such things as adhesives, plastics and fertilizers, can transform visible laser light into ultraviolet wavelengths. Under the work of electrical engineer C. L. Tang and colleagues at Cornell University, urea crystals suitable for "nonlinear" optical applications (studies of the behavior of matter under intense light irradiation) have been demonstrated to extend the range of color-tunable lasers into the ultraviolet.

Until now, few methods of generating such intense ultraviolet beams have been available. According to Tang, not only is urea more efficient than the best existing crystals for ultraviolet lasing, but it also works well at room temperatures without the need of temperature stabilizers. Existing nonlinear crystals for ultraviolet lasers must be cooled and accurately maintained at temperatures as low as −193 °F. What's more, Tang says, urea crystals are not damaged in high-optical-density use, important when choosing candidates for high-power applications.

For crude cleanups

Sea trials are due to begin on "bregoil," a cellulose-derived product resembling swollen sawdust. Developed and now manufactured in a 3,500-ton-per-day plant by Bo Grenthe, a Swedish engineer, the material is reported to absorb crude oil but not water. Best of all, the glop that results hardly becomes sticky, making transportation of the expended cleaning agent a relatively neat operation.

Grenthe claims that bregoil performed well when he tried it out on oil-covered rocks after an oil spill swept Stockholm's archipelago last year. And according to a May 22 New York Times account, Sweden's national institute for materials testing also thinks it "is worth pursuing" after witnessing demonstrations of its crude appetite. Grenthe claims that not only is the cleanser cheaper than detergents used to absorb oil, but it also should prove far less toxic to fish and other biota.

Fluid beds with wash and dry cycle

Fluidized-bed combustion is recognized as one of the cleanest methods of burning high-sulfur coal. Pulverized coal enters a bed of crushed limestone or dolomite that is agitated by hundreds of air streams until the powdery grains take on a fluid behavior. Sulfur dioxide (SO_2) created as the coal burns will bind with calcium in the limestone or dolomite bed to form calcium sulfate. Only 300 to 600 pounds of the calcium-rich bed materials are needed to remove 90 percent of the sulfur dioxide from a ton of burned coal. But used bed grains generate a mountain of waste. Now chemical engineers at Argonne National Laboratory have found a simple way to recycle the bed stock and reduce the waste pileup: Add a wash and dry cycle.

During combustion an impermeable layer of calcium sulfate jackets the stone, preventing further SO_2 absorption. But spraying the rock with water initiates a reaction between the unused calcium and water forming calcium-hydroxide: Enlarged particles crack their hard sulfate jackets. When dry, calcium-oxide crystals form. After each wash and dry, the fluid-bed stone becomes more porous, allowing better SO_2 absorption.

In the past, only 20 to 30 percent of the bed material was actually used before it was thrown away. The Argonne team has demonstrated that with three wash and dry cycles, SO_2 collection efficiency can reach 86 percent. Not only does the process reduce the stone requirements of a fluid bed, and the mountain of wastes it leaves behind, but the researchers say it also appears to make heretofore poorly reactive limestones and dolomites economically attractive for fluid-bed combustion.