Mental illness from psychiatric drugs?

The powerful tranquilizers that are commonly used to control schizophrenic psychosis and to manage problem behavior may in some cases be doing as much damage as good. Two recent studies and a book-length review of the literature on psychiatric medication indicate that the popular class of drugs called "neuroleptics" may actually be causing serious mental and emotional problems that are unrelated to the original disorders. The hypothesis remains highly controversial, however, with critics arguing that the reported behavioral deterioration may well occur in the natural course of chronic mental illness.

Debate about the psychological effects of neuroleptic (or antipsychotic) drugs has been going on almost since the first, chlorpromazine, was successfully used in 1953. Long-term use of these drugs (which include Mellaril, Thorazine, and Haldol) has been associated with a physical disorder called tardive dyskinesia, a syndrome characterized by involuntary movements and thought to be caused by drug-induced changes in the movement coordination area of the brain; since the same physiological change, a supersensitivity to the neurotransmitter dopamine, could theoretically take place in the dopamine pathways of the brain's limbic system as well, it has been suggested that the drugs might affect mental and emotional functioning, too. The hypothesized limbic system counterpart to tardive dyskinesia has been called iatrogenic schizophrenia, tardive psychosis, subcortical dementia, and —most recently—"tardive dysmentia."

The term "tardive dysmentia" was coined by the late Ian C. Wilson, who as a psychiatrist at the Dorothea Dix Hospital in Raleigh, N.C., observed signs of emotional disturbance among schizophrenics during the 30-year period coinciding with the growing use of psychiatric drugs. When Wilson and co-worker James C. Garbutt investigated, they found (and report in the current SCHIZOPHRENIA BULLETIN) that the unusual behavioral syndrome — euphoria, unstable mood, and manic interactions with people — was closely associated with the worst cases of tardive dyskinesia — suggesting that the syndrome might be related to extensive drug use.

Another researcher, psychiatrist C. Thomas Gualtieri of the University of North Carolina in Chapel Hill, has found what he considers even stronger evidence for a behavioral analogue of tardive dyskinesia. Studying mentally retarded children and young adults, Gualtieri found cases of acute behavioral deterioration — including aggression, destructiveness, screaming and insomnia; as is often true with dyskinesia, these behaviors showed up only after the drugs were discontinued and were qualitatively different from the original behaviors for which the neuroleptics were prescribed. Although it is not possible to know if the drugs caused the behavioral changes, he says, the most appealing explanation is that the behaviors resulted from dopamine hypersensitivity in the brain's cortex and limbic area.

Others remain unconvinced. According to psychiatrist Daniel E. Casey of the Veterans Administration Medical Center in Portland, Ore., it is too early to rule out an alternative hypothesis — namely, that behavioral changes are part of the chronic schizophrenic process. In his own research with monkeys, he notes, he has found that abnormal movements occur spontaneously with aging; in addition, he says, 19th century descriptions of schizophrenia include references to movement disorders very much like what is today called tardive dyskinesia. So it is not possible to blame even the dyskinesia entirely on drugs, much less to conclude that dyskinesia has a psychological counterpart. Psychiatrist Kenneth L. Davis of the Bronx VA Hospital agrees; he was among the first to hypothesize that there might be a limbic system equivalent of tardive dyskinesia, but he says that after three years of study the data are inconclusive.

Peter Breggin, a Bethesda, Md., psychiatrist and author of the recently published book, *Psychiatric Drugs: Hazards to the Brain,* argues that the evidence is overwhelming; psychiatrists, he says, simply cannot admit that they have effectively "lobotomized" millions of patients with chemicals that are toxic to the brain. The euphoria that Garbutt and Wilson report is a symptom of dementia, or general brain deterioration, Breggin says; in fact, he adds, the literature on tardive dyskinesia reveals that most people with the movement disorder are also demented. The euphoria changes to apathy as the brain continues to deteriorate, Breggin says, and ultimately the chemical damage to the frontal lobes accomplishes the same thing as psychosurgery. Only a lobotomized patient would be indifferent about a disorder like tardive dyskinesia, as most older chronic schizophrenics are, according to Breggin.

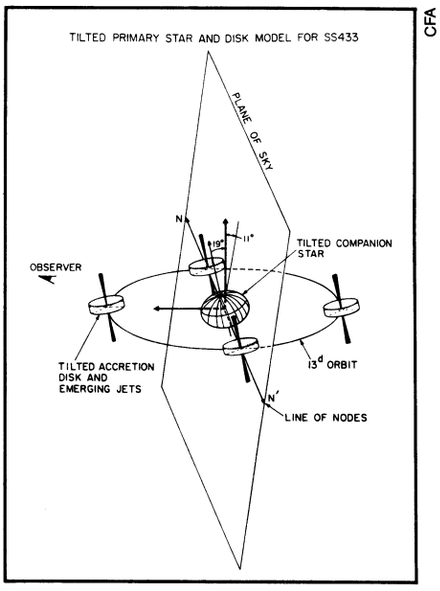
Even if it were possible to confirm a causal connection between neuroleptic drugs and tardive dysmentia, many psychiatrists say that some schizophrenics are so psychotic that they cannot function off drugs. But according to Gualtieri, neuroleptics are often used inappropriately — to manage rebelliousness in children, for example; in one recent study in which he withdrew children from drugs, he found that fewer than one in five required neuroleptic treatment. Psychiatrists, Gualtieri says, should be less aggressive in prescribing neuroleptics and more vigilant in monitoring the side effects of those that they must prescribe.

—W. Herbert

X-raying the odd object SS433

SS433 was just a number in a catalog of peculiar astronomical objects until a few years ago when astronomers discovered that there are patterns of resonant emission lines in the spectrum of its light that move back and forth in wavelength in cycles (SN: 4/28/79, p. 277). Complicated motions in the source would produce such cycles. Astronomers rushed to observe SS433 in light, radio and X-rays and to devise models to explain the spectral data.

The Einstein X-ray Observatory satellite observed SS433 numerous times over an 18-month period. Jonathan E. Grindlay of the Harvard/Smithsonian Center for Astrophysics in Cambridge, Mass., and colleagues from the CFA, the Marshall Space Flight Center in Huntsville, Ala., and the Goddard Space Flight Center in Greenbelt, Md., will publish a compilation and analysis of these data in the Feb. 1, 1984 ASTROPHYSICAL JOURNAL. In it they state that the X-ray data generally support the model of SS433 that had been derived from optical and radio observations.



CFA

The lines in SS433's visible spectrum change according to two cycles, one of 13 days, the other of 164 days. SS433 is also a radio source consisting of a compact central object flanked by two teardrop-shaped lobes embedded in a more tenuous cloud that astronomers consider to be a remnant of a bygone supernova explosion. In X-rays it shows a similar configuration of a compact central object and flanking lobes.

The model that emerged is a binary star system in which a very compact object (a neutron star or a black hole) orbits around a companion, which is an ordinary star of some kind. The 13-day period is the binary orbit. The 164-day period is the precession period of the compact object's rotation. In

the direction of its poles the compact object emits two jets of radiant material, which ultimately become the radio and X-ray lobes. The light with the moving spectral lines comes from these jets. The material for the jets is continuously drawn from the companion star by the compact object's gravity.

The X-ray observations, which concerned mainly the central X-ray object, found that it throws flares, and that these flares are correlated with the 13-day period. Furthermore the flares are more numerous at particular points of the 164-day cycle. This finding imposes a refinement on the model: The equator of the companion star is at a small angle to the plaen of the binary orbit instead of coinciding with the orbital plane as the simplest dynamical considerations would suggest. The skewing results in an enhanced flow of matter from the companion to the compact object at two points in the 164-day cycle and so an increase in the number of X-ray flares at those times. Further dynamical considerations lead Grindlay et al. to conclude that the compact object is a black hole with about 10 times the sun's mass. —*D.E. Thomsen*

Jupiter's tail at Saturn: The clincher

Was Saturn enveloped in the "tail" of Jupiter's magnetic field while the Voyager 2 spacecraft was flying by in August of 1981? The concept is awesome: that one planet might have actually been enclosed by the electromagnetic domain of another, especially with the two worlds nearly five times as far apart as the earth is from the sun. The case has been frustratingly inconclusive (SN: 4/10/82, p. 247), but now one scientist has reported what he believes to be the clincher.

The first sign that the Jovian magnetotail might be that long came in 1976, when the Pioneer 10 spacecraft, cruising beyond Saturn's orbit, reported that the solar wind seemed to have disappeared for a day. At the time, the probe was on a line with Jupiter and the sun (Saturn was far away around its orbit), and the inference was that it had actually passed through the Jovian tail (which is "blown" straight out from the sun by the solar wind's pressure), whose magnetic field lines had temporarily blocked out the arriving solar-wind particles. This suggested that Jupiter's tail would move across Saturn about every 20 years, when the two planets are lined up with the sun, and it was noted that Voyager 2 might be passing Saturn just about at the time of such an alignment. But did it really happen? Studies have indicated that the outer reaches of extended magnetotails may whip back and forth or split into separate "filaments," so finding the answer has depended on what could be learned from the Voyager data itself.

During the Voyager 2 flyby, scientists were startled when certain frequencies of Saturn's usually continuous radio emission (in a portion called Saturn Kilometric Radiation, or SKR) abruptly disappeared for about four days. SKR is believed to be driven by solar-wind particles pouring into the planet's magnetosphere, so the cutoff could have happened when Jupiter's tail swept by, blocking out the solar wind. On the other hand, it could also have been due to a weakening of the solar wind itself. Later analysis revealed several other SKR dropouts before the flyby, and a few more afterward, but the solar wind is indeed fickle. Confirmation was needed.

The clincher, says Michael D. Desch of the National Aeronautics and Space Administration's Goddard Space Flight Center in Greenbelt, Md., came when he looked at the data from Voyager 1, which had flown past Saturn 10 months before, when the Jovian tail was nowhere near. His finding, reported in the Sept. 1 JOURNAL OF GEOPHYSICAL RESEARCH: No SKR dropouts at all. The ones observed by Voyager 2, he concludes, were "certainly caused by an immersion of Saturn into Jupiter's tail."

Voyager 2 is now on its way to fly past Uranus in January 1986, though it is thought unlikely that *Saturn's* tail extends that far, twice the distance from Jupiter to Saturn. The tail would actually pass by slightly *after* the flyby, notes Desch, but the probe will still be able to monitor Uranus's radio emissions for dropouts.

—*J. Eberhart*

UN and WHO attack needless disability

Of an estimated 1 in 10 persons disabled worldwide, 8 in 10—or 360 million—inhabit the nonindustrial, developing world. And the real tragedy, says World Health Organization (WHO) Director-General Halfdan Mahler, is that with good medical care, roughly "half of all disabilities in developing countries can be prevented or postponed." That's why WHO is teaming up with two United Nations agencies—UNICEF (the United Nations Children's Fund) and the Development Programme (UNDP)—to launch a global campaign aimed at preventing disabilities.

Named Impact, the campaign will deliver its opening salvos Oct. 2 in New Delhi, India. Among activities scheduled to kick off the program are a series of two-week medical camps. Expected to draw 15,000 to 20,000 patients, each Indian camp will offer free cataract removal, treatment of dangerous ear diseases and orthopedic treatment for the restoration of useful limb function.

Mass medical camps have cut cataract-removal costs to just $10 per person.

Royal Commonwealth Soc. for the Blind

Since Impact's shoestring budget will probably never have sufficient money to fund individual outreach programs, its primary tools of war will be ideas and organizational coordination, explains UNDP's Mary Lynn Hanley in New York. She says the program hopes to drive home what even small, targeted investments can do. For instance, mass treatment costing less than $1 per person annually can control trachoma; affecting 340 million people, it's not only a very widespread infection, but also the leading cause of visual impairment. Simply adding iodine to salt can stem endemic goiter now affecting 200 million people. (Goiter is believed responsible for congenital deafness and retardation in offspring.) And vitamin concentrates costing pennies per person — or diets with green, leafy vegetables—can prevent vitamin-A deficiency, which blinds 250,000 children annually.

Targeted at local health care providers, government health planners and independent relief agencies, Impact expects not only to disseminate information on what can be achieved at low cost, but also to demonstrate techniques and devices designed specifically for the developing world. Hanley cites the Jaipur (India) artifcial foot, as one example of the latter. This rubber prosthesis was designed to accommodate farmers who labor in muddy fields and who desire a flexible limb to allow such typical Indian postures as squatting or sitting with crossed legs.

Most important, Impact organizers hope to keep independent projects in the field from duplicating efforts or working at cross purposes. It may sound easy, but "disability prevention is no simple 'trick,'" Mahler says. "A long-term international effort is needed."

Moreover, these disabilities may cost affected societies a 10 percent loss in their productive capabilities, according to UNDP Administrator Bradford Morse. Costs to serve the disabled may increase a society's welfare burden by another 10 percent, he says. "All told, the result is a 20 percent deficit to society at a time when developing and developed countries alike are fortunate if they register social and economic growth rates of even one or two percent a year," Morse says. —*J. Raloff*