Behavior

Mental illness: The eyes have it

A 24-year-old woman, diagnosed as schizophrenic and hospitalized off and on since she was 13, was found upon examination to suffer from a severe vision problem. She reported that she was unable, without an extreme act of will, to hold visual images in her mind—a disability that made study and work impossible. Indeed, her history revealed that the prospect of work or study had invariably triggered a psychotic break, characterized by depression, social withdrawal, aggression and hallucinations. Unable to successfully treat her psychiatric symptoms, her psychiatrist treated her visual problem (with highly specialized, prism-like glasses), and as her vision steadily improved, her mental health improved as well. She is now symptom-free, in school and working.

This woman's story is not unique. According to New York City psychiatrist Frederic F. Flach, he and opthamologist Melvin Kaplan have treated several patients suffering from serious mental disorders by dealing with their visual and perceptual disabilities. And based on a recent study (reported in the July/August COMPREHENSIVE PSYCHIATRY), serious vision problems may be quite prevalent among the mentally ill and, in fact, may be a major obstacle to recovery.

Flach and Kaplan examined 48 randomly selected psychiatric patients for a variety of visual and perceptual problems, and they found the most severe forms of spatial disorientation almost exclusively among those with major psychiatric disorders, such as depression, schizophrenia and alcoholism; 66 percent of those subjects had severe visual disabilities — compared to 9 percent of the general population.

In addition, the researchers report, visual dysfunction was much more common among those with chronic mental disorders (eight out of every 10 were affected) than among those suffering brief episodes. And, where visual disability was quite uncommon among patients who were working and functioning socially, such disability was found in nearly every patient who was unemployed or socially withdrawn.

Just what role impaired vision plays in the onset and endurance of mental illness is unclear, Flach told SCIENCE NEWS, but one possible explanation is that the visual system plays a key role in resilience to stress. Stress causes physical and psychological disruption in healthy and unhealthy people, but where normal people bounce back from such disruption, the mentally ill, with a compromised perceptual system, cannot. Whatever the connection, Flach says, visual therapy—sometimes simply a pair of glasses — clearly improves mental health in some individuals. A visual examination, he concludes, should become a routine part of every psychiatric evaluation.

Fighting sleep with opiates

Narcolepsy is an incurable brain disorder that manifests itself primarily in irresistible daytime napping. Logically, the disorder is usually treated with stimulants. Now, illogically, a sleep researcher at the Medical College of Pennsylvania in Philadelphia reports that she is treating narcoleptic patients with codeine, an opiate derivative that normally causes drowsiness.

According to June Fry, five narcoleptics have so far been treated with codeine, resulting in what she calls "fantastically dramatic clinical results." All severe narcoleptics, the patients suffered not only from extreme sleepiness, but also from amnesia due to unrecognized "microsleeps" throughout the day; both symptoms were completely resolved in all five subjects. And unlike stimulants, the codeine appears to cause no significant side effects—even after as much as a year of use. Although the results are counterintuitive, Fry admits, she notes that the body's natural opiates are known to be involved in brain stem activity—possibly modulating the effects of other chemical systems involved in the sleep-wake cycle.

Energy

The breeder still breathes, barely

The Reagan administration has acted quickly to try to restore funding for the Clinch River Breeder Reactor project in Tennessee by enthusiastically endorsing a new financing scheme proposed by a consortium of private companies. Last month, the U.S. Congress voted not to fund the project until more private money was brought into the venture (SN: 7/23/83, p. 52). In his letter to Congress, Energy Secretary Donald P. Hodel, who reviewed the proposal and presented it to President Reagan, wrote, "... the President emphasized his strong support for completion of the Clinch River Project."

The financing plan calls for $675 million (plus interest) to be raised through a bond issue that will be supported by the future sale of electricity generated by the completed reactor. The government, however, must guarantee the project against failure for any reason, including increased construction costs because of delays, low energy demands and potential accidents. Whether or not Congress goes along with this scheme will depend on how it reacts to the request for guarantees, which places all the risk with the government. Congress must decide on the issue before the beginning of October if funding for the project is to continue without interruption.

Keeping the sun out and savings in

Sun-reflecting plastic films applied to office building windows reduce summer energy needs for cooling, but this advantage may be offset by increased winter heating-energy demands. Steve Treado of the National Bureau of Standards (NBS), who studied a range of solar film types in seven U.S. climatic regions, says, "It's easy to reduce your cooling load by a certain amount by putting on a solar film, but...you may end up paying more for heating." A recent NBS report summarizes the study's results and presents guidelines for selecting the most appropriate solar film for a given area.

Solar films vary considerably in their ability to transmit, reflect and absorb light and to reflect infrared radiation. A typical solar film consists of two or more thin plastic layers sandwiched into a sheet. These layers may contain vapor-deposited aluminum to make the film more reflective and dyes to produce a particular tint. An adhesive coating allows the film to be applied directly to windows.

The study shows that solar films are the most cost-effective in warmer cities, such as Phoenix, Houston and Atlanta, where cooling needs are high. In colder areas, such as Chicago and Boston, there are no significant savings, unless cooling-energy costs are much higher than heating fuel costs.

"Most manufacturers do offer a range of films," Treado notes, "and if they don't, they will now, as people start asking for them." Treado cautions that the results of his computer-model study do not apply to residences because homes rarely have the expanse of glass found in modern office buildings.

Giant thermocouples in the stacks

A Philadelphia-based research and development company, U.S. Energy Research, Inc., is proposing the use of a thermoelectric generator to convert waste heat from the smokestacks of electric utilities into electricity. The company's design is a refinement of a well-known phenomenon in which heat applied at the junction of two different, properly chosen materials (to form a thermocouple), generates a voltage. Thermopiles (several thermocouples connected in a regular pattern) are used today in submarines as emergency power suppliers, but they are not efficient current generators. The new thermopile, based on thin-film technology to make junction areas larger, results in a thermoelectric generator "an order of magnitude more efficient" than an ordinary wire thermocouple.

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