Nervousness over tranquilizers

In a recent movie, Burt Reynolds portrayed a man having an anxiety attack in a busy department store. As Reynolds crouched into a ball of fear, his brother asked the sizeable crowd of onlookers if anyone had a Valium — immediately, almost all of the surrounding women reached into their handbags and produced Valium bottles. Though fictional, the scene may not have been too far off the mark in reflecting the scope of prescription tranquilizer usage in the United States. In pill form, such tranquilizers (benzodiazepines) are taken at the rate of 5 billion a year and prescribed to 68 million individuals a year, according to the Food and Drug Administration. And a 1973 study reported that 97 percent of general practice physicians prescribe tranquilizers. Concerned over such figures, the FDA has announced that some drug companies manufacturing benzodiazepines have agreed to routinely inform physicians that the drugs should be prescribed primarily in acute or severe cases of anxiety and should not be used for "the stress of everyday life."

Despite the possibility of addiction and other potential problems of long-term use, tranquilizers generally are not regarded with the same alarm as are narcotics. However, a study reported in the July AMERICAN JOURNAL OF PSYCHIATRY suggests that long-term use of benzodiazepines can trigger significant nervous system difficulties, while therapeutic doses of narcotics (for pain) do not. Moreover, the researchers say it is not known whether such changes disappear or remain once a person stops taking the tranquilizer.

Johns Hopkins Hospital scientists administered three separate tests measuring cognitive and psychomotor performance and intelligence, along with EEG brainwave measurements, to patients among 106 consecutive admittances to the hospital's Chronic Pain Treatment Center. While, according to the researchers, it has "never been demonstrated" that benzodiazepines do anything to alleviate chronic pain, 43 percent of the clinic's patients take prescribed tranquilizers. And though long-term use of narcotics is "contraindicated" even in chronic pain patients, 80 percent of those at the clinic also receive these drugs.

In comparing the cognitive performance of those taking either tranquilizers or narcotics, the researchers found "a significant impairment in cognitive functioning among persons taking benzodiazepines compared with the patients not taking drugs or [taking] narcotics." They found, further, that:

- Regardless of EEG outcome, 10 of the 13 patients taking benzodiazepines alone had signs of cognitive impairment, compared with 4 of the 13 taking narcotics alone.
- None of the 13 taking narcotics alone exhibited any EEG changes, compared with 8 of the 13 tranquilizer group members.
- None of the narcotics patients exhibited *both* EEG and cognitive impairment, while seven of the benzodiazepine group did.

"By comparing two populations that were mutually exclusive...one could conclusively state that benzodiazepines were far more likely to produce cognitive impairment, with concomitant EEG changes, than were narcotics," report the researchers, headed by Nelson Hendler of Johns Hopkins and the Mensana Clinic in Stevenson, Md. "It is apparent that any cognitive impairment noted in the patient receiving both narcotics and benzodiazepines is far more likely to be due to benzodiazepines..."

While neither type of drug should be used on a long-term basis, the researchers urge specifically — in line with an FDA suggestion — that "benzodiazepines be limited to short-term use" — a course of action underscored by the still-unknown answer to "the question of reversibility of the benzodiazepine effect." □

EPA's new twist in chemical-dump suits

The federal government has taken a new tack in its war on chemical polluters. Should charges that were filed in a lawsuit this month stick against 10 of the nation's largest chemical manufacturers, a powerful precedent will have been established making not only chemical dumpers but also chemical-waste generators responsible for improper disposal practices and for any environmental degradation that results.

The case chosen to test the precedent involves two Louisiana chemical-dump sites owned and operated by Petro Processors of Louisiana Inc. The Justice Department claims that Petro Processors deliberately discharged chemicals from one site — 54.5 acres known as Brooklawn — into Bayou Baton Rouge. Another 8.5-acre Scenic Highway site has not received wastes since 1974. But the government alleges that due to improper burial, runoff from erosion and flooding has contaminated surrounding regions with dangerous concentrations of chlorinated hydrocarbons, heavy metals and other chemicals.

In addition to naming Petro Processors a defendant in this case — developed by the Environmental Protection Agency — Justice has also cited 10 chemical manufacturers for "contributing" to waste-disposal violations. Justice argues that since Petro Processors appears to have had a long history of hazardous dumping practices, the waste generators "knew, or should have known" that their wastes were being handled improperly — especially after a private landowner named all but one of the firms (U.S.S. Chemical) in a 1969 suit over contamination from one of the two sites named in this case.

The manufacturers named as defendants include American Hoechst Corp., Allied Chemical Corp., Copolymer Rubber and Chemical Corp., Dow Chemical Co., Ethyl Corp., Exxon Chemical Co., Rubicon Chemical Corp., Shell Chemical Co., Uniroyal Inc. and U.S.S. Chemical Co. □

Chick's death haunts condor program

Tupper Ansel Blake/U.S. Fish and Wildlife Service

Healthy condor chick, measured June 28.

Births nearly always occasion celebration. But when the baby is a California condor, one of the world's rarest birds, each birth becomes a major event. With only 20 to 30 of the majestic vultures surviving it is understandable why ornithologists waxed jubilant on May 15 as news circulated of the direct observation, for the first time ever, of a hatching condor chick. Soon scientists learned of another, adding to their enthusiasm. But a pall fell June 28 when one of the chicks died while being measured—in the hands of a condor researcher — presumably of fear-induced stress.

"This is just a real rarity," said John Borneman of the California Condor Research Center in Ventura, Calif. These creatures "are known to be hardy," he explained, and the researcher handling the 13-pound chick did so correctly. Awaiting autopsy results, several researchers have offered possible explanations for the death, ranging from a calcium-phosphorus deficiency to pesticide poisoning. Borneman recounted a similar incident involving a brown pelican. Its death was later shown to have occurred when stress pumped high levels of dieldrin, a pesticide that had been stored in its fat, into the bird's bloodstream.

Because little is known about the condor and its decline, each chick became the

focus of intense, near round-the-clock telescopic observation by researchers a quarter-mile away. But certain vital data could not be gleaned remotely, such as weight, bill length and length of primary feathers. The latter two are constants, independent of the bird's nutrition, Borneman explained. What's more, eggshell shards being gobbled up by both the chicks and their parents offered data on pesticide levels in shells. While remote surveillance of the remaining chick continues, researchers worry that emotional criticism stemming from the chick's death could seriously jeopardize the condor-conservation program. □

Three-eggs-a-week plan

In the first revision of their 1968 "Risk Factors and Coronary Disease," the American Heart Association asserts once again that a diet high in cholesterol and saturated fat increases risk of heart disease. The new statement was released early (it will appear in the August CIRCULATION) to clarify the association's position in the controversy surrounding the recent report of the National Academy of Sciences Food and Nutrition Board (SN: 5/31/80, p. 343). The AHA recommends "moderate changes in food selection and preparation" to increase consumption of fruits, vegetables, legumes, whole grains and dairy products with low fat content and to decrease consumption of saturated fats and egg yolks. The report emphasizes that interaction of many risk factors is responsible for coronary heart disease in an individual. □

Chemotherapy consensus

Roughly 109,000 women in this country get breast cancer each year, and sometimes it may seem to doctors that as many journal articles are published on the relative value of various types of chemotherapy. In an effort to define the current state of the art for the use of chemotherapy following breast cancer surgery, the National Institutes of Health held a consensus conference earlier this month.

Among their recommendations:

- Pre-menopausal women whose cancers have spread to their lymph nodes should receive chemotherapy following surgery, since this increases the five year survival rate from 45 percent to 60 percent.
- Women with no evidence of spread should be spared chemotherapy, until such time as it becomes possible to determine who is at risk of relapse. Survival rate is now at least 80 percent. Chemotherapy would "expose the majority to the risks of toxicity without possible benefit."
- Preliminary studies of post-menopausal women show there may be some benefit to chemotherapy, but there is not enough research for a definitive conclusion. □

Comets: Seeing one is like seeing all

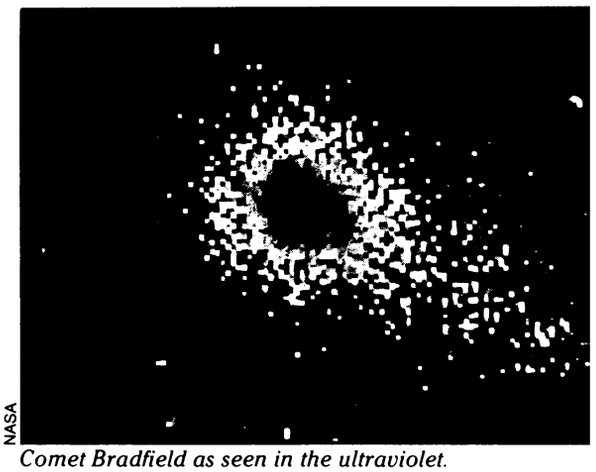
There's further evidence for the vintage idea that all comets have a common parentage — a conjecture that involves statements about the origin of our own solar system. The latest results are the consequence of nine scientists from five institutions studying the ultraviolet spectrum of Comet Bradfield. (Since it is possible for several comets to have been discovered by a sole observer, they are less ambiguously identified with the year and order of their discovery. Thus, the one of several Comets Bradfield being discussed here is designated 1979l, the twelfth comet found in 1979.)

By comparing the spectral appearance of Comet Bradfield with those of Comets West and Sargeant, which had previously been observed in the same wavelength range, the scientists found all three to be identical in crucial respects. This is significant since the ultraviolet spectral region is especially revealing about a comet's composition: Almost every molecule advertises itself within that range of small wavelengths (1.2-3.2 $\times 10^{-5}$ centimeters). Though by itself this comparison of three comets is a weak statistical foundation from which to jump to conclusions, coupled with previous knowledge the tempting suggestion is that comets are all molded from the same cosmic clay and perhaps are emigrants from a single far-flung venue.

Credit for the ultraviolet observations goes to the International Ultraviolet Explorer Satellite, launched by NASA in 1978. From its lofty vantage point, thousands of miles above the Atlantic Ocean, the satellite can see a comet's UV emanations with crystal clarity. By contrast, a terrestrial observer, who must contend with the atmosphere's propensity to absorb them, is rendered blind to whatever information they impart.

Reporting in the July 10 NATURE, P.D. Feldman and colleagues also discuss various meanings for the presence of hydroxyl, OH^-. Among these is that comets are indeed dirty ice balls, a thirty-year-old idea first suggested by Harvard University's comet guru, Fred Whipple. Since the comet's presumably frozen nucleus of water-ice and dust is obscured by its extensive halo, astronomers now can only assume that the measurable abundance of OH^- is directly related to the amount of water contained in the comet's invisible regions.

Besides being less dusty, Comet Bradfield is very similar to its more popular contemporary, Halley's Comet, due to make its anticipated reappearance in 1985. Consequently, astronomers are interested in fully exploiting the analysis of Comet Bradfield as something of a trial run. Pursuing these studies, astronomers believe



NASA

Comet Bradfield as seen in the ultraviolet.

that if—as the Dutch astronomer Jan Oort suggested several decades ago — comets come to us from the periphery of our solar system (far from the transmuting effects of the sun), they bring material of the seminal solar nebula, preserved these past four-odd billions of years in the deep freeze of their insulated nuclei. □

Tempus fugit . . . it also varies

Under pressure, any one of us might be heard complaining about the shortage of minutes in a day. But to the verity of that familiar lament there is an interesting postscript, an aspect of which has recently gotten empirical validation.

For years, scientists have reasoned that the length of day varies as consequence of the earth's rotational period being affected by natural circumstances, among them the mercurial shiftings of ordinary winds. As they blow, impelled by a global network of high and low pressure zones, they grate against the landscape, upsetting the earth's rotation rate. Now, actual measurements of these very tiny effects — less than one millisecond in a typical day — have been added to, with results reported by D. J. Shea and colleagues in the July 10 NATURE. Based on 16 weeks of meteorological data sampled every twelve hours, their measurements of "high-frequency" fluctuations in the length of a day (those that ebb and flow more frequently than four times during the year) verified what had previously been seen for lower frequencies of the same phenomenon. The triumph of this latest analysis derives from the higher frequency fluctuations being far more subtle, though not less important.

Ultimately, geologists hope to measure and thereby eliminate all known contributions to the total fluctuation, leaving by inference only the part that arises from the earth's core rubbing against the planet's crust. Applying further arguments to such a result could lead to important conclusions regarding the composition and viscosity of the core. □