

Sound psychology

The Acoustical Society of America met in Washington this week, and the effects of noise on human behavior was a major topic.

• A high level of noise in an automobile may slow down a driver's braking reflex. Donna Mergler-Racine and Pierre Buereur of the University of Quebec in Montreal put drivers in a simulated car and exposed them to recordings of actual intravehicular noise. The drivers were told to brake as quickly as possible when a red light flashed on. As the noise levels rose, the braking reflex slowed. The more intense the noise, the more rapidly the reflex deteriorated. Measurement of leg muscle electrical activity confirmed these findings. The researchers attached sensors to subjects' legs and recorded the electrical pattern of the muscles used during braking. As the noise level rose, an electrical pattern normally associated with muscle fatigue appeared. The higher the noise level, the sooner this pattern appeared.

• Jerome E. Singer of Yale University also reported on the effects of noise on behavior. The direct effects of noise include interference or degradation of performance of activities or tasks (such as braking). But, he says, most people adapt quickly and efficiently to the levels of noise usually found in the environment. It is the indirect effects, he says, that may be more serious. And even though these subtle effects often go unnoticed, they can continue long after the noise that caused them ceases. The indirect behavioral after-effects often produced by the noise of transportation and other sources include: Trouble reading at home after working in a noisy office; lowered ability to learn incidental material at a job or to read in school; adverse effects on subjective feeling of well being, as well as a lowered general enjoyment of life; and the emergence of aggression and asocial attitudes.

April is the cruelest month

Instead of rhapsodizing about fancies lightly turning to thoughts of love, T. S. Eliot cast aspersions on spring and called April the cruelest month. As much as this goes against the grain, it now appears that Eliot's poetic insights may have been at least partially correct. Chronobiologists, researchers who study biological rhythms, are coming up with some less than cheerful data about spring.

Franz Halberg of the University of Minnesota in Minneapolis has computer processed millions of medical measurements and found, among other things, that spring is a peak time for suicide, depression and ulcers. And this is not just confined to Minnesota. A German chronobiologist, Jurgen Aschoff, has found that the peak for suicide occurs later as you move northward from Greece. A seasonal correlation seems likely. And the same holds true for ulcers. In all parts of the world tested, onset of ulcers is most common during spring and fall.

As for love, old adages once again prove false (at least for men). The excretion of testosterone in men and male sexual activity both increase in the fall, not spring. (These measurements were made in Paris by Alain Reinberg, visiting professor at the University of Minnesota.)

Chronobiologists are not completely sure why humans have seasonal or "circannual" rhythms, but according to Halberg, these changes are not just psychological. Blood pressure, cholesterol levels and hormones are all implicated. Measurements of them suggest a predictable, seasonal variation. Knowledge of biological rhythms has already been useful in the timing of medication, and Halberg says his group is studying the medical implications of rhythms for the prediction and treatment of heart disease, strokes and cancer.

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Accuracy for finding acid droplets

Corrosive sulfuric acid (H_2SO_4) is a significant air pollutant, and has been so since the first heavy reliance on sulfur-bearing fossil fuels. Catalytic converters, required equipment on new automobiles, have added to this problem. Until now, it has been difficult to measure concentrations of airborne H_2SO_4 droplets due to chemical reactions during measurement. Chemists from Louisiana State University have now developed what they call "the first accurate method" for measuring them.

Philip W. West and co-workers at LSU's Environmental Studies Institute report the new method in the April ANALYTICAL CHEMISTRY. The H_2SO_4 droplets, during normal measurement procedures, react with other suspended pollutants. This neutralizes them and prevents complete measurement. The new method stabilizes the acid at the moment of collection by capturing it on a perimidylammonium bromide filter, then releases it later as sulfur dioxide, which can be accurately measured. Increased reliance on sulfur-bearing fuels to meet energy demands will result in more airborne H_2SO_4 , they state, and a greater need for accurate monitoring procedures.

Rubber-making: Cancer potential

Following the discovery in 1974 that vinyl chloride can cause liver cancer in industrial workers, the B.F. Goodrich Co. began a comprehensive study of employee health records. A few of that company's workers contracted liver cancer and the management was anxious to spot potential health problems from other chemicals. The survey of health records has now turned up another possible chemical-cancer link—this time, between exposure to synthetic rubber manufacture and leukemia.

Records indicate that five workers in the company's Port Neches, Tex., plant contracted leukemia and four have died from it since 1966. A second company, Texas U.S. Chemical Co., also in Port Neches, has now uncovered three leukemia cases and a possible fourth from its workers' health records. Both companies use a process that involves the organic chemicals styrene and butadiene. Most of the synthetic rubber for tires and conveyor belts is made with this process.

Both companies invited officials from the National Institute of Occupational Safety and Health to investigate employee health records and plant operations. Statistical and experimental research on the potential link between rubber-making and leukemia will be stepped up. Both industry and government spokesmen emphasize that the link has not been confirmed and may be a statistical artifact. A NIOSH scientist, however, told SCIENCE NEWS that a rate of eight leukemia cases among the employees of two companies may be much higher than the expected incidence.

Aluminum orbs over a blue-green sphere

Most of the medium-sized particles floating in the stratosphere come from rocket exhausts, a report in the March 26 SCIENCE reveals. A team of astronomers, headed by D.E. Brownlee of the University of Washington, sent research balloons and U-2 aircraft 20 to 34 kilometers above the earth to sample particles in the 3 to 8 micrometer range. (It is hard to capture smaller particles with the team's collection technique and larger ones are probably extraterrestrial in origin.) Ninety percent of the particles collected from more than 100,000 cubic meters of air were very pure aluminum oxide (Al_2O_3) spheres. These, they state, are probably formed during combustion of solid rocket fuel with its powdered aluminum additives (SN: 10/4/75, p. 219). These particles probably have little or no effect on climate or radiation, one team member says.

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