

SCIENCE NEWS of the week

'Sick' Buildings Exert Stressful Impact

Call it the edifice complex: People working in the same building complain of headaches, fatigue, eye irritation, dizziness, itchy skin and other symptoms that intensify during the workday but abate in the evening and on weekends. No known toxins or diseases cause these physical problems. Sufferers learn to dread the workplace, and supervisors may question their emotional stability and motivation.

Scientists call this problem sick building syndrome, or SBS (SN: 10/19/91, p.247). Most SBS sufferers react to "real environmental contaminants," psychologist Russell M. Bauer of the University of Florida in Gainesville and his colleagues report in the April JOURNAL OF CONSULTING AND CLINICAL PSYCHOLOGY. The investigators assert, however, that psychological reactions often make SBS symptoms worse, particularly if a building remains contaminated or if physical complaints get dismissed as "hysterical reactions."

Some recent reports suggest that SBS stems from increased levels of dust or airborne chemicals, caused in some way by mechanical ventilation systems, fluorescent lighting or building materials. Others find evidence that SBS spreads among employees troubled by some form of stress at work and possibly hampered by preexisting psychological problems.

"There is often an organic cause for SBS that is difficult to identify," says psychologist Christopher M. Ryan of the University of Pittsburgh, who studies behavioral reactions to toxic substances. "There may also be psychological causes, but little is known about psychological factors associated with SBS."

Bauer's group administered health and psychological surveys to 111 people. Of that number, 27 worked in a building where they had complained of SBS symptoms for up to two years; 58 worked in the same building but had not experienced SBS; and 26 controls worked for the same company in a different building where no SBS complaints had surfaced.

The two groups working in the same building scored similarly on psychological measures, including depression, paranoia and a history of vague physical complaints. But these employees showed elevated measures compared with workers in the control building. This suggests that "working in a 'sick building' is not without its psychological costs," the researchers conclude.

Most important, occupants of the building with SBS cases displayed more defensiveness, anxiety, confusion, and resentment and distrust of authority than did control workers, Bauer's group contends. This may reflect general frustra-

tion with an unexplained and protracted building problem, as well as the reactions of those with SBS to accusations that they suffer from psychological problems, the researchers note.

Employees with SBS reported substantially more cigarette smoking than their co-workers, they add. The investigators theorize that smoking may sensitize people to airborne contaminants in poorly ventilated buildings or impair immune function and thus encourage SBS symptoms. Further research must address whether nonsmokers exposed to cigarette smoke at work become more vulnerable to SBS, the investigators say.

Further studies must also evaluate psychological health when employees begin work at an allegedly "sick" building, Ryan maintains.

"Problem buildings usually have three to 10 major engineering flaws as well as pollutants that contribute to SBS," says physician-epidemiologist Michael J. Hodgson of the University of Connecticut School of Medicine in Farmington, who has directed several studies of contaminants in the workplace. "Psychological causes may play a minor role, but organizational dysfunction is always an issue."

For example, companies with open lines of communication usually resolve such problems quickly and thus do not come to the attention of researchers, Hodgson points out. In addition, he says, SBS complaints intensify among employees with little control over their work situation — for instance, those who must sit all day at a computer terminal with no access to an open window. — B. Bower

Huge landslide threatens at Alaskan volcano

Jutting steeply out of the waters of Cook Inlet, Alaska's Mount St. Augustine presents a stony profile that seems to transcend time. But a study of this active volcano indicates that every 150 to 200 years, large parts of the mountain have collapsed and fallen into the sea. If the past cycle continues, a major avalanche could come during the next several decades, volcanologists warn.

In light of these new findings, geological researchers question the wisdom of the President's proposed 1993 budget, which seeks far-reaching cuts in programs that monitor earthquake and volcanic hazards in the United States.

Most volcanologists have thought that major landslides occur only rarely on volcanoes, perhaps once or twice in the lifetime of the mountain. But the new study shows at least one volcano has a habit of collapsing. James E. Begét and Juergen Kienle of the Alaska Volcano Observatory and the University of Alaska in Fairbanks report in the April 23 NATURE that large landslides have shorn Mount St. Augustine a minimum of 11 times in the past 1,800 to 2,000 years.

"This is the first time this type of behavior has been documented for a volcano," says Begét. He says volcanologists have not studied most of the other volcanoes in the world well enough to know if they behave the same.

Using the carbon-14 dating technique, the Alaskan researchers determined the ages of individual debris layers piled one atop the other. The most recent slide occurred during an eruption in 1883. At that time, the north side of the 1,200-meter-tall volcano slid into the sea, leaving a large horseshoe-shaped crater.



Austin Post, USGS

Effects of the last avalanche are evident in a 1966 photo of St. Augustine. Arrows indicate pre-1883 coastline. When debris fell into the sea, it formed a new coast.

Such an avalanche might have carried away about 10 percent of the volcano, estimates Lee Siebert of the Smithsonian Institution in Washington, D.C.

Since 1883, a series of eruptions has filled in the hole left by the last landslide. With each successive eruption, the top of the volcano grows steeper and more unstable, says Begét, who believes St. Augustine has reached a point where another collapse is possible. Judging from past deposits, the next landslide would barrel down the north side of the volcano. As it crashed into the sea, the debris would generate a tsunami wave heading in the direction of cities and oil platforms in Cook Inlet.

St. Augustine is only one of many active volcanoes in the western states. Despite the potential threat, the proposed 1993 budget for the U.S. Geological Survey would reduce its volcanic hazard program by nearly a quarter and slash 83 percent from current federal funding for the Alaska Volcano Observatory. The earthquake hazard program would also suffer a large cut. — R. Monastersky