

biomedical sciences

More insight into sudden infant deaths

After the neonatal period, the sudden death syndrome is the greatest single cause of death during the first year of life, accounting for some 10,000 deaths annually in the United States. The typical victim is a generally healthy-appearing infant who dies silently during sleep.

The cause or causes of sudden infant deaths have been tough to pin down, but during the past several years there has been increasing evidence that the final cause, if not the total cause, of sudden infant deaths is lung abnormalities. Several investigators noted that purplish skin (indicating a lack of oxygen) and a prolonged absence of breathing preceded some cases of sudden infant death. Now a pathologist at the Pennsylvania State College of Medicine reports in the Nov. 29 *NEW ENGLAND JOURNAL OF MEDICINE* that infants who die suddenly have abnormal quantities of smooth muscle in the arteries of their lungs—perhaps enough to cut off breathing and lead to death.

Richard L. Naeye studied lung tissue from infants who had died from the sudden-death syndrome or from other causes. He found the sudden-death infants had 1.6 times more muscle in their pulmonary arteries than controls did. The increased muscle was characteristic of persons who suffer chronically from a lack of oxygen. Naeye could find no evidence in the victims of sudden-death syndrome that heart disorders might have increased pressure on the lung arteries, and thus obstructing breathing.

Cyclic AMP calls heart beats

In 1957 researchers discovered a natural cell chemical that would have a profound bearing on subsequent physiological research. It was cyclic AMP. Cyclic AMP is now known to usher hormone messages into cells. Cyclic AMP is controlled by nerve chemicals and prostaglandins (hormone intermediaries that work between cells).

More needs to be learned about cyclic AMP, though, and Gary Brooker of the University of Virginia School of Medicine reports in the Nov. 30 *SCIENCE* that cyclic AMP appears to regulate heart contractions.

Brooker has found that heart concentrations of cyclic AMP rise and fall during each heart contraction cycle, and this rise and fall is controlled by the nerve chemical epinephrine. Peak cyclic AMP concentrations precede peak systolic tension (when the heart disgorges blood). "These transient changes . . ." Brooker says, "indicate a potential role for cyclic AMP as a beat-to-beat regulator of myocardial contractility."

How lead causes hyperactivity

Hyperactive children are exceptionally active physically, have short attention spans and are easily frustrated. While psychological problems or brain diseases can cause hyperactivity, there is strong clinical evidence that hyperactive children from the inner city may be the victims of lead poisoning.

Now the first strong neurological evidence that lead can lead to hyperactivity is reported in the Dec. 7 *SCIENCE* by two environmental investigators at the University of Cincinnati—Mitchell W. Sauerhoff and I. Arthur Michaelson.

When newborn rats were suckled by mothers eating a diet containing four percent lead, they became hyperactive at four weeks of age. There was an eightfold increase in lead in their brains, and a 20 percent decrease in the nerve chemical dopamine, suggesting lead can upset dopamine and in turn the central nervous system.

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environmental sciences

What you don't hear can hurt you

Sound pollution has been gaining increased attention and new regulations limit the amount of noise to which workers and the general public can be subjected. But concern so far has been concentrated on the nuisance value of noise one actually hears. A series of articles in the Nov. 8 *NEW SCIENTIST* suggests that inaudible noise may be more insidious.

Infrasound has frequencies below the threshold of human hearing. Preliminary studies show that some unpleasant symptoms—primarily a seasick sensation—occur at moderate volume levels. Such levels can result from wheel vibration in a car, clanking office equipment and the beating of storms against tall buildings. The studies suggest that in susceptible people obscure discomforts may be derived from such sources of infrasound.

Ultrasound has frequencies too high for humans to hear and has been used for years without undue notice in industrial processes such as emulsification. But now the general public may sometimes be exposed to such sounds, with possibly harmful effect. Some burglar alarm systems, according to the *NEW SCIENTIST*, use ultrasonic sources that remain in operation all day. As a result, some customers and employees have complained of headaches, dizziness and nausea.

Finally, under just the right conditions, some people seem to be able to hear the jet stream as a low throbbing sound inaudible to everyone else around. They appear none the worse for this extraordinary ability, unless they start worrying about it like a person obsessed by the drip of a distant faucet.

Long-range energy conservation

Americans are just beginning to cut back on energy use by curtailing driving and chilling their homes, but a little preplanning could save a lot more heat with much less inconvenience, according to an article in the current *IEEE SPECTRUM*.

In a typical contemporary-style office building, glass may occupy 40 to 60 percent of exterior wall area, with "fixed light fenestration" (a euphemism meaning "you can't open a window in the entire bloody structure"). As a result, natural ventilation is impossible and heat radiates in during the summer and out during the winter.

Without returning to the old-style, small window office buildings, contractors can save greatly on energy requirements by installing specially glazed glass panes. Also, a quarter to a third of light-fixture heat can be used for heating rooms by ventilating the fixtures properly.

Home architecture, too, may soon undergo energy saving revisions. Westinghouse Electric Company will open a demonstration house in Florida in January that will use solar and waste heat for tap and swimming-pool water. In a much colder climate, the Pennsylvania Power and Electric Company is planning a house whose energy requirements will be furnished by two heat pumps, waste heat reclamation and solar collectors. The savings of incoming electricity may be as much as 50 percent.

Finally, a Government survey conducted last year showed that almost 4 million gas lamps are still in use, each requiring 20 times the energy of an equivalent electric light. Replacing the gas lamps with incandescent bulbs could save enough energy to heat some 600,000 homes. Gas is 2.2 times more efficient for heating than electricity, however. As one wag put it, "the only less efficient way to heat a house than with electricity is to burn it down."

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