

Wolfgang Ehrenstein and Wolf Müller-Limmroth have looked at another aspect of noise-sleep interaction at the Technical University of Munich in Germany. Monitoring humans exposed to noise throughout the different stages of sleep — i.e. delta-sleep, the rapid-eye-movement phase, etc. — they concluded that sleep was “resistant even to extreme noise exposure” — as measured by the time spent in each sleep phase. A perplexing observation they were unable to explain involved qualitative changes in the sleep of six subjects exposed to eight consecutive nights of loud noise. “After the first night of noise exposure, the moods were negatively affected [for] ten minutes after awakening. With succeeding noise exposure during bedtime,” the German team reported, “this negative effect spread more and more to the late morning hours and to the early afternoon, thus indicating an increasing deterioration of sleep quality.”

Robert Wilkinson and colleagues with the Medical Research Council in Cambridge, England, reported finding that the performance of certain specific tests could be negatively affected after a night of noise-disturbed sleep. Daytime noise, however, has an even more profound impact on task performance, particularly the storage and selective recall of information and the processing of speech.

“[N]oise of sufficient intensity probably discourages conversation, it probably reduces the content of verbal communica-

tion, it probably degrades the fidelity of verbal exchanges, and it probably requires frequent repetition of messages,” says John Mills of the Medical University of South Carolina. Not surprisingly, he says this “can lead to irritation, confusion and fatigue on the part of the talker and the listener.” When adults are put in such situations, they usually give up attempts at conversing after only a few minutes. How much more dangerous is it, Mills asks, to put children in such a setting when it’s largely through verbal communication that they can expect to acquire language skills and the seeds of knowledge?

However, as serious as this noise-induced inhibition of speech may be, it’s the link between noise and hypertension (high blood pressure) that garners the lion’s share of attention among those studying nonauditory effects of noise. More than 40 studies, many of them involving industrial workers, have shown a link between high levels of noise and cardiovascular changes. One of the most respected of those studies was conducted by H. Ising and H.-U. Melchert at West Germany’s federal Institute for Water-, Soil- and Air-Hygiene in Berlin. They found that on days when brewery workers deliberately wore no hearing protectors, their diastolic and systolic blood pressures and urinary excretion of norepinephrine metabolites were elevated — relative to when those same workers wore hearing protection.

Yet to be truly cataloged are the broad-

band changes in blood chemistry caused by noise-induced stress and a dose-response index correlating noise exposure to cardiovascular changes. E. A. Peterson and colleagues at the University of Miami have been looking into attempting just that. Beginning with rhesus monkeys (SN: 3/28/81, p. 198) and now using crab-eating macaques, Peterson has exposed his primates to noise of the type, duration and hourly regimen that human workers might encounter. Although most researchers consider Peterson’s work the most promising U.S. inquiry into the cardiovascular effects of noise, his research may come to a halt on October 1.

To date, Peterson has been funded through EPA’s noise office, which has come under the Reagan budget ax — a victim of the President’s regulatory-reform program. As of September 30, 1982, it and the programs it has funded will cease. Noise is a local problem, the new administration has said, and as such should be funded and administered by state and local authorities.

However, notes Jeff Goldstein, who just left EPA’s noise office, “The states’ big problem will be to get priority funding for noise programs. Even if they do I doubt very much if a state would conduct noise-effects research. It just wouldn’t pay them to do it.” If so, many of the unanswered questions regarding harm posed by noise will remain unanswered a good while longer. □

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THE MATHEMATICAL EXPERIENCE — Philip J. Davis and Reuben Hersh, introduction by Gian-Carlo Rota. Not a mathematics book, but a book about mathematics which is intended to explain to the general reader what mathemati-

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