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. deltasleep, 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 or 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 AMERICAN MEDICAL ASSOCIATION BOOK OF WOMANCARE — Linda Hughey Holt and Melva Weber. Describes how a woman's body functions and explains how she personally can play a key role in caring for it. Discusses the fertile years and accompanying body changes, childbearing, gynecologic problems and then discusses well-being past childbearing. Includes a chapter on cancer. Random, 1982, 263 p., illus., \$12.95.

THE ESSENTIAL GUIDE TO PRESCRIPTION DRUGS — James W. Long. Though copious information is available to the health professions, only a small portion of it reaches the public. This book, written by a physician, is meant to be a source of basic information about the most commonly used drugs. A patient complies with a doctor's instructions far better when sufficiently informed to recognize anticipated drug effects and to know when to consult the doctor about the drug therapy. Har-Row, 3rd ed., 1982, 935 p., \$32.95, paper, \$9.95.

**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-

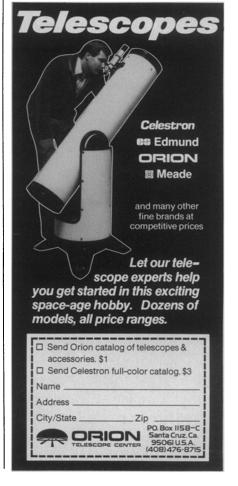
cians do. The emphasis is on the substance of mathematics, its history, its philosophy and how mathematical knowledge is gained. In some areas specialized material is directed to the professional who uses or produces mathematics. "At such places the [general] reader should judiciously and lightheartedly push on." Originally published in hardback by Birkhauser Boston in 1981. HM, 1982, 440 p., illus., paper \$9.95.

A PICTORIAL GUIDE TO FOSSILS — Gerard R. Case. An illustrated presentation of past life forms that inhabited the earth millions of years ago. Many typical forms of fossils are presented as well as "index" or guide fossils, together with newly discovered specimens rarely seen outside scientific journals. Many specimens have been photographed from several perspectives to give the reader a multidimensional view of the fossils. Van Nos Reinhold, 1982, 514 p., illus., \$29.95.

2081: A Hopeful View of the Human Future

— Gerard K. O'Neill. Discusses the lessons that can be learned from earlier attempts at predicting the future, describes the five developments that the author believes will determine the course of the next 100 years, views the world of 2081 and explores the most exciting developments of a century from now. Originally published in hardback in 1981. S&S, 1982, 284 p., illus., paper, \$6.25.

WEATHER AND ENGERY — Bruce Schwoegler and Michael McClintock. Looks at the enormous amount of energy present in meteorological phenomena of all kinds. Explains how the weather system works and explores the connections between weather and weather-related sources of energy that are potentially useful. McGraw, 1982, 230 p., illus., \$22.50.



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