

even the autumn leaves contain substances which eventually become acidic in their biodegradation process. For some reasons not completely understood, the Northeastern United States and Southeastern Canada have experienced definite effects of some acidic nature. At this point, science and politics differ from opinion as to what should be done. Mr. Pawlick, an American residing in Canada, has treated the subject as an investigative journalist, giving considerable data to back his highly readable text. For example, he notes that the pH of precipitation in parts of New York State, Pennsylvania and Ontario was 4.1; in New England in 1979, 4.4 (annual mean average). Fish and forests are not the only questions; the role of aluminum (previously considered a relatively harmless metal ion) in causing bone damage and in "dialysis dementia", as related to "senile dementia" or Alzheimer's disease, is possibly related to ingestion of aluminum from water where lower pH results in higher solubility.

Six pages of general references on acid precipitation and who is interested make up one appendix; another lists 1979, 1980 and 1981 ratings of the top SO₂ emissions from North America's five coal-fired power plants (one each in Kentucky, Tennessee, Indiana, Michigan, and Illinois), while the third appendix lists the top ten sources of SO₂ emissions for 1980 (two each in Canada and Ohio, one each in Kentucky, Tennessee, Indiana, Illinois and Michigan). One plant in Manitoba, Canada was also in the top ten.

There is little doubt that more public awareness, plus a great deal more specific knowledge (including the airborne experiments now underway) will be necessary before the question of "killer rain" is resolved. Certainly this book will increase public awareness.

H.H. FAWCETT

Toxic Hazards of Rubber Chemicals, by A.R. Nutt, Applied Science Publishers Ltd., Barking, Essex, England, April 1984, 194 pages, cloth, \$ 45.00.

The author, who is with the Health and Safety Department, Technology Division of Dunlop, Ltd., Birmingham, U.K., points out in the preface that the rubber manufacture is essentially a chemical industry, but that many of the several hundreds of "chemicals" used in the industry are inadequately documented from a health and safety concern. Mr. Nutt has attempted to supply some of the missing data by first discussing the knowns (epidemiological studies of the rubber industry in the U.K., the U.S.A., Finland, Switzerland and Sweden). Next he discusses the status of current knowledge on bladder cancer in the rubber industry, and the hazards from aromatic amines, polycyclic aromatic hydrocarbons and nitrosamines, each section of which is well referenced. The major part of the volume deals with the toxicity of rubber chemicals, discussing monomer and polymers, reinforcing

agents, activators and fillers, curing agents, ester plasticizers, accelerators, retarders, antidegradants, blowing agents and solvents. The physiological effects of chemicals, the toxicological testing and atmospheric monitoring aspects are well presented. Perhaps most valuable to the average "non-rubber expert", such as this reviewer, are the bibliography, and the chemical trade names index (from Al to Wingstay), and chemical names index (from acetone to zinc stearate). This is a most excellent, highly specialized source of data which should be useful to the rubber and related industries.

H.H. FAWCETT

Disaster Management: Warning Response and Community Relocation, by R.W. Perry and A.H. Mushkatel, (Quorum) Greenwood Press, Westport, CT and London, 1984, 280 pages, \$ 35.00.

From earliest times to the present, the importance of planning for warning, evacuation, and often relocation of persons from both natural and man-made threats has been recognized by social scientists, but largely ignored by engineers and physical scientists. This book, by two professors at Arizona State University, is based on studies of the American National Science Foundation, the Ohio State University Disaster Research Center, and the earlier studies at the National Academy of Sciences by Charles Fritz and others.

After the recent Mexico City propane and Bhopal, India methyl isocyanate tragedies, considerable soul-searching is obviously indicated as to the industry/community/governmental/environmental interfaces, and the responsibilities of each component to set up and effectively insure adequate disaster control.

A model of evacuation warning compliance is presented in Chapter 2, followed by sociological theory and warning response studied. The authors next match their models with "real-world" incidents, derived from the Riverine flood warning responses. Chapter 4, pages 101-135, "Citizen Response to a Hazardous Materials Emergency", will be of most interest to industrial planners, since it delineates the various problems which arise when a community is threatened by a propane-rail tank car incident. Especially interesting in this book is the difference in responses to the questionnaire between whites, blacks, and Mexican-Americans, since ethnic background is frequently overlooked in such studies.

In the appendix, the questionnaire instrument used for the studies in the book is recorded. It is followed by the references, which are unusually well done, and comprehensive, making it possible for any serious student to have access to a considerable volume of data.

The book, especially Chapter 4 and the appendix, should be of much value in understanding disaster management, whether from "natural" or "man-made" emergencies from nuclear attacks to accidental chemical