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INTRODUCTION

Lead—A Ubiquitous Hazard

Lead is the most widespread environmental health hazard in modern American society. Seventeen percent of all preschool children in the United States have elevated blood lead levels, according to data developed by the Centers for Disease Control. Among poor minority children in our inner cities the prevalence of elevated blood lead levels is 68%. By any definition, this is a public health disaster.

Lead is also widespread in the workplace. The National Institute for Occupational Safety and Health estimates that over two million American adults are at risk of exposure to lead in their work. Affected industries include construction, demolition, battery making, microelectronics, stained glass making, shipbuilding, and automobile radiator repair. Public health surveillance data from New York, New Jersey, California, and other states document that each year thousands of American workers suffer occupational lead poisoning.

Lead has toxic effects in many organ systems, including the developing red blood cells, the kidneys, the cardiovascular system, and perhaps most importantly the nervous system. The neurotoxicity of lead is most critical for the pregnant woman and the developing fetus. Lead produces a wide range of toxic effects including anemia, renal failure, hypertension, peripheral nerve injury, and permanent neuropsychological impairment. Moreover, research conducted in recent years has established that lead causes toxic effects at extraordinarily low levels, levels that are insufficient to produce clinically detectable symptoms and that just a few years ago were considered to be safe.

The series of papers that appear in this issue of *Environmental Research* present snapshots of current research on the epidemiology and toxicology of lead. They were chosen from among the papers presented at a symposium entitled "Getting the Lead Out: Priorities for the 1990's—Research and Clinical Management," on May 8–9, 1991 Annual Scientific Meeting of the Universities Occupational Safety and Health Educational Resource Center, held in conjunction with UMDNJ–Robert Wood Johnson Medical School at Livingston College of Rutgers University, Piscataway, New Jersey. Three of the papers, those by Mushak, Wartenberg, and Guthe *et al.*, examine current patterns of pediatric lead exposure and utilize computer-based systems for pinpointing populations of children at excessively high risk. These studies are of great importance because they demonstrate the wide range of environmental media through which children may be exposed to lead. At the same time, these investigations are of great practical utility because they permit prioritization of scarce public health resources and targeting of preventive effects.

The data presented in these studies remind us that lead was not dispersed in the environment by accident, by nature, or by divine intervention. Instead, the widespread distribution of lead in American society today in paint, gasoline, and

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consumer products reflects decades of unheeding, uncaring, imprudent, negligent, and reckless behavior by the manufacturers of lead products in this nation. Unfortunately, it is our children and our children's children who must pay the price for this unbridled activity.

The final paper in this series by Todd *et al.* describes the application of *in vivo* X-ray fluorescence (XRF) to the analysis of lead in bone. XRF appears to represent an extraordinarily promising technique for the assessment of chronic lead accumulation in skeletal tissues. This noninvasive dosimetric technology will enable precise reconstruction of past exposure histories on an individual basis and will permit delineation of dose–response relationships for chronic lead intoxication with a precision and accuracy never before achieved. It represents an excellent breakthrough in our continuing struggle with this most persistent problem in environmental health.

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