

## Excess lead linked to boys' delinquency

A group of boys between the ages of 7 and 11, with high lead concentrations in their bones displayed attention problems, aggressive behavior, and delinquency, a new study finds. In contrast, boys in that age group possessing low to moderate lead concentrations showed fewer such problems, asserts a scientific team directed by Herbert L. Needleman, a psychiatrist at the University of Pittsburgh School of Medicine.

"These data argue that environmental lead exposure, a preventable occurrence, should be included when considering the many factors contributing to delinquent behavior," the investigators conclude.

The link between high lead concentrations in bone and boys' delinquency remained strong even after taking into account differences in mothers' IQs, occupations, and schooling. Consideration of the presence of two parents in the home and signs of adequate child-rearing practices also left the results unchanged.

None of the previously identified characteristics of lead poisoning showed up in boys displaying high bone lead content, Needleman's group reports in the Feb. 7 *JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION*. The investigators relied on an X-ray technique to estimate lead concentration in the upper leg bone of one leg of each boy; the extent to which these measurements correlate with lead concentrations in blood, on which current guidelines are based, remains unclear.

If the new findings are representative of the general population of U.S. children, "the contribution of lead to delinquent behavior would be substantial," the scientists contend.

Their study consisted of 212 boys enrolled in Pittsburgh public schools, all of whom are taking part in a larger, long-term study of delinquency. The researchers obtained lead measurements from the boys twice, at about 10 and 12 years of age.

Experimenters administered behavior and delinquency questionnaires twice annually to each boy from age 7 to 11. Questionnaires included items on physical complaints, depression, anxiety, and thought and attention problems. At around the same times, parents and teachers also rated the boys on these measures.

About half the boys selected for the study had consistently engaged in aggressive and problem behaviors before the study began.

When the boys were 7 years old, parent and teacher reports did not reveal any striking difficulties unique to high-lead youngsters. But 4 years later, parents and teachers noted substantial increases in behavior and attention problems for the high-lead group, compared

to the rest of the boys. Self-reports by boys with high concentrations of lead in their bones also revealed significant boosts in delinquent acts and attention difficulties by age 11.

These findings confirm earlier reports of lead-related behavior and attention difficulties based on smaller samples of children, parents, and teachers, Needleman and his coworkers conclude.

Problem behaviors that emerged in

high-lead boys serve as moderately accurate harbingers of adult violent crime, alcoholism, and domestic abuse, states Terrie E. Moffitt, a psychologist at the University of Wisconsin-Madison, in an accompanying editorial. Moffitt's own studies indicate that symptoms of attention deficit-hyperactivity disorder and impulsive behavior, as well as low intelligence, loom large in cases of lifelong delinquency (SN: 4/15/95, p. 232).

"Links between such measures and lead exposure warrant careful attention," she holds. —B. Bower

## Planning the budget for this year and last

The President's fiscal year (FY) 1997 budget plan, released Feb. 5, is a quick read. At 20 pages, it outlines spending recommendations but, unlike previous budget proposals (SN: 2/11/95, p. 87), contains no figures for individual agencies, including those funding science.

The administration promises to provide those details the week of March 18.

Disagreements between Congress and the President over FY 1996 appropriations and balancing the budget slowed the administration's FY 1997 budget preparations. "This has been a very difficult year in which to make a budget," explained Alice M. Rivlin, director of the Office of Management and Budget, at a press conference Monday.

The President has nonetheless signed into law FY 1996 appropriations for the entire budgets of some agencies and parts of others. Research and develop-

ment (R&D) stands to receive a good portion of the FY 1996 pie, predicts the American Association for the Advancement of Science (AAAS) in Washington, D.C., which has recently compiled and analyzed available government budget figures.

"There is still a tremendous amount of uncertainty because of the ongoing budget negotiations," AAAS reports. But as of late January, "R&D is faring better than many had expected earlier in the year."

The National Institutes of Health received an appropriation of \$11.4 billion, 3.5 percent more than in FY 1995. Indeed, NIH "is likely to be the only civilian agency to enjoy an increase in FY 1996," AAAS predicts.

Congress and the administration have yet to agree on how much to give NIH's parent agency, the Department of Health

AAAS

### Research and Development Funding (So Far) Budget Authority (in millions of dollars)

Department or Agency	FY 1995 (estimated)	FY 1996 (Clinton)*	FY 1996 (Congress)**	% Change (1995-1996)†
Defense (military)¶	35,216.2	35,161.2	36,631.9	1.3
NASA	9,728.6	9,517.1	9,238.7	-7.7
Energy	6,261.0	7,012.9	6,318.9	-1.8
Health and Human Services (National Institutes of Health)	11,496.6 (10,770.2)	12,014.7 (11,293.3)	12,055.8 <sup>#</sup> (11,441.3)	2.2 (3.5)
National Science Foundation	2,411.7	2,540.0	2,373.7	-4.3
Agriculture¶	1,527.7	1,483.4	1,471.3	-6.4
Interior	671.6	679.3	554.2	-20.2
Transportation¶	639.4	727.1	525.5	-20.5
Environmental Protection Agency	599.7	681.6	526.8	-14.9
Commerce	1,117.1	1,403.7	805.1	-30.6
All Others	1,315.4	1,346.2	1,171.7	-13.6
<b>TOTAL R&amp;D</b>	<b>70,984.9</b>	<b>72,567.1</b>	<b>71,673.8</b>	<b>-1.7</b>
Total Defense R&D	37,775.5	37,929.9	39,431.9	1.7
Total Nondefense R&D	33,209.4	34,637.2	32,241.9	-5.6

\* Budget requested by Clinton administration.      ¶ Final appropriations.  
 \*\* Budget requested or appropriated by Congress.      # Appropriation requested by House only.  
 † Difference between 1995 estimates and 1996 congressional figures, after subtracting projected FY1996 inflation rate of 2.7 percent.