

BEHAVIOR

Limits to growth

A century of growth may have come to an end for young people in the United States. According to the National Center for Health Statistics, males and females aren't getting any taller than they were 20 years ago, and females aren't maturing any earlier. The average height for males has leveled off at slightly more than 5 feet 9 inches and for girls at 5 feet 4½ inches. The average onset of puberty for females, which had been going down, seems to have stabilized at 12 years 9½ months.

Researchers suggest that physical growth in the United States may have reached the limit of its genetic potential. Peter V. Hamill, chairman of the NCHS group that studied more than 20,000 children from infancy to adolescence, says that because of better nutrition and health care growth may have reached its limit among the top socioeconomic groups 40 years ago. Now it has spread to 95 percent of the population.

Revising limits to intellectual growth

Intelligence tests have often been accused of discriminating against minority groups because they were designed especially to test the abilities of larger groups. The charge has also been made that IQ tests are unfair to another group—the aged. Gisela Labouvie-Vief, an educational psychologist at the University of Wisconsin in Madison, has completed research on learning abilities of the elderly that she feels will dispel the view that an irreversible decline in intellectual activity is a natural and necessary consequence of growing older.

Traditional cross-sectional studies seem to show that human intelligence begins to deteriorate as early as a person's 30s. But much testing of the elderly, Labouvie-Vief feels, does not take into account the many differences between the generations. In other words, younger people may be more tuned in to particular skills asked for in most intelligence tests. Recent studies have shown that if the same people are followed up for a long period of time, intelligence seems to increase or stay stable until at least 60. Even thereafter, stability and increases are often observed as long as people are not affected by debilitating diseases or confined to nonstimulating social settings.

Limiting test bias

For years, clinicians, counselors, educators and personnel administrators have been aware of the fact that psychological evaluation tests are not free of bias. But now, Margherita Henning has developed a test, the Learning Ability Profile (LAP), that may have overcome some of the biases seen in other large-scale psychological evaluation tools. Henning described the LAP at the recent meeting of the Western Psychological Association. The test is supposed to be culture-fair, independent of most formal education and unbiased in relation to age, sex and ethnic background. It evaluates an individual's ability to learn, instead of testing a core of knowledge previously accumulated.

The LAP departs from the usual method used in psychological measurement in that test takers find out immediately if the answers they have selected are correct, and how close or far they are from the best solution. If the best answer out of four possibilities is not chosen, the test takers are instructed to keep choosing until the right answer is found, thus enabling them to learn from their correct or incorrect responses. Individuals can proceed at their own pace without being penalized. The emphasis is not on the degree of formal education but on problem-solving skills. The test can be used singly or in groups, for adults in business or educational environments and for children from the third grade up.

JUNE 19, 1976

TECHNOLOGY

The giants of industrial R&D

Industry now provides about half the research and development funds in the United States, contributing some \$23 billion last year. A list of the 50 biggest spenders, which account for almost half that total, has been compiled by INSIDE R&D, a New York-based newsletter.

About 1,000 companies spend enough on R&D to necessitate reporting the amount. To rank in the top 50, a company last year had to spend more than \$59 million. Some, like General Motors, which led the list with \$1.1 billion, qualified simply because of their size. Next in the top 15 were IBM, Ford, AT&T, ITT, General Electric, DuPont, United Technologies, Kodak, Chrysler, Xerox, Boeing, Exxon, Caterpillar and Dow.

Other companies made the list by devoting an unusually large proportion of their funds to the effort. Hewlett-Packard plowed back the most—9.1 percent of its sales. Upjohn and Lilly were next—8.8 and 8.9 percent—followed by United Technologies, Merck and Polaroid.

The compilers noted some interesting absentees from the list. These include the metals, food processing and paper industries. Total industry R&D spending rose 4.8 percent in 1975 compared with the previous year.

How not to save New Orleans

New Orleans is sinking. Many older parts of the city are near or below sea level, having dropped as much as 8 feet due to drainage which caused underlying peat deposits to shrink. To reclaim new areas and make older ones safer from flooding, the Army Corps of Engineers has presented a plan for a system of levees and locks expected to cost \$327 million, but environmentalists say a better idea would be to just raise existing levees.

This view is presented by University of New Orleans urban studies specialists Fredrick W. Wagner and Edwin J. Durabb in the May ENVIRONMENT. The Corps plan, they say, would open vast new areas of marshlands to urbanization, destroying the habitat of several wildlife species and incurring \$15 million in extra maintenance costs as this land, in turn, begins to sink. The extra costs were not in the original cost-benefit estimate.

At present, the city of New Orleans must continually operate pumps to push rain runoff and ground water uphill to sea level and pour it into Lake Pontchartrain. A total of 87 miles of canals, 57 miles of large pipelines and 21 pumping stations are now involved in the process, and the authors contend that these requirements would be needlessly raised if the ambitious Corps scheme were followed.

Modified motor saves energy

Industrial motors account for 35 percent of all U.S. consumption of electricity. Most were designed when electricity was cheap and the resulting tradeoffs tended to emphasize providing more power in smaller units rather than increasing efficiency. Now that energy is becoming more costly, however, motor manufacturers are seeking ways to redesign their products to increase the power output for a given unit of electrical input.

One new candidate has just been announced by Gould, Inc., a product line called the "E-plus" motors. A computer was used to modify design parameters to cut power consumption without sacrificing performance. By lengthening the iron cores, changing the air gap and reducing the resistance of conductors, the company was able to produce motors that not only perform more efficiently but should last longer and run more quietly. The efficiency of a 5-horsepower motor, for example, was increased to 87 percent, compared with an industry average of 83 percent.

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