

published simultaneously and in the clearcut manner in which the facts of the falsification are acknowledged.

The incidents took place at the Max Planck Institute for Biochemistry in West Germany and involve a postdoctoral scientist named Robert J. Gullis. Gullis left the laboratory in September 1976 after having spent two postdoctoral years there, engaged mainly in measuring the levels of the chemical cyclic GMP in neuroblastoma cells and neuroblastoma/glioma hybrid cells.

The statement about the incident is written by Bernd Hamprecht of the laboratory:

"After Dr. Gullis had left," reports Hamprecht, "several of my colleagues (Brandt, Traber and van Calker) repeated this work but were unable to reproduce it. Dr. Gullis was therefore asked to return to our laboratory and repeat his essential experiments under supervision. . . . In none of the experiments was Dr. Gullis able to obtain his previous results. Neither morphine nor levorphanol nor the enkephalins nor cholinergic agonists changed the level of cyclic GMP in hybrid cells.

"Dr. Gullis admitted having invented the results of all his experiments. Thus, I should like to let it be known to the scientific community that the following three publications are based on invented data."

Hamprecht then lists three papers for which Gullis was the lead author:

One of them, in *NATURE* 256:57-59 (1975), concluded that morphine elevates levels of cyclic GMP in a neuroblastoma/glioma hybrid cell line. The other papers were in *FEBS LETTERS* 59:74-79 (1975) and in a book titled *Opiates and Endogenous Opioid Peptides* published by Elsevier in 1976. In a fourth paper stating that enkephalin regulates levels of cyclic nucleotides in the hybrid cells (*NATURE*, 262:311-313, 1976), Hamprecht says the data on cyclic AMP were falsified by Gullis. Hamprecht was a co-author with Gullis on all four papers.

Gullis follows with his own statement fully admitting he made up the data:

"I wish to disclose the fact that papers published in several journals with myself as principal author are not reliable. The curves and values published are mere figments of my imagination, and during my short research career I published my hypotheses rather than experimentally determined results. The reason was that I was so convinced of my ideas that I simply put them down on paper; it was not because of the tremendous importance of published papers to the career of a scientist.

"Therefore I would like to let it be known that the following papers published while I was working in the laboratory of Dr. B. Hamprecht are not reliable."

He then lists the same papers mentioned by Hamprecht. He also lists four other papers published in four separate bio-

chemistry journals, which, he says, are "purely hypothesis."

Gullis concludes with apology: "This letter is to point out to the scientific community that the results presented in these papers are wrong and based purely on hypothesis. I must take full responsibility for these unfortunate incidents and have consequently suffered. I hope that my experiences are noted by others, and I

would like to apologize to the scientific community and the various people involved."

Faking of results is, for reasons Nobel laureate biologist P. B. Medawar recently discussed (SN: 5/22/76, p. 335), a scientist's greatest sin. With this published admission not only is an entire group of research results wiped off the record; the scientific career of Gullis is ended. □

Vindication of early childhood programs

Recent analysis of several long-range studies indicate that early childhood education programs like project Headstart can effectively raise the intelligence of disadvantaged children, guide them toward better social adjustment and help them learn more in school. Discussing the accumulated research during a symposium at the AAAS meeting in Denver, Bernard Brown of the U.S. Office of Child Development declared that except for a few short-term local studies, "the score is 96 to zero" in favor of the early childhood programs.

Such enthusiastic support, apparently shared by other participants in the symposium, has not always been so forthcoming. After 11 years, with a current budget of \$450 million, Headstart remains a politically controversial program. Much of the problem, Brown says, began with an early study of Headstart by the Westinghouse Learning Corp. and Ohio University (SN: 4/26/69, p. 400), which concluded that children were not benefiting from the program. Brown blames press coverage and personal praise of the study by President Nixon for perpetuating the incorrect results of an unreliable piece of research.

Psychologist Francis H. Palmer of the State University of New York at Stony Brook presented a paper analyzing several of the studies and he concludes that early, pessimistic results were based on short-term data that did not take into account how well children actually performed once they entered school. "Where school-age results are available, they are consistently encouraging," Palmer says. Although gains derived from these programs depend on their duration and the amount of effort involved, he says, even brief programs involving a very young child may later make their mark, as "sleeping effects" become evident during school years.

Yale psychologist Victoria Seitz reported that delayed effects may be particularly important for girls. In one group she studied, girls who had participated in Headstart and Follow Through programs did not show any superior mathematics ability over controls when tested in the third grade, yet they scored significantly higher when tested again in the eighth grade.

The relative effectiveness of various

individual programs remains unclear. Palmer summarizes the results of studies involving, among others, the Montessori method (emphasis on self-initiative) and the Bereiter-Engelmann method (involving rigorous drill). Not surprisingly, the Montessori children initially scored higher on measures of inventiveness and curiosity, while the Bereiter-Engelmann children outperformed others in academic achievement. However, the differences virtually disappeared by the end of the second grade.

Robert D. Hess of Stanford University points out a structural difference between programs that does appear to be significant. Those involving some home visits by program professionals result in the greatest gains. Nine programs that combined home visits with preschool classes, he says, produced IQ gains of around 10 points. Twelve programs that did not involve home visits resulted in IQ gains for the children of around 6 points.

"It seems that the content of a curriculum may be less important in determining program effectiveness than how the curriculum involves parents," Palmer concludes. He points, for example, to an entirely home-based program in Nassau county, New York. For seven months a year, over two years, an instructor would make two half-hour visits a week to show mothers how to teach their children. The children started out with below-normal IQs in the low 90s, but now that they are in school they show above-normal IQs averaging between 107 and 108. They also show similar superiority in school achievement tests and have experienced less behavioral problems.

Ultimately these programs could result in "considerable economic benefit" for society, Bernard Brown says. By raising the abilities of disadvantaged children up to normal, preschool programs have helped save larger amounts of money that would have been needed later for remedial education. An outstanding example of this was cited by John H. Meier of the Office of Child Development at a Denver press conference. In Gainesville, Fla., he said, only 1 percent of children whose parents had participated in a home-based education program needed special education by the fifth grade. Nearly 30 percent of the students in a control group needed special help by then. □