as a group. But they would also make comments such as, "girls don't like mechanical stuff as much as boys." Prepared females were more likely to be interested in other professional fields such as business, medicine, and law; yet pay was mentioned as a factor in career choice twice as often by boys. Half the students said their parents were influential in their choices. The researchers concluded that information and encouragement (from sources outside school) were more important for girls than boys in choosing science as a career.

Camilla Benbow of Iowa State University, who is involved in the Johns Hopkins University Study of Mathematically Precocious Youth (SMPY), had a similar message. She reported that of 2000 mathematically gifted students, 63% of the males and 35% of the females chose to major in math or science. She also said males were twice as likely as females to choose research careers. "Attitudes toward science" emerged as the most powerful variable, followed by "family support for goals" and the educational levels of subjects' fathers. Irene T. Miura of San Jose State University, who compared science interests between the sexes in high and low socioeconomic groups, also concluded that the sexes "did not differ on variables most likely to be influenced by schools."

Marlaine Lockheed of the World Bank suggested that sex differences stem more from affective (emotional) differences than from "a reasonably nonexistent cognitive deficiency." She noted that there have been "major changes" in course participation by females and that "as courses become required there are fewer and fewer differences."

This observation, however, does little to explain the findings that have been emerging from the group at Johns Hopkins, headed by Julian Stanley. The findings from SMPY suggest that sharp sex discrepancies exist at the extreme end of the achievement spectrum in many subjects.

The Johns Hopkins group has been looking at thousands of youths who score 700 or above on the mathematical portion of the Scholastic Aptitude Test by the age of 13. The sex ratio at this level is 12.9 males to every female. At 451 (the male mean), they found the ratio to be 1.5:1. This increases to 2:1 at 500 and 4:1 at 600.

The group has been analyzing national data from a variety of standardized aptitude and achievement tests, and has found that males consistently score higher in the quantitative domains than do females. They compared gender differentials among tests by estimating the "effect size," which is computed by dividing the difference between the male and female means by the standard deviation of the scores. An effect size of 0.8 is large, and 0.2 or below is small.

In the Differential Aptitude Test, for example, 8th-grade females show a modest superiority in numerical ability, abstract reasoning, and verbal reasoning, but this disappears by the 12th grade. Males, on the other hand, show an effect size of 0.66 on mechanical reasoning, which goes up to 0.89 by the 12th grade. The male effect size for space relations goes from 0.13 in 8th grade to 0.22.

The general pattern is similar for high school students taking the American College Testing Program, where male effect sizes range from 0.23 to 0.40 in social studies, math, and natural sciences. In College Board Achievement tests, females did slightly better in English and composition, but males showed intermediate effect sizes in biology, math, chemistry, and European history. Graduate Records Examinations revealed two of the largest effect sizes favoring males—0.79 in political science, and 0.71 in math.

Graduate and professional school entrance examinations tell the same story. Effect sizes are negligible only in the Law School Admissions Test, which is the most difficult in terms of logic and reasoning but contains no quantitative questions. The largest effect size favoring females was 0.19, on the verbal portion of the management test.

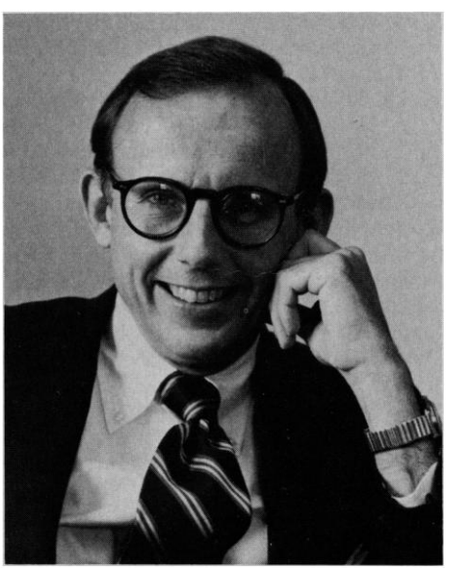
Although many of the effect sizes are not large, Stanley said they can result in severe discrepancies in the upper scores. For example, the male advantage in spatial relations (0.22) translates to a male-female ratio of almost 2 to 1 in the top 10% of scores. The male effect size of 0.63 in European history in 1985 corresponds with a 10 to 1 ratio among the highest scorers.

Stanley observed that females are overall better students from kindergarten through graduate school, and that they do better on course-related exams than on standardized tests. He characterized women as being more oriented to social interaction and aesthetics, while men go for the quantitative, the abstract, "power and control." He did not hazard any explanations for this—"we've tried to firm up the whats so that other researchers may pursue the whys."

It remains a matter of debate whether observed sex differences in math and science achievement are significant, and whether they represent a problem to be solved. Some cling to the view that the discrepancies can be explained by differential course-taking; others believe that they stem from factors as yet unmeasured. Some think the subject has been blown all out of proportion. Said Susan F. Chipman of the U.S. Office of Naval Research: "People are just *too* interested in this topic." ■ CONSTANCE HOLDEN

Academy Rejects Huntington Nomination

For the second time, the National Academy of Sciences (NAS) has voted not to accept political scientist Samuel P. Huntington of Harvard University as a new member. Huntington, a prominent author and president of the American Political Science Association, was turned aside in a vote on 28 April. He was nominated in 1986 and again this spring by NAS's Class V, representing the behavioral and social sciences.



Samuel P. Huntington

The campaign to keep Huntington out of the Academy—at times acrimonious—was led by mathematicians and other "hard" scientists who took issue with his use of statistics. Yale mathematician Serge Lang publicized a charge that Huntington engaged in "pseudomath" by larding his work with mathematical terms (*Science*, 5 December 1986, p. 1192).

In response, Huntington said that Lang had taken out of context some mathematical figures in Huntington's book, *Political Order in Changing Societies*. The figures in question were not meant to be read as equations, he said, but to serve as "a shorthand way of summing up a complicated argument." After the NAS vote, he reportedly said the Academy appears to be suffering from "an acute case of Langitis."

Lang's attack prompted some strong reactions. Herbert Simon, a professor of computer science and psychology at the Univer-

sity of Pittsburgh, defended Huntington's use of mathematics. He and ten other NAS members circulated a letter saying that Huntington had run afoul of unfair political hostility. Huntington was a vocal supporter of early U.S. involvement in Vietnam. He also took some flak for participating in a CIA-funded research project at Harvard. Some of his opponents in the NAS disapproved.

The Academy strictly forbids any public discussion of the debate, and members were reluctant to comment. But one mathematician not directly involved in the scrap said he thought it would be wrong to blame politics for all that happened. "There was a general uneasiness about how members are selected this year," he said. Many people were dissatisfied with the way foreign associates are chosen, for example, and some asked why social scientists are admitted but historians are not. Others asked why social scientists are admitted at all, a particularly divisive question. ■ ELIOT MARSHALL

NAS Elects New Members

The National Academy of Sciences has elected 61 new members and 15 foreign associates. This brings the membership total to 1523 and the foreign associates total to 249. The new members are:

Elihu Abrahams, physics, Rutgers University; **Wyatt W. Anderson,** molecular and population genetics, University of Georgia, Athens; **Clay M. Armstrong,** physiology, University of Pennsylvania; **Stanley Barber,** agronomy, Purdue University; **William J. Baumol,** economics, Princeton University; **Robert A. Berner,** geology and geophysics, Yale University; **Barry R. Bloom,** microbiology and immunology and cell biology, Albert Einstein College of Medicine; **Armand Borel,** mathematics, Institute for Advanced Study; **Ralph L. Brinster,** reproductive biology, University of Pennsylvania; **Marvin P. Bryant,** microbiology, University of Illinois, Urbana; **Jane E. Buikstra,** anthropology, University of Chicago; **Manuel Cardona,** Max-Planck-Institut for Solid State Research, Stuttgart, Federal Republic of Germany; **Thomas R. Cech,** chemistry, cellular biology, and developmental biology, University of Colorado; **Eugene Commins,** physics, University of California, Berkeley; **Donald M. Crothers,** chemistry and molecular biophysics and biochemistry, Yale University; **Ernest Davidson,** chemistry, Indiana University; **Thomas K. Fowler,** magnetic fusion energy program, Lawrence Livermore Laboratory; **Daniel Gorenstein,** mathematics, Rutgers University; **Emil C. Gotschlich,** senior physician, Rockefeller University; **Robert B. Griffiths,** physics, Carnegie-Mellon University.

Leland H. Hartwell, genetics, University of Washington; **Hermann A. Haus,** electrical engineering and computer science, Massachusetts Institute of Technology; **Charles B. Heiser, Jr.,** professor emeritus, Indiana University; **Edward Herbert,** chemistry, University of Oregon; **George P. Hess,** biochemistry, Cornell University; **Albert O. Hirschman,** social science, Institute for Advanced Study; **Bela Julesz,** visual perception research, AT&T Bell Laboratories; **H. Ronald Kaback,** biochemistry, Roche Institute of Molecular Biology; **Emil T. Kaiser,** Haggerty professor, Rockefeller University; **William M. Kaula,** geophysics, University of California, Los Angeles; **George Khoury,** molecular virology, National Cancer Institute (elected posthumously); **Seymour J. Klebanoff,** medicine, University of Washington; **M. Daniel Lane,** physiological chemistry, Johns Hopkins University School of Medicine; **Charles S. Levings, III,** genetics, North Carolina State University; **Harvey F. Lodish,** biology, Massachusetts Institute of Technology; **Laszlo Lorand,** biochemistry, molecular biology, and cell biology, Northwestern University; **Paul E. Meehl,** psychiatry, University of Minnesota; **William Miller,** chemistry, University of California, Berkeley; **Bernard Moss,** viral diseases, National Institute for Allergy and Infectious Diseases; **Philip Needleman,** pharmacology, Washington University School of Medicine.

Douglas D. Osheroff, solid state and low-temperature physics research, AT&T Bell Laboratories; **Morton B. Panish,** technical staff, AT&T Bell Laboratories; **C. C. Patterson,** senior research associate, California Institute of Technology; **Samuel H. Preston,** sociology, University of Pennsylvania; **Thomas S. Reese,** neurobiology, National Institute of Neurological and Communication Disorders and Stroke; **Martin Rodbell,** scientific director, National Institute for Environmental Health Sciences; **Gerald M. Rubin,** biochemistry, University of California, Berkeley; **Jack Sandweiss,** physics, Yale University; **John P. Schiffer,** physics, Argonne National Laboratory; **Frank Shu,** astronomy, University of California, Berkeley; **Robert S. Sokal,** ecology and evolution, State University of New York, Stony Brook; **George R. Stark,** senior scientist, Imperial Cancer Research Fund, London, England; **Paul Talalay,** pharmacology and molecular science, Johns Hopkins University School of Medicine; **Robert E. Tarjan,** technical staff, AT&T Bell Laboratories; **Patrick Thaddeus,** astronomy and applied physics, Harvard University; **Daniel Tsui,** electrical engineering and computer science, Princeton University; **Emil R. Unanue,** pathology, Washington University School of Medicine; **Harry Wasserman,** chemistry, Yale University; **Lawrence Weiskrantz,** psychology, Oxford University, London, England; **D. Fred Wendorf,** anthropology, Southern Methodist University; **John W. M. Whiting,** professor emeritus of anthropology, Harvard University.

The new foreign associates are:

Gerd K. Binnig, IBM Zurich Research Laboratory, Switzerland (Federal Republic of Germany); **Arnold S. V. Burgen,** Darwin College, Cambridge, United Kingdom; **Charles Frank,** professor emeritus, University of Bristol, United Kingdom; **Antonio Garcia-Bellido,** Center for Molecular Biology, University of Madrid, Spain; **Pierre-Gilles de Gennes,** College de France and Ecole de Physique et Chimie, Paris, France; **Mary D. Leakey,** National Museums of Kenya and Olduvai Gorge Excavations, Tanzania (United Kingdom); **Jack Lewis,** chemistry, University of Cambridge and Robinson College, Cambridge, United Kingdom; **Benoit B. Mandelbrot,** IBM Thomas J. Watson Research Center, New York (France); **Donald Metcalf,** Walter & Eliza Hall Institute of Medical Research, Royal Melbourne Hospital, Victoria, Australia; **Manuel Peimbert,** faculty of sciences, National University of Mexico, Mexico City, Mexico; **Carlo Rubbia,** senior physicist, CERN, Geneva, Switzerland; **Roald Z. Sagdeev,** Space Research Institute, Moscow, U.S.S.R.; **Peter Starlinger,** Institute of Genetics, University of Cologne, Federal Republic of Germany; **Phillip V. Tobias,** anatomy, University of the Witwatersrand, South Africa; **Zhou Guangzhao,** Chinese Academy of Sciences and Institute of Theoretical Physics, Beijing, People's Republic of China.