

THE GIFTED CHILD QUARTERLY, Spring, 1978, Vol. XXII, No. 1
**RADICAL ACCELERATION:
RECENT EDUCATIONAL
INNOVATION AT JHU¹**

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For six years at Johns Hopkins my Study of Mathematically Precocious Youth (abbreviated as SMPY) has been seeking throughout the State of Maryland and elsewhere students in junior high school who reason extremely well mathematically. Tonight I shall talk briefly with you about several of the most remarkable of these young men and women to illustrate the educational achievements of which they are easily capable but which are usually denied them. You and I can be extremely proud that Hopkins has rapidly become the unique innovator in this important area of intellectual talent.

I'll proceed via sketches of the most remarkable youths among the 3000 indentified in our first four annual talent searches. The fifth such search is being planned now.

To help you understand better what we are doing I have brought with me tonight two Johns Hopkins undergraduates who each know a considerable number of the mathematically ablest youths well. They are Kevin Bartkovich and David Meyer. Both live in Baltimore County. After my remarks the three of us will entertain questions from you.

We find the most mathematical talent in Montgomery County, but it was not feasible to bring here tonight extremely unusual youths from there who are attending Johns Hopkins, because the most accelerated of the group are enrolled at other institutions. For example, Eric Cooper, from R.E. Peary High School in Rockville, and Steven Heyman, from Woodward High School, are in their third year at Harvard. Lorenzo Sadun, from Bethesda-Chevy Chase High School, is at MIT with sophomore status. We at SMPY help our proteges get admitted to whichever fine colleges and universities they wish to attend and for which they are qualified. In the fall of 1975, for instance, four of our group entered Harvard or Radcliffe accelerated in grade, in subject matter or both.

¹Based on an informal talk at a meeting of alumni of The Johns Hopkins University in Washington, D.C., on 20 September 1977. Dr. Stanley is a professor of psychology and Director of SMPY at Johns Hopkins University, Baltimore 21218.

Let me start by mentioning several "radical accelerants" who have attended Johns Hopkins, beginning in the fall of 1969, when the first one entered at age 13 after completing the eighth grade of a public junior high school in Baltimore. This brilliant young man, named Joseph, received his B.A. degree at age 17 years 7 months and his Master of Science in Engineering degree, specializing in computer science, at age 17 years 10 months. He began work toward the Ph.D. degree at Cornell University before his 18th birthday. Having become 21 last October, he has nearly completed the doctorate with consistent distinction.

After Joseph came Johnathan, also 13, who did well. He was followed by Jeff, who after a year at Hopkins transferred to Princeton University. Jeff was graduated there in the spring of 1976 at barely 20, two years ahead of his age group, *summa cum laude* in mathematics and with membership in both Phi Beta Kappa and Sigma Xi. Now a doctoral candidate in mathematical logic at the University of California in Berkeley, he won a National Science Foundation three-year graduate fellowship and completed his M.A. degree in two semesters.

Jeff was followed in 1973 by Dan and Mike, each 14 years old. Dan is now a student at another university near Baltimore. Mike was graduated from Johns Hopkins last May at age 18-1/2, having majored in theoretical physics and maintained an almost perfect gradepoint average. He was elected to membership in Phi Beta Kappa. Three years ahead of the agemates he left behind in 1973 when he came straight from the ninth grade to Hopkins, Mike is now a doctoral student in theoretical physics at Princeton University. Like Jeff, he won an NSF three-year graduate fellowship.

In the fall of 1974 we had ten "radical accelerants" on the Homewood Campus.² Eight of these returned in the fall of 1975 (one transferred to Cal Tech and the other to Brown) and were joined by six others. All of them returned in the fall of 1976, being joined by a dozen others. In addition, some 20 other students from various states entered Hopkins accelerated at least a year in age-grade placement. This makes our small undergraduate student body have by far the largest number of quite young entrants of any major institution in the country. (Three institutions cater mainly or exclusively to early entrants. They are Shimer College, Simon's Rock College, and the Freshman Year Program of the New School for Social Research.)

² SMPY began officially in September of 1971, supported by a generous five-year grant from the Spencer Foundation. Its current financial support comes from that foundation, the Camille and Henry Dreyfus Foundation, and the Educational Foundation of America.

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Let us focus first on the five young men who completed their baccalaureates at Hopkins during the past academic year, one in January and the other four in May. Then we shall consider one of the remarkable young females.

Colin completed his work for the B.A. degree in quantitative studies within a few days after becoming 17 years of age. He may be the youngest recipient of a baccalaureate Hopkins has ever produced, and certainly one of the most remarkable.

Two of the young men graduated in May were still 17 years old at that time. One, the physics major I have already mentioned, is still 18. The oldest of the graduating students, aged 19-1/2 when he received the B.A. degree in mathematics, was accelerated three years. By contrast, the youngest graduate in the class of 1971, before SMPY began, was 19-5/6 years old--older than any of these five. I seriously doubt that Harvard College, with a baccalaureate class more than twice the size of Hopkins', comes close to having this much educational acceleration among its graduates. We shall check on that.

Among these five young men, two are outstanding even in that distinguished company. One of them, Colin, leapt through the grades by skipping the seventh, ninth, tenth, and twelfth and by completing all of his course work at Hopkins in five semesters. In other words, he spent only one year in junior high school, one year in senior high school, and two and one-half years in college. Yet he found time in high school to win a wrestling letter while 13 to 14 years old, be the school's math and science whiz on its television academic-quiz team, help his barely 14-year-old friend get elected president of the student council, tutor another brilliant friend through three years of calculus mathematics fast and well, play a good game of golf, teach himself physics well enough to earn by national examination credit for a year of it at the college level, and get credit for college calculus. At Hopkins he made the varsity golf team at age 15, took advanced courses in a variety of areas such as political science, economics, astronomy, and mathematics, and wrote feature articles about "beat" poets and related topics in the student newspaper. After completing his degree work last December, Colin worked as a writer and reporter on a weekly newspaper in Ocean City, Maryland. This fall, still 17 years old, he is at the University of Chicago, studying for the M.B.A. and Ph.D. in economics degrees. Colin's management and political skills equal his great mathematical aptitude. When we first met him in October of 1971, just six years ago, he was a sixth grader. Without our intervention he would probably be in the 12th grade now!

The other one of the five whom I shall feature briefly is Eugene, who entered Hopkins with sophomore standing at age 15 years 2 months after having skipped the second, eleventh, and twelfth grades. He was graduated from Hopkins in May of 1977, two months before his 18th birthday. When we discovered Eugene--or, more accurately, when his mother called him to our attention in the fall of 1971 in response to newspaper publicity about our recently begun study--he was a 12-year-old eighth grader being snail-paced through first-year algebra by a teacher who tried to make him work every problem in the book. During the second semester of that school year he took the regular day-school course in computer science at Hopkins and, though only 12 years old, made a final grade of "A" in it. That summer he took college algebra and trigonometry. Then for two years and two summers, while a ninth and tenth grader, he took a course each term at Goucher College near his home and where charges for tuition were waived because his mother was on the professional staff. In this way he completed four more mathematics courses and the first year of both inorganic and organic chemistry. Thus he entered Hopkins with 39 college credits, 30% of the way through the sophomore class. He became involved in a number of activities. His major field was electrical engineering. This fall he is a doctoral student in electrical engineering at MIT, having won an NSF three-year graduate fellowship. Because of his outstanding involvement already in important research during three summers at two of the nation's leading scientific companies I predict a brilliant career for him, probably leading eventually to major honors such as membership in the National Academy of Sciences.

A third 17-year-old, Paul, received his bachelor's degree from Johns Hopkins last May. He was elected to membership in Phi Beta Kappa, won an NSF three-year graduate fellowship, and went this fall (a few days after his 18th birthday) to Cornell University to study for a Ph.D. degree in computer science. This brilliant young man also seems destined for a distinguished career.

To recapitulate, of the five radical accelerants who were graduated from Johns Hopkins during the past academic year, three were 17, one was 18, and one was 19. Two were elected to membership in Phi Beta Kappa, and one missed that honor by only three-hundredths of a gradepoint. On a 4-point scale their final cumulative gradepoint averages ranged from 3.93 to 3.10, with a median of 3.70.

Three of the five won NSF three-year graduate fellowships, a

great honor because John Hopkins graduates won a total of six of these in 1977 out of the 550 given for all fields of science throughout the United States.

This fall, four of the five are full-time doctoral students at major universities: Chicago, Cornell, MIT, and Princeton. The fifth is a part-time graduate student in applied mathematics at Johns Hopkins during evenings. He, the math major, is a full-time data analyst who plays tournament-level bridge after having been an excellent chess player.

In May or June of 1977 two other SMPY proteges were graduated from college with distinction. Both of these won NSF three-year graduate fellowships, so nearly 1 percent of all such fellowships in the country went to our small group of baccalaureate recipients. One of these young men, Eric, was graduated from Brooklyn College in mathematics, *summa cum laude*. He is now a doctoral student in mathematics at Princeton. On the 24th of March, 1978, he will become 16 years of age!

The other early graduate, Mark, was elected to membership in Phi Beta Kappa. A resident of Arlington, Virginia, he became a full-time student at George Washington University after completing only the ninth grade of a public school. Last month he became 19 years old. Now he is a doctoral student in mathematical statistics at Stanford University.

Most of these radical accelerants were found via the College Board's Scholastic Aptitude Test, taken when they were 9-15 years old. Great precocity in mathematical reasoning and in verbal reasoning is a powerful predictor of ability to move ahead much faster in mathematics and related subjects than the usual age-in-grade lockstep permits. Hundreds of our high scorers have chosen from the diverse smorgasbord of accelerative educational opportunities we have presented them. Most are not as accelerated as the ones discussed, of course.

We have found many mathematically talented seventh- and eighth-grade girls, but few of them want nearly as much educational acceleration as the best-motivated boys do. Our star female, Karen, is now a sophomore at the University of Michigan, having completed the eleventh and twelfth grades during the school year 1975-76. In May of that year she earned the highest score on the more difficult of the two calculus exams of the Advanced Placement Program that we have ever found, so her future as a mathematical scientist seems bright indeed.

Let us return to David and Kevin, who are among the ablest and most successful of the 50 or so SMPY proteges now studying full-time as undergraduates at Johns Hopkins. David became 18 on March 1 and Kevin on August 7. David has completed more than three-fourths of the credits needed for a B.A. degree in quantitative studies, but plans to remain two more years in order to get a strong background in a number of fields. Both he and Kevin will probably earn a master's degree concurrently with the baccalaureate during their four years at Hopkins, David in 1979 and Kevin in 1980.

Both are National Merit Scholars and splendid students. Kevin a second-year student but with junior-year course standing, is playing soccer this fall.

But enough talking by me. I feel sure that someone in the audience is itching to ask the inevitable question, "But what about the social and emotional development of these radical accelerants?" If you are, it would seem desirable to address your query to David or Kevin. They know a great deal about educational acceleration from personal experience and also know many of the others who entered college early. They and I are open for any questions you may care to ask.³

³David, Kevin, and Dr. Stanley were joined in the discussion by Joseph Wolfson, a teacher of mathematics at the Georgetown Day School who was the instructor for SMPY's first two fast-math classes (1972-74). He taught both David and Kevin. Since 1974 he has, besides, his full-time teaching at the independent high school, been a teacher of several special fast-math classes in the Montgomery County (Maryland) public schools. At present, Mr. Wolfson, is teaching precalculus work beyond plane geometry and the second year of high-school algebra—once each week to nine eighth-graders who had been outstanding in his summer of 1977 high-level geometry class at Johns Hopkins. That class, for which Kevin served as his teaching assistant, met three times weekly for seven weeks. The summer class was sponsored by the Intellectually Gifted Child Study Group (IGCSG) at Johns Hopkins, which is headed by Dr. Lynn H. Fox.

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