For forty-odd years in this noble profession,
I've harbored a guilt and my conscience is smitten,
So here is my slightly embarrassed confession--
I don't like to write, but I love to have written.
Michael Kanin

MY LIFE AND HOW IT GREW

Julian C. Stanley, Jr, Director of Study of Mathematically Precocious Youth, (SMPY), Johns Hopkins University, Baltimore, Maryland

The Background Years

The period that made a great difference in my life lasted 44 months. It began on January 6, 1942, less than a month after the Japanese bombed Pearl Harbor, when I "beat the draft" by enlisting in the Chemical Warfare Service. My Army Air Corps service ended on September 6, 1945, 18 days before I began course work toward a master's degree in educational and vocational guidance and counseling at the Harvard Graduate School of Education. That "stretch" as an enlisted man in a service outfit, 28 months of it overseas in England, Algeria, Italy, and Corsica, changed me from a routine high-school teacher to a frenetically achievement-motivated graduate student who ever since has found his greatest professional satisfaction in study, research, writing, and other scholarly activities.

In a small-city school system in a suburb of Atlanta, Georgia, where academic competition was slight, I had skipped the fourth grade. In high school I was studious but not scholarly, taking four years of Latin, physics, chemistry, etc., and making excellent grades but not doing much extra work in courses. I managed to be graduated as the "best all-round boy" in a class of 177 students while still 15 years old, because my birthday occurred in July and there were only 11 grades. The year was 1934, in the middle of the Great Depression.

I could claim that lack of money drove me to the nearby unselective State-supported residential West Georgia Junior College rather than a more appropriate institution such as Emory University or Harvard, but that would be untrue. Ironically, my father was much more prosperous from 1933 onward than he had been earlier. My under-aspiring was due to lack of initiative, poor judgment, and great desire to get away from home. Also, I had no suitable academic models or advisers.

As I look back now, the two years at junior college were fairly well spent, even though I had to study too little to make B's and A's. Good teachers were plentiful in those days, and the school had a number of them. The social life was really heady for me, and I had all the time in the world for it. I received a junior-college certificate while still 17 and felt infinitely learned, but my bad academic judgment persisted. A friend at the only teachers college in the state (then South Georgia Teachers College, now Georgia Southern University) persuaded me to enroll there that summer.

Except for organic chemistry and one other subject, this proved to be an intellectually uninspiring atmosphere, so I took extra courses (as, oddly, I had also done in junior college) and completed requirements for a B.S.Ed. degree in August of 1937, one month past my nineteenth birthday. A history professor suggested graduate school at the University of Chicago to me, but that subject was not appealing enough at the time. My other professors assumed that the main, and perhaps the sole, purpose of a teachers college was to produce public-school teachers.

I did not bother to debate the topic even with myself, but took the line of least resistance and set my mind to getting the best available position as a high-school teacher. The Fulton County (Atlanta) School System saved me from entombment in a small south Georgia town; there I taught a total of ten different subjects, including science and mathematics, for four and one-half years. At the time of my departure for military service I was 23 years old.

That brings me back around to the long period during which my ambition grew and I came to see the life of student and scholar as preferable to that of routine teacher. In retrospect, I am glad that the assignment to Officer Candidate School (OCS) came too late, after I was already in England, and I remained an enlisted man--top rank, staff sergeant--throughout the war. The utter intellectual vacuum of an isolated company storing mustard gas and handling incendiary bombs gave me time to think. The petty indignities to which any enlisted man is constantly exposed made me determined to rise in the occupational hierarchy after the war. I am particularly glad that ten months in Algeria, where I was a company clerk, and ten on Corsica as the Wing Chemical NCO were virtually devoid of stimulating activities, other than opportunities to read a great deal, learn to touch-type, and take a couple of USAFI courses.

Upon my return from overseas in late 1944, I was soon transferred to Third Air Force Headquarters in Tampa to wait out the war --but not before I delved into some career materials at the returnee center in Miami and decided to study guidance under the "GI Bill" at a great university such as Chicago, Columbia, or Harvard as soon as the war ended. I had chosen undemanding colleges too often before. At least, this error of judgment could be avoided as a graduate student.

It occurred to me, of course, that with my eight-year-old degree from a less-than-illustrious teachers college I might find the curricula at a major university difficult, but I chose Harvard (because to me it seemed the most prestigious of the lot). I was a well-conditioned 27-year-old and worked furiously. We early ex-GI's brought consternation to regular-age Ivy League students because of the vigor, seriousness, and effectiveness with which we attacked every assignment.

By the end of the first semester it became obvious that work at the Harvard Graduate School of Education

was readily accessible to me and fascinating. I discovered educational psychology, including measurement and statistics under Professors Truman L. Kelley and Phillip J. Rulon. The second year I continued, aided by a $600 fellowship (tuition then was $200 per semester!), the GI Bill, and a half-time instructorship in psychology at a local municipal junior college. That year I took ten psychology courses, wrote ten term papers, and made ten A's. The pattern was firmly set. I had received the Ed.M. degree in 1946 in educational and vocational counseling and guidance, after two semesters of study. The Ed.D. degree in experimental and educational psychology came after three more years, during the last of which I was an incredibly hard-working full-time instructor in education at Harvard.

The intellectual vacuum of the war interacted with the lure of 44 months of GI Bill support to launch me into the university orbit. Without both I probably would have retired from public school teaching in 1967 with 30 years of routine service. It seems most unlikely that I would have been the author or editor of 13 books and some 450 other published items, or active in national professional associations.

The Rise of SMPY

Sometimes I view my life in five phases: 1918-1942, growing up and teaching in high school; 1942-1945, the war; 1945-1949, graduate study; 1949-1971, educational psychology, especially statistics, testing, and experimental design; and 1971 to the present, finding youths who reason extremely well mathematically and helping them get the special, supplemental, accelerative educational opportunities they sorely need and, in my opinion, richly deserve. Although not quite the "five faces of Eve" schism, this partitioning does sometimes leave me a bit amazed about how the five Julian Stanleys differ. I don't always recognize the other four as being I. It is almost as if I have lived five different lives. Each in turn has had some distinctly interesting aspects, and I can see how each has led logically to the next stage. I enjoyed the challenges of creating the Laboratory of Experimental Design and training a large number (about 18) of Ph.D. degree recipients in statistics and measurement during the years 1961-1968 and doing research in those areas myself. Probably my greatest satisfaction, however (but not greatest professional recognition) has come from the Study of Mathematically Precocious Youth (SMPY), which arose rather adventitiously in 1971. The events leading up to it may be worth sketching.

How SMPY Started

During the summer of 1968 there was held on the Homewood Campus of the Johns Hopkins University a program about computers for junior high school students. One of these, who had recently completed the seventh grade, was Joseph Louis Bates. He knew much about computers and helped some graduate students with their use of the Fortran computer language. His knowledge and performance so impressed one of the instructors, Doris K. Lidtke, that she cast about for someone to help Joe. Ms. Lidtke had heard of me. She called and told me about 12-year-old Joe.

I was busy that summer and fall, and therefore did not talk with Joe until January of 1969. He seemed so able and advanced that I administered several difficult tests to him including the Scholastic Aptitude Test. His scores were remarkable. I might have half-believed he was the ablest kid in the United States, perhaps one of a kind, had I not known of Leta Hollingworth's above-level testing during the 1920s and 1930s (Stanley, 1990).

It was obvious to Joe, his parents, and me that just entering high school as a ninth grader in the fall of 1969 would not provide nearly enough advanced subject matter for him. I tried to find a public or private school in the Baltimore area that would let Joe take mainly eleventh and twelfth grade honors courses, but encountered strong disbelief that he could handle them well. Finally, in desperation, I suggested to Joe and his parents that perhaps he might become a regular freshman at Johns Hopkins that fall at age 13 (he was born in October) and take a light load of subjects likely to be relatively easy for him: 13 semester-hour credits of physics, honors calculus, and computer science. We were apprehensive about this, but willing to give it a try. I approached Dean Carl Swanson and described Joe's abilities without telling him Joe's age and grade. The Dean was impressed. When I told him that Joe was just 13 years old and had completed only the eighth grade, he didn't turn a hair, but just exclaimed, "Tell Brinkley [the Johns Hopkins Director of Admissions] I said admit him."

That first semester, Joe astounded all of us with his fine grades, achieved without undue effort. He went on to receive his B.A. and M.A. degrees in computer science and begin advanced graduate work at Cornell University while still 17 years old. He earned the Ph.D. degree in computer science. Currently, Dr. Bates is a researcher in computer science at Carnegie Mellon University.

Another youth, as able as Joe, heard about this early admission and insisted on coming to Johns Hopkins the next fall, also at age 13. He did well, too. Two years later, in 1972, a local boy came at age 16. He made 40 credits of A the first year, transferred to Princeton University, and graduated there, Phi Beta Kappa and summa cum laude in mathematics, the month he became 20 years old. This precocious young man is now an outstanding cardiologist.

These three cases were enough to suggest that there were quite a few extremely highly talented youths who needed far more stimulation than could be provided by almost any high school. They should be found and have special, supplemental educational opportunities in mathematics and related subjects devised for them. (For a modern update, see Brody and Stanley, In press.)

Fortunately, in 1970 I heard of the newly created Spencer Foundation in Chicago. A quickly prepared four and one-half page proposal to it yielded me $266,100 over a five-year period with which to start the Study of Mathematically and Scientifically Precocious Youth (SMSPY), later shortened to SMPY without deemphasizing its involvement with scientifically talented boys and girls. This enabled me to get started on a substantial basis, officially as of September 1, 1971, but actually in June of that year, when Baltimorean Daniel P. Keating arrived fresh from Holy Cross College as a beginning graduate student and SMPY's first research assistant. He and I spent that summer reading or rereading publications about gifted children, espe-

cially Lewis M. Terman's famed five-volume Genetic Studies of Genius Terman's pioneering longitudinal studies of high-IQ youths.

Lynn H. Fox, a mathematics teacher and educational psychologist from Florida, joined us early that fall as a graduate student. She, Dan, and I and several others began searching for good ideas to try out on youths who reason exceptionally well mathematically. We remembered the old saying, "If you want to have rabbit stew, you must first catch a rabbit. Otherwise, you'll have squirrel stew, chicken stew, or perhaps no stew." This cogitating led to our conducting in March, 1972, a systematic talent search for quantitatively apt boys and girls and starting a fast-paced precalculus class three months later. In that initial talent search, 450 able young students in the Baltimore area, most of them seventh and eighth-graders, took two mathematics tests (Scholastic Aptitude Test - Mathematical and Level I of the College Board Mathematics achievement test) and/or both forms of the Sequential Tests of Educational Progress Science test, college freshman level.

Via the talent search we found a large number of highly talented youngsters. Our results were reported promptly at professional meetings and in the professional literature, especially Stanley, Keating, and Fox (1974). We continued the talent searches, with ever increasing geographical diversity and numbers.

The first fast-paced math class was highly successful. All of its students who persisted on Saturday mornings beyond the summer of 1972 learned at least two years of algebra or geometry by June of 1973. More than half of them learned much more by June or August of 1973, some completing the four and one-half years of precalculus from Algebra I through analytic geometry in a total of about 120 class hours. Further details and references are contained in Stanley and Benbow (1986) and Stanley (In press a and In press b)

This class led to many other experiments by SMPY with various ways to help mathematically talented boys and girls learn mathematics and related subjects such as physics, chemistry, and biology much faster and better than they could in nearly any regular school class (e.g., Stanley and Stanley, 1986). Those were thrillingly innovative days. We knew we were breaking new ground and moving along for better ways to till it.

Principles, Practices, and Techniques of SMPY Promulgated

SMPY's staff remained small, consisting chiefly of me, with a full teaching load not much related to its work, several graduate students, William C. George, one or more undergraduate work-study students, and Lois S. Sandhofer, our 80%-time secretary and administrative assistant. In all of SMPY's talent searches we administered the Scholastic Aptitude Test (SAT) ourselves and scored it by hand, that being much faster and a bit more accurate than if the answer sheets were sent off to be scored by machine. Along with SMPY's many developmental, research, and service activities. This constituted a great operational load. In 1979, I decided to give away the annual talent search and the fast-paced classes by having created on the Johns Hopkins campus a new group to handle them. In about 15 minutes of conversation, President Steven Muller and I set up the Office of Talent Identification and Development (OTID), to start that fall. A few years later its name was changed to the present form, the Center for the Advancement of Academically Talented Youth (CTY). OTID and CTY have always been independent of SMPY, and vice versa.

Under Mr. George's directorship initially, OTID was an instant success. It "farmed out" the SAT testing to the regular local testing centers set up by the Educational Testing Service, thereby also getting rid of the need for administering and scoring its two parts, Mathematical and Verbal. OTID enlarged the talent search area to 13 states, plus the District of Columbia, from Maine to West Virginia. (Later, CTY added Alaska, Arizona, California, Hawaii, Oregon, and Washington.) Criteria for entering the search were changed to include students talented verbally but not necessarily mathematically. A residential summer program of quantitative and verbal courses was held for three intensive weeks during the summer of 1980 at St. Mary's College in southern Maryland, a state supported liberal arts institution. Another was held there in 1981. From 1982 onward, CTY has operated its summer program on campuses across the country and in Switzerland. It seems likely that a similar program will soon be set up in Ireland, with CTY's and SMPY's assistance but administered independent of them. The current director of CTY is Dr. William G. Durden.

I encouraged the then-provost of Duke University, Dr. William Bevan, to set up there in 1980 an organization similar to OTID. It has functioned ever since as the Talent Identification Program (TIP). Soon thereafter, I helped Dr. Joyce Van Tassel-Baska set up the Midwest Talent Search at Northwestern University. It is now called the Center for Talent Development. The University of Denver set up the Rocky Mountain Talent Search as well. These four regional talent searches and their, and other, residential summer programs serve all 50 states. There are also somewhat more local searches and providers of fast-paced classes across the country.

Success of the Idea

Of course, I've been greatly surprised and extremely pleased by the extent to which SMPY's conceptualizations have become disseminated successfully. No group founded on these principles has yet failed. Amazingly, all have flourished, even in the absence of most governmental or private funding possibilities. The talent searches and academic summer programs since 1980 are largely self-supporting because of fees charged the participants. On the other hand, SMPY at JHU has provided nearly all its services without any cost to its "proteges." This was made possible by a series of grants from a number of philanthropic foundations, most notably substantial support from the Spencer Foundation for 13 consecutive years, 1971-1984, and an anonymous donor more recently. SMPY has had only three government grants, two short-term ones from the National Science Foundation a decade ago and one later from the U.S. Department of Education.

The success of these various enterprises is mute testimony to the intellectual hunger that many academically talented youths feel. They are like a person dying of thirst who is offered little or nothing to drink. Well-meaning individuals bring food, flowers, books, or money, but no water, as "enrichment" programs may tend to offer goodies not attuned to the specific intellec-

tual hunger the gifted child needs assuaged (Wallach, 1978). Great mathematical reasoning ability calls for systematic opportunities to learn mathematics at the right level and pace. An interesting social studies discussion or a session on the greenhouse effect can hardly give this type of student the intellectual thrill, stimulation, and satisfaction for which his or her special quantitative talent cries out.

Repeatedly, my associates at SMPY and I decry this mismatch everywhere we can: in professional meetings, at conferences, in articles and letters to editors, in books, by telephone, in letters from us in response to things we've read--anywhere and anyhow we might make an impression on educators, parents, and especially the talented youths themselves. We started off with three Ds, the subtitle of our first book (Stanley, Keating, and Fox, 1974): Discovery (finding the talented), Description (learning more about them), and Development (providing them special educational opportunities, including much information). Soon we added a fourth, equally important, D: Dissemination. Besides our newsletters, correspondence, and conferences, we send out, without charge even for postage, about 500 sets of reprints and memorandums each year. We are ever alert to opportunities to influence and help those who fall within the "ball park" of SMPY's goals, even when they have not solicited our assistance.

When we began in 1971, probably fewer than a dozen boys and girls aged 13 or less took the SAT in a given year. In 1990, about 100,000 did. Most were tested in late January. Walk into a College Board testing site in your locality in January and see for yourself. In residential, academic summer programs during 1990 there were about 5000 enrollees. Drop in next summer at Dickinson College, Franklin and Marshall College, Skidmore College, Wheaton College (in Massachusetts), the College of Redlands, Duke University, Northwestern University, Iowa State University, or elsewhere in this set of programs, and see for yourself how eagerly the young students there pursue their studies--for example, precalculus mathematics five or six hours each day for three weeks, or intensive German. Unless you are already accustomed to this type of program, it is likely to amaze you.

Of course, SMPY's work thus far has been only a drop in the bucket. Even yet, many talented boys and girls have never heard of the talent searches or summer programs. Many parents cannot afford them. Much dissemination, development, and research must still be done.

Portents for the Future

As I write this, our country is deeply embroiled in an astronomically expensive savings and loan scandal, a huge and ever-increasing national debt, large annual national deficits that can only become larger, problems with AIDS that are sure to get much worse, severe drug problems, great increase in illegitimate births and single-mother homes, much homelessness, and poor educational performance of American school children, many of whom work far too much at dead-end jobs in order to indulge in the rampant materialism that TV and other ads encourage. Why should one bother to care about idealistic enterprises such as SMPY and CTY in the face of this invitation to pessimism?

But remember that the United States has almost always been in terrible shape. Are we worse off now than at the end of the War Between the States? During the Great Depression? Time will tell. Meanwhile, there are some reasons to be guardedly optimistic about the education of the ablest. For example, in the 1990 International Mathematical Olympiad (IMO), which pitted high school teams from 53 countries against each other, the United States ranked third, behind China (first) and the Soviet Union. Five of the six persons constituting the U.S. team were members of SMPY's "700-800 on SAT-M Before Age 13 Group." During the five years 1986-1990, 18 of the 30 (i.e., 60 percent) of them were. We inform our "proteges" from age 12 or younger that there is an IMO competition each year and that some of them are able enough to be among the six chosen from about 400,000 examinees. Information, encouragement, and role modeling are powerful tools for aiding the academically talented.

For me, the message of SMPY is simple: find youths who reason extremely well mathematically before age 13 and help them get the special, supplemental, accelerative educational opportunities they must have in order to use their abilities optimumly and move toward satisfying personal and professional lives. That formulation gives me the same kind of exquisite pleasure that creating an intricate experimental design once did.

References

Benbow, C. P. (1988). ***Sex differences in mathematical reasoning ability in intellectually talented preadolescents: Their nature, effects, and possible causes.*** *Behavioral and Brain Sciences. 11 169-232.*

Benbow, C. P., & Stanley, J. C. (1983). ***Academic precocity: Aspects of its development.*** *Baltimore, MD: Johns Hopkins University Press.*

Brody, L. E., & Stanley, J. C. (In press). ***Young college students: Assessing factors that contribute to success.*** *In W. T. Southern & E. D. Jones (Eds.), Academic acceleration of Gifted children. New York: Teachers College Press.*

Campbell, D. T., & Stanley, J. C. (1966). ***Experimental and quasiexperimental designs for research.*** *Boston: Houghton Mifflin.*

Glass, G. V., & Stanley, J. C. (1970). ***Statistical methods in education and psychology.*** *Englewood Cliffs, NJ: Prentice-Hall.*

Hopkins, K. D.; Stanley, J. C.; & Hopkins, B. R. (1990). ***Educational and psychological measurement and evaluation*** *(7th ed.). Englewood Cliffs, NJ: Prentice Hall. This is the lineal descendent of Stanley's 1954 3rd-edition revision of deceased Professor Clay C. Ross's 1941 textbook, Measurement in today's schools.*

Jenkins, W. O., & Stanley, J. C. (1950). ***Partial reinforcement: A review and critique.*** *Psychological Bulletin, 47, 193-234.*

Stanley, J. C. (1950). ***The differential effects of partial and continuous reward upon the acquisition of a running response [by rats] in a two choice situation.*** *Unpublished doctoral dissertation, Graduate School of Education, Harvard University.*

Stanley, J. C. (1955). **Statistical analysis of scores from counterbalanced tests.** Journal of Ex-

perimental Education, 23, 187-207.

*Stanley, J. C. (1961). **Analysis of unreplicated three-way classifications, with applications to rater bias and trait independence.** Psychometrika, 26, 205-220.*

*Stanley, J. C. (1969). **Interaction of intellectual vacuum with G.I. Bill.** Theory into Practice, 8, 318-319.*

*Stanley, J. C. (1971a). **Reliability.** In R. L. Thorndike (Ed.), Educational Measurement (2nd ed.) (pp. 356-442). Washington, D.C.: American Council on Education.*

*Stanley, J.C. (1971b). **Predicting college success of the educationally disadvantaged.** Science, 171, 640-647.*

*Stanley, J. C. (1990). **Leta Hollingworth's contributions to above-level testing of the gifted.** Roeper Review, 12, 166-171.*

*Stanley, J. C. (In press a). **An academic model for educating the mathematically talented.** Gifted Child Quarterly.*

*Stanley, J. C. (In press b). **Finding and helping young people with exceptional mathematical reasoning ability.** In M. J. A. Howe (Ed.), Encouraging the development of exceptional skills and talents. London: British Psychological Society Books.*

*Stanley, J. C., & Benbow, C. P. (1986). **Youths who reason extremely well mathematically.** In R. J. Sternberg & J. E. Davidson (Eds.), Conceptions of giftedness (pp. 362-387). Cambridge, England: Cambridge University Press.*

*Stanley, J. C.; Keating, D. P.; & Fox, L. H. (Eds.). (1974). **Mathematical talent: Discovery, description, and development.** Baltimore, MD: Johns Hopkins University Press.*

*Stanley, J. C., & Stanley, B. S. K. (1986). **High-school biology, chemistry, or physics learned well in three weeks.** Journal of Research in Science Teaching, 23, 237-250.*

*Wallach, M. A. (1978). **Care and feeding of the gifted.** Contemporary Psychology, 23, 616-617.*

*This article is an excerpt from Reflections: Personal Essays by 33 Distinguished Educators (1991) Phi Delta Kappa.