Black Colleges Cultivate Scientists

But questions linger about the quality of their science.

In the spring of 1981, North Carolina native B. Lee Stackhouse left all-black Hampton University in Hampton, Virginia, with at least two newly acquired assets: an M.S. in biology and the confidence that he could do a Ph.D. at a major university. Stackhouse, whose B.S. in biology is also from Hampton, decided to spend the summer as a research assistant in a cardiovascular research lab at Boston University, his initial foray into a mostly white environment. But his first taste of the world of big-time research was sour—so sour that he has never returned full-time to a majority institution.

He says that in the Boston lab, faculty members—and even his fellow students—treated him like a child, offering to write down the simplest instructions. In the city itself, security guards perked up when he entered grocery stores and followed him through the aisles. "If I'd gone to a majority undergrad institution I might have been accustomed to it," Stackhouse says. "But this hit me like a ton of bricks. I thought: 'Is this the way the country really is?'"

Stackhouse lasted out the summer, but in the fall, he headed back to Hampton, where he taught as an instructor for 2 years. Then he decided to get that Ph.D. after all—at historically black Howard University.

Like Stackhouse, an increasing number of black students are choosing black colleges. Overall enrollments have surged, especially at the undergraduate level, and the top black schools are flooded with applications. But how well do these schools teach science? Few can afford state-of-the-art instrumentation, and even fewer have a research tradition, scientists both inside and outside these schools agree. And the historically black colleges and universities (referred to as HBCUs) vary greatly in quality, with some small schools little better than junior colleges. Yet on the plus side, HBCUs provide a welcoming environment, personal attention from professors, and a plethora of role models who expect students to excel.

Howard grad Roosevelt Johnson, program director for graduate and postdoc programs at NSF, sums up the education at the best black colleges this way: "You come out with a very strong academic experience, but possibly a limited research experience."

Black pride. For many scientifically inclined students, the HBCU advantages apparently pay off. Although most blacks enter majority schools, black schools graduate more than their share of black scientists. In 1989, with less than 20% of black students, HBCUs awarded 40% of all black B.S. degrees in natural science, according to the National Science Foundation (NSF). At the bachelor's level, the top five producers of black biologists are all historically black schools (see table on page 1218).

And graduates from many of these schools go on to make the grade in Ph.D. programs at mainstream universities, suggesting that at least some HBCUs offer a good grounding in science. For example, of the roughly 700 blacks who received a Ph.D. in science and engineering between 1986 and 1988, 29% earned their bachelor's degree at a black college, according to NSF. In some fields the figure was much higher: 42% of black Ph.D. biologists and 36% of black Ph.D. engineers received undergraduate degrees from black schools.

Fans of the HBCUs say the numbers reflect what they do best: teach undergrads. Students are routinely showered with personal attention. At Clark Atlanta University, for example, biology professor Isabella Finkelstein keeps track of the academic profiles of students in her class. "I see a kid with 1200 SAT scores who gets a 30 on my first test, I put a note on there: 'YOU CAN DO BETTER.'"

Psychological boost. Black colleges' chief advantage—an environment that nurtures self-confidence—is hard to measure. But most HBCU grads insist the advantage is there. They say that at mostly white schools, simply being in the minority exacts a psychological toll. Spelman grad Sharon Neal, now assistant professor of chemistry at the University of California, Riverside, attended a white prep school in Philadelphia. The school "did more for me intellectually than any other experience," she says. "But it was at a great personal price in my youth. I got so sick of people being your friend in school and then not knowing you when we met in a department store." Other graduates of white high schools remember never getting dates and feeling pressure to live up to stereotypes like knowing the latest dance

Boom Time for Black Colleges?

Founded as schools for freed slaves, the historically black colleges and universities (HBCUs) have already evolved through several cycles of change. Throughout this century, while major universities barred their doors, the HBCUs trained blacks to serve as physicians, teachers, and ministers. Finally, the Civil Rights movement expanded job and educational opportunities, black universities broadened their fields, and blacks flocked to majority schools.

Today, about 80 HBCUs award degrees in science and math. After a decade of steady or gently declining enrollments, black schools saw a 15% jump in enrollment from 1986 to 1990, according to the National Center for Education Statistics. Black students may have been turned off by well-publicized racial tensions at white campuses. And black schools have enjoyed a wave of positive publicity, as in the prime-time TV show *A Different World*, which depicts life at a black college, says Frank Matthews, publisher of *Black Issues in Higher Education*.

But part of the enrollment boom was due to more whites attending historically black state schools, a move forced by court desegregation decisions, say Matthews and other education analysts. And while a few black colleges are growing, many others are cutting back. Most small, private black schools awarded fewer degrees in science and engineering in 1989 than in 1977, according to the National Science Foundation. The good news seems to be confined to a handful of select institutions. Only time will tell if the black college boom times will hold up through the 1990s.

–E.C.

steps. Neal turned to Spelman because she wanted a place where "race just wasn't an issue."

Such social concerns may seem irrelevant to what ought to be a primary concern in college: making the grade. But when blacks—or any other group—are in the minority in school, they tend to work in isolation. And in tough science courses, the savvy strategy is to band together. "The minute I didn't understand something in biochemistry the first thought in my head was, 'I'm the only one who doesn't understand this,' " remembers NSF's Johnson. "It took group study to realize the other guys didn't understand it either."

Working in concert with classmates is key, agrees mathematician Gloria Gilmer, who runs an educational consulting company in Milwaukee, Wisconsin, and has taught at six HBCUs as well as several mostly white universities. "I tell students to go where they give Ph.D.s to people who look like you. Don't go to some school and sit in a class where you're not even taking the same course as the rest because you're isolated and they're working together."

And at majority schools, the lone black chemistry major may feel that his every move must prove that black people can make it. The pressure not to make mistakes is huge. "People forget that freshmen are 18-year-olds. They're still kids," says Johnson. "They need to be able to be young, and do silly, foolish things, and not be under a microscope."

Working alone makes hard problems nearly impossible; maybe that's part of the reason blacks at majority schools tend to drop out of tough hard science courses

A Trio of Teaching Successes

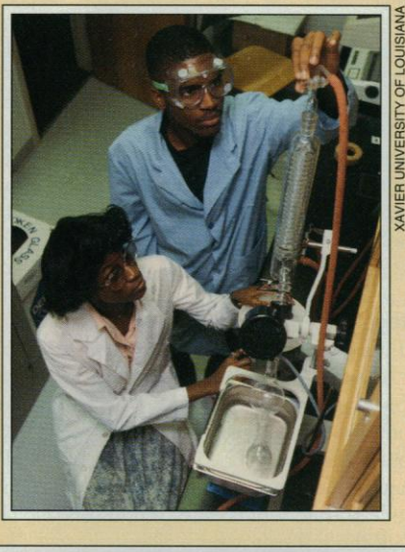
How does the supportive atmosphere at black colleges translate into academic success? Three case studies help illustrate the process.

Morehouse mystique. Morehouse College in Atlanta has been attracting an increasing number of young black men (it's for men only), who are impressed by the college's track record of producing leaders. Graduates range from Martin Luther King Jr. to filmmaker Spike Lee, and Morehouse partisans like to talk about an air of self-confidence—what they call the "Morehouse mystique"—that the college instills in its students. Applications are up 57% and combined average SAT scores are up 250 points, to 1003.

If there is a mystique about Morehouse, it is created in large part by unusually dedicated teachers. "I didn't do too well on one of my bio labs," recounts Morehouse freshman Brian Gaffney. "And I was walking with my buddies across campus to the mall, and my professor—his office is on the first floor—he leans out the window, and calls me in to discuss my grade! It's a good feeling to have someone behind you pushing. They get you on your feet if you start slacking off."

Spelman stars. Next door to Morehouse, Spelman College for black women is another star, winning the spotlight even when competing with mainstream schools. In 1992, *U.S. News and World Report* ranked Spelman first among Southern regional liberal arts colleges; last year, *Money* magazine put Spelman at the head of the class in Georgia and 18th in the nation for the best education for the money.

And although the college is pinched for space and facilities—math and science faculty members share offices in one crowded building—Spelman nevertheless won accolades from at least one visiting scientist. David L. Nelson, professor of biochemistry at the University of Wisconsin spent last academic year teaching at Spelman on an NIH exchange program. When he left Wisconsin, he was unconvinced of the need for either black or women's colleges. But Nelson, who is white, returned to Wisconsin a firm convert to both. "The students are first-rate, the teaching is first rate," he told *Science*. There was, he says, "an extraordinary difference" between the black undergraduates at Spelman and Wisconsin. "Those students [at Spelman] sit in the cafeteria surrounded by oil portraits of outstanding black women, and on campus there's a continual parade of such women. And the results are noticeable—those graduates come out with their heads held high." At Spelman, applications have increased fourfold in the past decade, 37% of the students major in math or science, and half the women go on for postbaccalaureate study.



XAVIER UNIVERSITY OF LOUISIANA

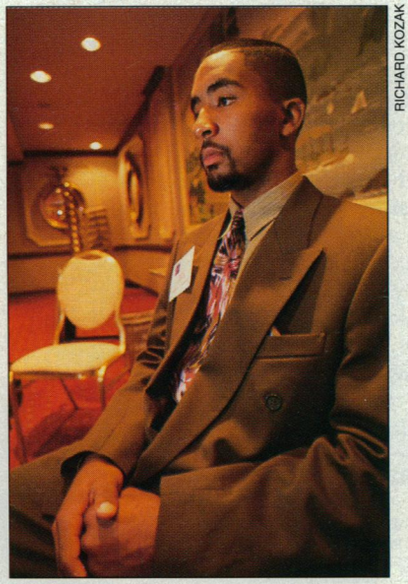
FRANCIS GILES

Lab results. Schools like Xavier *(top)* and Spelman *(above)* churn out black science majors.

Cajun candidate. And then there's the little Louisiana success story called Xavier University. A small black school in New Orleans, Xavier has transformed itself into a veritable factory for producing black graduates in science, especially biology.

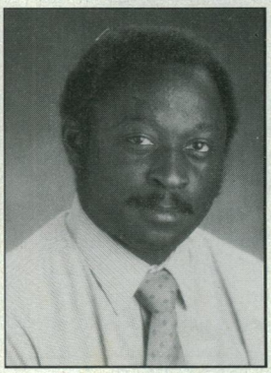
Xavier has a student population that is 95% black, 70% female, and has average combined SAT scores the Ivy League wouldn't touch: 825. But at Xavier, there's a process that won't quit: a structured program of introductory courses, summer enrichment opportunities, and peer support. Thanks to an environment that stresses science, half the students are natural science majors, and biology is the biggest department on campus. The results: Tiny Xavier, with 3100 students, is second in the nation (after Howard) at putting blacks into medical school. And the foundation they get at Xavier apparently serves these students well as they continue along the medical pipeline: Xavier officials report that over the past 10 years, 93% of graduates who enter med school have gotten their M.D.

–E.C.



RICHARD KOZAK

Black track. Freshman Gaffney chose Morehouse College; Professor Stackhouse has made his career at black schools.



and major in "softer" social sciences. Mainstream universities enrolled about 80% of black students and produced 74% of the black B.S. social scientists in 1989—and only 63% of the computer scientists, according to NSF.

Walter Pattillo Jr., chair of the biology department at historically black North Carolina Central University, complains: "The way we see it, the majority schools are wasting large numbers of good students. They have black students with admissions statistics [that are] very high, tops. But these students wind up majoring in sociology or recreation or get wiped out altogether." As a result, Pattillo is somewhat skeptical of majority schools who come calling: "These [white] schools come here asking for [graduate] students, and we say, 'What are you doing with the students you already have?' One of my colleagues says they got the cream, now they come back for the skim milk."

Coddling students? Others, however, point out the dangers of coddling students. Campuses devoted to nurturing may not be as academically rigorous as majority universities that expect students to "sink or swim." Upon arriving as an assistant professor at a well-regarded HBCU about 10 years ago, one black scientist recalls thinking that the school was more like a high school or junior college than a university. Professors were expected to call the roll before each class.

And students at black schools may be inadequately exposed to the research world: "Science is a culture," says Bertram Fraser-Reid, a Jamaican-born black chemistry professor at Duke. In his lab, he says, undergrads soak up chemistry simply by socializing with grad students and postdocs. If you choose a black or inexpensive private college, says Fraser-Reid, "You may be gaining one culture at the expense of the other."

In science, a good undergraduate education means research, or at least some ambitious lab courses—and that takes money. Financially strapped HBCUs may not be able to provide those courses. "Undergraduate teaching in science is an extraordinarily expensive business. People these days can't learn about molecular modeling, they need to learn how to do it," says Fraser-Reid.

At Pattillo's university, North Carolina Central University in Durham, for example, students—including master's students—had no access to many of the tools of modern molecular biology. Only last year, after one young faculty member won outside funding for a new lab course, did the university offer training in cloning, the polymerase chain reaction, and other basics.

This has long been a problem at black colleges. "I was poorly prepared," says Kenneth Olden, director of the National Institute for Environmental Health Sciences, who got his B.S. from Knoxville College in 1960. "I learned science from a descriptive point of view. I wasn't very quantitative. I hadn't done much lab work." As a result, Olden now believes that for many minority students, major universities are the way to go. "When you really get down to it, if you say, 'What I really want for my child is a serious rigorous academic training,' then you're probably talking about a majority school."

Tradeoff. Maybe the best solution, some say, is an education that combines the best of both worlds. Says Meredith Williams, a Yale-educated young physicist, now in grad school at North Carolina State University, a majority school, "In my dream world I'd go to an HBCU for 2 years and then transfer to Yale. Because I've seen how people come out of those black schools. They exude the message, 'I'm capable.'"

The ability of black colleges to keep turning out such confident students, however, will depend on whether they can continue to recruit outstanding faculty. Thirty years ago, that task was easy: All top black scientists went to schools like Howard and Tuskegee, since they were unwelcome elsewhere. No longer. Many HBCU fans worry that their faculty ranks are filling with foreign professors, instead of minority role models. And in the long run, HBCUs will have to rely on more than a sense of commitment to attract faculty.

For example, Stackhouse, who received three degrees from black schools, now teaches at one, Winston-Salem State University. "If we don't return to minority institutions, who will?" he asks. He keeps a research connection alive through summer programs but wonders if that will be enough. In his own university, he's frustrated by heavy teaching loads and lack of lab space and equipment. But like many black college alumni, he is passionate about keeping black schools alive so students have a choice. In his view, until integration works in both spirit and practice, some black students will benefit from learning science in a place where, for a few years at least, they are the majority.

–Elizabeth Culotta

TOP 10 PRODUCERS OF BLACK B.S. DEGREES, 1988–1989

	Institution	Total Degrees Conferred
1	Howard University	223
2	Southern University A&M College	212
3	North Carolina A&T State University	161
4	Prairie View A&M University	152
5	Jackson State University	151
6	University of the District of Columbia	123
7	Grambling State University	111
8	Tuskegee University	111
9	Hampton University	107
10	South Carolina State University	107

SOURCE: BLACK ISSUES IN HIGHER EDUCATION