RACIAL MODIFIERS II

Identity Crisis: Teaching v. Research

At a time when major universities are feeling pressure to pay more attention to teaching instead of research, a few black colleges are moving in the opposite direction: They're trying to enter the research arena. "We are going to strike out and get our own Ph.D. programs," promises Frederick Humphries, president of Florida A & M University in Tallahassee. Humphries says he and other black university leaders are fed up with seeing so few black faces in graduate programs. "We're being forced to do that by the inefficient performance of the major research institutions in this country. They aren't really trying [to produce minority Ph.D.s] and I'm sick of waiting on them."

One dismal figure is sufficient to back up Humphries' argument: Less than 2% of new science Ph.D.s in 1990 were black. But he can trot out other compelling reasons for a research focus at black campuses. Research helps recruit outstanding faculty and students and serves as a magnet to attract undergraduates to science. And black colleges are in the best position to tackle research problems vital to the minority community.

The federal government has accepted this logic for the past 20 years and has launched an array of programs to build research infrastructures in black colleges. But the transition from a traditional teaching university to a big-name research school isn't likely to happen easily or without controversy. Indeed some of the sharpest opposition comes from faculty members at black universities, who fear the push toward research could undermine their teaching mission. And changing identities is hard: While there's plenty of talk about beefing up research, few schools give professors the resources they need to do good science. Perhaps not surprisingly, therefore, the quality of the research undertaken so far is uneven, and many black schools still have trouble winning competitive research grants.

Boosting teaching. On the surface it seems research should complement, not clash with, a teaching tradition. Minority students—like their white classmates—often cite undergraduate research as the reason they chose science. "I learned more in one summer of research than in 4 years of classes," says Jenae Williams, a senior at mostly-white Pennsylvania State University.

But some respected teachers disagree with this philosophy. "I'm a heretic. If the emphasis is placed on research and publication, you cannot do the teaching. I don't see why we—and the small liberal arts colleges—have to make the same mistakes the big state universities did," says J.W. Carmichael, one of the architects of Xavier University's remarkably successful premed program (see story on page 1217). "Lots of scientists didn't do research as undergrads. And you can get research elsewhere."

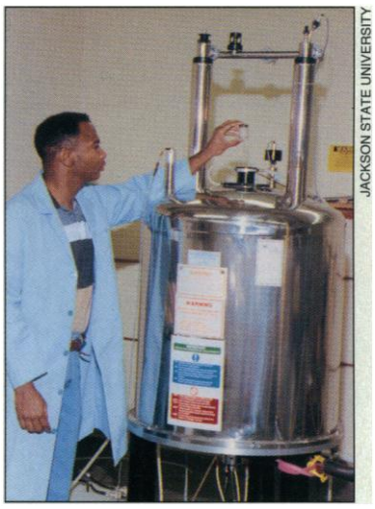
Others retort that not enough black students move on to research. Even Xavier sends few grads to graduate school. Black universities have no choice but to boost their own research and graduate education programs, these leaders argue. "You want to see what the world is like without us, you look at the graduate schools," says Humphries of Florida A & M University.

Indeed the few existing Ph.D. programs at black universities already produce more than their share of minority doctorates. For example, Meharry Medical College in Nashville, traditionally a medical and dental school, began a graduate program in 1972. Twenty years later it produces 8% to 10% of all black biomedical Ph.D.s. Last year five students graduated from Florida A & M's relatively new pharmacy Ph.D. program—"more than the rest of the country put together," according to Humphries.

Black universities also are in a unique position to do research crucial to minorities, on problems such as hypertension, asthma, and tropical diseases. "It's much easier to reach the [black] population if we have Howard University involved instead of Johns Hopkins or Tufts," says John Ruffin, associate director for minority programs at the National Institutes of Health (NIH).

Black schools covet research opportunities but fear losing their teaching tradition.

Still, some black scientists wonder whether creating a new research infrastructure at black universities is the best way to support black scientists. "Integration is the order of the day," says Kenneth Olden, director of the National Institute for Environmental Health Sciences, who is eager to improve the lot of blacks at existing research universities. "We need to help black students everywhere, including at Harvard and Yale if that's where they are."



JACKSON STATE UNIVERSITY

Eyes on the prize. Black schools like Jackson State are seeking more research dollars.

Easy money. Many of the research programs now in place at black universities were launched with federal grants targeted specifically to minority institutions. The government spent about $140 million on research and development (in all disciplines) at black universities in 1990, according to the Department of Education. The Department of Health and Human Services spent about $48 million; NSF chipped in about $17 million.

One goal of these programs is to boost black universities' research facilities so that they eventually can compete for mainstream research grants. At Meharry Medical College, NIH minority grants often serve as de facto start-up funds but are not intended to be long-term support, says George Hill, dean of the school of graduate studies and research. "I urge all my faculty to get off that money after the first grant. And we have long debates about that. But in the long run, we must be competitive for mainstream funding."

But weaning research programs off minority money has proven difficult (see page 1185). NIH and NSF say they can't calculate how much mainstream grant money goes to black universities. But it clearly isn't much: Less than 2% of all NSF's principal investigators are minorities. Data from individual institutions bolster this impression (see table on page 1224).

Lip service. Many black researchers told *Science* that if the black universities truly want to achieve success in research, then many will need new leadership, since today's administrators may not have the research backgrounds themselves to understand

what's needed. "We need an environment which really rewards research," says Hill of Meharry. And although black universities are creating new positions like vice president for research, many aren't trimming teaching loads or opening new labs fast enough for some research-oriented faculty members.

Warren W. Buck, who helped create the new Ph.D. program in physics at Hampton University, was drawn there because the school is near both the Department of Energy's new electron beam accelerator, CEBAF, and NASA's Langley Research Center. But when he first arrived 9 years ago, he felt he was swimming upstream by trying to do research. Things have improved—teaching loads in his department are down from four courses per term to one or two—but he still feels his research efforts aren't fully appreciated.

Julius Jackson, a microbiologist at Michigan State University, took a leave of absence to help build Clark Atlanta University into a world-class research institution. But now Jackson is disillusioned with the university's commitment to research and points out that teaching loads for many faculty are still three courses per term. Officials like Kofi Bota, who holds the new title of vice president for research and sponsored programs at Clark Atlanta, counter that the university's commitment is strong but there simply aren't resources to do everything at once.

Even at Howard, the only black school considered a comprehensive research university, faculty members say they have to be aggressive to win administrative support for their research. "When I first came there was a lack of understanding of what things had to be done to support big science research. But I think understanding is increasing," says Michael Spencer, professor of electrical engineering and director of the Materials Science Research Center at Howard. "The problem at many schools is that people who have never done research don't understand what it takes," says Spencer. "At major universities there's an appreciation for the mentoring of graduate students. Unless you've done it yourself or been in an environment where it's been done, you don't appreciate the effort."

Granting agencies are sensitive to this issue. When Hill moved from Colorado State University to Meharry 10 years ago, his NIH grant on tropical diseases (a mainstream, competitive award) was recommended for renewal for 3 years instead of 5: Reviewers wanted Hill to prove that his productivity could stay high in the new environment.

Today, Hill's grant has been renewed twice — and that's a good sign for Meharry. In the end, it may be the ability to get and keep competitive grants that determines whether black campuses are able to extend their undergraduate successes into the realm of graduate school.

–Elizabeth Culotta

RESEARCH AWARDS TO SELECTED BLACK UNIVERSITIES

Institution	Mainstream Grants	Minority Grants (in millions)	Total Research
Clark Atlanta University	$8	$16	$24
Hampton University	$4.8	$6.7	$11.5
Florida A&M University	$11.8	$17.6	*$29.5
Jackson State University	$2.7	$6.2	$8.9
Meharry Medical College	$4.8	$7.2	$12
North Carolina A&T State University	$3.1	$13.1	$16.2

*Numbers may not add up due to rounding.

RACIAL MODIFIERS III

Asian-Americans Bump Against Glass Ceilings

They're flooding the pipeline but say that they're still blocked at the top.

Alice Huang came to this country on a boat from mainland China at the age of 10. The year was 1949, she was a refugee without a penny to her name, and she was accompanied only by two siblings, but that didn't stop her from becoming a virologist and an American success story. It would be hard to imagine a more impressive curriculum vitae in science: Wellesley, a doctorate from Johns Hopkins, full professorship at Harvard. By 1989, she had become the first Asian-American to become president of the American Society of Microbiologists, and one of the first Asian-Americans to head any national scientific society. A year ago, in another first, she was named Dean for Science at New York University. On the surface, it appears that Huang has risen swiftly through the ranks, unimpeded. And yet she describes the very real barriers she has encountered. Says Huang: "There is no question that a glass ceiling exists for Asian-American scientists. I've experienced it. And the elite institutions are the worst."

Even after all her successes, she still remembers one committee that was searching for a woman to fill a "very top level job" at a prestigious college. "I realized early on in the interview that although I was qualified on paper, it was highly unlikely that they would appoint an Asian-American to the position," she recalls, "considering they had been so WASP for their whole history. They were pushing me on what I would be willing to give up for this job." In the end, Huang confronted them: "I told them that I doubted whether they were going to offer this job, at this time in the history of the institution, to an Asian-American woman." As she recalls, two of the committee members actually nodded, confirming her suspicions.

But other minorities would love to have Huang's problems. Compared to blacks and Hispanics, Asian-Americans have achieved tremendous success: They are "overrepresented" in the ranks of science, comprising 7% of all doctoral scientists working in the United