

Mississippi Mathematics Renaissance

Gerard Buskes

In the spring of 2006 four African-Americans received the Ph.D. degree in mathematics in one commencement at the University of Mississippi, a national record. This is a joyous note of reflection.

In 1848 a group of people just below the northern hills of Mississippi lobbied the legislature in Jackson to place a university where dense hickory-oak forest ruled supreme, a land filled with the mystique of Faulkner's Yoknapatawpha. When granted, the "other Oxford" established an ambitious plan for an institution of higher learning. What would have been the biggest refracting telescope of the then-modern world was ordered from Alvan Clark and Sons of Boston. Civil war erupted while the telescope was en route to Oxford, and the giant lens never arrived.

The news of the four African-American Ph.D.'s signals the opening to a new renaissance, long after that first promise. The university, with about fourteen thousand students on its main campus, has fourteen faculty members in its mathematics department. In 2000 the Department of Mathematics applied for a Graduate Assistance in Areas of National Need (GAANN) grant. Its arguments in the proposal were simple: Mississippi has a large constituency of African-Americans and a huge need for a technology renaissance for which it needs highly trained mathematicians. The mathematics department promised in particular to recruit, train, and graduate future African-American and female Ph.D.'s. The Department of Education bought into these arguments. The availability of a US\$20,000 stipend for a GAANN fellowship at the Department of Mathematics of the University of Mississippi, where the going rate for a graduate assistantship was US\$9,650, had enormous consequences. The GAANN grant first doubled the graduate student

budget and then the graduate student population. Finally, it more than quadrupled the number of Ph.D. students. It was a transforming moment. Eight GAANN fellows were supported from that first grant. Six have obtained their Ph.D.'s in mathematics (three of them African-American) and one more African-American is close to the finish line. Six of the eight fellows are female and four of these have obtained their Ph.D.'s. The grant created purpose and cohesion to the graduate program. The GAANN grant provided, as it were, a new lens from which to look outward. For the first time in more than fifty years the sectional meeting of the Mathematical Association of America took place on the Oxford campus in 2001. The GAANN grant enabled the GAANN fellows to go first to the national AMS/MAA meeting in New Orleans in 2001 and then to the International Congress of Mathematicians in Beijing, China, in 2002.

The transformation of the mathematics department at the University of Mississippi does not arrive in isolation. Bob Moses was the recipient of a MacArthur fellowship for an approach to teaching mathematics in his Algebra Project in Mississippi, based on understanding of the social and economic background of pupils. The university's commitment to diversity and its sense of responsibility to all citizens of Mississippi have created what its administration now calls the Renaissance Decade. The accomplishment of the four African-American Ph.D.'s in mathematics in Mississippi also is connected to other universities in the nation. At the University of Maryland, three female African-Americans received their mathematics Ph.D.'s in one commencement in 2003. The University of Iowa received a Presidential Award for its exemplary program that promises to deliver three minority Ph.D.'s in mathematics every year.

In reflecting on all these achievements, I was reminded of the following quote by Etta Falconer (the eleventh African-American female Ph.D.) upon

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Three of the four young Ph.D.'s: Adrian Wilson, Carla Cotwright, and Bryan Williams (not pictured: Joe Anderson).

success in locales with a similar background. For instance, regional differences in economic prosperity could have a large and at times unexpected influence on a national concerted effort to raise the overall number of minority Ph.D.'s. A national strategy should include questioning practices in the culture of advancing mathematics research that hinder achievement of the

moving to Wisconsin in pursuit of a masters degree in 1954:

Can you imagine what it was like for a nineteen-year-old black female from Tupelo, Mississippi, who has been immersed in segregation for all her life to attend the University of Wisconsin? I underwent a major culture shock.

The University of Iowa, with a low percentage of African-Americans in the region, is successful in breaking new ground for potentially very different reasons from the University of Mississippi in a region with a very high percentage of African-Americans. For historic, geographic, and economic reasons, recruiting and retaining students at UM is different from recruiting and retaining students in Iowa, which in turn is different from graduating Ph.D.'s in Maryland. What then could these diverse places of success have in common? For one, they have important role models. At the University of Mississippi, the African-American mathematician Donald Cole, with a Ph.D. from the University of Mississippi, has inspired generations of students to achieve their highest academic dreams. At the University of Iowa, appealing to the underlying humanity of it all, Philip Kutzko suggests another beautiful answer:

... such a transformation (of a department) is not based on recruitment and retention, although it leads to success ... It is based on a profound desire to live and work in a department that encourages and supports the hopes, dreams, and aspirations of young mathematicians from all parts and populations of our nation.

What is needed is a national strategy that studies similarities, but even more so differences between universities where success has arrived on the doorstep, and that then tries to replicate

highest degree for minorities, if such turn out to exist.

The Department of Education renewed GAANN funding to the Department of Mathematics at the University of Mississippi for 2006-2009. A student applying for a GAANN fellowship recently wrote to me:

It is very discouraging to have gone to predominantly African-American schools and institutions and not have one African-American mathematics professor. And what is even more disappointing is to go to a school, and be the only African-American student in all of your classes! It makes one feel that maybe "your kind" was not meant to do this.

Whether it be Iowa, Maryland, or Mississippi, a diverse cadre of teachers and researchers in mathematics will be a renaissance for all of American mathematics.

On a personal note, I arrived in Lafayette county from Europe more than twenty years ago, largely unaware of the complexity of the Yoknapatawpha region and I had not read Faulkner. I would like to take this opportunity to thank Carl Pomerance for his advice and inspiration to me when he visited the University of Mississippi, twice in the mid- and late 1990s and then once more a couple of years ago. He gave two beautiful lectures on mathematics at the university and an even more beautiful talk for high school kids at South Panola High School in Batesville, twenty miles west of Oxford, where he volunteered during Freedom Summer in 1964. I dedicate the accomplishment of the four African-American Ph.D.'s in mathematics at the University of Mississippi to him and all others who worked so hard to make success at the spring commencement 2006 at UM possible.