From Segregation to Department Head

Nathaniel Whitaker

As we stood at Fort Monroe at 6:00 a.m., gazing into the sea, I could imagine the ships approaching, bringing the first Africans to what would become this country, bringing my own ancestors. My wife and I had traveled to Fort Monroe in Hampton, Virginia, on August 24, 2019, to observe the 400th anniversary of this arrival. Amazingly, this site was only three miles from where I grew up. It is also the city where the Black women mathematicians in the book and movie *Hidden Figures* lived and worked. Their stories were hidden as were the stories of the triumphs of many African Americans. During much of my time navigating the White world as a mathematician, I myself have felt hidden and invisible. This invisibility is what the narrator in Ralph Ellison's landmark book *Invisible Man* feels. He is a Black man who feels invisible to Whites as he maneuvers through their world. This invisibility in the White world can also be a handicap when trying to further one's education or academic career, since the support from your fellow students and faculty can make a huge difference in your success. The combination of the recent death of George Floyd and the COVID-19 pandemic has somewhat uncloaked or made visible the plight of African Americans and sparked interest in their hidden history. This is the story of my journey from segregation to becoming the Head of the mathematics and statistics department at a major R1 university.

My parents were born in North Carolina in the 1920s in the midst of the Jim Crow era. My grandparents were sharecroppers and my parents began their life together as sharecroppers. They rented land from a White farmer and paid the owner with the goods that they produced. The system was designed so that the sharecropper would always be in debt. In 1953, when I was two years old, my father took a job in the Newport News Shipyard in Newport News, Virginia. We moved into a segregated housing complex called Newsome Park where most of the shipyard workers lived. Newsome Park provided housing for African Americans in all professions which were accessible then, including shipyard workers, teachers, and computers. These were human computers who worked at the National Advisory Committee for Aeronautics (NACA), which became NASA, performing computations for space flight. From 1943 to 1958, Dorothy Vaughan headed the colored computing section. Mary Jackson and Katherine Johnson were both initially part of Vaughan's group. Mary Jackson became NASA's first Black engineer and Katherine Johnson was a well-respected mathematician who John Glenn and other astronauts relied on for flight calculations. The inspiring stories of these women were told by Margot Lee Shetterly in the book *Hidden Figures: The American Dream and the Untold Story of the Black Women Mathematicians Who Helped Win the Space Race* and later in the associated movie *Hidden Figures*. In Newsome Park, I lived one block away from Dorothy Vaughan. As in North Carolina, segregation was everywhere in Virginia. Our family went to a drive-in theater on Sundays with a fence down the middle, separating Whites and Coloreds (Blacks), with separate concession stands. When my parents bought food from White restaurants, they had to go to the back door to order and pick up the food.

My parents were not highly educated but they have always served as my role models. My father was very good with numbers. He was a self-taught mechanic who could take a car apart and put it back together again. In the south, the game of checkers was very popular among African Americans in the 1950s and 1960s. Men would gather in Black-owned stores with 20 men watching while two players competed in a game of checkers with a long

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queue waiting to play the winner. There were no official tournaments but my father was considered one of the best in the Hampton and Newport News area. He helped me with math while my mother helped me with reading and writing early in elementary school. However, after my first few years in school, I was on my own. My parents instilled in me the need to give back to the African American community. A person that excited my interests in math was my Uncle Bobby, my mother's youngest brother. He would visit us and would challenge me with math questions. He has served as one of the major role models in my life.

Needless to say, I attended a segregated school in Newport News. This was the time of Virginia's massive resistance to desegregation. Before 1954, Virginia tried to maintain its segregated schools, which was allowed, as long as the schools were equal in quality, known as "separate but equal." The facilities at the Black schools were either not equal to those at the White schools or did not exist at all. The Brown versus Board of Education Supreme Court decision in 1954 overturned "separate but equal" and required schools to desegregate. In 1958, Virginia Governor Lindsay Almond closed public schools in Charlottesville, Norfolk, and Warren County rather than comply with desegregation ordered by local judges. Over 10,000 students were left without schools. The schools reopened in winter 1959. From 1959–1964, Prince Edward County closed all of its public schools, refusing to appropriate any of its public funds to schools rather than desegregate. White students were given tuition grants using public funds to attend a private educational academy, while Black students had to fend for themselves. Newport News schools were not forced to desegregate until the late 1960s. Virginia and other southern states resisted desegregation through a wide array of tactics, especially through "Freedom of Choice" plans.

I started my formal schooling in 1956 at the segregated Newsome Park elementary school. When I was in the second grade, I had rheumatic fever and physically attended school for only a month of the entire academic year. My second grade teacher, Mrs. Granderson, brought my school work to me at my house every day, so that I could complete the school year. The African American teachers in our school genuinely cared about us and tried to prepare us for a world that would not be very welcoming to us. When we were given our books at the beginning of each school year and had to put our name in the book, I would see as many as ten to fifteen names of students who had used the book before me, since the books were hand-me-downs from White schools when they acquired newer books. Back then, I was an average student in math, but I improved, especially when the concepts became more abstract.

In 1963, my family moved from Newport News to Hampton, just a month into my seventh-grade year. In Hampton, I attended George Wythe Junior High School. Katherine Johnson, the mathematician portrayed in the film *Hidden Figures*, lived a half mile from our new home in Hampton and across the street from my new school. My sister Vanessa later became her sorority sister. She loved to play cards and my sister and her other sorority sisters visited her frequently when she moved into a nursing home. They played games with her, but they really came to look in on her. My sister, Katherine Johnson, and a math teacher from Hampton High School are shown in Figure 1.

Figure 1. Photo taken in 2013 in Hampton, Virginia. From left to right is Vanessa Whitaker, Katherine Johnson, and Joyce Weeks (a former math teacher at Hampton High School).

The mothers of some of my classmates were also computers working at NASA. One of my classmates at George Wythe was Stephen Smith. His mother, Willianna Smith, worked as a computer under Dorothy Vaughan. In Hampton, as in Newport News, the schools were segregated. The Commonwealth of Virginia was under extreme pressure to integrate their schools and implemented the "Freedom of Choice" plan during my eighth-grade year in 1965. This meant that I could choose to attend any school in the city for my ninth-grade year, but I would have to be bussed there. A friend of mine, Sidney Ricks, asked me if I would attend Thorpe Junior High School with him, an all-White junior high school, since his mother was making him go. I had never really interacted with Whites since our communities and schools were segregated. Thorpe Junior High School was the old Hampton High School, and the very school that Mary Jackson, the engineer in *Hidden Figures*, had petitioned the City of Hampton in order to take classes there, just a few years earlier, in the 1950s. I told Sidney that I would go with him to Thorpe, but when I asked my parents, they said no. My parents had lots of negative experiences in their interactions with Whites. The Whites had perpetrated all types of violence and terror on them and their communities with little fear of justice. In one instance, my mother's uncle helped a White lady who was falling out of a carriage. She told other Whites that he

had behaved towards her in an inappropriate manner. A group of White men came looking for him but he fled to Baltimore and never returned. Lynchings of Blacks were common then as Emmett Till was lynched because of a similar accusation from a White woman. Given their experiences, my parents were rightfully cautious and distrustful with respect to interactions with Whites and were reluctant to allow me to attend this school. My father had a sixth-grade education, and my mother finished the tenth grade. My father had to quit school to work for his family. My mother was unable to finish high school because there was no high school for Blacks in her hometown. Because of educational constraints, they were never able to pursue their dreams but worked hard so that their children could pursue theirs. After a tremendous amount of pleading, my parents finally agreed to let me attend Thorpe Junior High School. Hardly any students chose to leave George Wythe and go to Thorpe that year. In retrospect, I know that Sidney's mother, who was college educated, wanted the best education for her son, and knew that things were not separate and equal at George Wythe.

At Thorpe, we were both put into the more advanced classes, having done well at George Wythe. The students in our homeroom were the children of doctors, lawyers, and other occupations which were usually not accessible to African Americans. I am sure that we were a shock to many of the White students who probably had not had many interactions with African Americans. Early on, one day at school, I saw that our homeroom teacher, Mrs. Bernstein, and some students at the school were very upset. Someone had drawn a swastika on a wall somewhere in the school. Maybe I had learned about this in my previous schooling but at that time I had no idea about it or what it meant. Sidney and I were isolated since most of the White students kept their distance from us. I was very fortunate that I had my friend Sidney in my classes and that I felt the support of my neighborhood every day when I came home from school. We were effectively invisible in the way Ralph Ellison describes the narrator in his book, "I am an invisible man. No I am not a spook like those who haunted Edgar Allan Poe: Nor am I one of your Hollywood ectoplasms. I am a man of substance, of flesh and bone, fiber and liquids, and I might even possess a mind. I am invisible, simply because people refuse to see me." It felt like we did not exist to the White students. This was also the time when boys and girls begin to notice each other. White girls were considered off limits for African American males for many reasons and there were very few Black girls at Thorpe. Academically, I had a hard time adjusting to all the new things and initially I struggled academically. In the ninth grade, we took French II, which was an advanced class. I felt very much behind academically in the class. I remember that Mrs. Bernstein (my homeroom and French teacher) would dictate to us a dialogue in French that we

had to write down. Initially I had no idea what she was saying. I eventually started memorizing what she was going to read in advance in order to do well. Geometry was also a struggle at the beginning. The geometry teacher, Mr. Riddle, would hand back exams from the highest scores to the lowest scores. I was always one of the last names called, near the bottom. In fact, a couple of months or so into the academic year I met with Mr. Riddle and the guidance counselor. They asked me if I wanted to go back into Algebra I. I asked to be given more time. I decided to work harder which included reading the textbook myself. This was a skill that I found out that I had and could use in the future. On the next exam, I made one of the highest scores. It was a little embarrassing because Mr. Riddle told my story in front of the entire class after handing back the exams. This accomplishment made me think that if I worked hard enough, then I could accomplish any goal. Thorpe was much better equipped than George Wythe; for example, in French class, we had audio equipment built-in at our desks where we could listen to native speakers speaking French. In geometry class, we had compasses and protractors for drawing angles and other figures on the board. Nevertheless, even though my previous schools lacked in facilities and equipment, I was happy that for my first eight years I had been nurtured in a Black environment. This provided me with an inner strength that I used and would continue to use to navigate through this foreign world.

N. Whittaker   **Sidney Ricks**

Figure 2. Photo taken in 1965 in Hampton, Virginia. Ninth-grade graduation photos of Nathaniel Whitaker and Sidney Ricks from H. Wilson Thorpe Junior High School taken from the 1965 *Deacon Dispatch*, H. Wilson Thorpe Junior High School's newsletter.

In the ninth grade at Thorpe, I had to choose what high school I would attend under the "Freedom of Choice" program. The decision now was to choose between attending the White high school, Hampton High School, or the Black high school, Phenix High School. These schools were separate but not equal. Mary Jackson could not take the courses that she needed at Phenix High School to become an engineer. Sidney and I had become very good friends

and we decided together to go to Hampton High School. We had gone through so much together (see Figure 2). At Hampton High, the situation was very similar to Thorpe. I did not like the environment and isolation but at least I knew what to expect. There were a few students that I had known from George Wythe Junior High School that had decided to choose Hampton High School for the tenth grade, as well as a few African American students from other junior high schools. Yet this was far from being a critical mass. The high school was much larger so the percentage of African Americans was probably about the same as at Thorpe. I was typically the only Black student in my classes. In the tenth grade, I did fairly well in my Algebra II class but not quite good enough to get on the track to take calculus in the twelfth grade. Nevertheless, during my time at Hampton High School, I did well in my math classes and enjoyed them. I was a little introverted, did not speak out or create any waves. However, I had some very talented African American male friends that did have some issues, in particular, those who felt comfortable challenging some teachers' ideas about society which related to race and fairness. My friends felt that they were penalized for their opinions. One of my more talented male friends was given a lower grade after speaking out, and as a result did not graduate on time. He is still bitter about that today. I graduated from the overwhelmingly White Hampton High School in 1969. During my senior year, I went to see my guidance counselor, who was White, to help me decide which colleges to apply to. I was, on one hand, disappointed that she only suggested HBCUs (Historically Black Colleges and Universities) but on the other hand felt that it would be a good thing for me. I had missed a lot of social development, being an "invisible man" at Thorpe and Hampton High.

For college, I attended Hampton Institute, Mary Jackson's alma mater and a small historically Black college in my hometown. Hampton Institute (now Hampton University) was and still is now a highly regarded institution of higher learning. My good friend, Sidney Ricks, also attended Hampton Institute. I had not given much thought to my major, but at the last moment I decided to choose mathematics, since that had been an area of strength for me. I did not excel in math in college. My calculus professor had a strong Russian accent. I had him for all semesters of calculus and had a difficult time getting much out of the courses. I did have some excellent African American professors after calculus who served as great role models, including Dr. Geraldine Darden and Mrs. Rosaline Exum, but the lack of a stronger calculus background made higher math courses more difficult. Eventually I changed my major and graduated in economics. I am pretty sure that my lack of success in mathematics was because of not having the correct work ethic, due to an underdeveloped frontal lobe, a problem that a lot of young males suffer from! To be honest, race was not a factor anymore and I was no longer

an invisible man and did enjoy myself a little too much socially. There was also a lot happening on campus. Quite a few African American leaders came to speak on our campus, including Muhammed Ali and Arthur Ashe. They along with the Black faculty at Hampton served as role models to the Black students in a world where Black accomplishments were typically hidden. This exposure was a source of pride and self-esteem. There were lots of famous Black musical groups coming to campus. This was also the time of protests and unrest against the Vietnam war and racism. Our academic year was cut short at least twice due to this unrest. One year, a student actually planted a bomb and blew up the famous Wigwam Building on campus. During my last year, I worked for Vehicle Services, transporting students to activities off campus, such as student teaching. In one instance, I was assigned to transport members of the board of trustees from the airport to campus. I remember distinctly transporting one board member, an older White lady who was a little rude to me, from the airport. Amazingly, the main character in *Invisible Man* drove for Vehicle Services at his Black college and had a similar experience transporting an important White person. My supervisor told me afterwards that the rude woman I had driven was the famous Margaret Mead. At the time, I had no idea who she was.

After graduating from Hampton Institute, I worked for the Army performing cost-benefit analyses on weapon systems at Fort Monroe for three years. Unbeknownst to anyone at that time, this was the site where the first Africans arrived, three miles from where I was raised. After three years, I transferred to Fort Lee in Petersburg, Virginia. Petersburg was a very rural area but not far from Richmond. I was not very happy in my job and I missed academics and mathematics. There was a project that I worked on where I used integrals from calculus to solve a problem. My supervisor did not completely understand but was impressed. Those projects were few and far between. I wanted to give math another chance since I believed that I could be good at it if I really committed myself to it. I started taking evening classes at Virginia Commonwealth University in Richmond in math, physics, astronomy, etc. Instead of relying totally on the instructor, I decided to read the books. I did very well and decided to apply to some graduate schools in mathematics.

I was only accepted at the University of Cincinnati with a teaching assistantship and the University of Connecticut with no support. The decision to leave my good job was not an easy one, but I was not happy there, so I began graduate school at Cincinnati in 1979. I started studying the summer before, reading books and doing problems associated with courses that I would take. I was afraid of failure and worked harder than I had ever worked in my life with great results. In my analysis course, a well-meaning professor told me that I really surprised him. He said,

"in his classes the Asians usually were the best students, the Whites next, and the Blacks were the worst." I guess that he felt that he was giving me a compliment. I was the only African American student in the graduate program in mathematics at Cincinnati. My favorite class was numerical analysis, taught by a young energetic assistant professor, Diego Murio. I loved the subject and Murio's passion. After two years and receiving a Master's degree in mathematics at Cincinnati, I was planning to look for a job where I could use my mathematics. Professor Murio encouraged me to apply to a PhD program, in particular, to the University of California at Berkeley, where he had just done his doctorate. He told me that it was a supportive environment for minorities. Several faculty at Cincinnati wanted me to complete my PhD at Cincinnati. They thought very highly of Berkeley and felt that Berkeley might be a reach for me, but I was not motivated to stay at Cincinnati since I felt very isolated there. I applied to Berkeley but did not tell a lot of people. After I was accepted, I told Professor Murio and he spread the news to the other faculty. I perceived that the analysis professor and many of the other professors were apprehensive about me going to Berkeley. However, I still had the inner belief that I could do anything if I worked hard enough. Maybe I was fooling myself, but I truly believed that. After all, I had conquered Mr. Riddle, VCU, and Cincinnati! I graduated from Cincinnati in May 1981 and got married in June 1981. My wife and I agreed that we would give Berkeley a try.

At that time and even now, there are very few African Americans who earn PhDs in mathematics. From 1982 to 1986, there were 6, 3, 4, 7, and 6, respectively. Most places at that time had no African American graduate students, and even now, not much has changed. Nevertheless, two places have been noteworthy: the University of Michigan and the University of California at Berkeley. At Michigan, during the 1970s, the graduate program averaged approximately six African American graduate students each year. The key figure at Michigan was a White professor, Maxwell Reade (1916–2016). He had the authority to offer fellowships to African American students that he recruited from HBCUs. These students resulted in a critical mass where they supported each other academically and socially. They formalized their group and called it the Ishango Math Society. They encouraged cooperation among African American students (both graduate and undergraduate) through lending books, tutoring, and collaborative studying for courses. Between 1970 and 1976, over 40 African Americans were admitted to the graduate program and six received their PhDs. They have been referred to as the Michigan 6. Maxwell Reade's counterpart at Berkeley was Leon Henkin (1921–2006) with strong support from George Bergman through the Mathematics Opportunity Committee. Professor Henkin negotiated with the department to reserve 10% of the admissions and financial support for women and underrepresented minorities. From 1978 to 2016, Berkeley awarded approximately 27 PhDs to African Americans in mathematics and I am sure to quite a few women. I made this count using information from George Bergman. Recently, several other schools have had some success, including Maryland with Professor Raymond Johnson.

I had studied the structure of Berkeley's program and it seemed to me that the big hurdle was the Preliminary exam that one must pass by the end of the first year. Berkeley provided me some support to come during the summer and start preparing for the exam. I attended some classes and a Prelim workshop. When I got to Berkeley, I met two more advanced African American graduate students, Richard Baker and Darry Andrews. I was quite surprised since I had seen no African American graduate students in math at Cincinnati. Richard, who is now a professor at the University of Iowa, told me that he was committed to helping me pass the Prelim exam. He met with me quite frequently to go over old problems. Darry, who is at Ohio State now, educated me about negotiating the Berkeley math department as an African American. Some of the faculty were not very accepting of Black graduate students. He noted several African American students who had been victims of bias and unfair treatment from some faculty. Taking a class or having to depend on one of them for your success could be dangerous. A very appealing aspect of the first exam (Prelim exam) was that you received a number to put on your Prelim exam rather than your name. Hence the grader did not know whose paper they were grading. I liked this very much as a way of insuring fairness. The year that I was admitted, the department admitted around 100 new graduate students. Based on previous results, somewhere between 33%–50% would be successful. With such a large class, the passing percentage on the Prelim exam might be at the lower end. I passed the Prelim exam on my first try with a very respectable score. The day that I saw my score beside my given number 12 and the word "pass" was one of the happiest days that I can remember.

The next step was to organize an oral exam (the second exam) where a member of the exam committee had to agree to supervise your thesis. I knew that I wanted to do numerical analysis but more importantly needed a good professor for a thesis advisor. It was important to me to choose someone who believed that I would finish and would be supportive. I had to use my intuition and gut here. At the department's social hour, I remember meeting Professor Alexandre Chorin, who in 2012 would be awarded the National Medal of Science. He was thought of very highly, yet there was a calmness and genuineness about him. I was a little apprehensive about asking him to be my thesis advisor since he already had 10 students, but I did. There were no African American students in the research area that I was interested in, but I got some great support from quite

a few White and international students in preparation for the oral exam. Two of Professor Chorin's students, Claude Greengard (now at Two Sigma) and Robert Krazny (now a professor at Michigan), gave me several mock oral exams. Besides Professor Chorin, the other members of my examining committee were Professors Andy Majda, Ole Hald, and Harry Morrison. I had taken numerical analysis with Professor Majda, who would become one of the leading applied mathematicians of his time. He had very high standards but was very supportive and fair. Professor Morrison was an African American professor from physics who had served as a mentor for myself and many Black doctoral students in STEM at Berkeley. There were very few African American professors in STEM at Berkeley so Professor Morrison was the go-to guy. I had met David Blackwell, a very famous statistician, who is African American, but he was not in the same research area. I took the oral exam and did very well and Chorin became my thesis advisor.

Around this time, several other more junior African American graduate students had entered the PhD program. Two that became very good friends with me were Duane Cooper (now a professor and chair of the math department at Morehouse College) and Janis Oldham (now a professor at North Carolina A & T). Duane and I would have a beer and play Ms Pacman every Friday as a ceremony to end our week. Being more senior, I tried to support Duane and Janis as much as possible as Richard and Darry had supported me. We had exam review sessions and potlucks, similar to the Ishango group at Michigan. That critical mass made a huge difference. Duane and Janis did the same for students entering after them. Berkeley was a good place to be with this number of supportive Black graduate students. Berkeley also recruited a lot of international students and many were very friendly to the Black students. In general, things worked out well for me at Berkeley except for the language exams. Ironically, I had never taken German but passed the German exam on my first try. Nevertheless, I could never pass the French exam after many tries. During my last semester, the department gave a special French exam only for those who were graduating. Voila, I passed. The only negative that I remember about my time there was when two White graduate students tried to physically intimidate me, but I ignored them. I was used to much more, being from the South. Some of my fellow African American graduate students also had negative encounters. However, we supported each other and had backup from Professors Henkin and Bergman. At Berkeley, towards the end of my time, my analysis professor from Cincinnati visited Berkeley. He stopped by my office and congratulated me. He admitted that he had not been confident that I would be successful at Berkeley but he was proud of me. Richard Baker and I finished Berkeley together in 1987. My father and sister flew to California for my graduation.

As I have grown older, I have come to realize more and more how much my parents had been shackled by racism. There were many esteemed, educated people at the graduation ceremony, but my parents are my heros. For me, receiving my PhD showed them what they could have accomplished without those shackles of Jim Crow holding them down. I stand on their shoulders. People in the community where I grew up did not know what a person with a PhD in mathematics does. One of my mother's best friends said she was very proud of me and now she had someone that could help her with her taxes.

After Berkeley, I decided to try the professorate. I got quite a few relatively good offers for tenure track assistant professorships. In making a decision, certain things were important to me. Most importantly, I wanted to go back east. I even interviewed and got a job offer from my old school, the University of Cincinnati, which I decided to decline. In the end, it came down to deciding between the Applied Math Department at the University of Virginia and the Math & Statistics Department at the University of Massachusetts at Amherst. UVA should win hands down. That is my home state and for me anywhere north of Washington DC would have been too cold. Why would I even visit UMass. During my interview at UVA, I talked to faculty in the department during the day as is typically done. Usually a group of math faculty take you to dinner, but a Black administrator that I had never met, from equal opportunity, took me to dinner. This seemed odd to me. At UMass, someone cooked dinner for me at their house, another person had a reception at their home, and another night we all went to dinner. The department was also very interested in my mathematics and felt that I would fit in. Even then it was hard to choose the "Arctic" over my state university, but I did. One additional fact that influenced me is that there were already two African American Full Professors (Donald StMary and Floyd Williams) at UMass. This was astounding since almost all majority institutions had zero and I would make the number three!

I am now a Full Professor in my 33rd year at UMass. I have published over 40 refereed mathematical papers. In my thesis at Berkeley, I began my research developing numerical methods for evolving fluid interfaces. At UMass, I continued this work but also began work with a colleague, Bruce Turkington, to produce a series of papers on 2-dimensional fluid turbulence. Most recently, I have worked with Panos Kevrekidis in math biology. I also published five other papers in mathematical physics with Panos and our good friend Rudy Horne, who was a professor at Morehouse College. Rudy was African American and was the mathematical consultant for the movie *Hidden Figures*. This is another one of my connections to *Hidden Figures*. Unfortunately, Rudy passed unexpectedly in 2018. I have traveled quite a bit because of my research. I spent a sabbatical year at Ecole Normale Superior de Lyon; one

semester in the math department and one semester in the physics department. Still, because of the scarcity of African American researchers in mathematics, it is difficult not to feel like an invisible man. At research conferences, one feels alone and isolated. People form research groups with those that they are most comfortable with and Blacks are typically excluded. In conversations, some people avoid making eye contact, as if you do not exist and your statements are given less value. Part of this is the culture in mathematics but this can be impactful for those, like African Americans, who are already not quite sure if they belong.

Growing up in a supportive African American community and having been taught by my parents the importance of giving back, I have been slightly disappointed to not have been able to impact more African Americans in mathematics as some of my friends that are employed at HBCUs have done. Nevertheless, I have mentored quite a few students and influenced their choices as Professor Murio influenced me. I love numerical analysis and have communicated to others the beauty in it such that they decided to pursue the area. I advised and supervised the thesis of the first African American (Idris Stovall) to receive a PhD in mathematics at UMass Amherst. I have supervised or co-supervised seven PhD theses in total at UMass, four of them women. I have mentored quite a few undergraduate students including a very talented young lady, Heather Harrington, starting from her freshman year at UMass. She now has a permanent faculty position in math biology at the University of Oxford. I played the role of Harry Morrison in mentoring many other Blacks at UMass in STEM.

In the Amherst school system, it was known that Black kids did not do well, in general. This was true regardless of the education or economic status of their parents. When my son was in elementary school, there were very few Blacks in the honors or AP classes in the high school. Trying to counter this, I started tutoring my son early in math. My wife and two other ladies, based on my efforts, started an academic program (called AIMS) for African American children in the Amherst school system. The core of this program was a two-hour math class every Saturday morning. The program built a community and exposed the students to a broad range of activities. At one point, we had over forty kids participating. I taught the upper level math classes with another parent who was an engineer. Other parents taught the lower level classes, starting with the times tables. These were not remedial classes. Our objective was to push the kids farther than their schools did, because we believed that success in math would overflow into other subjects. This program lasted almost nine years and was held on the UMass campus in the math and statistics building. It was very successful in that almost all of the students took AP calculus and other honors courses in the high school. In addition, most went on to very prestigious colleges and have spoken and written about how impactful AIMS was

in their lives. I won the University Distinguished Outreach award as well as the UMass system President's Award for my efforts but I was just a part of the efforts of some super people, especially my wife. This is one of my proudest achievements.

I had been thinking about retiring, but in January 2018, after 30 years at UMass, I was offered the Department Head's position. Many of my colleagues asked why would I want it. It is known everywhere as a thankless job. Nevertheless, I decided to take it. It is a huge job, running a department with 43 Tenure Stream Faculty, 17 Visiting Assistant Professors, 20 Lecturers, and a staff of 12. The Department has about 100 graduate students and 1,000 undergraduate majors and teaches over 15,000 students each year. This position gives me a platform to make an impact in many ways. This includes increasing the representation and success of underrepresented groups in the mathematical sciences. I can also serve as a role model. I have been amazed at how excited some African American students have been to meet me. Since becoming Head, I have been very proactive in the recruitment of minorities and women. I have made eight tenure track hires. Three of the eight were women and one was an African American male, which is extremely rare in math and statistics. I have also hired three permanent lecturers which includes an African American female and an African American male. Due to the urging of Assistant Professor Annie Raymond, the department now teaches a 3-credit class once a year at the Hampshire County Jail. Because of the size of our department, the department head does not usually teach but I wanted to be involved so I co-taught the inaugural course in finite math at the jail in Spring 2019 with Professor Raymond. There were five inmates in the class who were very appreciative.

Amy Harmon wrote several articles in the *New York Times* about the difficulties in being a Black mathematician. She counted 1,769 tenured mathematicians in math departments at the top 50 US universities. There were 13 Black tenured professors in these departments or 0.7% of the total. Blacks make up 13% of the population. How many Black department heads are there in the top 50 or top 100 math departments in the US? I know of one other African American department head.

About 20 years ago, I became very interested in genealogy. I especially wanted to know who my ascendants were. Because of a lack of information about individual enslaved people, there were many dead ends. Nevertheless, through the combination of censuses and DNA, I was able to put names to my great- and great-great-grandparents and this caused me to think about their difficult lives. Slavery, Jim Crow, and systemic oppression have limited their dreams for their future and the future of their descendants.

I have come a long way in my life, from a kid on the colored side of a drive-in theater to the Head of a Research

Figure 3. Photo taken in 2018 of Nathaniel Whitaker and Sidney Ricks in Petersburg, Virginia.

Nathaniel Whitaker

Credits

Figure 1 is courtesy of Vanessa Whitaker.
Figure 2 is courtesy of Hampton City Schools.
Figure 3 is courtesy of Joshua Whitaker.
Author photo is courtesy of John Solem.

I mathematics and statistics department. I stand on the shoulders of so many "hidden figures." In taking the Head's position, I am fulfilling the wildest dreams of my ancestors. I am inspired by Maya Angelou's words in her poem *Still I Rise*. As she states, "Bringing the gifts that my ancestors gave, I am the dream and hope of the slave."

References

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