

Truths, Lies, and Serendipity—A Walk in My Shoes

Carolyn W. Meyers

This article is an edited transcript of the presentation delivered by Carolyn W. Meyers, Provost and Vice Chancellor for Academic Affairs at North Carolina Agricultural and Technical State University, at the 2005 Materials Research Society Spring Meeting in San Francisco. It was the keynote address at the Women in Materials Science and Engineering Breakfast, held March 30, 2005.

On thinking about this occasion, I found myself facing several dilemmas: Shall I discuss the statistics which have and still point to the need in STEM [science, technology, engineering, and mathematics] for women in every venue? Should I be personal or should I be philosophical? Should I tell you my truths or should I reiterate common lies and paint a rosy picture—in the hopes that things will be better? Should my remarks include the personal or the impersonal or a bit of both? What's here is a little of everything except the statistics, because in that case I know I'm preaching to the choir here.

You already know that the world needs desperately the EQ and IQ that only women possess.

You already know the results of the recently released NSB report, "Broadening the Participation in Science and Engineering Faculty": Women and minorities of talent and promise are underrepresented and that this underrepresentation is hurting the health and well-being of our scientific and engineering enterprises.

You already know that by 2020, as Molly Broad, president of the University of North Carolina, related to faculty at A&T recently, China predicts that roughly 90% of the science and engineering workforce will probably live and work in Asia.

You already know that the forces of global change are gathering momentum, shifting the seats of the knowledge-based economies of the 21st century.

You already know that the choices our society across many segments has made disenfranchise and dissuade talented women and minorities from the pursuit of STEM careers.

You already know this and more.

These are some of the truths of our pro-

profession, some of which have been around for at least 30 years—the time I've been in the engineering education profession. So let's focus on other truths as I share personal reflections on my life which hopefully will encourage you to reflect on yours and be comfortable sharing these. The lies will be implied, mostly; you can figure them out as we meander through time. And I'll add a dash of serendipity—sometimes a major traffic cop at the intersections of our professional lives.

Why am I telling you these things? You're already successful; you're on the STEM caravan traveling to exotic places in your disciplines, charting new frontiers. Why? Because in addition to your professional accomplishments, the most important thing you can do all of your life is to mentor the next generation—to enable the coming generation to fill your shoes and move beyond to fill bigger ones. All of the external awards and internal programs aimed at increasing participation depend on one-on-one personal interactions with the participants. That's power. You are a powerful group; you hold the future participation in our profession in your hands and for many of you, mostly alone, unfortunately! So through today's conversation, I want most of all to encourage you.

"Truths, Lies, and Serendipity—A Walk in My Shoes" is a very personal story—about values and lessons learned, about mentoring and outreach. Let me share the context of my comments by

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relating a few of my underlying beliefs.

I believe Shirley Malcolm's statement, in the "Broadening the Participation" document previously mentioned, that "... laws by themselves rarely change things—people change things." In the end of almost everything, it's all about people. And I believe that your being in the STEM professions, your presence, affords you valuable mentoring and outreach opportunities. I believe that this millennial generation is looking to the STEM professionals not only for professional direction but also for what my generation and yours had—but in all of our giving to our children a better life, we failed to pass on the solid values that go hand-in-hand with success in any endeavor. So now, as mentors and professional coaches, we have the tasks of filling in the gaps in human values and of personalizing the STEM professions.

My intent is that through sharing with you some of my life's lessons, annotated with quotes from women of accomplishment in honor of Women's History Month, you will be reminded of some truths that I think are important to share with your mentees, you will gather up once more the courage to rail against still the persistent lies in the STEM communities and in society, and hopefully you will appreciate even more than you already do the value of serendipity.

Close your eyes and travel back in time with me to the 1950s—the world of black and white TV—small ones at that, before permanent press fabrics, before microwaves, cell phones, central air conditioning, and cable TV, a world of one car and one bathroom per family home for most, a world of segregation in which black kids like me only got textbooks that were discarded from the majority schools in Newport News, Virginia, where we African Americans couldn't try on clothes before buying them, a world without satellite communications and stealth bombers—we had the Cold War with what was then Russia, a world without Sandals and Couples resorts, a world just embracing Disneyland, and a world in which no one thought of bottled water for the most part. And I was "colored."

Open your eyes. This was my world at eight years old and I was happy, as were most kids in my generation. It's hard to miss what you never had. My mom had a thing about naps—she loved them—I hated them. But every day her will prevailed—take a nap—stay in your room. She was tired; I wasn't.

My mother put a curious and slightly hard-headed child in her room alone for a couple of hours with a brand-new clock

radio. I held the radio, turned it over, shook it—and still couldn't figure out how it worked. I knew electricity made the face light up and the dial move (no digital clocks then), but what was inside the box fascinated me. I stared and stared at the back of the radio. Rummaging around in the bedroom, I found a nail file in the dresser drawer. Eureka! Idea—Take off the back of the radio and find out how the radio works.

I must admit I thought I was quite clever: I unplugged the radio first and then systematically removed the back of the radio, and there were all of those tubes. I then took vacuum tubes and other things out and laid them on the bed in reverse order so that I could put them back in the right sequence. The vacuum tubes amazed me—I was careful and didn't break them—but I shook them and played with them. Then I tried in vain to put everything back in precisely the order of removal but, of course, the clock radio did not work. I knew I was in deep trouble.

When my mother awakened and realized what I had done, I got one of the most memorable spankings of my life—not for taking the radio apart but for not asking first. She praised my curiosity and safe-guarded that, but not my bottom. She then took me to the library to find out how radios worked.

Truth: One of the most precious attributes you have—and that successful scientists, technologists, engineers, and mathematicians everywhere have—is curiosity. In your formal and informal mentoring, invite this curiosity in your interactions, praise it, encourage and promote it in your outreach and mentoring activities! That curiosity will help your mentees become good-to-great scientists, technologists, engineers, or mathematicians.

Skip forward with me to 1963—John F. Kennedy had been assassinated and some of America's innocence had been lost. I was a "Negro" then. It was the era of the Civil Rights movement, the Beatles, the Temptations, Smoky, Elvis, go-go girls (one of my teen ambitions in spite of no long legs), crinolines, and sweater sets, French poodle haircuts. Our family had color TV but still, like most Americans, one bathroom per home and one car. And hallelujah, permanent press fabrics had been invented, and as a Negro person, I could try on clothes in downtown Newport News. What's more, I no longer had to sit in the balcony at the theater and my classmates and I had new textbooks for the first time in our lives. The Sputnik era had begun and the space race was on.

As a rising high school senior, I was chosen for a summer science institute spon-



*Carolyn W. Meyers (right) with 2005
MRS President Dave Eaglesham.*

sored by NASA [National Aeronautics and Space Administration] and the NSF [National Science Foundation] in aerospace engineering. From my 17-year-old perspective, this was just my luck—10 weeks in summer school—every rising senior's dream. My dad bribed me into going. I had just gotten my driver's license and the family had a new car. Dad was going to the University of Virginia for a graduate summer program and would leave the car with me, but only if I attended the NASA-NSF summer institute. What's more, my mother could not drive. A car for going to summer school until 2 p.m. each day—that worked for me!

As it turned out I was one of three girls and the only Negro in the institute. Needless to say, most of the other students were not thrilled with me or friendly. What was wonderful was that the manned spacecraft center for NASA was at NASA Langley—not in Houston, where it is now. We met and interacted with the seven original astronauts—Alan Shepard, John Glenn, Deke Slayton, Wally Schirra, Gus Grissom, Leroy Cooper, and Scott Carpenter. We played in the lunar landing simulator, jumping in the simulated environment without gravity.

And then—a little magic, for me a little serendipity—back in the classroom, a University of Virginia professor named George Matthews explained the mathematics, physics, and engineering behind what we had experienced and seen. Dr. Matthews treated me just like all the other students; he didn't see me as a Negro—just a student who liked math. In so doing, other students forgot in the classroom, at least, that I was different.

For the first time I understood what engineering was about and what one did with mathematics. And I fell in love with engineering and now knew what I wanted

to be when I grew up. I had always loved math but had no clue as to how to use it.

Serendipity: In your outreach and mentoring activities, you are opening doors that you may not even realize are there. Never forget that how you open the door, and what is experienced once inside initially, can be life-changing. It was for me.

My high school guidance counselor reminded me that there were to her knowledge no Negro or women engineers; her advice was that I should prepare to be a math teacher; she wouldn't endorse my applications. But I had a dream and parents who repeatedly told me I could do anything; I applied to engineering programs anyway and was admitted everywhere I applied.

Truths:

1. Sometimes people fall or are bribed into something wonderful. I did. Encourage your mentees to let themselves explore something new and be open to whatever comes. Good professionals in any discipline are open to new experiences.

2. Shore up in your mentees the confidence to fall in love with something no one else around them has heard of or thought about or done before. For me, this was the dream of a career in engineering then. Remind them that it's your dream—you can fall in love with anything you choose. Eleanor Roosevelt said, "The future belongs to those who dream." People who have made and are making a difference in this world have always been and are dreamers.

3. Encourage your mentees to believe in themselves even when no one else does—like my guidance counselor. Susan Taylor says, "There's magic in believing."

Skip forward with me to the years of 1964-1968—engineering school at Howard University in Washington, D.C., then the only Historically Black College or University (HBCU) with accredited programs in engineering. By then I was an "Afro-American." Once again, to my surprise, there were only four girls, and the guys were not too thrilled with our invasion of their territory—engineering. But from my perspective, there was a positive spin—all of those cute guys and no curfews.

I can still remember one faculty member's comment to me on the first day of class: "Miss Winstead, as far as I am concerned, you do not exist; what you are

doing is taking up the space a boy would occupy in engineering who will leave here and take Howard's engineering reputation into the world. All you will do is get married and have children. You are a waste of our time. I will not call on you in class or entertain your questions during office hours. Understand?"

I understood that, and one other thing—he was just one man and he alone could not hold me back. This was my dream, my plan, and I held on to it and decided I would change majors only when and if I decided to, not in response to or when someone else pushed me. Those comments would not be said out loud today, but the sense of those and the like are still present in our classrooms, our universities, our professional societies, our corporations, our government agencies. The lie is that people who are "different" are accorded the respect and opportunities afforded to others. That lie, sadly, is alive and well.

I stuck it out and graduated in four years in 1968—"thank you laude" instead of cum laude. By then, Robert Kennedy and Martin Luther King Jr. had been assassinated. Our country lost still more innocence. The Civil Rights Act was under debate, I got my own car. And I had 16 job offers, some of the best offers in my class but almost all for the wrong reason: I was and am a double minority. Eventually I found a great job with a top company, GE; then I promptly fell in love, got married, and had two babies all in 20 months or so—and in the right order, according to my mother.

Through bottles, baby talk, more babies, dogs, husband, I kept the dream and kept up my professional associations with the ASME [American Society of Mechanical Engineers] and SWE [Society of Women Engineers]. SWE was my only contact with professional women; these women in the Atlanta Section of SWE were my strongest supporters—and many times the only ones—of my dream then of doing graduate work in engineering. They sprinkled the magic of believing.

In the Atlanta Section of SWE, I was the only Afro-American. But the women engineers in the section were the most supportive of my dreams of any of the women I knew. Here's serendipity.

Who would have thought in the early 1970s that a group of white women in Georgia would freely give major and continuous support to a black woman? Encourage your mentees to accept support from wherever it can be found, treasure it, luxuriate in it, grow from it, and most importantly, later spread it generously.

Truth: Concerned and secure STEM

professionals support talent from all segments of the global society!

In 1977, I started graduate study at Georgia Tech, 11 years after my BSME degree and with three children, one dog, one cat, and one husband. Once there, I decided to stay in school until they put me out. At my first registration experience—then at the gym with my three children hanging on to me—my first advisor, who left Tech shortly after I arrived, told me to go home and have more children—they were cute and a credit to my race. Once more the ugly lie that only certain groups could master engineering reared its ugly head. My second advisor was different—British, a brilliant and fine man, ahead of his time in encouraging women to pursue engineering. John Berry, now at Mississippi State, thought I was just fine, three kids and all. He gave meaning to Tom Robbins' *Skinny Legs and All*: "Differences give human encounters their snap and their fizz and their brew."

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According to John Berry, my being an older student, with a family, and being a woman and African American at that, were their problems, not mine! Serendipity brought this advisor into my life who is comfortable with himself, with who he is, with others who are different. His comfort allowed a host of others to be comfortable, too.

Truth: Good-to-great STEM professionals know themselves and are comfortable with themselves. They enable others to be comfortable.

In graduate school, I found that I had to catch up because I had forgotten a lot in 11 years of being the "perfect wife and mother," or trying to at least. I can remember taking graduate metallurgical thermochemistry without ever having taken the undergraduate courses in physical chemistry. This meant that I studied three books simultaneously, for by now I knew how to learn—one of the most important things anyone can learn.

Truth: Alvin Toffler said, "The illiterate of the 21st century will not be those who cannot read or write but those who cannot learn, unlearn, and relearn." Successful people are constantly learning, unlearning, and relearning.

I had the support of the school chair, Scotty Kezios, and some faculty like Perry Desai. And I had great inspirations

from many, including the most mesmerizing lecturer I've ever encountered, S. Ramalingham, and in the brilliance and security of Steve Spooner, and others. Great professors all; professors who focused on content and the most important student outcome—learning. In their class and out-of-class interactions with me, I forgot I was Afro- and becoming African American. I was an engineering master's student.

I started teaching at Georgia Tech in the George W. Woodruff School of Mechanical Engineering in 1979 after the MSME degree—while embarking on doctoral studies in the School of Chemical Engineering. A student banged my head on the first day of class; I was spit on early one quarter, and there were other indignities, but I kept the dream and the optimism that I could be just as good a faculty member as anyone else. I had a few truly good people—faculty colleagues, students, and staff—to balance the unpleasant ones and to remind me to focus on the positive because, as Helen Keller said, "No pessimist ever discovered the secrets of the stars or sailed to an uncharted land or opened up a new heaven."

Truth: Good-to-great STEM professionals believe in their work and its value and are invariably optimists. Share this with your mentees.

As I struggled with wondering whether or not I could make it at Georgia Tech, I remembered Sir Francis Bacon, "Modest doubt is the beacon of the wise." So I pronounced myself "wise" and kept chugging along. Share your doubts along the way with your mentees. Remember, we all have doubts sometimes. Encourage your mentees to use these doubts as fuel to do more, do better, to reach higher.

I was really surprised that I finished the terminal degree (this was a lofty dream), and gained tenure and promotion (another lofty dream), because, like the old saying from Jacob Braude, I "always behave like a duck: keep calm and unruffled on the surface and paddle like the devil underneath."

Truth: Good-to-great STEM professionals paddle furiously and are good at it—Sally Ride, Carly Fiorina (former CEO of HP), Eleanor Baum, Kristina Johnson, Janie Fouke (engineering deans); Denise Denton (UC—Santa Clara chancellor), Sam Mattingly (assistant vice president of corporate communications at L'Oreal), Judy Perkins at Prairie View, and Shanti Iyer and Anna Yu at A&T right now, to name a few, have been paddling furiously and gloriously. They make it look easy. Share with your mentees some of the times you've had to paddle furiously and

give them permission to do the same.

I have moved several times since then to different positions and been successful, not without help and not without obstacles. That's the reality of life, I think. The truth is, as Mary McLeod Bethune said, "It ain't easy but it ain't impossible!"

The help came from unlikely sources. After a particularly ugly indignity, from a faculty member at Georgia Tech due to either or both my race or my gender, I was reminded that there are good people all around us—quiet and not in the headlines, but good. An unlikely and quiet person stood up for me at a significant personal cost. He explained to me that he had his honor, his values, his knowledge, and his confidence that he could find another job in the profession if necessary; but if he lost his values and personal integrity, he didn't know how he could be true to himself and pass those family values on to his five-year-old daughter.

That individual is very successful in industry. He reminded me of the value of personal honor, the value of standing up for what's good and decent. There's truth in the old saying, "All that it takes for evil to prevail is for good people to do nothing."

The world cannot afford for you or your mentees to do nothing. The lies and the ugly will keep winning if you do nothing. Good STEM professionals are good people, too.

Nevertheless we are human—all of us. At times all of us fall victim to our own prejudices and biases, even me—an African American woman engineer, educator, and administrator. An experience with one student still leaves me shaken and ashamed each time I recall it. This student, a Caucasian male, had the strongest of what I thought was a southern accent that I had ever heard; he was hardly intelligible. Other students, Black and White, made fun of the way he talked and snorted as he talked. I associated with him all of the negative stereotypes of the movie *Deliverance*; I was short but polite with him, kept him at arm's length—after all, he was in my mind a certifiable redneck.

He stopped by my office one day for help with homework—just one question, really. A friend who is a speech pathologist for the public schools had dropped by and she overheard our conversation. When the student left, I turned to her and said, "Do you believe that?!"

She patiently explained to me that this student did not know how to do what most of us do naturally—talk and breathe simultaneously. She gave me the contact information for a speech therapist who worked with public school kids in the

afternoon at a nearby high school.

Ashamed that I had assumed this student embodied the negative stereotypes, I shared the information with him just with the brief comment that this person maybe could help him communicate better. He thanked me. Again, I was ashamed; he was so grateful and open to getting help. The ugly part of the human condition was in me. I had to face it.

As the quarter progressed, I noticed a change—gradual but a decided improvement in the student's oral communication skills. And then one day his mother called me to thank me for helping her son. He was bright, she said, but all of his life he had been on the outside because of the way he talked. Other children laughed at him. Being a parent, I know that when our children hurt, we parents hurt. The parents had tried to get help in their small town but nothing worked. For the first time this mother's son was not uncomfortable talking to people and he was getting better. And she thanked me.

Today, that young man is successful in industry. And I am forever humbled by that experience. Without the serendipity of my friend the speech pathologist being in my office on that particular day, a talented person might not have become a contributing member of society and to the engineering profession; the "getting to know you" of a nice human being might have been limited not only to me but to others and to our profession. The

real dangers of biases, stereotypes, and prejudices were right in front of me—in me. Without the serendipity of my friend's intervention, I would have failed as a professor, as a human being; I would have contributed to the limiting of someone's sphere of interaction—someone I could have helped.

Truth: The ugly side of the human condition—the stereotypes, biases, prejudices—that ugly side can separate us easily. The stakes of giving in to this ugly side are high. We must every day confront the ugly in ourselves and rise above it all of our lives. Good STEM professionals are human too and have to work at keeping the ugly side at bay sometimes just as others do.

Today and all of this week has been extraordinarily hectic—is there a full moon or what? I've had 12–15 hour days at work while trying to do taxes, settle my mom's estate, have time for my cat and friends and a husband. The chancellor has been calling throughout the week—he's on vacation and thinking up "stuff"—little emergencies here and there. I have documentations, some in multiple volumes, of tenure and promotion materials for over 30 faculty members to sift through and review for the chancellor. But I stopped toward the end of each of the past few days to enjoy the March Madness. And on Monday—the day that started with a teleconference at 6:45 a.m. in the office and included a visit



Carolyn W. Meyers gives the keynote presentation to the Women in MS&E Breakfast at the 2005 Materials Research Society Spring Meeting in San Francisco.

from the president of the University of North Carolina—I went across the street to get a manicure at lunch time. That little break made and makes me happy.

Truth: There is value in taking care of yourself and taking the time to do things that you enjoy, that nurture you outside of the profession. These things that we do just for us enable us to keep other things in perspective.

According to Anthony Giddens in his book *Runaway World: How Globalization is Reshaping Our Lives*, he credits Archbishop Wulfstan with this statement: “The world is in a rush and is getting close to its end.” The year was 1014, 991 years ago! Take time for you. The world didn’t end in 1014 nor did it end when I watched the Elite Eight games or got my nails done.

I could go on and on about some of these themes that run through my life and the lives of others—STEM professionals far more accomplished than I.

The truth is: The world around us is still prejudiced and biased, fraught with danger, disease, and misery; full of fear and apathy; desires changes and resists them; is in need of your talents, your values, your honor, and your leadership.

Keep believing, keep dreaming, keep your optimism, keep paddling like the devil underneath—still doing all of those because as the astronaut Mae Jemison said, “Life is what the creator gave you for free. Style is what you do with it.”

The truth is that as STEM professionals, to you falls the responsibility, as it has for generations before you, to make this world a better place, to clothe all of humankind in safety and security and comfort, and to make sure that someone behind you is prepared to take your place, to propel civilization forward. It’s a tremendous responsibility but you can handle it. You must handle it! In her biography, Mary McLeod Bethune, founder of Bethune-Cookman College with \$1.50 said, “Our responsibility is to carry our generation one step forward.”

That is still our responsibility—to enable the next generation to go one giant step forward. Included in this enabling are the professional and the personal. The lies get far more press than they merit. They are still there—haven’t changed that much in my 30-plus years in the profession—sadly. But around you and me are STEM women who undoubtedly didn’t know that they were genetically disinclined to STEM. And thank heavens

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they didn’t; our profession is richer for their ignorance.

I leave you with this quote often attributed to Nelson Mandela’s inaugural speech but that actually originates from Marianne Williamson’s *A Return to Love: Reflections on the Principles of a Course in Miracles* (1992):

“Our deepest fear is not that we are inadequate. Our deepest fear is that we are powerful beyond measure. It is our light, not our darkness that most frightens us.

We ask ourselves, ‘Who am I to be brilliant, gorgeous, talented, and fabulous?’ Actually who are you not to be?

You are a child of God. Your playing small doesn’t serve the world. There’s nothing enlightened about your shrinking so that other people won’t feel insecure around you.

We are each born to manifest the glory of God that is within us. It is not just in some of us; it’s in everyone and as we let our own light shine, we unconsciously give other people permission to do the same. As we are liberated from our own fears, our presence automatically liberates others.”

The truths are:

- You are powerful beyond all measure! Don’t be afraid of it. What you are doing in mentoring and outreach has tremendous potential to color the faces of the engineering profession.
- You are brilliant, talented, and gorgeous—revel in these!
- You don’t need to play small. Bring out the glory in everyone because everyone has some glory within them.
- And don’t be shy about letting your light shine; women tend to do this. Remember, in so doing, you will liberate others and encourage them.

You will make the world a better place! And your mentees will keep it going.

Carolyn W. Meyers, the provost and vice chancellor for academic affairs at North Carolina A&T State University, received her

PhD degree in chemical engineering from the Georgia Institute of Technology. Among her awards and honors are the NSF Presidential Young Investigator Award, designation as one of 28 worldwide by the Foundry Education Foundation as a FEF Key Professor, the Society of Automotive Engineers Ralph A. Teeter Award, the Emerald Honors Lifetime Achievement Award from Career Communications, and the National Society of Black Engineers’ Golden Torch Award, as well as recognition by several professional organizations as the Engineering Educator of the Year. Meyers is a member of the Academy of Distinguished Engineering Alumni at Georgia Tech and received Distinguished Achievement in Post Graduate Education and Research honors from the Howard University Alumni Association. A fellow in the American Society of Mechanical Engineers, Meyers’ publications and presentations are in excess of one hundred. She is a member of Tau Beta Pi, Sigma Xi, Beta Gamma Sigma, and Phi Kappa Phi honor societies.

Active professionally and in the community, Meyers currently serves as chair of the Board of Directors of the National Institute of Aerospace and holds memberships on the Board of Trustees of the North Carolina School of Science and Mathematics, the Advisory Board for the Journal of Engineering Education, the Board of Directors of RTI International, the Board of Trustees of the Moses Cone Health Systems, MentorNet, and the Center for the Advancement of Engineering Education. For the third consecutive year, she was appointed the co-chair of the NSF Advisory Committee for the Government Performance and Results Act. Previous appointments include the United Way of Greater Greensboro; the Engineering Advisory Board; the Materials Research Advisory Board of the National Science Foundation; associate editor of the Journal of Engineering Education (American Society of Engineering Education); and consultant to the NSF Education and Human Resources Advisory Committee, Congressional Committee on Equal Opportunity in Science and Engineering (CEOSE), and the Basic Energy Sciences Advisory Committee of the Department of Energy. She is the past vice president of the Board on Minorities and Women of the American Society of Mechanical Engineers, past president of the Atlanta Section of the Society of Women Engineers (two terms), and past vice president for public affairs of the American Society of Engineering Education.

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