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Robin Porter, from McKinley High School in Washington, D. C.



PHOTOGRAPHY BY JIM WELLS

ENGINEERING ORIENTATION

No More Stumbling Blocks

By Judith S. Andrews

With the job market constantly in a squeeze, it is welcome news for many students to learn that there still exists a field with far-ranging career possibilities, especially for minorities. While the past decade has seen an increase in the overall number of minorities pursuing studies in most technical areas, the number of Blacks in the engineering field has remained dismally small. According to available figures, Blacks make up less than one percent of the total number of engineers in the country.

The reasons for the scarcity of Black engineers are many. Elbert L. Cox, assistant dean of Howard University's School of Engineering, cites a few: lack of preparation in high school, inadequate orientation to career opportunities, and an apparent lack of confidence in math and

science on the part of many young Blacks.

Cox says, "Because of the lack of orientation to engineering in most high schools, our recruiting effort had to be extended to the lower grades as well as to high school seniors. By the senior year, it is often too late to interest students in engineering, especially those whose math and science background is deficient."

A large number of the students encountered on recruitment trips, according to Cox, were convinced that only those who were "brains" in math and science could ever aspire to become engineers.

"Too often high school seniors decide to enter engineering school without really being aware of the skills required, and with inadequate background in math and science," Cox says.

Students receiving Instructions in electrical circuit measurements from Professor Bentley Priestley, second from left.



29



Assistant Dean Elbert L. Cox.

<https://dh.howard.edu/newdirections/vol2/iss1/5>

In an effort to push aside some of these stumbling blocks, the School of Engineering has now launched four summer programs for different age groups. One is called the PREFACE (Pre-Freshman and Cooperative Education) program and is designed for students who have already been accepted in the School of Engineering. Another is the MITE (Minority Introduction to Engineering) program and is aimed at high school seniors. Also, there is another MITE program for high school juniors. The Junior High School Workshop is for the youngest age group.

Each of the four summer programs has a common theme—that of giving students a head-start. In the case of the MITE program and the Junior High School Workshop, a head-start in career decision is the goal. For the PREFACE program par-

ticipants, it's an opportunity for some freshman to jump ahead of the rest of the class.

The PREFACE Program

The PREFACE Program began in June, 1973, under the cooperative education concept which blends classroom theory with practical experience.

During the '74 summer, 24 incoming freshman students participated in the program. For two weeks, the students received instruction in math and science; took field trips, and underwent extensive testing. This was followed by six weeks of work experience for which the students were paid \$100.00 a week. Also, the students were paid during the two weeks of orientation on campus, as well as travel and living expenses and tuition for the first year of college. *Cont. on Page 30*

30 The financial aid received by each PREFACE student is one of the most appealing features of the program. One student said he gave up a scholarship at another university after he was accepted into the PREFACE program at Howard.

While financial aid is a critical problem with most students today, often of even more importance is the emotional maturity of a student. According to Cox, PREFACE students make an easier adjustment to college life because of the advantage of their summer experience in class and on the job.

"We see quite a difference in maturity and confidence between the average freshman and one who has taken part in the program," Cox says. "Last year, PREFACE students inspired other students to survive in engineering."

Several of the students in the program, when interviewed, indicated that the idea of getting ahead of everyone else kept them plugging away even though the schedule was quite grueling. Classes were in session for five hours daily, followed by more hours of homework. For students out of high school—with some still unsure of themselves in math—this introduction to engineering was perhaps frightening.

"It's really hard, especially if your background is a little weak," said Pagan Douglas. "Some of our professors just aren't ready to teach freshman."

Another student expressed similar frustrations. "It's frightening not to know what a professor is talking about," the student said, but added quickly that he got more sure of himself as the days went by.

Still, other students, including Pagan Douglas, worried about the inadequacies of their high school preparation. "I'm not an expert in either math or science, so I wasn't encouraged to go into engineering," she said. "It wasn't until I came to Howard I realized that my ability to organize thoughts logically and use reasoning were also important qualifications for the field of engineering."

Eli Climbingbear said: "In my math classes in high school, it was never emphasized how much you could use math. I had no idea that all those angles and stuff could be useful in a career. Now I'm having problems with math."

Andre Williams had a high aptitude in both math and science but had planned a career in business. His Congresswoman, Cardiss Collins (D-Chicago), suggested that engineering could be combined with business, therefore, he decided to enter engineering school.

Cox stresses how few minorities are aware of the potentially high salary of engineers. He says companies are "crying out for more minorities."

The job sites this summer for PREFACE students included, Argonne National Laboratories in Argonne, Illinois, and Brookhaven National Laboratories in New York. Some students worked at the National Bureau of Standards in Washington, D. C. The work experience is a vital part of the program in that it exposes students to what Cox calls "an engineering atmosphere."

"Of course," he points out, "these students are not prepared to do actual engineering work, but they can carry out basic support work. This support work could include certain aspects of computer programming, drafting, measurements or data correlation at an introductory level." According to Cox, "engineering involvement at this point is most important, because it helps the student to discover how an engineer ticks."

The MITE Programs

Learning the various aspects of what makes an engineer tick is also an important component of the two MITE programs, each of two weeks duration. The programs provided for 64 students—most of them from the Washington, D. C. area—a series of lectures in math and science, laboratory experience, field trips, and recreational activities. The objective was for the students to learn more about engineering, and to enable them to make an intelligent

choice as to whether engineering is the field for them.

The MITE program began in 1969 under another name, Inner City Introduction to Engineering, at the University of Illinois. At Howard, it was started during the summer of 1973. This program, which was initiated by the Engineer's Council for Professional Development, touches students at 10 different schools throughout the country. Of the 10 schools selected to participate this year, only Howard and Prairie View College in Texas are predominantly Black.

Student interest in the MITE program was surprisingly strong, according to Cox. More than 100 applications were received for the 40 openings in the MITE program for seniors. The final selection of candidates for the program, which was funded by a \$13,445 grant from the Eastman Kodak Company, was based on technical potential rather than demonstrated expertise in math and science.

A highlight of the MITE students' two-week stay at Howard was the appearance of several guest speakers, most of them engineers or working in related areas.

The students were particularly engrossed during one visit—a session with Allen Turner, supervisor of Research and Development at the Ford Motor Company in Detroit.

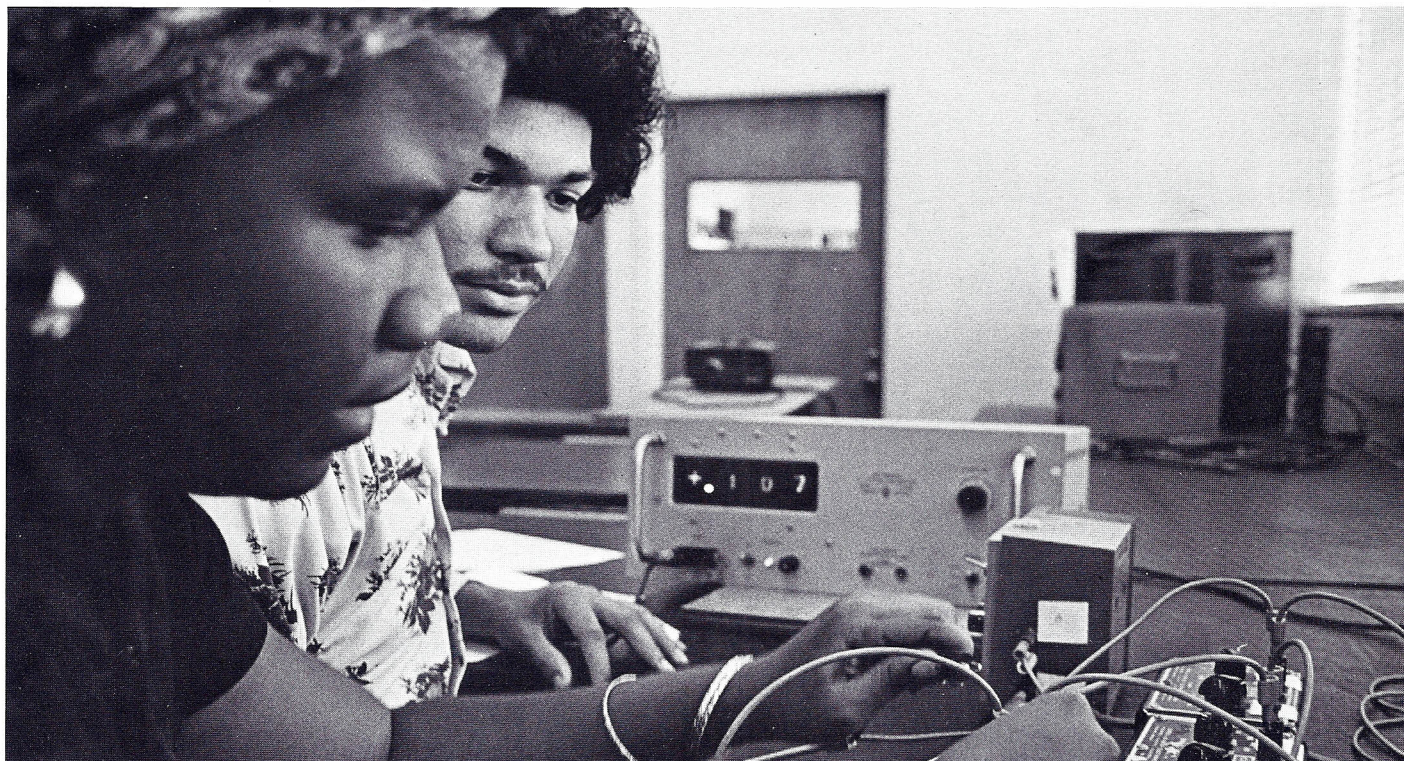
The salary that an engineer commands was of particular interest to the students. "The starting salary is usually around \$900 a month and the sky's the limit," Turner told them.

"Black engineers are in a very unusual position today. They can virtually write their own ticket, but how long this situation will last is anyone's guess."

The significance of the talks by practitioners in the field was evidenced by the comment of one student who after four days in the program decided he was too weak in math.

"I feel I can make it now," he said. "One of the speakers mentioned that he had been weak in math and now he's a patent lawyer."

Annell Johnson and **Tyrone Mosley**, from *Malcolm X. Shabazz High School* in Newark, N.J., getting ready for experimentation in electrical engineering.



31

Of the 40 participants in the high school senior program, almost half had decided on a career in engineering before coming to Howard. However, after four days in the program, several made up their minds against engineering. Cox says only about half of the students are expected to apply to engineering schools, but he thinks this is a good number.

The Junior High School Workshop

The Junior High School Workshop is in its third year. Fifty students from the Washington, D. C. area were given four hours of classroom instruction for three weeks in civil, mechanical, chemical and electrical engineering.

"Their classroom work is considerably watered down compared to the other three programs," according to Cox. "Theirs is more of a laboratory setting where they have demonstrations and do individual projects, but there's no homework or formal classroom work."

Cox emphasizes that it is never too early to begin acquainting students with engineering type activities. "Junior high school is a good time to start exposing kids to engineering," he says. "They have had a little math and science, enough to do some elementary lab work."

Increasing the number of women in the School of Engineering is one important objective of the four summer programs. Approximately 25 percent of the MITE students this past summer were women; seven of the 24 PREFACE students were female, and almost half of the Junior High School Workshop participants.

Several of the female students said they were surprised at the encouragement they received at Howard, especially since less than five percent of the enrollment in the School of Engineering is female.

"They tell us women have the patience to be engineers," Pagan Douglas said. "I think the most important thing is not to be afraid of it. There were three women in the

program last year and they finished the freshman year successfully," she said.

Jessica Jackson, a participant in the MITE program, said she was encouraged because "engineering needs more women and Blacks."

Another MITE participant, Deborah White, said she was in the program only because "I knew engineers made a lot of money."

The summer programs at the School of Engineering touched 140 students—some who before this experience knew nothing of engineering and its promise as a lucrative career. Hopefully, these students will share their experiences with others in their respective communities, but how many will eventually become engineers is not known. As the programs continue, statistics will tell the story.

As Cox said many times: "We know they all won't become engineers, but at least we will have helped them make an intelligent choice." □