

Need a Black Scientist with doctoral degree?

Is your institution seeking to fill the vacancy in your science department with a Black who has a PhD in one of the science disciplines?

Then there are a few questions that you might like to have answered. Where does one find such persons? Most likely in the South. Sixty percent of all Black American scientists with doctoral degree are teaching at predominantly black colleges and universities, which are mostly in the South.

Although 75% of all black students now enrolled in college are at predominantly white colleges and universities, the majority of those students that go on to do graduate work still come from the predominantly black colleges. It is estimated that about 600 000 Blacks are enrolled in American colleges and universities today. A recent study by the Educational Testing Service¹ indicates that 15 400 Blacks are in graduate schools, a number which constitutes 5.4% of all graduate-school enrollments. The areas of concentrations that relate to science were: 6% in the physical sciences; 4.3% in the biological sciences, and 3% in engineering or a total of 1977 students studying natural sciences in graduate schools. Fred Crossland's study² in 1968 for the Ford Foundation showed that only 1.7% of all enrolled graduate students were black, while only 0.78% of those go on to complete doctoral studies.

When one takes into consideration the attrition rate at the doctoral level, one sees the significance of this study and a different pattern emerges. This is that there is an alarmingly low number of Blacks with doctoral degrees in the natural sciences. James Jay's study³ in 1969 estimated that all science doctorates at that time were about 700. The estimated increase of 30 to 40 per year by Jay (a figure confirmed by J. W. Bryant⁴ for the Ford Foundation in 1970) would bring this number up to at most 1000 doctorates today. This total includes biology, chemistry, physics, engineering, mathematics, agricultural sciences, pharmaceutical, health sciences and related areas, but not physicians or dentists.

The study conducted by Herman Young⁵ of black doctorates, nationwide, showed presently employed doctorates to be 45% in biology, 25% in chemistry, 7% in physics and the remaining 10% in



all of the remaining areas of sciences.

Eighty-nine percent were employed in academic institutions, while 11% were employed in government, industry, and so on. Eighty-nine percent were male, and 11% were female. The average age was 49 years. The rank of positions ranged from assistant professors to research-project directors on the one hand, and to presidents of colleges on the other. These also included vice-presidents of predominantly white universities. The institutions of employment were throughout the US, although 60% were employed at predominantly Southern institutions while 40% were at non-Southern predominantly white institutions. A closer look at the candidates reveals that the ages ranged from 28 to 74 years. At either extreme, there were 1% at age 28 and 1% at age 71.

Seventy percent of these employed scientists were born in the South, 13.6% in the East, 8.6% in the Mid-West, 4.5% in the border states, 3% were foreign born and 0.5% were born in the West. Seventy-five percent did their undergraduate work at predominantly black colleges. However, 53% obtained their doctoral degrees from institutions in the Mid-West.

Why then are the majority of them working at small predominantly black institutions when they could be working at large prestigious universities? Can

we assume that racial pride is the reason? Most scientists felt that discrimination in employment was the major factor. At the beginning of their post-doctoral work experience, most felt very optimistic about employment on the open market. They felt that their ability and doctorate degree ("union card") would provide for them the proper job opportunity. Seventy-four percent preferred to be employed in a situation where they could teach and do research. Since most black institutions have few research facilities, they would have accepted offers from predominantly white institutions. Coincidentally only 11% wanted to do pure research. Others would have preferred management, development, applied research or governmental applications, and so on. But institutions where teaching and research both go on refused to hire them at that time, so most accepted jobs where they were needed and could be employed, at predominantly black colleges.

No difference was found in those scientists who attended black undergraduate schools compared to predominantly white schools. Most of those coming from black schools attributed their success to five factors:

- ▶ The small schools allowed for more personal attention and personal development.
- ▶ Most were greatly influenced by one science instructor as well as their interest in science.
- ▶ Students saw science instructors who had achieved on their own at black campuses, but they did not necessarily want to emulate them. Instead they wanted to attain their own heights in the dominant society.
- ▶ The special push by one science instructor. This instructor on spotting a student of unusual ability, earmarked that student for scholarship and graduate school. He was guided, advised and challenged to his fullest potential.
- ▶ Role model: While admitting that their science instructor was mostly responsible for directing their careers, most had aspired to be physicians or dentists. Doctors, lawyers and ministers are the professionals of the highest repute in the black community. Only 30% never considered the field of medicine. (There are six times more holders of doctorates in medicine than in natural sciences.)

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But with the change of the social structure of the dominant society and the advent of affirmative-action programs, demands for scientists of color have been created in the market place. Sixty percent of these scientists have had job offers from predominantly white institutions while only 12% have never received such offers. The 11% of scientists employed in the non-academic areas have all had multiple offers from government and industry. Of the 89% employed in academia, 97% have had offers from other black as well as white institutions.

The next major concern about the prospective black candidate is how well he gets along with non-blacks, or, what is his level of black awareness? Most of the scientists have great loyalty to their discipline. Thirty-six percent of the scientists felt that their personal contributions toward helping in the black struggle could best be done through increasing the general store of knowledge (helping to increase the bank of all knowledge through science). They should be good scientists who happen to be black. Thirty-four percent believed in being a good black scientist.

The first group preferred to be referred to simply as "scientists," while the second group prefer to be considered "Blacks who are scientists." Seventeen percent believe their contributions to Blacks would best be done through being role models for other Blacks. This was felt by almost all of those in industry.

The socio-political dogmas of the young were not significantly different from those of the old, nor did there appear to be any greater demand for younger scientists than older scientists. The greatest demand ages were between 32 and 56. Most had socio-political attachments to moderate organizations such as NAACP and the Urban League.

Salary? Although the law of supply and demand does have its effects, the salary scale for Blacks is not unreasonable; most salaries are negotiated from average salary levels at the institution plus a couple of thousand dollars extra to help in relocating a family of a wife and two children to a community amenable to middle-class Blacks.

And finally, what are the possibilities for getting them to change jobs today? Of those scientists employed in government and industry, 42% would prefer to both teach and do research (these could be attracted). Of those already teaching in universities both black and white, 78% are quite happy with their work. Nine percent of this group prefer industrial research, and 11% prefer university research without teaching.⁵

Now that you have the facts on the black doctorate, to get one in your insti-

tution you might do well to consider the following alternatives.

In light of the most recent figures of Educational Testing Service, which showed close to 2000 Blacks enrolled in graduate schools in the natural sciences, two approaches could be used to increase the supply of doctorates: (1) Encourage a graduate student to enroll in a doctoral program in your department (with an adequate stipend) with prospects of his staying on for a limited time after he has completed the terminal degree in order for him to attain top-caliber university experience. (2) Hire someone with a master's degree and subsidize him to go back to school to obtain his doctorate. It was by the latter method that most predominately black schools obtained their present supply of black doctorates. And in the process of encouraging a black to get a science doctorate, you can also chalk one up for altruism; you'd be adding to the pool of available black doctorates.

References

1. Chemical and Engr. News, 5 November 1973, page 13.
2. F. E. Crossland, *Graduate Education and Black Americans*, Ford Foundation, New York.
3. James Jay, *Negroes in Science: Natural Science Doctorates 1876-1969*.
4. J. W. Bryant, *A Survey of Black American Doctorates*, Ford Foundation, New York.
5. H. A. Young; unpublished dissertation: "An Educational and Professional Profile of Black American Doctorates in the Natural Sciences," Indiana University, 1973.

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Michelson clarifications

I read the article on Albert A. Michelson in the April issue (page 36) with great interest and pleasure. Physicists all over the world, at my own university in particular, should be grateful to Robert Shankland for the historical insights provided by his paper.

There is, however, one minor point in Shankland's excellent article that deserves clarification. This point concerns the Michelson-Gale-Pearson experiment—the "optical analog" of Foucault's pendulum. The key idea of detecting rotation through the interference between two coherent lightbeams traversing the same closed circuit in opposite directions is due to G. Sagnac, who mounted a ring interferometer on a rotating platform in 1913. (Arnold Sommerfeld, in his well-known textbook on optics, also refers to a similar experiment by Harress, but I could not locate the relevant publication.) In using Earth as the platform, Michelson and his co-workers faced of course the

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