The Culturally Disadvantaged Student and the Science Fair

- Mother M. Sebastian, I.B.V.M., Loretto Academy, Chicago 37, Illinois

How can Negro girls be encouraged to enter scientific competition—and win—is the subject of this fine report of a true teacher in action.

In some circles whenever the term "Science Fair" is mentioned, immediately the picture of a group of scientifically sophisticated students, gaily clutching ponderous tomes and swinging their National Honor Society Pins from lab aprons or coats comes to mind. Hardly anyone would dream of entering a group of culturally disadvantaged students with moderate IQs, moderate scholastic achievement, and no parental incentives for scholastic success into this lions' den of the intelligentsia. Yet in the past six years, a group of Negro girls with all these disadvantages has participated successfully in four state, five regional, and two city science fairs and in three state-wide scientific paper writing contests. At the regional level, approximately 30% of their projects have placed in the top echelons, qualified to participate in the state fair. They have been invited to attend four national symposia or conferences, two area conferences, and three courses for outstanding science students. In these six years they have won for themselves and their school a reputation for keen competitive spirit, thorough workmanship, and scientific acumen that is envied throughout the Chicago area.

The competition they have engaged in has been keen. The Chicago area has five regional fairs each year. Over 1000 projects are entered in each fair. From each of these fairs only 200-300 are chosen to participate in the Illinois Junior Academy of Science State Fair. The schools entering projects range in size from 250 to 5000 students. Since 1962 each school is permitted to have a number of projects equal to but 3% of their total enrollment. As a result, the participants in the regional fair are also a highly selected group.

The school these Negro girls attend is an all girls school of limited enrollment. Desegregation began in 1951. The school was one of the first Catholic schools in the Chicago area to enroll Negro students. By 1958 the desegregation process had reapportioned the numbers of Negroes and whites equally. In 1959 the "tipping" process occurred and the entire white population of the school transferred to other schools. The school enrollment of this year dropped by about 1/8 from 350 to 225.

In 1959 the faculty began an intensive campaign to build the image of the school among the Negro community as a place where any girl who could meet our entrance requirements and maintain our standards, could develop into a woman in the fullest sense of that word. She would know her strengths and her weaknesses. She would have had an opportunity to acquire new skills, to try out her ideas, and to have a sense of achievement in any field in which her talents and her interests lay.

To this end the music, speech, and science departments began an intensive program of training and experimentation. Clubs were formed in each department. Membership was open to any and all, but membership soon became quite selective as the girls realized the amount of work entailed in becoming an outstanding participant.

During the first year the science sponsor encouraged the girls to explore the areas in which projects could be done with their abilities and with the human as well as material facilities at hand. Student tours of the excellent scientific museums of the Chicago area were taken. A Saturday was spent learning how to use the facilities of the John Crerar Scientific and Technical Library. Contacts were made with the staff of DePaul University biology department, and one of the professors agreed to confer with and counsel the botany-minded students.

Permit me to briefly relate the history of the achievements of our Science Club since 1959. In 1959 five of the 15 Science Club members exhibited projects at the Chicago Catholic Science Teachers Association Dis-
strict Fair. Two First Awards were won. This entitled the two girls to present their projects at the Illinois Junior Academy of Science State Fair. One of these two projects also won a citation from the Society of American Bacteriologists. At the State Fair and in competition with 800 top-notch students from all over the State of Illinois, these two students won a First Award and a Third Award respectively.

In February 1960 an inter-school science fair was held in conjunction with another high school in Chicago. The two school enrollments were roughly equal. While the Academy had a 1:1 ratio of Negro students, the high school had a 1 Negro to 10 white ratio. The Science Club membership in our school by now had reached 20. Of 32 projects exhibited, our students won 5 first awards. These five projects, plus six others, then participated in the Chicago Catholic Science Teachers Association District Fair. This year the 3% limit on projects had not been levied and as a result there were more projects exhibited throughout the city. So many more projects were entered that the CCSTA had to have 3 elimination fairs before convening the official district fair. Of the eleven projects entered, only one reached the district fair. Here it was awarded a Second Award.

However, as has been the practice since the formation of the Club, most of the scientific papers and abstracts required by the Illinois Junior Academy were sent to the IJAS Scientific Writing Contest. Of the five papers entered by the school in this contest, one was chosen as an alternate paper to be read in the Botany division. 85 papers from all over the State of Illinois were entered in the Botany division. Of these 85, six students and three alternates were selected to present their papers to a group of college professors, high school teachers and students, and parents. A judging panel of college professors and high school teachers rated the six papers read at this session according to First Prize, Second Prize, Third Prize, and Honorable Mention. Students designated as alternates read their papers if one of the six participants was unable to attend. The alternate from our school did read her paper entitled "The Growth of Penicillium notatum and P. chrysogenum." On the basis of scientific worth and accuracy, as well as actual presentation, the student won Second Prize and an honorarium of $5.00. She also won a citation from the Society of American Bacteriologists.

By 1961 Club membership had risen to 25. The CCSTA had returned to the system of but one district science fair. The quota for projects was still 5% of the school enrollment. Eleven projects were entered in the CCSTA District Fair. Of these, two were given First Awards. At the IJAS State Fair these won two First Awards.

In November 1961 our school had a student and a teacher chosen to attend the National Youth Conference on the Atom sponsored by 58 public utility companies of the U.S. At this conference Illinois had 30 student and 14 teacher delegates. Of these, 7 students and 2 teachers were from the Chicago Catholic Schools.

In May of 1962 two students were invited...
by the American Society of Bacteriologists to attend their convention meetings held in Chicago.

In 1962 the Science Club maintained its membership of 25. The CCSTA imposed the quota on the number of projects from each school. The number of projects is limited to a number equalling 3% of the total school population, although two girls may enter a joint project. This means a school may, for example, enter six projects with twelve students participating. In the 1962 CCSTA regional fair six projects were entered. Two First Awards were won. These two projects then were awarded a First and a Second in competition at the IJAS State Fair. A Citation from the American Society of Bacteriologists was also won by one of these.

In 1963 nine projects were entered in the IJAS Fair. One project was given a First Award. This same girl had won a First Award the year previously, and was the first of our Club members to participate for two consecutive years in the IJAS State Fair. In the IJAS State Fair she was awarded one of the 133 Outstanding Awards. These 133 Awards were distributed among 1,166 projects. This same girl's Scientific Paper won First Prize and a $10.00 Honorarium in the Astronomy Division. In August 1963 this girl was one of 10 from Chicago who exhibited in the Youth Division of the Education Exhibit at the Illinois State Fair held in Springfield, Ill.

In 1962-1963 and in 1963-1964 one of our students was selected each year to attend the Illinois Institute of Technology Saturday classes for outstanding biology students. In 1964 one of our freshman girls was one of 28 students throughout the city of Chicago chosen to attend a course in “Learning to Use the Microscope” sponsored by the State Microscopical Society of Illinois and the Chicago Academy of Science. At the completion of the course she was given First Prize for the highest average in the course.

This year two senior girls represented the school at the American Cancer Society Symposium. One of our junior girls was selected to attend the AAAS Holiday Lecture Series. For the second consecutive year one of our girls was selected to attend the Chicago Heart Association Tri-County Invitational Research Conference of High School Students. This latter is a new venture sponsored by the Committee on Recruitment to the Biological Sciences. It has achieved great success in the past two years. An invitation to participate in this conference, even as a spectator, is a great honor inasmuch as only 150 students from all of the schools—public, private or parochial—in the Chicago area are invited to participate either as the reader of a paper or as a spectator and participant in the discussions.

Eight projects from the school were entered in the 1964 CCSTA District Fair. Here an unprecedented success was attained. Three projects were given First Awards and one of these three, in addition, was given the U. S. Air Force Outstanding Aerospace Award for the best project in the Aerospace Sciences. This was one of five U. S. Air Force Awards distributed among the 1400 projects exhibited at this Fair.

Not only were these three projects eligible for participation in the IJAS Fair but one of these scientific papers was chosen to be read at the IJAS Paper Reading Session and two others were selected as alternates. One of these alternates was read. The three projects all received Second Awards. The two papers read received Third Prizes and the paper selected as an alternate but not read was accorded Honorable Mention.

In 1961 a Science Fair Manager was introduced. This girl is one who is not scholas-
tically capable of preparing a research paper, but who has the ability to work well with people. Her duties include making up a time table for the research students. This time table, if adhered to, provides each student five private consultations with the sponsor on her project, and four reading consultations on her paper. The project consultations are scheduled as follows:

1. Early May—selection of project and accumulation of a reading list for summer
2. October—report on summer reading
3. December or early January—report on experiment
4. February or early March—report on experiment
5. April—final presentation of project and paper

The reading consultations are scheduled as follows:

1. Late May—final approval of summer reading
2. October—report on summer reading and selection of additional references
3. January—presentation of first draft of scientific paper. Several further consultations concerning revision are scheduled for January and February when all papers are typed by the Commercial Department of the school.
4. March—presentation of final typed scientific paper to Science Club

The sponsor is available for consultation by appointment at other times from October to June if needed. However, formal appointments are necessary to make certain that the girl is actually doing her work over a long period of time and with sufficient depth. Even with these formal appointments some students still manage to do most of their project in a three-week period, which results in lower awards than should be won. Only by actual bitter experience does the Negro girl learn that awards are won by long hours of hard and often unrewarding work. She becomes so taken up with the excitement that pervades the exhibition hall when the projects are judged and awards are given that she misses the long and arduous path that has led to the moment of triumph.

A student manager who has been through a fair or two with the Club can be a great help to the students and to the sponsor as well. The day before the school fair, the district fair, and the state fair she checks each project to see how it is set up. She appoints one or more Club members to assist in the transportation of the materials and their actual placing in the exhibit area before the fair, and to assist in disassembling the project afterwards. She makes certain that all participants are on time for transportation to the fair. Once at the fair she is in full charge. She re-checks each project before it is judged. She checks each girl’s appearance from head to toe and has authority to send girls off the floor to make themselves more presentable.

She and her assistants know where to find the sponsor in case of trouble and know what the sponsor considers “trouble,” i.e., personal injury, damaged equipment, racial discrimination.

This latter has not been encountered at any of the fairs we have entered. Our school has long had a reputation for training young ladies. Any girl who shows touchiness concerning the race question usually does not join any of our extra-curricular activities where she will be in competition. By the end of her freshman year she has usually gotten over much of her touchiness. She realizes that her teachers and her parents are working as a team to help her to find herself and to reach her potential. She knows she will not be thrust into situations where she will be exposed to unkindness. She knows she will be expected to meet the challenges of the emerging Negro society by making a positive contribution to it. She also knows she is expected to give only her best whenever she represents her school or her race.

In brief, our group of girls has had a great deal of success for four reasons:

1. Their own desire to succeed.
2. Ready availability of resource materials.
3. Willingness of people within and without the Negro community to give these girls their time, their patience and their knowledge.
4. Encouragement by their sponsor.

Of these, the first and the last are of the utmost importance. No student can succeed on her own without an interested sponsor. And no matter how interested the sponsor may be, no success can come unless his students desire it—no matter what the cost.