

The Abell Report

What we think about, and what we'd like you to think about

Published as a community service by The Abell Foundation

Abell Salutes:

Baltimore Baseball League; It's a Whole New Ballgame For Baltimore City Public School Kids. The idea is to keep averages up—in the classroom as well as on the field.

Renell Johnson of Baltimore's Johnston Square neighborhood got up one Saturday in April, put on a new uniform and smacked a fist into a ready glove. Later, on the field, carefully raised a bat and stared down a young pitcher for the first time in his 11 years.

"Play ball!"

It was a familiar call for most kids, who had at the first sign of spring rescued bats and gloves from the dark corners of closets, sheds and garages, and headed outdoors for months of baseball league play and backyard pick up games. But for scores of boys and girls in the city's poor neighborhoods, it was a rallying cry heard for the first time.

Renell is in the fifth grade and attends Madison Square Elementary, at 1401 East Biddle at Caroline Street. He is a charter member of the Baltimore Baseball League, an program operated by the Parks & People Foundation with the participation of the Junior League of Baltimore, the Depart-

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A Math-Science Residential High School For Maryland: Changing Times Mandate Revisiting The Issue.

To meet the need for scientists and engineers, many states are establishing residential math-science high schools. With Maryland's vision for its future focused on science and engineering, is it time for Maryland, too, to have a residential math-science high school?

"Clearly, the life sciences are this region's best chance of providing opportunities for high-skill and high-wage jobs to all citizens."

— William Jews,
Chairman of GBC Life
Science Strategy Team

"The National Science Foundation, in a controversial report, has predicted that within two decades the U.S. will be suffering a shortage of more than 600,000 scientists."

— Susan L. J. Dickinson
writing in "The Scientist,"
May 11, 1992

A consensus of Maryland's leadership is currently making the case that the state's economy is tied to the future of science-oriented industries. It follows that if science-oriented industries are to flourish in the state, the state needs all the scientists and engineers it can get; from a national perspective, America also needs more of its students to become scientists and engineers. Given the state's ambitions for and investment in

this effort, it is timely for this same leadership to revisit the issue, explored some four years ago, of whether the state should create a math-science residential high school. The questions to consider: would the presence of such a school persuade and enable more young Marylanders to become better scientists; and if it did, would those scientists stay and work in Maryland and so contribute to the state's vision of its future?

What is a math-science residential school?

The math-science high school as originally proposed by Governor Schaefer in 1988 weds a three-year residential high school offering a liberal arts program, emphasizing science and math, for highly able students, with a center to assist elementary and secondary schools throughout the state in improving science and mathematics education for all students. (For a detailed profile of the math-science residential school as the state had proposed it, see page 3.)

One model of a math-science school widely regarded as a successful model is the North Carolina School of Science and Mathematics (NCSSM), located in Durham, N.C. It has been functioning for 12 years, and in its brochure, "A Decade of Achievement," defines its mission this way: "To help meet North Carolina's need for responsible leadership in the development and application of science, mathematics and technology. The NCSSM community should offer a comprehensive, challenging, and innovative academic program, and act as a catalyst for educational improvement in the state and nation."

*Mandate is to make
a continuing contribution
to the quality of
math-science education
in every school in the state*

The original plan for Maryland's resident math-science school called for it to sponsor summer residential institutes for science teachers and offer enrichment programs to the total school age population. It took as a mandate a responsibility to make a continuing contribution to the quality of math-science education in every school in the state.

Published bi-monthly by
The Abell Foundation
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Baltimore, Maryland 21201
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What states have created math-science high schools?

The most frequently referenced model is the North Carolina School of Science and Mathematics, in Durham, N.C. The school was founded in 1980 with less than 100 students; today, it boasts more than 2,000.

Other states that have subsequently established similar math-science residential high schools are Illinois, Louisiana, Mississippi, Texas, Indiana, South Carolina and Oklahoma.

Examples of non-residential math-science magnet schools are Thomas Jefferson in Fairfax County, Virginia, and in New York City, Bronx High School of Science, Stuyvesant, and Brooklyn Technical High School. Thomas Jefferson has won more National Merit Scholarships than any other high school in America; Bronx, Stuyvesant and Brooklyn have been recognized as "paragons of excellence in education" by the Task Force on Science Education of the National Educational Council for Minorities in Engineering; they serve all of the families that make up New York City's 7,000,000 population.

What are the arguments for establishing such a school?

Perhaps the most frequent one is that the schools will be an incubator for the future scientists the country so sorely needs. Statistics abound defining the profile of America's student population planning to go into science: the number is small and getting smaller, with discouraging implications for the nation.

- * Japan, with half America's population, trains twice as many scientists.
- * Our nation ranks 14th among developed countries in terms of students' ability to perform advanced algebra.
- * Korean schools children solve complex math problems four times faster than U. S. pupils.
- * A survey of college bound U.S. high school students revealed that a mere one percent were planning to major in math or the physical sciences.

American industry, looking to compete in an increasingly competitive and global marketplace, is clearly starved for scientific talent. The problem is especially acute for Maryland, which is looking to tie its economic future to building a science-oriented economy, and so will have a particularly strong need for scientists and engineers. It is thought by its advocates that establishing a residential math-science school in Maryland will go a long way towards solving that problem.

The problem is especially acute for Maryland.

But detractors disagree. Whatever hopes for the school its advocates may envision, detractors argue, the school is an idea that cannot be justified. They advance a variety of arguments.

A frequently used argument against the establishing of a math-science residential school in

Maryland is that it is "elitist." It works, they say, to single out the few for privileged treatment. (The cost for each student would be roughly \$13,000, more than two times what is spent on other school children). In this regard it is interesting to note that many handicapped children in Maryland have many times that sum spent on them annually, and that the annual rate of maintaining one teenage child at the state's Hickey School for juvenile delinquents is \$50,000.

A second argument often heard is that the money could be better spent building up the science programs in existing Maryland schools—Baltimore Polytechnic, in particular.

Among other arguments against the idea is that the school would create a brain drain, siphoning off the best students into the one school and that such a school accomplishes nothing since the students who would attend would do well anyway.

Positive results in North Carolina

But if the idea of such a school is to interest more students in majoring in science in college with the hope that they will become scientists and, if the ultimate hope is realized, take up a career in science in Maryland, advocates can point to positive results in North Carolina.

A 1990 study conducted by NCSSM on the occasion of its 10th anniversary covered some 900 alumni from the school's first eight

The State's 1988 Proposal For THE MARYLAND SCHOOL FOR SCIENCE AND MATHEMATICS

Adequately educating all of our young people for potentially happy and productive lives in the 21st century is a challenge that a democratic society cannot afford to ignore. If we are to succeed, we must explore a variety of non-traditional approaches and offer public school students a variety of educational opportunities.

The state has proposed two programs for students with very different needs, yet both would contribute to the future health and well-being of the state and its citizens. One program ties state, federal and private resources together to establish a drop-out prevention program. The second program weds a three-year residential high school offering a liberal arts program with an emphasis in science and mathematics for highly able students with a center to assist elementary and secondary schools throughout the state in improving science and mathematics education for all students. The purpose of this article is to share the vision for the Maryland School for Science and Mathematics, and how this program for gifted and talented students will have a positive effect on the general education program.

Committed to moving Maryland to the forefront of science and mathematics education, the state seeks to establish a public educational

institution of national standing that will contribute to scientific literacy for all of Maryland's students, and expand the number of Maryland students preparing for further studies and careers in mathematics, science and engineering.

Six hundred young people from every part of Maryland will live and study in a stimulating educational environment. The proposed enabling legislation calls for the School to develop and implement enrollment policies that are both consistent with admissions standards and have as an objective that the School admit students proportionate to each county's proportion of the state's total public school enrollment for kindergarten through grade 12. It further provides for a minimum goal of three students from each county for each entering class of 200 students. The proposed statute further requires the School to develop and implement outreach programs to attract female and minority applicants.

Admissions decisions will be based on a variety of factors that reflect each student's past accomplishments, potential development and personal interests. Students may be asked to take an objective aptitude test (e.g. SATs), to write an essay, to submit teacher evaluations, or to

A Proposal

THE MARYLAND SCHOOL FOR SCIENCE AND MATHEMATICS

(continued from page 3)

participate in a personal interview. School staff, educators from the community and business leaders will participate in the application evaluation process.

The curriculum will provide students with a broad variety of science and mathematics courses in physics, chemistry, biology, mathematics, computer science, and their interrelationships. Students will study social sciences and the humanities, learn to write clearly and expressively, become proficient in a foreign language, and develop an appreciation for the arts. Students will have opportunities for independent study and for participation in research activities in private, university and government laboratories.

The academic program will promote the excitement of learning and will emphasize the learning of skills, mastery of information, and understanding the methods of scientific inquiry. At the same time, students will be taught the special responsibilities of scientists to society, both through the study of historical relationships of science and society and through required community service projects. Varsity and intramural sports and a wide variety of extracurricular activities also will be a part of the program.

At the Maryland School for Science and Mathematics, students will learn with other young people of similar interests and goals in a supportive environment. In a residential setting students continue their concentrated study beyond the regular

school day. Further, this residential setting is designed to foster and nurture high performance expectations and standards for students; increase opportunities for student-faculty interaction; enhance student peer support for academic pursuits and achievement; and encourage student initiated projects.

The Center for Science and Mathematics Education, as an integral part of the School, will assist elementary and secondary schools across Maryland in improving the quality of science and mathematics instruction for all students. The Governor will appoint an advisory council composed of educators from across the state to participate in the development of the programs. The Center will build upon the already successful programs operating in local school systems, the Summer Gifted and Talented Centers and the Maryland Professional Development Academy sponsored by the Maryland State Department of Education.

Most likely, the Center will:

- (1) sponsor summer residential institutes for elementary teachers and secondary science and mathematics teachers;
- (2) develop and share innovative teaching techniques and new curriculum with science and mathematics teachers;
- (3) provide a forum for teachers to exchange promising practices;
- (4) arrange for teachers from across the state to serve as "visiting" teachers for an academic year (with approval from the appropriate local authorities);
- (5) offer summer enrichment programs in science and mathematics to the general school-age population; and
- (6) seek federal, private and foundation support for science and mathematics initiatives across the State. The full-time students at the School will be encouraged to share their knowledge and excitement for learning with other students.

The State of Maryland spends \$1.5 billion annually on elementary and secondary education (24 local school systems with approximately 650,000 students). Federal and local spending brings the total spending for public schools in Maryland to approximately \$2.9 billion. The Maryland School for Science and Mathematics will cost about \$8.3 million annually when it is fully implemented. The program has been designed to supplement and complement the ongoing activities of Maryland's public schools and to become the nucleus for science and mathematics education in Maryland. Perhaps, we will become a national leader in sharing the fruits from programs for gifted students with the general education program. (At this writing, February 22, 1988, we are waiting for the General Assembly to act.)

classes (1982-1989) and revealed the following statistics.

- * 64 percent of NCSSM students majored in science and math or technology in college, as compared with the national average of 40 percent of students in the top 10 percent of their high school class. Perhaps more significant were the results with respects to women and minorities; 61 percent of NCSSM alumnae and 70 percent of NCSSM minority alumni reported majoring in science, technology or mathematics, vs. 26 percent and 29 percent of the top 10 percent of students nationally, respectively.
- * Of special interest to the taxpayers of North Carolina, the study determined that two-thirds of NCSSM graduates attended college in North Carolina, and that more than half of the respondents who were employed full time worked in their home state. What this study does not tell us is what these students would have done if they had not gone to a math-science high school.

North Carolina findings reinforced by University of Illionis findings

A more relevant survey conducted by the Illinois Mathematics and Science Academy (IMSA) paints a similar picture. One hundred and thirty two members of IMSA's graduating

class of 1990 were compared to 77 seniors enrolled in summer math and science programs for academically talented students. Both groups were surveyed as college freshmen and the results revealed that

- * Nearly 58 percent of IMSA graduates have declared a major in mathematics or science, as opposed to 48 percent in the comparison group.
- * Among the IMSA graduates, 22 percent have declared double majors, as opposed to only 5 percent of the comparison group.

And none of the statistics above speak to what many consider one of the most persuasive aspects of a math-science school in Maryland: the statement to America and the world that Maryland is energetically promoting an environment hospitable to science-oriented industry. In fact, as an increasing number of states establish such a school, Maryland's failure to do so may send the opposite message.

How would such a school be funded?

State funding must provide the core financial support. But private sector money could figure heavily in the budgeting. In the case of North Carolina, for example, the state's leading industries (R. J. Reynolds, Carolina Light and Power) and national foundations (Ford, Carnegie, Xerox) contribute generously.

In the case of Maryland, according to Judith S. Sachwald, former executive assistant to Governor Schaefer, the cost to maintain such a school is estimated at \$8.3-million annually. An additional appropriation would be

needed to create the school. The size of this appropriation would depend on whether an existing facility was used or a new one constructed. An effort could be undertaken to determine whether private funds would be available to reduce the public obligation. Local systems should be charged a fee equal to the amount they would have spent on any child attending the math-science high school from their county. Such a fee would reduce the annual state budget substantially.

The Maryland math-science school was presented to the legislature in 1988 and turned down.

Since that time, the state has concluded that its future is best served by building an economy in which science figures large. The conclusion takes into account that the state can build on a science industry already in place. But in the vision, serious questions loom. Among them, looking at similar and successful efforts in competing states where math science high schools play so important a role, is not a comparable program vital, too, to Maryland's effort? And given the rate at which other states are establishing such institutions, could not the day come when Maryland finds itself one of the few states without such a school?

The state has recognized that its future lies in a sciences economy; persuasive evidence argues that a math-science high school would work to support that goal. It may be time for the leadership to ask itself: how can the state recognize the one without committing to the other?

Abell Salutes: Baltimore Baseball League

(continued from page 1)

ment of Recreation and Parks and the Baltimore City Public Schools. Funding for the program was provided by the Abell Foundation, the Junior League of Baltimore, the Baltimore Orioles, and Major League Baseball. The program is about much more than baseball. The Baltimore Baseball League logo features a baseball resting on an open book and a pencil—the pencil is in the picture as a symbol of the academic component of the program. Between games and practices, each player is required to maintain satisfactory grades and attendance or risk forfeiting play. By playoff time 90 percent of the initial team members were still “playing ball.” Renell knew that if his grades or attendance went down, he might not be competing in the playoffs and that his coach was concerned about how he was doing in school. The League provided, daily, a wholesome, challenging activity for 10- and 11-year olds in many neighborhoods, from elementary schools with no other after-school programs for their students.

A big event for kids, family, and neighbors

From mid-April through the end of June, 24 each of the elementary schools in Baltimore City

fielded a team of 20 fourth and fifth graders. Coordinator Keith Leacock, of the Parks and People Foundation, conducted a lottery at each school so all interested students had a chance to play. Junior League volunteers became school liaisons to help monitor the players' attendance and grades. Department of Recreation and Parks staff trained coaches and umpires and prepared the fields. The kids did the rest.

Three days a week after school they practiced with their coaches and every Saturday competed against nearby schools at their local recreation center. The games not only were a big event for the kids but for their families and neighbors as well. At the corner of Madison and Caroline Streets, where Renell and his schoolmates played every Saturday, the stands were full of enthusiastic family and friends cheering for the young players, most of whom had never worn a glove or picked up a bat before.

Fans could be heard shouting, “That’s my nephew playing first base,” and “My son is pitching great today...” They were quick with fans’ advice, “Steady now, don’t swing at everything...” and, “Keep going, son,” and “Run, baby, Run!” to that runner rounding third.

This past summer in Baltimore, the Baltimore Baseball

League provided exciting Saturdays of baseball, rain delays, game-saving catches in the ninth, and a championship series attended by Baltimore Oriole Sam Horn. Glenn Davis treated 450 student athletes and their coaches to a night at Oriole Park, a first Big League game for almost everyone.

Thanks to the creation of the Baltimore Baseball League, hundreds of Baltimore City Public School youngsters had special motivation to maintain good grades and attendance, while representing their school in organized league play. Next year the program will double to 48 teams with a total of 960 players.

The Abell Foundation salutes Baltimore Baseball League and all who helped to make it work-keeping averages up in the classroom as well as on the field.

A Talk With Mr. Geoffrey Jones, Principal of the Thomas Jefferson High School For Science and Technology, in Annandale, Virginia.

Thomas Jefferson is a magnet, day high school offering a specialized curriculum that focuses on a science and technological education. The school serves the counties of Prince William, Fairfax and Loudon, and the city schools of Falls Church. Only about 20 percent of the applicants are accepted for admission. The students of Thomas Jefferson High School consistently win more National Merit Scholarships than any other high school in America.

What do you say to critics who argue that Thomas Jefferson's role in public education is an "elitist" one?

Jones: "We tell critics that either they want 'equity' or they want 'education.' We are not about equity; we are about education. And as part of our mission we have programs that reach out to raise the level of math-science education in every school in Virginia.

"We also have a program called VISIONS that runs alongside of our regular curricula. It is funded by foundations for the underserved black students. It operates Wednesdays and Saturdays mornings and five weeks in the summer.

"But in the end less than 4 percent of the school is black though 25 percent is Asian."

Does the school help to bring more scientists into the American workplace, and in particular, into the Virginia workplace?

Jones: "Yes, but that

objective is not a large part of our mission. We focus on turning out students who will be part of a more scientifically-literate community—no matter what they do for a living. Twenty percent of our students do not go on to math-science curricula, but with the education we give them many do go on to become artists, photographers, writers and administrators capable of bringing the value of a science background to specialties within the field of science. We don't look to graduate scientists so much as we do young people better able to work in the specialties where a science education will make a difference.

"For example, some of our best students go on to become artists working for scientific journals. Others, writers for science journals and science programs of one kind or another. Our object is not to turn out more scientists, although we do; our object is to broaden the scientifically-literate community in Virginia.

"It's too early to say, but we are hopeful that we will manage

to keep most of our graduates here in the science community in Virginia. Sixty-five percent of our students are channelled into the universities in Virginia. Once they are in the state university we think they will tend to work in the state.

But what is the "value added" here? Would not bright kids turn out to be bright kids if they didn't go to the Thomas Jefferson?

Jones: "There is significant value added because of what we teach and how we teach it. Let me give you some examples.

"A student in a regular math-science school, even a magnet school, studies from this manual (here Jones holds up a manual for teaching biology created for teachers teaching in the Virginia school system). They will learn exactly what is in here, no more no less. And it is this material that the student will be graded on.

"But at Thomas Jefferson,

a student will study biology, English and Technology in a 3-hour block, as an interdisciplinary experience. They may even cover less ground than a regular school will, but the ground covered will be supplemented with individual research and projects.

"Each student will learn to become familiar with the use of a science library.

"Each student will deliver a paper (or papers) in a symposium forum, paralleling a scientific conference.

"Each student will come to understand science as it integrates into every aspect of human knowledge and action; science will become part of an interdisciplinary program.

"Each student will become attached to a mentor, working with scientists from the Virginia scientific community.

"When the regular high school student goes on to college he or she will do OK. But our graduates will very soon be challenging the professors—they will want and need more. They have been trained to look deeper, go farther, and to become innovative beyond what is taught.

"Traditional Math-science magnet schools cannot deliver that kind of science education."

Does Virginia have traditional magnet math-science schools to which funds directed to Thomas Jefferson might otherwise go?

Jones: "Yes, there are about six magnet schools in Virginia. When you hear the comment, would the money be better spent shoring up those programs rather than putting the money into a Thomas Jefferson, I answer by saying there is no better way to shore up the existing, traditional magnet schools in Virginia than by strengthening a Thomas Jefferson."

What about the "results?"

Jones: "Thomas Jefferson's first senior class to graduate college will graduate this year. But we are betting that, with so many of our kids in the universities in Virginia, those same kids will find jobs in Virginia. You will find, I am sure, the same situation could prevail in Maryland."

Some Recent Grants by The Abell Foundation

Baltimore Opera Company \$18,000
To implement the "Create and Produce" educational outreach program, a six-week curriculum for Baltimore City Public School students to create their own operas in six Baltimore City middle and high public schools.

Citizens Planning and Housing Association \$35,108
Towards staffing related to a project to find replacement public housing for units lost in the Lafayette Court's redevelopment plan.

Citizens Scholarship Foundation of America \$150,000
Three-year grant in support of a collaborative funding effort to establish a Baltimore "Dollars For Scholars" project, a volunteer operated, neighborhood-based scholarship foundation. The local foundation will encourage neighborhood youth to pursue higher education and provide scholarship funding raised from neighborhoods throughout the city.

Kennedy Kreiger Institute \$150,000
A challenge grant to develop an extended day program for returning adolescents with learning and behavior disorders who have been placed out-of-state or who are at risk of being placed out-of-state.

Maryland Food Bank, Inc. \$100,000
Two-year grant towards staffing to implement an organizational restructuring to enhance efficiency and upgrade professionalism.

Save Our Streams \$47,500
For general support of Baltimore City initiative to clean up and monitor water quality in Herring Run, Jones Falls and Gwynns Falls to help meet pollution abatement requirements of the Water Quality Act.

Towson State University \$49,073
For two-year funding of returning Peace Corp volunteers to be trained as teachers in the Baltimore City Public Schools.

University of Maryland College Park \$23,000
Towards the development of a working test model of Maglev technology for a rapid transportation system between Washington and Baltimore.