

GIFTED EDUCATION PRESS

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Holiday Greetings! As we enter the third year of publishing this newsletter, we would like to repeat our concern for the well-being of gifted education in this nation. We are particularly concerned with the proliferation of so-called models for teaching and designing curriculum for gifted students. It is our common sense view that an overabundance of these models now exists and this situation is having detrimental effects upon educators of the gifted, particularly those in the public schools. This excessive number of models diverts attention away from the major work yet to be accomplished in this field -- designing comprehensive and valid identification procedures and developing excellent differentiated curricula. It appears that almost every major periodical in gifted education has presented "new" models of teaching or curriculum within the past year. Why does this relatively delimited field need so many models? Of what use are they to school-based educators?

In our opinion, this situation has led to confusion and "angst" among many program administrators and classroom teachers with resulting negative effects upon the instruction and learning of gifted students. If this field is to produce useful knowledge regarding accelerated individuals, it should emulate those empirical areas which have made the greatest scientific advances. For example, physics and biology are grounded upon only a few models/theories. Physics is built upon Newtonian Dynamics, Einstein's Theory of Relativity and Quantum Mechanics while biology is primarily driven by Darwin's Theory of Evolution and Genetic Theory. In comparison, gifted education has at least tenfold more models and theories, which indicates that our model/theory builders have gone far beyond current needs and the ability to effectively use this information in schools.

This issue of our newsletter contains the type of discourse on subject matter ideas and student characteristics which should occur more frequently among educators of the gifted. We begin with a statement which the famous physicist and cosmologist, Stephen Hawking, has sent to one of our authors, Scott Reedy, for use in his forthcoming book, Quantum's Lesson. Reedy is a mathematical physicist, and his article shows how the study of physics and quantum mechanics can inspire gifted students to become creative individuals who are knowledgeable about modern science. The article by Cecile Frey addresses educators' concerns for underachieving gifted students. Her comprehensive discussion of this problem should provide educators with many ideas for helping them. The last article by Michael Walters shows how gifted students can benefit from studying the lives and works of great architects such as Frank Lloyd Wright. M. D. Fisher, Publisher

INTRODUCTION TO SCOTT READY'S BOOK ON TEACHING QUANTUM
MECHANICS TO THE GIFTED

BY STEPHEN W. HAWKING, LUCASIAN PROFESSOR OF MATHEMATICS
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The world we live in is very different from that of a hundred years ago, or even thirty. This transformation has been brought about by developments in technology, which have been made possible by advances in science. Yet the general public has very little idea of what science is, what it has done to bring us to our present state, and what it may do to change that state in the future. I'm not suggesting that everyone should be trained as a scientist. But, in a democracy, it is essential that we all have some general understanding of science, if we are to control our future. How can one decide on the difficult measures needed to deal with acid rain, or the green house effect, if one does not know what acids, or carbon dioxide are? How can one decide about nuclear power, if one does not understand the possible consequences? In the next ten years, or so, genetic engineering will become a practical possibility. How will the public control it, if they have no idea what DNA is? At the moment, computers are useful for carrying out simple tasks, very quickly and accurately. But their mental level is that of a clever moron. However, the pace of computer development is now so rapid, that it is conceivable that within twenty years, we will be able to build a system that is more intelligent than we are. How will we control such a Frankenstein, if most people do not have any idea of what a computer can, and cannot do?

UPON THE SHOULDERS OF GIANTS
BY SCOTT READY, GRAND LAKE, COLORADO

Over the past ten years, the number of journal articles recorded annually in physics abstracts has swelled from 100,000 to 150,000. Each of these articles can be expected to cite a score of significant references in its footnotes, and these sources in turn reach farther back to milestone achievements. The cumulative effect of these labors, performed around the world, is enough to make any budding scientist feel very small. The final crusher is that there are equally voluminous annual abstracts produced in mathematics, computer science, chemistry, electrical engineering, and medicine. Coming face-to-face with the professional literature is a humbling and frustrating experience for all serious students. Computerized indexes are useful, but without a prior vision, a glimmer of what one is trying to accomplish, an hypothesis, the indexes are like a ship without sails, wind or captain.

Without an intuitive leap, both humble and vast, a scientist can make no headway in the reading he must do. From where is this preeminent vision to be obtained? Who will serve as his guide in sifting the important ideas from those of little value? "A hundred times a day I remind myself that my inner and outer life depend on the labours of other men, living and dead, and that I must exert myself in order to give in the same measure as I have received and am still receiving." (Einstein, The World As I See It, 1934, p.1) The guidance comes from our deep past, a lineage of those who have been awe-struck to feel the torch of wisdom pressed into their hands, who have surefootedly run with it, renewed its oil, and then lovingly pressed it into young hands. These visions are acquired from the study of great writers such as Shakespeare who said about his work "that in black ink my love may still shine bright." (Sonnet LXV) Children need to study these writers at an early age rather than "Dick and Jane" readers in order to stir their creative imagination. Their first fairy tales should be works of art.

What enraptures, also transports. The bird that flies the farthest soars. He is lifted by the whirlwinds of others and rides winds not of his own making. No one obtains complete understanding of a field of study by himself. "If I have seen further. . .It is by standing upon the shoulders of Giants." (Newton, 1675; See On the Shoulders of Giants by Robert K. Merton, HBJ Books, 1965, for the long history of this idea.) Each mind is a union of nature and nurture, hardware and spiritware, a synthesis of factors which fade into the terrors and glories of time immemorial.

Einstein's humbleness was not just an expression of good old world manners. It arose from his self-effacing membership in an esprit de corps which involves climbing a great white mountain. An invention is not just a product, but an inspiration to one's kindred spirits. I know of a book which magnificently conveys an esprit de corps towards which many scientists aspire. It is Niels Bohr: A Centenary Volume (Harvard University Press, 1985). It can be used as a browsing ground for gifted students and gifted teachers. Although it does not explain the mystery of the quantum, it does reveal how the quantum revolution was initiated and nurtured at Bohr's international school in Copenhagen, Denmark. Physics can be divided into two complementary halves: on the one hand, one finds the standard logical arguments found in textbooks; on the other, one can study the emotional lives of physicists themselves. "To Newton and to Newton's Dog Diamond, what a different pair of Universes!" (Carlyle, 1837)

Quantum physics teaches us that there is no one-to-one correspondence from descriptive terms to what really exists. A

true invocation of the source of phenomena calls for an ingenious interplay of seemingly irreconcilable elements, none of which directly corresponds to what actually exists. As Shakespeare does not appear in his scenes, the Quantum is not present in phenomena, yet is responsible for them. Through the process of unifying knowledge, the quantum revolution affects fundamental issues concerning what is real and what are fictions (albeit, useful ones) in all of the arts and sciences. By fully squaring up a single specialized fact, specifically a limit to reductionism imposed by Max Planck's irreducible quantum of interaction, Bohr succeeded in unfolding his expertise and touching upon many hard to crack nuts which the wise enjoy whole, and fools break.

In his 1985 speeches commemorating Bohr's centennial, John Wheeler (Past President of the American Physical Society, Past Vice President of the American Philosophical Society, and frequent collaborator with Bohr and Einstein) proclaimed the following: "What we take to be contradictions are not contradictions, [Bohr] tells us; they are complementary insights. Each gives part of the story. Our picture of the truth is not complete without both. Complementarity, in this sense, he considered a guide to human problems of such universal use that it should be taught to every child in secondary school." (Wheeler, Physics Today, Oct. 1985)

From twelve time zones away, the same thought is recorded by the Indian physicist, D. S. Kothari, in the Bohr centenary volume (p. 325): "The complementarity approach. . . allows the possibility of accommodating widely divergent human experiences into an underlying harmony, and bringing to light new social and ethical vistas for exploration and for alleviation of human suffering. Bohr fervently hoped that one day complementarity would be an integral part of everyone's education and would provide guidance in the problems and challenges of life."

The curious and skeptical should incredulously wonder how Bohr's atomic theory could possibly bring a lesson of consequence to verbal arts far removed from mathematical physics. What do hydrogen and helium have to do with people, culture, war and peace? Beyond its many and promising technological applications, of what use is quantum physics? Physics can give gifted students: (1) an enlarged sense of community and collegueship; (2) a rigorous sense of what is physically true; and (3) a crack at the mystery of existence. Einstein's religious awe arose from his astonishment that through earthly instruments, we can touch upon cosmic orders.

We have enough technocrats, bureaucrats and pragmatists. What we miss are geniuses, not in the modern sense of mavericks, but in

the old vein of torchbearers and keepers of the flame which burns in the hearts of heroes. The older mode of genius was not that of an eccentric, but of a doctor who fathoms his countrymen's ills and humors and sees where strong medicine can be deeply set to secretly work its magic.

Accelerated students have a gift of time which can be used to creatively test the foundations upon which superstructures of science have been built. They have the opportunity to dig deeply and resuscitate the goals which our specialized techniques were originally meant to serve. "Perfections of means and confusion of goals, seem . . . to characterize our age." (Einstein, Out of My Later Years, 1950, p. 113) "A" students are to be more than just technicians, more than just good providers. It is not enough for them to study Shakespeare and know the names of his characters and his plights. They need to see Shakespeare wholeheartedly giving and then being amazed by a responding embrace whose full arms encompass us all. High upon the shoulders of giants, the young need to be lifted. With an optimistic view of their inheritance, they may profitably begin to imagine how they might use those gifts which are laid before them.

How do the gifted learn to employ their time intelligently? I can think of no better advice than that given in The Sound of Music: "Climb every mountain, ford every stream, follow every rainbow, till you find your dream -- a dream that will need all of the love you can give. . ." This done, they may "Drink the spirit of the golden day, and triumph in existence" (E. Young, 1742) "and thunder through the sapphire deeps." (Tennyson, 1830)>>

I do not know what I may appear to the world, but to myself I seem to have been only like a boy playing by the seashore, and diverting myself in now and then finding a smoother pebble or a prettier shell than ordinary, whilst the great ocean of truth lay all undiscovered before me.

Sir Isaac Newton, 1727

Philosophy may be defined as the art of asking the right questions. . . Awareness of the problems outlives all solutions. The answers are questions in disguise, every answer giving rise to new questions.

Abraham Joshua Heschel, 1956

GIFTEDNESS AND UNDERACHIEVEMENT

BY CECILE P. FREY, COORDINATOR OF GIFTED PROGRAMS
LOWER MERION SCHOOL DISTRICT

One of the most persistent problems among parents and teachers of the gifted is that of underachievement. How can Jon or Mary be so bright (as measured by an IQ test), yet do so poorly in school? Karen Horney, the psychoanalyst, defines the problem as "Failure to live up to one's potentialities. . .this prevents the individual from attaining self-fulfillment, the self-actualization of which he is capable, and this prevents his becoming a truly integrated person." (The Neurotic Personality of Our Time, 1936) In education, there is no universally accepted definition of the term, but several elements appear in most discussions. An underachiever is one whose performance, as judged either by grades or achievement test scores, is significantly below his demonstrated aptitudes or potential achievement. He is someone who has shown exceptional performance on a test of intelligence and who, nevertheless, does not perform as well as expected for students of the same ability on school-related tasks.

Underachievement may be chronic or situational, may begin early, as is frequently the case with boys, or at puberty, as is more common with girls (Fitzpatrick, 1978, p. 645). In the higher grades, it may stem from a lack of basic skills, and may occur only in one subject area (e.g., mathematics, spelling), or appear to be more general. Many students suffer from "hidden" underachievement; they work above the level of others, but still not up to expectations. Paul Daniels labels such students "pseudoachievers." (Teaching the Gifted/Learning Disabled Child, 1983, p. 5) At adolescence, when the importance of peer group relations and a detachment from the family occur simultaneously, some begin to underachieve in order to conform to peer group demands and to gain social acceptance. Females and students from culturally diverse backgrounds and a low socioeconomic status are especially prone to succumb to peer pressure.

The characteristics of underachievement include a lack of self-confidence, an inability to persevere (together with a low frustration tolerance), a lack of integration of goals and an inadequate philosophy of life, a passive-aggressive personality, a fear of growing up (where one must take responsibility for him/herself), a denial of giftedness, an inability to take responsibility for one's failures (as in "the dog ate my homework"), a desire to work only in areas of interest, low motivation, neurotic perfectionism, and inadequate social relationships. These multiple symptoms make an understanding of

such students difficult. Yet as Calvin Taylor says, "The longer that any talent or set of talents remains dormant and unused, the more confidently can it be predicted that the person will never really use such potential in his/her life." (from a presentation in King of Prussia, PA, 1985) Hence, it is necessary for the school to be alert to such problems and to provide the resources, both finances and manpower, to help such students begin to achieve.

The early identification and remediation of underachievement are difficult because this problem has so many causes. According to Bricklin and Bricklin (Bright Child, Poor Grades, 1967, p. xi), about 80% of underachievement stems from emotional difficulties which originate in the home. These problems include parents' ignorance of what the label means, the fact that parents' expectations are too unrealistic, parent disagreements about child-rearing procedures, and placing too much pressure on a student to be "perfect" or to excel in all areas. As Seligman indicates in his description of learned helplessness, "Intelligence, no matter how high, cannot manifest itself if the child believes his own actions will have no effect." (in Trotter, 1987, p. 34) Conversely, some parents disengage from their gifted children, giving them a message which says, "It was all right for me to be a blue collar worker; why should you try to be something better?" Other parents try to fulfill their own unrealized dreams by living through their children's gifts. In some affluent school districts, nothing less than the student's acceptance by an Ivy League college is acceptable. Such messages create chronic underachievers with low self-esteem.

Many parents accept complete and unreasonable responsibility for their children's actions; this leads to the types of problems discussed by Bruce Baldwin (Beyond the Cornucopia Kids: How to Raise Healthy Achieving Children, 1988). These children never develop internal governors or an internal locus-of-control because they know that their parents will never force them to face the consequences of their actions.

Physiological handicaps may exist as well. Something as simple as poor eyesight or hearing loss, may lead a child to fall behind in school. Gifted students also suffer from learning disabilities which are undiagnosed until relatively late because they are able to compensate in the early grades. Additionally, they may have Attention Deficit Disorders, and lack the social skills necessary to perform well in school.

Societal causes of underachievement are often discussed in the literature. For example, the influence of a poor neighborhood

mitigates against good school performance, particularly if the student's peer group is lower in academic ability. Uneducated parents may be unable to guide such students positively, and minority students from low SES backgrounds can receive mixed messages regarding academic achievement from their family, community and school. In addition, gifted girls may begin to change their behaviors in middle and high school. Despite the existence of feminist ideas for the last twenty-five years, girls still want to be pretty, popular and not "too smart." (see, for example, Barbara Kerr, Smart Girls, Gifted Women, 1985)

This is not to say that schools are blameless. Gifted children, like all children, need teachers who are warm, considerate, cheerful and friendly, and above all, are NOT intimidated by their students' giftedness. The gifted are more capable than other children of reading body language and the messages of non-verbal communication. Such students need clearly stated goals, instructional objectives, feedback, reinforcement and praise, plus the opportunity to explore their own interests in a cooperative atmosphere. They must understand what the label "gifted" means, and that their learning style may be different from the teacher's learning style. Teachers must be sensitive to boredom, and accommodate to individual differences in skill levels. Professional educators frequently exhibit the same behaviors towards gifted students as do unthinking parents; both stress the need for absolute perfection, and look for the child to be equally gifted in all areas. In order for a gifted child to succeed, both groups must change their attitudes and behavior.

Is it possible for an underachieving child to improve? Obviously yes, but parents and educators must work together to cause it. According to Sylvia Rimm (Underachievement Syndrome: Causes and Cures, 1985, pp. 129-164), parents, teachers and the student must plan a course of action together. Joanne Rand Whitmore (Giftedness, Conflict, and Underachievement, 1980) also recommends the development of a sense of partnership among parents, teachers and the student. Often, family counseling is recommended (Green, Fine and Tollefson, 1988). In addition, some school systems use group counseling, where such topics as the nature of giftedness, career planning, learning styles, teaching styles, and intellectual and philosophical differences are discussed. In the Lower Merion School District, resource teachers begin the school year by discussing the nature of giftedness and the kinds of problems caused by this label. By using the Judy Galbraith books (e.g., Managing the Social and Emotional Needs of the Gifted by Connie Schmitz and Judy Galbraith, 1985), our students -- many for the first time -- are able to understand why they are in a special

program. This awareness helps them to work better with parents and teachers.

When one bears the label "gifted," it is assumed, at least by school personnel, that the student will automatically attend college. But many gifted students have other aspirations. Schools and parents must help them to establish realistic, long-range goals; for some, this may be a high school diploma, for others, admission to a prestigious college. Sometimes, goal-setting alone helps an underachiever do well enough academically to be able to enter college if that becomes the final choice.

A complete evaluation, both educational and psychological, is necessary before a "prescription" for change can be written. Although this is both expensive and time-consuming, it alone can give parents and educators an understanding of the problems which may be causing the underachievement.

Schools too must make modifications, even without the support of parents. Resource room teachers of the gifted can create a supportive environment for students, in which goals are clearly stated and rules set. Rewards and punishments must be clearly understood by the student and fairly implemented. Teachers, whether in a resource program or one which is subject oriented, must remember that students who are gifted may be as different from the norms as those who are retarded; allowances must be made for different learning styles and academic strengths and weaknesses. Often, this involves education for teachers who work in the basic program and for administrators; both groups have difficulty understanding the components of giftedness.

Working with gifted underachievers can be very frustrating. Even with intervention such as therapy, family counseling and in-school modifications, the evidence of positive change, in the form of better grades, may not be apparent for two or more years (Mallinson, 1962). Today, most school districts remove underachievers from their gifted programs if they "can't or won't keep up." Dr. Ann Crabbe, a former President of The Association for the Gifted (TAG), wrote that: "I am very concerned about the students we select to take part in programs for the gifted. . .the reality of the situation is that many of the states concentrate their services on students identified according to academic achievement. . . .If we concentrate efforts on the high ability nonachievers, we risk showing no positive gains at all. . . .As long as we have limited funds for serving gifted students, I do not see how we can continue to justify spending those funds on programs for kids who are already excelling in school. . .at the expense of

those who are failing to come at all close to their potential. . .I strongly advocate giving priority to services for those children and youth whose potential is high, but whose performance is low." (from the Pennsylvania Association for Gifted Education Newsletter, 1987) The problem of underachievement must be studied in depth. Only by reaching out to gifted underachievers will they be able to reach their potential.>> REFERENCES FROM PERIODICALS: [1] Fitzpatrick, J.L. (1978). Academic underachievement, other-direction, and attitudes towards women's roles in bright adolescent females. Journal of Educational Psychology, 70(4), 645-650. [2] Gallucci, N. (1988). Emotional adjustment of gifted children. Gifted Child Quarterly, 32(2), 273-279. [3] Green, K., Fine, M.J., & Tollefson, N. (1988). Family systems characteristics and underachieving gifted adolescent males. Gifted Child Quarterly, 32(2), 267-272. [4] Mallinson, T.J. (1962). A comparative study of four types of treatment in improving adjustment and school achievement of gifted underachievers. Toronto (Ontario) Board of Education Research Department.>>

ARCHITECTURE AND THE GIFTED CHILD'S SENSIBILITY
BY MICHAEL E. WALTERS, NEW YORK CITY PUBLIC SCHOOLS

The intellectual activity of careful observation should be an important component of the differentiated curriculum. Architecture is one of the grand areas of the Humanities which develops and extends the gifted student's innate skills of observation. This type of observation is not a passive seeing but instead involves the gestalt personality traits of the gifted, i.e., their desire to analyze information, reconstruct ideas by using their imagination, theorize, and understand the impact of individual and collective endeavors through making detailed observations of the environment.

The writings and life of the great American architect, Frank Lloyd Wright (1867-1959), are an excellent example of why architecture should be an important component of the gifted curriculum. The study of Wright's early life shows how essential his kindergarten experience was for his future development. The concepts of Frederick Froebel such as the importance of using blocks in play activities were emphasized in his early years. "Cosmic, geometric elements were what should first be made visible to the child-mind. . . .In outline the square was significant of integrity; the circle -- infinity; the triangle -- aspiration; all with which to 'design' significant new forms." These words of Wright describe the power of Form upon a developing gifted child.

The gifted child needs to become involved in the intellectual debate involving the role of Form and Function in architecture. Wright is believed to have supported the idea that form follows function, but he actually believed in the unity of form and function. His awareness of this concept was stimulated by his personal experiences with nature which influenced him to create architectural forms that used the natural landscape. For the gifted child, this observation concerning the relationship between the landscape and houses or buildings is indeed an important stimulant to the creative process.

Perhaps Wright's greatest insight was his realization that simple architectural designs are related to organic forms. Pseudo-complexity disunites and dissolves; it is the preciseness of simplicity that creates valid organic forms. Finally, Wright's perception of architecture as being simultaneously a beginning of creative structural forms and a link with our past, present and future is an important insight for the gifted student. The architect creates his new art form out of humanity's cultural past. Wright was influenced by various cultural forms such as the temples of primitive Central American Indians (e.g., the Mayans) and the Japanese house and rock garden.

Thomas Jefferson also demonstrated how architecture is a serious human activity for the gifted personality. Jefferson's two great architectural creations were his home, Monticello, and the University of Virginia. The following comments by historians Allan Nevins and Henry Steele Commager (1942) in their popular history of the United States written during World War II captures the spirit of Jefferson: "Thomas Jefferson was, in his generation, the most imaginative and resourceful of American architects, the only one who combined landscape gardening with architecture in the great English tradition. . . . The University of Virginia, planned and built and landscaped by Jefferson when he was in his seventies, was -- and probably still is -- architecturally the most beautiful and harmonious group of buildings in the country."

Wright was very influenced as a teenager by Victor Hugo's The Hunchback of Notre-Dame, especially a chapter (Book III, Chapter 1, pp. 112-113) in which Hugo describes how architecture expresses the concepts discussed in this essay -- organic structures, individual and collective endeavors, originality, and a cultural continuum: "Great edifices, like great mountains, are the work of the ages. Often art undergoes a transformation while they are yet in progress -- pendent opera interrupta (works once interrupted, remain suspended) -- they go on again quietly, in accordance with the change in art. The new art form takes the structure as it

finds it, encrusts itself upon it, assimilates it, develops it after its own fashion, and finishes it if possible. The whole process is accomplished without effort, without reaction, without disturbance, according to a natural and tranquil law. A shoot is grafted on, it grows, the sap circulates; vegetation is in progress. Certainly there is a volume of material, even a history of all human nature, in those successive engraftings of several styles at different heights upon the same structure. The man, the artist, the individual is lost under those great masses without an author's name. Human intelligence can be traced there only in its aggregate. Time is the architect, the nation is the builder."

By studying the great architects such as Frank Lloyd Wright and Thomas Jefferson, gifted students will see how developments in history, politics, the arts, the sciences and technology have influenced the edifices and homes of our civilization. These architectural designs provide the gifted with the most ostensible examples of how the values of the Humanities affect their daily lives. This is why it is necessary to make the study of architecture a vital part of the Differentiated Humanities Curriculum.>> REFERENCES: (1) Gill, Brendan. Many Masks: A Life of Frank Lloyd Wright. New York: Ballantine, 1987. (2) Hugo, Victor. The Hunchback of Notre-Dame. New York: NAL, 1965. (3) Kaufmann, Edgar, & Raeburn, Ben (Eds.). Frank Lloyd Wright: Writings and Buildings. New York: NAL, 1960. (4) McLaughlin, Jack. Jefferson and Monticello: The Biography of a Builder. New York: Henry Holt, 1988. (5) Nevins, Allan, & Commager, Henry Steele. A Pocket History of the United States. New York: Pocket Books, 1981.>>

NEW CURRICULUM GUIDE ON TEACHING THE HUMANITIES TO SECONDARY LEVEL GIFTED STUDENTS -- Phyllis Girard, James LoGiudice and Virginia Woodbury of the Bucks County, PA Intermediate Unit No. 22 have recently published an outstanding summary of their humanities curriculum entitled, Making Connections: Learning Challenges for Secondary Gifted Students. We highly recommend this book because it provides many rigorous ideas for teaching such topics as Contemporary Art, Drama & Philosophy, Ethical & Social Questions, and Greek Theater. It can be ordered by sending \$10.00 to: Bucks County Intermediate Unit 22; Attn: James LoGiudice, Supervisor, Programs for the Gifted; Bucks County Bank Center; Doylestown, PA 18901. Please note that both Jim LoGiudice and Phyllis Girard have published books with us in specific areas of the humanities, i.e., drama, ethics and the foundations of the humanities (with Mike Walters), and an introduction to philosophy. Write GEP for more information about these comprehensive publications.>>