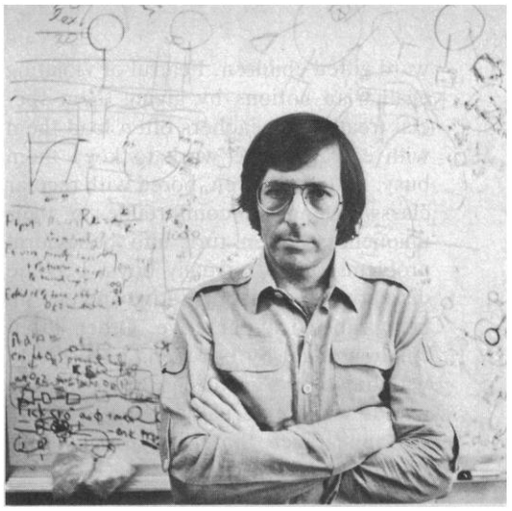
mitted to the Harvard company and their colleagues who were signed up with private gene splicing companies. He is also unhappy at the example that may be set for other universities. "Harvard's decision is not just a selfish decision of its own because, for better or worse, Harvard provides a pace setting image." The university set an excellent example when it declined to accept classified research in its labs; Mendelsohn fears the opposite effect of a decision to admit industrial research on campus.

Other critics feel the whole notion is naïve. They wonder how it would help for Harvard to play the nice guy in the business arena and finish last.

Faculty opinion seems weighted against the Bok proposal at present. According to one observer, the overwhelming majority of scientists have objections to the plan, while those in the humanities and social sciences say it is the scientists' affair but are privately very apprehensive. The faculty council has asked for two committees to be set up to study the issue, but it is not clear how far the administration intends to listen.

What has drawn Harvard into this quagmire is the heady expectations of a genetic Eldorado, which were made even more feverish by the extraordinary reception accorded last month to Genentech's first public offering of its stock. Genetic engineering is at present enjoying high fashion in the business world. The Dow Chemical company recently announced a $5-million contract with Collaborative Genetics, a small genetic engineering company based in Waltham, Massachusetts, which specializes in yeasts. Dow's rival, Monsanto, has purchased a $20-million share in Biogen, a small but multinational gene splicing company. The National Distillers and Chemical Corporation announced last month a $100-million project to produce alcohol from corn by a continuous fermentation method that eventually will use genetically engineered yeasts developed by Cetus, another leading gene splicing company.

These activities reflect a basically healthy development, but one that is not without its dangers. Investors' response to Genentech, whose shares leaped from $35 apiece to $89 in a matter of minutes, is seen by some observers as a danger signal. Companies with less solidity than Genentech might attempt to profit from investors' excessive hopes for genetic engineering. Not only may the wrong companies get the investments, but a lot of people could lose their money when the speculative bubble bursts.



Rick Stafford Photo

The Ivy League Gene Co.

Mark Ptashne has made Harvard a tempting offer.

As for academe, the growing pains caused by the commercialization of molecular biology are obvious enough. "It would be much better to keep the field clear of all commercialization. I feel it will lead to much less warmth, if there ever was any, to a lot less trust, and a lot less fun," says an NIH researcher involved in a hot money field of molecular biology. As Harvard seems to be discovering, money is nice, but maybe it's less painful to let others make it.

—NICHOLAS WADE

A New Visibility for Gifted Children

Programs proliferate for the exceptionally able, but few know how best to nurture the "severely gifted"

Einstein didn't talk until he was 4 years old or read until he was 7. Thomas Edison was regarded by both his parents and teachers as retarded. How many modern day Einsteins and Edisons are being overlooked now by their teachers, shunned by peers for their odd ways, allotted by society to the weirdo pile where their extraordinary talents may never have a chance to unfold?

There is a marked upsurge of interest these days in the phenomenon of gifted children and how best to nurture their abilities. The Office of Gifted and Talented in the Department of Education, established in 1972, got its first substantial budget this year—some $6.2 million. Many states and localities have developed an active interest in providing special programs for gifted students. The suicide this year of a gifted Ohio teenager, Dallas Egbert, has resulted in creation of a foundation in his name whose purpose is to supply clinical psychological services to gifted children. Gifted children have become the "growth stock of the education business," according to educational psychologist Joseph Renzulli of the University of Connecticut. Psychologists and educators tend to agree that the trend is in reaction to widespread deterioration in the quality of public education—in other words, a backlash against mediocrity.

Now, many people are coming to believe that investment in nurturing the gifted is an investment in the future of the country. Says Harold C. Lyon, director of the Office of Gifted and Talented, "they are our most valuable and neglected natural resource."

Despite the existence of government programs to aid every conceivable type of minority, the general attitude has been that exceedingly bright and creative children can perfectly well take care of themselves. "Talent will out," or "the cream always rises to the top" have been generally accepted aphorisms, but those involved in the field insist that the talents of many gifted children can easily be stifled and their motivation snuffed by conformist educational systems devoted to catering to the needs of the majority.

The fact is, according to experts in the field, gifted children have a tough row to hoe, and the more exceptional they are, the tougher it is for them, both educationally and emotionally. An unusually able child in a class of average children is often made to feel like an oddball. Even teachers, perhaps threatened by superior brains, often respond with hostility to-

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ward gifted children. Fearful of violating egalitarian notions by giving them special treatment, teachers often load them with extra routine work to keep them busy. Gifted children, bored with regular classwork and uncomfortable in their uniqueness, often turn into behavioral problems. Many, usually boys, become disruptive and uncooperative and end up being labeled hyperactive. Other gifted children adapt by becoming excessively withdrawn and go off into their fantasy worlds while externally trying to create the appearance that they are just like everyone else.

But according to James T. Webb of the School of Professional Psychology at Wright State University, gifted kids "are different by definition. They don't act like other kids by definition. They are more inquisitive, quite active, they often need less sleep, they get into things. Very often they are seen as hyperactive, obnoxious, unruly, strongwilled, mischievous, unmanageable and rebellious."

Webb, who has been named to administer the Dallas Egbert Fund, says that because they are out of step with family and peers, gifted children are more prone to feelings of loneliness and depression. They manifest depression even as very small children—through withdrawal, temper tantrums, destructiveness. Psychiatrist Rima Laibow adds that the gifted child often suffers from isolation and feelings of "invalidation" of internal perceptions. Children need to grow up with a feeling of "rightness" she says—that "what is there is real and right. Yet what they get is continuing invalidation."

> Gifted children have become the "growth stock of the educational business."

Webb says the problems are particularly severe for gifted girls, since females are not expected to be rebellious. Since minorities often come from a culturally impoverished environment, the disparity between them and their peers is even greater. They are often ostracized and even their parents think they're strange.

Parents of the gifted also have problems. Some try to force their little geniuses into a purely cognitive track of development, overlooking the fact that even if they think like adults, they still have the emotional needs of all children. Some parents feel almost as lonely as the children. They find that very few people sympathize with their "problem." They get no help from the schools and suffer from a general unavailability of information.

Research on gifted children has been paltry; indeed the main reference point remains the longitudinal study of high IQ children begun by Louis Terman in the 1930's which, among other findings, contributed to dispelling certain derogatory myths about brilliant people by demonstrating that the intellectually able also tend to be more successful, productive, and physically and mentally healthier than average.

One reason there has been so little research is that looking at exceptional people is by definition an elitist pursuit and runs against the prevailing egalitarian philosophy. Now a new generation of research is in the seminal stage, research which strives to reconcile egalitarianism with elitism by proposing a far broader definition of "gifted." In all past research, IQ tests have been the sole determinant. Now researchers are looking into a variety of measures, subjective as well as objective, of creativity as well as intellect to identify the gifted. This development, says Renzulli, "is about the newest and biggest thing in the field since Terman's work." There still is an intellectual division in the field, which Renzulli characterizes as being represented by the "absolutists" on one hand, who believe giftedness is a fixed quality "you either have it or you don't" and those, on the other hand, who see giftedness as a more fluid, plastic quality often dependent on particular circumstances.

The federal government definitely espouses the latter concept. According to Lyon of the Office of Gifted and Talented, IQ tests, which he regards as culturally biased, have become of marginal use in detecting giftedness. Indeed, he maintains that if definition of giftedness were confined to the top 5 percent of IQ scorers (130 and above), 70 percent of what his office defines as "gifted and creative" would be left out. His office has evolved a five-dimensional definition of giftedness: high IQ; academic aptitude; creativity as evidenced in "divergent thinking;" ability in the performing or visual arts; and "leadership." This last category comprises what Lyon calls the "psychosocially" gifted. Although some states are adopting this taxonomy, not everyone agrees with it. At the Uni-

(*Continued on page 882*)

Advising Reagan on Science Policy

During the campaign, Ronald Reagan said little about how he would direct the government's science and technology policy, and he mentioned no candidates for the post of White House science adviser. But now that Reagan has won the presidency, he will find it easy to get advice. On the first weekend after the election, a group of senior science gurus met in Washington, D.C., to draft some preliminary recommendations for the President-elect and possibly suggest nominees for key science posts.

The 15-member task force on federal science and technology policy is being cochaired by Simon Ramo, director and the "R" of TRW Inc., and by Arthur Bueche, senior vice president for technology at General Electric Co. The group has held a couple of informal meetings in the last month, and plans to begin working in earnest on 8 November.

According to Ramo, the first assignment is to come up with a paper by the second week of November addressing three concerns of Reagan's staff. First, the administration-in-waiting wants to know what the scientific community considers to be the most urgent actions needing the President's attention. Second, the group has been asked to suggest ideas for the inaugural and state of the Union addresses, particularly legislative ideas. Third, the task force will be asked to suggest candidates for appointive offices in technical agencies throughout the government.

One of Ramo's wishes, which may or may not find its way into the group's paper, is that the President include scientists more intimately than did Carter on decisions that affect national security, energy, economic competition with other nations, innovation, and unemployment. Ramo thinks the role of the science adviser was narrowed and weakened in the Carter White House. He would prefer a science adviser who could initiate programs, attend meetings of the economic advisers and the National Security Council, and speak in a voice that would be heard above the background clatter of Washington politics. Ramo would also like to see the Presi-

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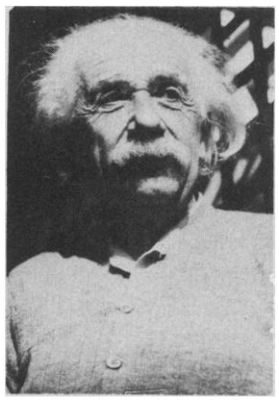
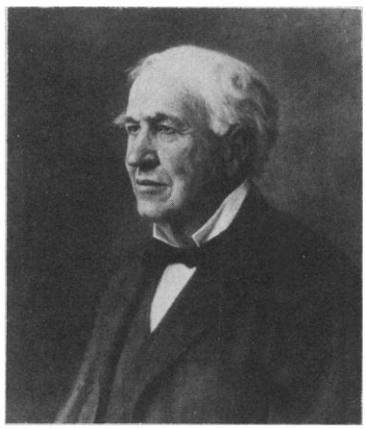


Princeton University Photo

Einstein: slow to read



Edison: dim bulb?

(Continued from page 880)

versity of Connecticut the definition is a threefold one involving excellence in a particular area; "task commitment" or motivation; and creativity.

Lyon's office, which gives 75 percent of its money in matching grants to states for educational services to gifted children, has laid down extraordinarily open-ended criteria for their identification. Giftedness may be measured by IQ tests—in states where such tests have not been outlawed in the schools—also by various tests of creativity devised by Paul Torrance of the University of Georgia. Children can also be "nominated" for programs without tests, simply through judgments by their parents, teachers, peers, or just themselves. The government, which democratically wants to include as many people as possible in the gifted elite, decrees that no child can be barred from an educational program based on only one measure. Ideally, Lyon thinks everybody should be gifted.

Education programs, thus guided by the federal government, are really aimed at bright, creative children—with emphasis on those from culturally impoverished backgrounds, and more recently, handicapped children—rather than what used to be referred to as "geniuses."

The trouble is, of course, the more children included under the label "gifted," the less likely programs are going to be relevant to those at the top of the spectrum, the super gifted, sometimes referred to as the "severely gifted."

Rima Laibow, a psychiatrist and mother in Dobbs Ferry, New York, has taken it upon herself to be the champion of what she refers to as "supremely gifted" children, those whose IQ's measure 180 and higher. "These are the children," she says, "who if nurtured properly will change our culture and our lives." There is really no way to accurately test their abilities—"there is no norm for these kids. They just blow the top off any test they come in contact with." These are the types of children who start spouting Shakespeare at 2, beat all the local chess masters at 5, write symphonies at 10. For these children and their parents, life can be difficult. They are so rare—Laibow says she has so far located about 45 such children around the country—that they have no one else to share their experiences and problems with. Classes for the gifted don't serve their needs, for in them they are like bright children put in a class for the retarded. Not only are they isolated, says Laibow, but discriminated against by a society that is simply "not set up to deal with the divergent." For example, she says, children under 5 are not allowed to visit the Franklin Institute Planetarium.

Laibow has written an elaborate proposal to improve the lot of this, probably society's most exotic, minority. She wants to set up an education network for children aged 3 to 16 which would involve computer, video, and telephone hookups so the young geniuses could readily communicate with each other. The network would also involve locating and training mentors for the children. (The federal Office of Gifted and Talented also wants to get children together with mentors, which surveys have shown are often crucial in the development of gifted people.) Laibow also wants to set up a family support system that would feature twice-yearly meetings including a 2-week summer camp for children and families. She also wants to generate research on such things as infant development, cognitive styles, and construction of ability tests capable of reflecting the talents of the supremely gifted.

The field is indeed ripe for research. Although much attention is being paid to development and evaluation of special programs for the gifted, very little research is being done on the children themselves. One exception is a longitudinal Study of Mathematically Precocious Youth that has been conducted for the past 10 years by Julian Stanley at Johns Hopkins University. One finding of Stanley's group has been that boys score significantly higher than do girls on math in the Scholastic Aptitude Tests, a finding they do not believe can be totally attributed to socialization.

Another project, conducted by Halbert Robinson at the University of Washington is a study of the social and emotional as well as intellectual development of preschool children who are extraordinarily advanced academically—that is, whose IQ scores are at least four standard deviations (164) above the norm. Robinson says the experiences of his group puts the lie to the idea that intellectually precocious children are inherently more "at risk" socially and emotionally.

There is still very little known about the etiology of genius because the subjects are so rare. But experts believe the gifted can supply unique information on the development of intelligence in human beings, different cognitive and learning styles, and clues about what sort of environment it takes for ability to blossom.

There is no question that there is a fresh surge of interest in gifted children around the country. Lyon attributes it partly to a repetition of the post-Sputnik flurry of concern about education. "The country is concerned about the gifted only when in crisis," says he. James Gallagher, professor of education at the University of North Carolina, says that there seems to be an "aching for excellence" across the land, as reflected in the fact, for example, that a meeting in October of the National Association for Gifted Children attracted more than 1000 people, compared with only a handful a decade ago. He also remarks on the proliferation of parents' groups. The thirst for quality is also shown in the overwhelming number of applications received at North Carolina's new residential high school for those gifted in science and math, in Durham.

So the gifted, like the blacks, the women, the handicapped, and innumerable other groups are finally making their presence and needs known. It is perhaps comforting to see that, amidst strong currents of anti-intellectualism and a widely perceived decline in quality in this country in everything from presidential leadership to candy bars, a countervailing force, recognition and cultivation of excellence, is making itself felt.

—CONSTANCE HOLDEN