but I do not ever recall an anonymous award of any size being bestowed at a science fair. I am convinced that the type of recognition suitable for fostering student achievement must be determined locally and awards should be assigned with discretion. I can think of no more logical approach to the question because it has such parochial implications. Local science fair directors know their students best. The 4-H awards different colored ribbons for different accomplishments. Some are first place ribbons, other second place. Some are for the grand champion, some for reserve grand champion placement. Every entrant receives an award—a ribbon. No one goes home feeling his efforts were completely in vain, though some realize that they could have done a better job. Likewise, every science fair entrant should be given some acknowledgment of participation. This is the essential minimum.

Who Should Participate?

I cannot leave the subject of science fairs without reference to one more concern. Who should participate? Because science is, in the investigative sense, an activity requiring more than superficial involvement, the science fair experience should be reserved for students who want to do something extra. Students should never be assigned to enter a science fair, unless the assignment is optional with an academic string attached. It is my belief that the assigned project that most often appears as a poster, chart, diagram, or model. Such projects, as I have said, only exacerbate the ill of science fairs.

I do not subscribe to science fairs for only the scientific and academic elite. I do subscribe to high-quality fair administration and participation. High quality need not be synonymous with elitism; it can simply be an acknowledgment that minimal standards, however defined, have been established and used. Participation should be voluntary with no academic reprisals for the student who chooses not to participate. Annual fair dates should be announced in advance. If possible, fairs should be held at approximately the same time each year.

In Conclusion . . .

One is obliged to understand what science really is before assuming the responsibility of leading another through the process of science. All science fair directors and teachers-sponsors accept this obligation when they assume a responsibility related to student gain; it is a science fair. To assume the responsibility without honoring the obligation is not fair to anyone—especially the student.

Recent Related References


Hormone Action

from p. 42

References


Adolescence Obligations

and Educational Policy

Stephen P. Heyneman

During this century we have made great progress in extending human rights to children and young people. Large scale, exploitive sweatshops are a phenomenon of the past; many state statutes contain provisions against corporal punishment in schools; and the public is now influenced when there is evidence of child abuse or neglect. Many constitutional rights and privileges, previously granted to adults over 18, have been extended to children and adolescents. High school dress codes and modes of speech restrictions have been relaxed; the right to defense in juvenile court is now mandatory; and employers are required to pay children the national hourly minimum wage for part-time work. These are but a few.

Moreover, these legal trends are consistent with social trends and social policy generally. Over the last two decades, educational systems have been modified so that young people can play an increasing role in deciding what they want to learn. As a result of career education and other reform movements, young people are helped to make informed choices in their training for their future careers (Heyneman, Mintz, and Mann, 1977); these projects were designed to give young people an increasingly active voice in the guidance of their own affairs and in the affairs of others. This, too, is healthy.

Nevertheless, social policy on adolescence can be divided into two categories; the above examples represent only one. They represent a category in which an adolescent's participation is "sponsored"(2); that is, an adult's privilege or an adult's activity is extended to adolescents, which they can choose to exercise without having to remember their non-adult financial or legal status.

The second category of social policy is one that recognizes adolescents. This differs from the first in that in exchange for legal protection, education, and work, a non-adult is asked to participate in an activity over which he has little or no choice (Heyneman and Tatum, 1977). Thus the first category of policy represents the "sponsoring" experience; the second category represents the "required" experience. I contend that public policy on adolescence has concentrated on the first and has ignored the second. Briefly I shall summarize how each can be defined both for private (family) and public policy, including education, and then suggest how social policy which "requires" something can be advanced without it being unjust.

Sponsored Adolescent Participation

When adolescents are given the right to help make family decisions, the extent of their authority is determined on the basis of their maturity and the issue involved. Outside the family when adolescents are extended the right to help run school disciplinary committees, serve on courts, school boards, small businesses, run away centers, drug control programs, or day care centers, their authority within these institutions should be encouraged and welcomed; but in such settings adolescents do not have either ultimate control or responsibility for failure. The extent of adolescent authority is based upon a mixture of personal competence, precedent, and negotiation. However, because nonadults cannot legally own property, make a will, act as business agents or fiduciaries, hold public office, vote, or enter into business partnerships, and especially because they cannot be held responsible for debts, the financial and legal obligations accruing from their participation in institutions ultimately rests with adults.

Regardless of how much authority adolescents are given, it is sponsored authority, and the limits of their authority can always be identified (Becker, 1975). Despite

Stephen P. Heyneman is a sociologist/educator in the education department of The World Bank, 1818 H Street, N.W., Washington, D.C., 20433. He received his B.A. degree in political science and international relations from the University of California, Berkeley, in 1966; his M.A. and Ph.D.degrees in comparative education from the University of Chicago in 1971 and 1975. His fields of interest include comparative education, the development of public policy on adolescence, and program evaluation, and he has published articles in each of these fields. This article is based on a presentation he made to the American Educational Research Association, April, 1977, and his work with the Federal Government's Interagency Panel for Research and Development on Adolescence.

ADOLESCENCE OBLIGATIONS 423

422 THE AMERICAN BIOLOGY TEACHER, OCTOBER 1978
these restrictions, sponsored participatory experiences are believed to be so important that some have suggested that they should be a universal addition to classroom participation. (See also pages 630, 701.)

**Required Adolescent Participation**

Adolescents are frequently required to participate in family duties. In families without wealth, contributions in such areas as household maintenance and child care are financially essential. However, even among wealthy families, adolescent participation may be required in exchange for support. Requiring assistance in the home is justified in the eyes of the law of both state and church. In this way, when many families live on farms, adolescent participation was unquestioned and universal; today we have to be reminded by professionals that to require participation is as necessary for healthy adolescent psychological development as it ever was (Baumrind 1974).

In communities larger than families, it is also normal to require adolescents to assist in exchange for privileges and opportunities. A common example is the requirement that members of some communities see required participation as essential for maintenance and survival. This is the case in those African countries where school children are required to teach others to read within a local kibbutz (where adolescents as well as adult labor is needed); and among religious communities, such as the Mormons or the World Community of Island in the West, which require adolescent participation as a normal part of becoming a community member.

**Required Participation and Educational Policy**

The question I wish to raise is twofold: (1) Is there justification for considering this "required" participation as a part of educational policy? (2) Given that we are a democracy that values free choice, how might we go about requiring participation without being unfair? To answer these questions it might be helpful to examine the views of several individuals: the famous Flandersian etiologist and educator; James Redfield, a classics scholar; Sidney Hook, a sociologist; and Francis Schrag, a philosopher.

Flanders holds that one purpose of schooling should be to teach the common culture. Deciding what is "common culture" in America is not simple, she admits, especially when a teacher is faced with a class containing a wide variety of students. Furthermore, she argues that it is hazardous for adults to not decide anything, and instead turn the problem over to students and ask them to choose what they think is "universal" (Flanders 1970).

Asking that adolescents choose what they wish to learn and what they wish to prepare for certainly may, at times, temporarily, ease our moral dilemma with respect to curriculum. But this would not be at the cost of respect for, or even recognition of, the fact that social groups are disproportionately represented in different occupational specialties, "we can always cite the adolescent as the cause. After all, wasn't it their choice that precipitated the more privileged to choose the less privileged?"' Their decision to choose chemistry and physics and the less socially privileged to choose "housekeeping"?"' Their decision to choose "housekeeping"?"' Their decision to choose the less privileged to choose a job that can offer them little or no self-respect, no more understanding of our society, and no more sees than the rest of us. The response: interest in counseling in schools is a sign of weakness, not strength. It is important that schools think of themselves fundamentally as socializing institutions--solutions for passing on the culture of the society--not as systems for individualized training. Although it does not follow that the society that controls the society must be the only one to blame for the limited choices the next generation has to prepare for continuing the ongoing society (Flanders 1970).

**Obligations in School: What to Learn First**

If it is intelligent socialization required to children to learn something in common, then we might ask what we should teach that is common among us. There are at least two responses to that question. If we were to follow the advice of Redfield, we would teach all children something about a classic. As he says:

The loss of the classic . . . parallels the loss of the sacred; both involve the loss of traditional authority. Here, in the man of today and throw him on his own resources; both, in celebrating individual conscience and individual achievement, are based on an ideal level of academic which he does not comprehend (Redfield 1976).

There is, of course, more than one classic. We might choose from Homer, the Bible, the Koran, the Iliad, Gita, and the Torah--all of which have elements in common, both religious and secular. However, if for some reason our courts decide that public schools cannot have anything religious, then perhaps we should require that education be based upon the constitution and the laws that derive from it, for clearly both of these are sacred and represent our common experience.

These are not our only choices, however. As a second option, we could take Hook's advice and require that adolescents learn what we decide is "absolutely essential for them to know." Hook would have all adolescents learn to communicate clearly and effectively and acquire a basic working knowledge of the natural sciences, to understand the nature of their own bodies; and be aware of the history of their society and the political and economic forces shaping its future. His requirements would hold for all, regardless of their projected careers and irrespective of whether they are presently aware of new needs (Hook 1971).

**Obligations of the School: How To Order Priorities**

As educators we must ask ourselves how schools can correctly socialize large groups of young people. I think we would all agree that the answer to this question is not new course, perhaps entitled, "Ways to Live Correctly." A curriculum of this nature is remarkably ineffectual, which sinks it in the irony, not the flattery; and this is particularly true when the message is juxtaposed against the shameous, aerial, and all found in Our hands and homes and roads. De-stigmatizing the curriculum will not affect behavior.

There are two answers. At the very least, students should be forced to adhere to the same legal and behavior codes as their teachers. Baumrind (1974) reminds us that "crimes committed within the high school setting should be punished just as seriously as crimes committed in the classroom, regardless of an individual's race or social experience. Such acts should be punished the same as any other crime." Teachers who commit these crimes are punished. To not apply laws to adolescents is morally inferior to the victims and to the society. The rights of adults and nonadults to work hard and in peace should at least apply to all individuals as anywhere else.

Furthermore, confusion in schools, particularly in the United States, stems from our unwillingness as adults to make choices. In some way we must force ourselves to decide what our educational priorities are. Are shop and driver's education really just as essential as biology and language? Students are confused by the lack of clear guidelines on what to study in high school in order to function in the world outside of their schools. In some schools students are denied the privilege of participating in team sports unless they maintain a specified level of academic achievement. An achievement is prevented from wasting their time on nonsensical subjects, even when they are living in more important areas.

**Public Policy Outside of Schools**

I began the discussion of adolescent obligations with the schools and their curricula but not because these are the most important elements in children's lives, but because they are the most central point of contact between the public and the individual child. In addition to being the most widely recognized role, they are a good illustration of obligations, because we probably would all agree that adolescents should learn something in common in exchange for social privileges that are established by the national for the public to place some priority on what children learn and how they behave, we must also ask ourselves if our schools are the only arena. To answer this question, we must look to the child in school. He reminds us that there are universal differences between a young child, an adolescent, and an adult. These are the differences to which I refer when speaking of a social policy grouped about the adolescent age is a youth who is below the legal age of adulthood (Heinemann and Daniels 1976). Schrag's reasoning illustrates why an adolescent is not a child; a child is more dependent, physical and emotionally. A child might run in front of a car before she can understand streets. Thus three-year-olds cannot be allowed to drive trucks, for they would be a danger to themselves and others.

An adolescent differs from a child in that she is more capable. The development of competency is far from even; some 15-year-olds are less mature than the 5-year-olds. But the normal 15-year-old is more able than an 8-year-old. As children grow older, the more capable they are of assisting their communities; therefore, it is right to require that adolescents fulfill social obligations and to give adolescents special privileges not yet afforded children.

Yet, no matter how capable adolescents may become, the fact remains that they are not adults and should not be treated in precisely the same way as adults. There is a sound legal distinction between an adolescent and an adult, and the privileges and responsibilities of the 15-year-old are far different from the 15-year-old, that are far different from the 15-year-old who has not yet attained the political power to "powerless" persons, such as women and minorities, should be emphasized. And the criterion of age (Baumrind 1974). Thus, the legal concept that divides an adolescent from an adult is not to be based solely upon science, for many adults retain adolescent characteristics and many adolescents possess adult characteristics. Instead the distinction is correct to decide upon an individual and which an individual deserves special protection. Whether we define adolescence as being 15, or 18, or 21, and no matter how much we wish to have them participate in decision making, the category of adolescence must remain. Our society is passing through a healthy period in which we are trying to decide what is and is not reasonable to expect from normal adolescents. The best way to answer this question is: nonadults social policy will always have to contain an element of what Fellers calls "induction," and, by that, this is not wrong.

Recent policies have not extended new rights and privileges to adolescents on the grounds that to deny these rights and privileges will somehow inhibit the transition to adulthood and socialize them to the proper standards that the nonadults social policy will always have to contain an element of what Fellers calls "induction," and, by that, this is not wrong. (Concluded on p. 432)
Adolescence Obligations... from p. 425

resenament, alienation, and, ultimately, in social deviance. Clearly there is enough evidence today of social deviance to justify our fear of it, but the question that continues to nag us is whether social deviance is inevitable. Must the opportunities and insufficient choice, or whether it exists for exactly the opposite reason—too much independence and too little guidance from the community, the culture, the family, and the race. As Wilson says, "There is absolutely no reason to believe that extending rights will reduce violence. Indeed, there is... no evidence against as in support of that proposition" (1967).

Scholars disagree intensely on this point. Because they disagree, it is important to examine our policy and see if it reflects both sides. So far, public policy has been unbalanced. Though there have been many gains in the realm of new rights and privileges, there have been no new extensions of adolescent obligations.

The white principal is that there are two elements with respect to policy on adolescence and two modes through which the wider society can encourage adolescent participation. One is sponsored, and on the adolescent's part, voluntary; the other is required, and on the adolescent's part follows in exchange for privilege and protection. Both styles should be encouraged in public policy, for without both, public policy will remain out of balance and ineffective.

Acknowledgment—Before anything else, I would like to acknowledge the support of the National Institute of Arthritis, Metabolism, and Digestive Diseases of the National Institutes of Health, and the Office of the Assistant Secretary for Planning and Evaluation, Department of Health, Education, and Welfare who, from opposite points of view, helped to sharpen my views on the rearing of children.

References

Selenium

Selenium is a trace element with a wide range of metabolic functions, including the regulation of several enzymes involved in antioxidant defense. Selenium is found in all animal tissues and is essential for the proper functioning of the immune system. The main source of selenium is food, particularly meat and seafood. Selenium deficiency is associated with increased risk of various diseases, including cancer. Selenium supplementation is often used to treat or prevent selenium deficiency, but the optimal dose and form of selenium supplementation are still being studied. Further research is needed to determine the optimal dosage and formulation of selenium supplementation for different populations and health conditions.

References