Crisis in Science Education

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This article reflects some of the opinions expressed by people attending the discussion about science education (1983 Annual Meeting). These opinions do not necessarily coincide with the views of the authors but these viewpoints certainly deserve to be expressed.

As with many problems facing the country, the bottom line seems to be economics. There is just not enough support for higher education. Some of the more obvious results are poorly equipped laboratories, lack of funds for research, limited money for sabbaticals, and last but not least, poor salaries for teachers. Too many qualified people are leaving higher education for better paying jobs.

Another concern is trend toward the retraining or "retreading" of teachers. Teachers are permitted to go back to school to acquire minimum knowledge of a subject and then are required to teach this subject. Some of these "voluntary" retraining programs are accomplished by holding the threat of job loss over the faculty member's head.

The policy of hiring part-time faculty has also contributed to the problem. These people often have less training and will work for less compensation. Too often these people have another full-time job and one questions how much time they can be spending on preparation for classes.

Another concern is the poor preparation of students at the secondary level. Not enough science courses are required for entrance into college; thus, many students avoid taking these courses in high school. Even more appalling is the lack of oral and written communication skills. There should be a minimum competency in writing obtained before students enter college.

A possible corollary to poor training is the way that science is often taught at the secondary level. In many courses, science is taught as a foreign language requiring students to memorize a vocabulary without having them think.

In addition, there is too much emphasis on job training at the secondary and college level. Students are too often encouraged to take only courses which will prepare them for a vocation. Hence, they may leave college without an education.

One of the foremost concerns is that of the training of administrators both at the secondary and at the college level. In most instances, they have none or little background in science. As a result they see little value in the laboratory portion of science courses. Another ramification of this concept is that laboratories do not require as much preparation as lecture; hence, labs are not counted as much toward the faculty member's workload. There is a tendency to place all too much emphasis on FTE as the sole basis for determining workload.

Perhaps the basic reason for the trouble in science education or education in general is the way that the public appears to perceive teachers. Teachers are now thought of as not being truly professional. Teachers have been relegated to
second class citizenship in terms of their salaries and the respect they are
given. Teaching often is perceived as a second job serving only to augment the
primary income of the family. Thus one of the big problems seems to be a public
relations problem.

There are some who feel that the teaching of "scientific creationism" is
detrimental to science education in general. It certainly does not appear to
contribute to true scientific thinking. One of the things science must teach is
to be aware of all possibilities.

Last but not least, faculty morale has descended to such a point that this
should be a serious concern of every citizen of this country. All of the
preceding factors contribute to this problem.

Some of the solutions would appear obvious. There must be a reordering of
the priorities of this nation. There must be more money and wiser use of the
funds which are allotted to education. Education should be the cornerstone of
our nation. It is important that knowledge be accorded its proper role in our
society. For too many years teaching as a profession has been relegated to a
secondary position. Until this is remedied problems will continue to occur.

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REVIEWS OF SOFTWARE FOR THE BIOLOGY CLASSROOM

(Editor's Note: As part of a computer evaluation program, members of the
Wabash College Biology Program reviewed software for Apple II+ and IIe computers.
Software were ordered with the conditions that (1) software could be returned
within 30 days if unacceptable, and (2) we agreed in writing not to copy
documentation, disks or program code prior to purchase. All software suppliers
agreed to these conditions.)

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Nucleic Acid Connection, COMPress $60.00

Content: There are three parts to the program: (1) Optional diagrams of nucleic
acid bases, (2) Graphics of a cell synthesizing 3 RNAs (transfer, messenger,
ribosomal) and (3) Nucleic acid connection. (2) is embedded in (3). (1) gives
structural formulae for AT:CG base pairs and allows a "Mutation to occur": DO
YOU WANT MUTANTS? A color monitor is important here. This viewer didn't care
for (1). (2) shows the RNAs coming out of the nucleus of a cell, folding up into
their conformation and forming polyribosomes. Parts (1) and (2) are elementary
compared to (3) which allows the operator to choose the length of a gene (100 or
300 bases) and display the DNA sequence, mRNA sequence or amino acid sequence of
the protein product. A genetic code dictionary is available as a display; it
should be printed in the instruction guide. A mutation always comes up in the
gene initially.

Evaluation: One should be able to see the whole gene and its system before
mutation occurs. 10 mutagenic agents may be applied to the gene. A sense of
mutation frequency is implicit in these operations; the program is virtually open
ended. The CG:AT ratio is indicated for each display of DNA sequence. The