Gray on the other hand, while not doing so during his lifetime, certainly triumphed after his death; for as the years pass, with each new book being written about early American scientists, his name is increasingly mentioned and his fame grows. His hard work, perseverance, and open-minded approach to new paths in science, particularly toward plant physiology, led the way to modernization of botany and other sciences in America. His textbooks brought science to the everyday man, not in flowery speeches but in simplified scientific terms recognized the world over. His classification and naming of American plants assured the American people of an uncluttered and undisputed beginning of their botanical nomenclature. And his work with his own students produced new leaders with visions of things yet unexplored and questions yet to be asked.

Gray stood for the open-minded approach to science looking upon the domain of nature as essentially an open universe made for scientific investigation and interpretation. Agassiz stood for the closed-minded approach to science using his a priori hypothesis as his basis and suiting his experiences to fit it. When Agassiz died in 1873, fifteen years before Gray, he had already seen the effects of Darwinism and the changes in science. During the remainder of Gray's life, the old followers of Agassiz either changed their views or died, so that Gray was able to see the modernization of American philosophy in science and to realize that in part it was due to his own efforts. The first battle in the history of America's war over evolution had been fought.

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VIEWS OF INSTITUTE PARTICIPANTS ON ENVIRONMENTAL ISSUES

During the academic year 1972-73, the University of Wisconsin-Superior coordinated an in-service institute sponsored by NSF that was held on four campuses of the University of Wisconsin system. Using the Tilton project materials (Hershey et al. 1972) as a basic resource, the institutes focused on environmental issues, particularly those relating to water quality.

Most applicants identified the need to expand their knowledge about environmental issues and to learn how to plan laboratory studies in environmental science that could be utilized by their students. For many participants with inadequate subject matter backgrounds, the institute served to upgrade basic skills.

The institute faculty had considerable difficulty implementing this program. How does one enhance or encourage teachers to use materials and ideas developed in an institute? Based on the assumption that the teachers' incorporation of strategies relating to environmental science would depend upon their own views about environmental problems, an effort was made to measure their initial attitudes. At the end of the course of study, another response was sought to determine if there was any change.

The instrument used was that reported by D. R. Stronck in 1972, "A Questionnaire on Environmental Issues," *(ABT* 34[4]:212), which was originally developed by students. Its ready availability and timeliness overcame certain reservations regarding specific items. In addition, it allowed the comparison of responses of teacher participants to those of students and parents.

The specific questions found in Stronck's article will not be repeated here. For purposes of analysis, the response "I strongly agree" was arbitrarily assigned a value of 1. (Questions 6 and 15 were exceptions, and the responses were scored opposite to the others.) "Agreeing" was scored as 2, "Uncertainty" as 3, "Disagreeing" as 4, and "Strongly disagreeing" as 5. Since this is opposite of Stronck's method, the values in table 1 must be subtracted from 5 to be comparable to his data.

In addition to the attitude questionnaire, participants were asked to report certain characteristics of their background and experience. This information was used to determine if there was correlation between these characteristics and the views they expressed on the questionnaire.

The responses were coded on data cards, and all analyses were done by computer. Measures of partici-

Table 1. Significant correlation coefficients between participant characteristics and attitudes. Correlations of 0.205 are significant at the .05 level of probability for N = 95.

		Correlated with	
Item	*Characteristic*	*Item*	*Correlation*
1	Grade level assignment	7	0.227
		*12	0.347
		Sum	0.213
2	Total credit hours taken	1	0.252
3	Years teaching experience		
4	Sex		
5	Size of school		
6	Size of community		
7	Hours of environmental science teaching	8	0.256
		12	0.236
		Sum	0.254

*Significant at the .001 level.

Table 2. Test-retest t scores for attitude questionnaire.

Item	Mean initial score	t score
1	2.3	1.30
2	2.0	1.62
3	3.0	0.15
4	1.8	0.01
5	1.5	1.41
6	2.9	1.07
7	1.7	2.58*
8	1.4	1.09
9	1.5	0.05
10	2.0	3.51*
11	1.9	1.05
12	1.7	0.75
13	1.9	2.11*
14	2.0	0.49
15	4.1	1.89*
16	2.9	1.47
17	1.7	0.89

*Significant at the .05 level for N = 90.

pant background were correlated with their scores on the questionnaire, and significant correlation coefficients are reported in table 1. To determine if there was a significant attitude change, a test-retest strategem was employed. The mean score, standard deviations, and standard error of the means were determined for each question and the sum of all items for the two test administrations. The correlation of the sets of scores for each question and sum were calculated. A t statistic was calculated for the comparison, following the procedure outlined by Garrett (1953).

Correlations between participant characteristics and views expressed on the questionnaire are conspicuous by their absence. Grade level assignment (of teaching duty) correlates with item 7 (that is, higher grade level assignment correlates with strong endorsement of the wise use of technology), with item 12 (enforcement of planning codes), and the sum score of all questions. Total credit hours earned are inversely related to item 1 (technology threatening man's survival), which might be expected. The other parameter in which significant correlations are found is in the number of hours the participant actually taught environmental science. This is correlated with item 8 (adult need of environmental science), item 12, and the sum of all the items. Teaching experience, sex of participant, major academic background, and size of school and community showed no significant correlations.

Table 2 reports the mean and t score for the questionnaire items. The mean response by the teacher participants varied from item to item more than those groups reported by Stronck. Other than items 1 and 15, the participants responded in a manner similar to college students and parents.

Changes in the responses of all items were evident, but only four questions displayed significant shifts of attitude. Item 7, which involves teaching the wise use of technology, was one in which there was significant change. Other noticeable changes occurred in items 10 (limiting use of gasoline in automobiles), 13 (land use control), and 15 (treating an aspect of progress). That such a strong shift should occur with the use of gasoline is somewhat surprising considering the relative lack of formal class attention to the topic.

In summary, teacher participants held views of the environment that were closer to those views held by other college students and parents rather than those held by younger students. Only very limited correlations were found between participant characteristics and their views. Some attitudinal change did occur during the institute. This is consistent with the realization that attitudinal change is a slow and demanding process which educators cannot take for granted. In fact, if attitudes are indeed important in environmental education, it is apparent that teachers not only need to examine their own views but they must provide experiences and opportunities which will enable them to help students clarify their own values.

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U.S. population grew by over two million people, almost the population of Los Angeles, reported Zero Population Growth in a year-end summary of population trends in 1974.

ZPG's estimate is based on Census Bureau data on births and net legal immigration. The Census Bureau estimated that U.S. population grew by 1.6 million in 1974, as a result of 3.2 million births, 1.9 million deaths, and 360,000 added by net immigration (legal immigrants minus emigrants). The number of illegal immigrants is estimated to be between 650,000 and 1 million by the Immigration Service, indicating that total growth in 1974 could be as high as 2½ million. The Census Bureau's estimate of 1.6 million additional people in 1974 is greater than the increase in 1973, which was 1.5 million.

According to the Census Bureau, the U.S. began 1975 with an estimated population of 213,203,059. This figure does not include the 3 to 6 million illegal immigrants estimated to be living in the U.S. who are not counted in census reports. Excluding illegal immigration, U.S. population is growing by 0.7 percent annually.