

BUILDING BRIDGES THROUGH HIGHER EDUCATION¹

by Robert W. Miller

Throughout recorded history the prospect of entering a new century has been cause for reflection and anticipation. It is not surprising then, that we are making much of the upcoming transition to the Twenty-first Century. However, this transition will likely be the most profound to date because it coincides with major social and economic shifts that are redefining what we think and what we do. These changes are rapid and accelerating, and are affecting our profession in bewildering ways. Most of these changes arise from an excess of new information that is providing new possibilities, new challenges, and new threats.

There is not space to discuss the many ways information and change affects our personal lives, rather I will address the effect of information and change on our professional lives. One way to keep up with change is to keep in touch with our system of higher education. Our colleges and universities, through research, provide information that generates change; and, through teaching, provide a source of future employees who are prepared to deal with change. The theme of my message then, is that: 1) change is inevitable, 2) change is accelerating, and 3) students are your link to change.

Change, The Big Picture

Human society has undergone two broad transformations; the Agricultural Revolution, and the Industrial Revolution, both of which produced broad social, scientific, economic and cultural changes. There is much evidence that we are now undergoing a third transformation to what has been variously labeled the "Post Industrial Era", the "Information Age", the "High Technology Society" or the "Era of Multiple Transformations". Furthermore, this transformation is occurring much more rapidly than previous revolutions, and subsequently is having an even more profound effect on us as individuals.

Numerous books have been published describing these changes, including "Megatrends" by

John Naisbitt (1) and "The Third Wave" by Alvin Toffler (2). These authors describe social and economic trends that are profoundly altering society, a number of which have a very definite influence on arboriculture and urban forestry (Table 1).

Today people are much more individualistic than in the recent past. They want to select from many options, abhor mass consumption, and are not at all concerned that their values might be different from yours. These values are reflected in the kind of landscapes encountered today; from urban prairies and woodlands, through oriental gardens, to formal landscapes. The ubiquitous bluegrass/maple savanna of suburbia may well be in decline.

More than ever before, people are loud and clear on issues such as pest management, safe and accessible parks, urban trees, wildlands, wilderness, etc. Not only do they speak out on these issues, they willingly form special interest groups to promote their causes.

We are undergoing a transformation from big to small; in business, labor, and government. Corporate takeovers in the business community are making the headlines, but most of the action today is in small business. For example, since the early 1970's most job creation has been in small business rather than the Fortune 500 companies (2). What could better define small business than the multitude of firms in the "Green Industry"?

Small business is not the realm of big labor unions, but for success small business requires qualified and dedicated employees. In order to hold on to good employees, work enrichment, fair compensation, and professional certification are essential components of personnel programs.

In government today innovation and new programs occur at the state and local level. Our profession is increasingly dealing with local ordinances and state laws, and we are in desperate need of better strategies for input in government decision making.

Linear thinking is giving way to holistic or

1. Presented at the annual conference of the International Society of Arboriculture in St. Charles, Illinois in August 1989

ecologic thinking at all levels. There is a growing awareness that urban areas are ecosystems and that the survival of urban trees depends on the interaction of social, biologic, and economic factors; rather than biology alone. Linear thinking led to the indiscriminate and sometimes foolish use of pesticides. Ecologic thinking is leading us to integrated pest management.

Industry demands hierarchies for control, but an economy based on information depends on a rapid and unencumbered exchange of ideas. Organizational structures of the future will be less well defined, and will encourage shared management.

The disposable society is giving way to the conserving society, and our profession will make major contributions to this effort. Eighteen percent of all urban waste is landscape waste. Our profession will recycle this waste, and it will be recognized for what it is; valuable resources as compost, minerals and energy.

Cities are no longer regarded as disposable. Cities are now being renewed on all levels; including parks, open space, and trees. The public embrace of Global ReLeaf should come as no surprise to anyone contemplating the future.

As we enter the next century our profession will no longer be dominated by white males. Between now and the year 2000, 85 percent of new entrants into the labor force will be women and minorities. The conserving society will stop wasting this valuable resource.

The Pace of Change

Toeffler in his classic work "Future Shock" (3) was the first to describe the acceleration of information flow. A few facts illustrate this point.

- One issue of the New York Times contains more information than one would experience in a lifetime in seventeenth century England.
- The average professional today reads 1000 pages a month just to keep current in his/her field.
- The scientific information doubling time in 1984 was 22 months; by the year 2000 it will be just 7 months (4).

This flood of information has completely overwhelmed conventional means of handling information. It is no coincidence that the computer age has not only coincided with the information age, it

helped make it possible. The capacity and speed of computers is keeping pace with the information explosion. In the 1980's the capacity of computers increased ten fold. The capacity of computers will increase 100 fold in the 1990's, just to keep up. Computer capacities and their expanding ability to process very complex problems will also greatly assist us in solving problems more holistically.

Technical information today has a half-life of around five years, and this is becoming shorter (4). This means that 50 percent of what we know about trees today will be obsolete in just five years.

Students—A Profile

Much is being said about education in the United States today, most of it negative, giving the impression that our young people are hopelessly mired in ignorance. Unfortunately, these statistics are based on national means and totally ignore the individual. My personal experience with students in Wisconsin leads me to conclude that they are of high quality, and every bit as good as they were when I first started teaching 17 years ago.

However, today's college student is different from those of a decade or two ago. For one thing they're older, the average age now being about 29. Older students are called non-traditional students, and they range from individuals who have never been to college to professionals seeking a career change.

Table 1. Social changes that will affect arboriculture as we shift from an industrial based society to an information/high technology society.

<i>Industrial society</i>	<i>Information high technology society</i>
Conformity	Individuality
Few options	Multiple options
Mass consumption	Individual selection
Single value set	Multiple value sets
Big	Small
—big business	—new industries
—labor unions	—local bargaining
—national government	—local/state government
Linear systems	Ecologic systems
Hierarchies	Networks
Disposable society	Conserving society
—resource waste	—recycling
—urban decay	—urban renewal
—neglected people	—new opportunities

College graduates today are in far greater debt than their predecessors (Table 2); an important factor to consider when offering a starting wage. A resident of Wisconsin attending a state university will spend more than \$20,000 on their education. Private schools are considerably more expensive than state universities.

This years' college graduate will change careers four or five times before they are 50, they won't retire until 70 or 75, and they will likely live to be 90. Professionals under 35 are now changing jobs every 18 months, and homes sell every 5.25 years (5). We not alone in our concern over rapid personnel turnover.

Opportunities

Opportunities abound in arboriculture and urban forestry. Our program at the University of Wisconsin—Stevens Point graduates about 25 to 30 students per year, half in December and half in May. Last spring we had 16 seniors about to graduate. On April 11 the job bulletin board listed 36 opportunities, and those were only current listings (Table 3). For the entire semester there were two to three times that many jobs posted.

Salaries are market driven, and starting salaries have been rising steadily over the past decade (Table 4). It is hard to find people because institutions of higher education are not producing graduates anywhere near the number demanded by our profession. On the other hand, employers must be sure just how much education they need in an employee. There are high school diplomas, one year technical degrees, two year associate degrees, four year baccalaureate degrees, Master of Science degrees, and Doctor of Philosophy degrees to select from.

Employers need to decide if they want a tree worker, a manager, or something in between. If you want a tree worker then it makes sense to hire a high school graduate and train the person on the job. If you want a manager, then hire a person with the most education you can afford relative to the responsibilities that person will assume. This is not meant to imply that a college graduate should not begin in the trees, for experience in the trees will make anyone a better professional in the long run. However, employers should not expect a college-educated person to be content with tree work for

an extended period of time.

Although colleges and universities are not graduating enough students to meet the demand, there are more schools out there preparing students for careers in arboriculture than we might imagine. Table 5 was derived from scanning catalogues of schools offering degrees in arboriculture, landscape maintenance, landscape architecture, urban forestry, horticulture, ornamental horticulture, etc. Most college libraries have extensive collections of catalogues from other schools.

Change and the Student

Just as change is affecting the profession, change is also affecting what the profession

Table 2. Average dept of graduating seniors from the University of Wisconsin.

<i>Year</i>	<i>Average debt</i>
1980	\$3,500
1986	6,900
1989	8,000 (estimated)

Table 3. Current job postings on April 11.

<i>Firms/agencies</i>	<i>Job postings</i>
—Arboricultural firms	15
—Landscape firms	11
—Municipal	3
—Consulting	2
—Other	5
Total	36

Table 4. Range of starting salaries in 1980 and 1989.

<i>Year</i>	<i>Starting Salaries</i>
1980	\$14,000 to 16,000
1989	\$18,000 to 24,000

Table 5. Number of schools in selected states offering programs of study in arboriculture, horticulture, landscape maintenance, urban forestry, and related fields.

<i>State</i>	<i>Number of schools</i>
Florida	8
Illinois	9
New York	11
Michigan	5
Minnesota	4
Oregon	4
Wisconsin	6

wants from the graduate. This presents something of a dilemma for the university. Initially, employers want to hire graduates who are technically competent, but, as stated previously, technical information has a half life of five years. Conversely, a key function of the university is to teach students to think, to question, and to broaden their horizons. The challenge for the university is to do all of this in four years.

We cannot ignore the need for technical competence, nor can we ignore the need for a broad-based education. Complex problems require solutions framed in a broad sociological and ecological context in which the problem exists, not just technical solutions. DDT is a good example of what can happen.

Just what are the skills needed for an emerging economy based on information and high technology? Graduates entering the new economy need: 1) communications skills, 2) problem solving—thinking skills, 3) ability to adapt to change, and 4) commitment to continued learning. This is not new, but a restatement of what is traditionally referred to as a liberal education. What is new is that a broad-based education is even more important today than it was in the past. Technical information is important, but over the length of a professional career the social sciences, humanities, and communication courses are equal in importance.

The Profession and the Student

There is a need to keep up with both technical and social change in our profession, and this takes leadership. Our leaders of tomorrow are in technical schools, colleges and universities today, but do we as professionals recognize this? Last year ISA Executive Director Bill Kruidenier, interested in involving more students in the ISA, asked the president of the Student Special Interest Group to write the 21 chapter presidents to request a list of schools in their areas. Only three responded!

In the Wisconsin chapter our experience involving students continues to be rewarding, and it is providing a source leadership for our chapter and our state. Students have always been made to feel a part of the Wisconsin Arborists Association (WAA), and the results speak for themselves. Of

the 443 members in the WAA, 48 are former members of the Student Society of Arboriculture (SSA). Four of the nine current members of the WAA Board of Directors are alumni of UW-Stevens Point, and our 1989 president is a former president of the SSA. Good habits are learned in college, and professional involvement is a good habit.

What can chapters do to involve students? First, make a commitment to become involved with students. Officers and members of the Wisconsin Arborists Association have always made a real effort to include students in chapter activities. Invite students to join your association. Encourage them to develop their own student chapter. Develop a good working relationship with faculty. When students come to your meetings make an effort to make them feel welcome. We forget how intimidated we were when we attended our first professional meeting.

Keep the cost of student participation low, both in dues and registration fees. Give free registration for assistance in helping with meetings. Collect meal tickets from members leaving early and give them to students. Set up a scholarship fund. Scholarships don't have to be for thousands of dollars, a few hundred will suffice. These activities won't cost you much, and you will reap the benefits many-fold in the future.

We also need to get more high school students interested in our profession, and we can only do this by being interested in them. Talk to high school guidance counselors about what we do and the opportunities in our profession. It's surprising how little they know about us.

To attract young people to our profession we need to present a better public image of who we are and what we do. A crew of poorly-equipped, sloppy looking characters with a dirty, beat-up truck will not make young people want to be "just like them" when they grow up.

Conclusion

What does all this mean to our profession? Change is inevitable; change is accelerating; and students are an important link in keeping abreast of change. The best professionals recognize this, and are hiring the best people they can afford.

As we prepare to enter the next Century with all

the sociological and technological changes it will bring, we can expect the green industry to continue to boom on all levels. Municipal forestry will also grow, but more slowly because of budgetary constraints. On all levels we will face increasing demands and challenges. In the private sector it will take innovation to provide improved services at a reasonable cost in an environmentally acceptable manner. In the public sector it will take innovation to provide these same services with limited resources.

To meet the challenges of the Twenty-first Century, cooperation and shared goals are essential between the green industry, government, professional organizations, and educational and research institutions. To meet the challenges of the Twenty-first Century we need information to cope with change. Today's students are one of

our most important links to change, and they are our future leaders. Our profession needs students, and students need us.

Literature Cited

1. Naisbitt, John. 1984. *Megatrends*. Warner Books, New York. 333 p.
2. Toffler, Alvin. 1980. *The Third Wave*. Bantam Books, New York. 537 p.
3. Toffler, Alvin. 1972. *Future Shock*. Bantam Books, New York. 561.
4. Wurman, Richard S. 1989. *Information Anxiety*. Doubleday, New York. 350 p.
5. Zach, David M. 1989. *An Owners Guide to the Future*. Speech, November 29. Green Bay, Wisconsin.

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ABSTRACTS

SHURTLEFF, MALCOLM C. 1989. **Diagnosing shade tree diseases.** *Grounds Maintenance* 24(6):22, 24, 26, 68, 72.

Learning how to diagnose common diseases will help you maintain healthy trees. Rapid and accurate diagnosis is the first step in the treatment of any disease. Follow these basic steps: 1. Evaluate the overall appearance of an unhealthy tree. When you evaluate problem trees on-site, knowledge of the past history of a tree will help you to determine the true cause or causes of a problem. 2. Look for direct evidence (signs) of the cause. Examine the foliage, twig and branch system, trunk, and roots. A weakened tree is much more susceptible to secondary attacks by insects (such as borers) or diseases (like cankers, certain wilts, root rots and wood decay). 3. You may need a laboratory examination and/or culturing to confirm your tentative diagnosis.

ILES, JEFF. 1989. **The case against tree topping.** *Grounds Maintenance* 24(6):51, 74.

The practice of topping—which also is called heading, stubbing or dehorning—involves the drastic removal of large branches with little regard for location of the pruning cut. However, professional arborists and other tree care practitioners now realize that the well-intentioned practice of topping can create a host of problems for trees and the people who co-exist with them. Proper early training, selective branch thinning, or entire tree removal are favorable alternatives. By removing a major portion of the tree canopy, the delicate balance between foliage and the rest of the tree is upset. These imbalances can lead directly to decline and death, or predispose trees to other problems, with death the inevitable result. Large branch stubs that result from topping are open invitations to insects, and wood-rotting pathogens. Regrowth resulting from topping is also succulent and more susceptible to attack from insects and disease pathogens. Topping also disfigures the tree and ruins its aesthetic value in the landscape.