Green is Not Just a Color

...it is an attitude

Pennsylvania College of Technology

SPRING 2003
As a Resourceful and Respectful Neighbor ...

Several years ago, at the request of a civic organization exploring the unique offerings of our community, I had little difficulty in compiling a list of the local resources that make my Pennsylvania neighborhood a glorious place to call “home.” A lingering winter might well make us yearn for a warmer place to work and play, but it’s no secret that — in the long run — the breadth and beauty of Pennsylvania College of Technology’s immediate community rival virtually anywhere else on Earth.

What I did not mention then, mainly because it goes without saying, is this College’s role in beautifying, enhancing and celebrating those natural surroundings. As you’ll read in this edition of One College Avenue, Penn College has a tradition of teaching a reverence for its surroundings.

Our Schneebeli Earth Science Center sits upon hundreds of acres of Penn’s Woods. Our automotive students research alternatives to fuels and ways to reduce wasteful and harmful vehicle emissions. Architectural technology students explore “greener” construction practices. Our Hospitality students look to local growers for their meat and produce. Our faculty/staff have fruitful discussions at our Morgan Valley retreat facility. (So wonderfully remote is that building, that our astronomy students find a wealth of star-gazing overhead there, far from the competition of streetlights and neon.)

In addition to the classroom lessons, Penn College regularly practices concern for the environment. Campuswide recycling programs prolong our finite raw materials, and conscientious building programs respect — rather than ravage — our neighborhoods. The new Student and Administrative Services Center, for instance, rose from an environmental eyesore to become the latest addition to a thriving landscape along a well-traveled and visible highway corridor.

I said it then and, with this magazine’s focus on ecological concerns, I’ll repeat it now: It’s my incredible good fortune to work where I do. The green spaces, the flowering trees and plants, and the greenery within our buildings remind us daily of the responsibility to respect and maintain the environment that contributes to our pleasure and well-being.

Davie Jane Gilmour, Ph.D.
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A “Citizen of the World” Looks to His Own Back Yard

“T”hey” were right, after all. You truly can’t judge a book by its cover … and that apparently goes for a college’s quarterly magazine, too.

As I shiveringly struggle with this column, there’s no more “spring” in the air than there is in my step. My cream station wagon has adopted a less-than-fashionable coat of “road-salt gray,” and the Christmas lights have yet to re-emerge from beneath the snow-shrouded shrubbery. There was an express run from Halloween to New Year’s this past year, with no stops to savor the leaves before they’d fallen and were blanketed.

The bathroom window rattles in the morning chill, an annoying sound that cries, “Go back to bed, fool.” The morning commute these days, often amid a blinding snow squall, leaves my knuckles as white as the passing lane. I long for the mating chirp of birds, hearing only the grating scrape of snowplows crisscrossing my neighborhood.

With the inevitable April, however, comes Earth Day, a time to heed the reminder that the so-called “President’s Day Blizzard” hammered home by the foot: Try as we might to control her whims, Mother Nature is in control – a formidable force to be appreciated and, more to the point, respected. It’s easy to take her for granted the longer I live in her presence; what “parent” hasn’t been ignored at times by know-it-all offspring?

I heartily confess to doing that less and less these days.

When I leave my home each day, I make it a point to look to the surrounding mountains to celebrate my blessed roots. I cross the Susquehanna River at least twice daily, marveling at its scenic and historical significance. I walk my empty soda cans to the recycling bin down the hall; I flick off light switches in unoccupied rooms and stick to shorter songs in the shower.

All commendable efforts, but I’m obviously kidding myself.

In anticipation of Earth Day – born amid Kent State and “Let It Be,” and being observed this year for the 34th time – I consented to an “ecological footprint” quiz. After checking off my habits regarding diet, quality of living, reliance on mass transit vs. personal automobile, I shockingly learned that – if everyone on Earth followed my all-consuming lifestyle – we would need 13.1 planets to accommodate us all.

My apparent selfishness reminded me of the ride everyone loves to hate at Disney World:

“There’s so much that we share
That it’s time we’re aware
It’s a small world after all.”

Instead of looking across the valley to the awesome majesty surrounding me, instead of gazing past my doorstep to the vast expanse beyond, maybe I should turn my gaze inward. It is a small world, after all, and one that begins with me.

Tom Wilson, Editor
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FOREST COMES “ALIVE” WITH ACTIVITY, SIGNIFICANCE
by Dr. Dennis F. Ringling, professor of forestry

The forest becomes alive with activity and added significance when the students of the forest recreation class utilize the Outdoor Natural Laboratory.

Forest Recreation (FOR 237) is a one-credit, three-hour lab course required for the Forest Technology program. The Society of American Foresters requires such a course for all recognized forest technology programs in the country.

Forest recreation is rapidly growing in this country and it is competing with America’s discretionary time and income. According to commonwealth sources, recreation and tourism quickly is becoming the No. 1 “economic engine,” usurping agriculture as the current leader. Therefore, it is important for a forest technician to possess awareness of how to plan and provide quality forest recreation.

To help in meeting the forest-recreation goals of the program, Pennsylvania College of Technology is very fortunate to have an Outdoor Natural Laboratory at the Earth Science Campus. This approximately 100-acre facility has an interpretive trail system consisting of several miles of maintained trails that have various points of environmental interest identified. In addition to the trail system, there is a pond with a walkway across it, two streams, a pavilion-picnic area, pine plantations, a sawmill with log and lumber yards, ongoing timber-stand improvement projects, deer-fencing experiments and even a low-level ropes course.

As one might surmise, this is a very valuable resource – not only to the Forest Technology students, but for all Earth Science students, the College and the community, as well. (This author, being familiar with two dozen or so Forest Technology programs in the Eastern United States, can truly say our facilities and equipment are unequaled.)

To meet the objectives of the course, students first need to plan and develop their own interpretive trail map brochure. This involves a survey and inventory of the property, where such skills as surveying with Global Positioning System technology, computer skills, and general awareness of forestry and the environment are utilized. Secondly, they need to maintain the existing interpretive trail system, which is never-ending. The skills of carpentry, machine usage, etc. are highly valued here. Many hours each year go into the maintenance of the property. When time permits, classes do some community work, for we constantly are getting requests. For example, PP&L Montour Preserve has had some of our classes working on its trail system, and we sometimes will host an elementary school where the forestry students will act as interpreters and tour guides. Students acting as “environmental interpreters” are especially beneficial because they have an opportunity to explain various environmental concepts to other individuals, something they will need to do extensively in their careers.
Pennsylvania’s program is funded by the U.S. Department of Agriculture and administered by the Bureau of Forestry of the Pennsylvania Department of Conservation and Natural Resources. Private landowners who own a minimum of 5 acres may enroll in the voluntary program, joining the other parties involved: the consulting forester and DCNR. The consulting forester writes the plan with the intention of fulfilling a landowner’s goals and objectives, subject to approval by the DCNR’s service forester. (Like the plan-writers, service forester Gary Glick is a Penn College forestry alumnus). The landowner is under no obligation and may choose how to implement the plan. If the federal government approves funding, cost-share dollars are made available to offset the cost of the plan writing, as well as projects that are written into the plan. The projects could include things such as fencing, planting or nesting boxes. (Penn College, being a public entity, did not qualify for cost-share funding.)

The plan-writing process begins with the collection of data from the property. The forester surveys the property to note dominant vegetation, site quality for growing trees, management history, size and stocking level of trees, presence of insects and disease, wildlife food and cover, and any special features that exist on the property. The property is divided into management units based on results of those preliminary surveys. Maps are developed that delineate the units and topographic features. A description of each unit, including soils, is followed by specific recommendations that are directed toward landowner goals. Finally, the recommendations are prioritized and presented in a schedule of activities for a 10-year period.

Penn College owns three forested properties, comprising roughly 575 acres. The largest is the Morgan Valley property (425 acres), approximately eight miles from South Williamsport on the south face of Bald Eagle Mountain. The Earth Science property is six miles south of Williamsport adjacent to Route 15,
near Montgomery, and the Susquehanna River property is two miles south of the Earth Science campus and lies adjacent to the river.

As the stewardship plans were developed, four goals were determined to be appropriate to the College’s interests:
1. Develop forestry educational projects
2. Enhance and develop wildlife habitat
3. Enhance recreational opportunities
4. Provide sound forest management to ensure the health and future productivity of the forest resource

Now that the plans have been written, we are beginning to move to the implementation phase. At the Morgan Valley property, squirrel-and bird-nesting boxes have been placed throughout the property. This was done because not many natural-cavity trees were available to wildlife. Trees near the springhouse have been cut to allow sunlight through, so as to reduce decay of the structure. This spring, students will begin preliminary surveys to determine the location of a trail and possible silvicultural treatments to the woodlot. These treatments may include timber-stand-improvement cuts that would remove diseased or poorly formed trees that are not desirable growing stock.

The Earth Science facility opened in the fall of 1972, offering a much-needed addition to forestry and other programs at the College. This property provided an area for students to receive hands-on technical education, the strength of Penn College’s programs. Since then, extensive work has been done by students to improve the property, and recommendations within the plan are meant to augment that work.

Silvicultural treatments are under way at the site. First, a two-stage shelterwood cut is planned in an oak stand just south of the greenhouses. The trees that are to be saved have been selected and marked by students with paint. In the fall, the cut trees will be harvested and the logs processed into lumber at the sawmill. An area will be fenced to keep the deer outside so that regeneration can be monitored and comparisons made of the two areas. In about five years, when regeneration has reached about 5 feet, the fence will be removed and the marked trees will be harvested.

The second is a seed-tree cut in a yellow poplar stand just south of the shelterwood. This type of treatment removes most of the trees from the stand and allows approximately six trees to remain per acre as a seed source for regeneration. Part of this area also will have deer fence installed by students.

The third is an area on top of the hill by the tower, which is to be harvested to allow the cherry regeneration much-needed sunlight to grow. The fourth is an old pine plantation that is to be clear-cut and planted with seedlings. It has been determined that this 2-acre plantation is not meeting management objectives.

Finally, a food plot is being planned in an area near the pond. Many landowners are very interested in providing a food source for wildlife. This project will allow students to plan, plant, and monitor a forage crop. The public is welcome to enjoy these College properties; the only restriction is that no hunting is allowed.

All of these projects are designed to achieve the goals of the stewardship plan. The Susquehanna River property will be surveyed by students in the coming year for potential projects. These projects, a very important part of students’ training in the forestry program, duplicate the kind of circumstances that graduates will encounter in the real world of work...it’s hands-on technical education at its best.
Jamie Ruane (a field biologist on loan from the Larson Design Group) teaches interns Jason Grottini and Don Muraco how to identify macroinvertebrates, animals that do not have a backbone (mayflies, stoneflies, crayfish, etc.).
three years ago, retired biology professor Ron Thompson and I applied for a Growing Greener Grant to revitalize the Loyalsock Creek Watershed Association. The Pennsylvania Department of Environmental Protection had funds available, and there was community interest to “preserve and protect the pristine beauty” of Loyalsock Creek. When we wrote the grant, we budgeted for a brochure and funds to hire interns to collect chemical and biological samples to assess the water quality of the Loyalsock. Pennsylvania College of Technology supported us, and several members of the faculty and staff contributed to the project.

Some parts of the project were more difficult than others. Ron and I had no experience in designing brochures, nor did any of the members of the LCWA. Ideally, the brochure was to explain the goals of the LCWA and to attract new members. Ned Coates and adjunct instructor Jim Pagana (School of Integrated Studies) enhanced our knowledge of the human history and geology of the watershed. My late sister, Monika Koval, designed the brochure. “Loyal to the Sock” has become the LCWA logo. Our DEP liaisons were as pleased with the final product as we were.

Fortunately, Ron and I did have plenty of experience collecting quality data. For 37 years, Ron taught biology, ecology and microbiology at Penn College. In partnership with the LCWA, he and his ecology students collected samples from the same 17 locations along the ‘Sock’ from 1972. With the data we collected the past two summers, we have measurements taken over a 30-year period of 10 water-quality parameters, including pH, alkalinity, temperature and the presence of fecal coliforms. We also made use of the Internet and retrieved water-chemistry data collected by the DEP that goes back 40 years and flow data collected.

“For me, the most rewarding part of the project was working with the student interns.”
at the U.S. Geological Survey gauge station at Loyalsockville that goes the whole way back to 1925.

For me, the most rewarding part of the project was working with the student interns. Too many skilled undergraduates are forced to work for minimum wage, but, using Growing Greener funds, we were able to offer our interns a stipend commensurate with their abilities. These students had the opportunity to become involved in research and to apply skills that they likely will use in their own chosen fields.

The interns put in long days. The first sampling location is downstream from Dushore, nearly 50 miles from Penn College. Although much of Loyalsock Creek is adjacent to Route 87, some of the roads to the sampling stations are not on your typical map. At each station, the interns took measurements and collected bacteria samples to be processed back at the lab. Penn College contributed incubators, sterilizers and bacteria counters. Lab manager Bonnie Ingram taught the interns how to prepare sterile media to grow bacteria. Deb Buckman (School of Natural Resources Management) mentored the interns, and helped manage uncooperative equipment.

In the summer of 2001, Stacey King and Sonia Pankonin worked as interns. Stacey has since graduated from Penn College and is currently doing field work in Erie. Sonia is in her second year of the Physician Assistant program at Penn College. In addition to sampling and lab work, Sonia used her computer skills to download, tidy up and graph data from the DEP and USGS. Thanks to her efforts, we have a

“These students had the opportunity to become involved in research and to apply skills that they likely will use in their own chosen fields.”

Jason Grottini uses a Hach kit to measure alkalinity.

Don Muraco checks nitrate/nitrite concentration.
picture of how the water quality changed over the past 40 years.

Jason Grottini, Don Muraco and Lisa Phillips were our 2002 interns. Jason and Don are currently enrolled in the Environmental Technology program. Don is considering pursuing a four-year degree in Environmental Technology at Penn College. Jason is heading for the West Coast to study ecology. Lisa has since transferred to Penn State to major in sociology. While Lisa managed the lab work, Jason and Don were in the Creek. They hauled equipment, got rained on, got interrogated (“What are ya’ doing here?”), and even surveyed small aquatic critters that have the ability to inflict pain.

Once the data was assembled, we hired a consultant to analyze it. Environmental specialist Jon Klotz of Larson Design Group selected the most critical information, and the final report was expected early this year. Those of you who enjoy swimming, paddling or fishing in the Loyalsock will be relieved to know that the water quality of the creek is relatively good. In a meeting with members of the LCWA, Klotz commented that water samples need to be collected during high-water conditions – an important piece of the environmental puzzle, but a serious safety issue.

With support of Penn College, Ron and I intend to continue to work with the LCWA to monitor water quality. The LCWA has been awarded a second Growing Greener Grant, and we will be hiring interns for the summer of 2003 to map sites for remediation.

Ron Thompson’s long-term commitment to the Loyalsock Creek has provided the DEP with a valuable database, and, over the years, has provided numerous Penn College students the opportunity to study biology and ecology in the field. By supporting our efforts, Penn College has played a role in helping to preserve one of Pennsylvania’s most beautiful natural resources, the Loyalsock Creek.
Building is a fundamental human activity – we build to keep warm and dry, to show civic pride and to express ourselves. We rely on buildings as a basic fabric of our lives. But our penchant for building has great impact on the environment.

You might not have thought about it, but, according to the U.S. Green Building Council, commercial and residential buildings account for:

- 65.2 percent of total U.S. electricity consumption
- more than 36 percent of U.S. primary energy use
- 30 percent of U.S. greenhouse-gas emissions
- 136 million tons of construction and demolition waste in the U.S. (approximately 2.8 pounds per person each day)
- 12 percent of potable water in the United States

On a global scale, 40 percent (3 billion tons annually) of raw materials are used in buildings.

There is no question that we face serious ecological realities of global warming, oil consumption, landfill fill rates and water shortages. The way we design, produce, use and dispose of buildings needs to change. We must implement sustainable practices.

A new course offered this spring at Pennsylvania College of Technology is “Sustainability: Building and Living Green.” This hands-on course includes labs working with sustainable products and design issues such as photovoltaics and straw-bale building. It is an overview of the concept of sustainability and its economic, political and environmental consequences.

The class explores the historical basis for the ideology of sustainability and its definitions and applications in today’s society. While the majority of the course emphasizes sustainable building practices – including design, specification, construction and life-cycle issues – students also discover the implications of choosing to live a green lifestyle.

What does “sustainable” mean? The World Commission on Environment and Development states, “Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” Sustainable building uses a holistic and integrated systems-design approach to provide building solutions that minimize energy use, reduce consumption of nonrenewable resources and promote healthy, safe methods of manufacture, use and disposal of building materials. This approach often is referred to as “green.”

Green is not just a color – it is an attitude focused on minimizing the negative environmental impact of human activity. The term “green building” has been in use for at least 20 years, but the misconception that building green results in odd, strange or overpriced buildings persists. In fact, many of the buildings that received the Top 10 design awards this year from the American Institute of Architects are sustainable green buildings. These buildings not only provide beautiful living and workplaces, but also environmental benefits through reduction of natural-resource consumption, economic benefits through reduced energy costs, health
and safety benefits through enhanced occupant comfort and health, and community benefits by minimizing strain on local infrastructures and improving the quality of life.

How do you know if a building is green? The Green Building Council has developed an international rating system called Leadership in Energy and Environmental Design. A LEED-rated building must meet criteria in five areas: sustainable site planning, safeguarding water and water efficiency, energy efficiency and renewable energy use, conservation of materials and resources, and indoor environmental quality. The building is awarded points in each of those categories and receives a rating based on the point total. The levels of accomplishment range from certification (lowest) to silver, gold and platinum (highest). The Commonwealth of Pennsylvania has committed to building all new government buildings at the silver level. The Pennsylvania’s Governor’s Green Government Council, responsible for “greening” all governmental operations, has produced several videos, CDs and GreenWorksTV about green building programs and sustainability issues facing Pennsylvanians.

What can consumers demand so that their buildings are green? According to the GGGC, there are 10 areas on which an architect should focus when creating a sustainable design. Topping the list is energy use – establishing a budget for the yearly operation of the building and using computer programs to model the design to make sure it meets the desired performance level. One also must optimize the building envelope to take advantage of natural light, shading and thermal efficiency, as well as consider the color and reflectivity of finish materials. The architect should specify building materials with low emissions of volatile organic compounds, low toxicity and high recycled content, as well as provide for good indoor air quality, water-efficient plumbing fixtures, landscaping with native plants and stormwater design. Facilities for recycling of items such as paper, glass, aluminum, plastic, cardboard and organic waste should be included in the design. During construction, contractors should be required to recycle construction waste such as asphalt, concrete, wood, metals, plastic containers and cardboard.

How can you promote sustainability? You can purchase your power from a green producer, such as Green Mountain Energy, that uses renewable, nonpolluting resources such as wind to generate power. Because buildings account for so much energy and water usage, reducing demand will make a big difference. According to the National Association of Home Builders, there are several things homebuyers and homeowners should do to get the most for their energy dollars. The biggest savings can be realized by improving the thermal envelope of your home using high insulation values for the roof, floor, walls and windows. Check to ensure that the house is well-sealed against air leakage, since as much as 30 to 40 percent of a home’s energy load can be attributed to the leakage of outside air into the home. About half of your energy budget is spent on heating and cooling, so invest in efficient equipment. A programmable thermostat will automatically turn down your heat at night and when you are away at work. Consider

“The way we design, produce, use and dispose of buildings needs to change.”

continued next page
using the sun’s energy by installing solar water heaters and photovoltaic systems that can convert sunlight into electricity. Maintaining hot water in a water heater uses a lot of energy. Turn down the thermostat setting to 115 from 120 degrees Fahrenheit, and buy an energy-efficient water heater. To reduce water consumption (and your bill!) install non-aerating, low-flow faucets and showerheads, use the “warm” water setting on the clothes washer instead of the “hot” water setting, and set the dishwasher to “energy saver” or “water saver.”

If you are interested in living in a sustainable community, you should investigate the Global Ecovillage Network. There are hundreds of these communities worldwide. In 1998, the United Nations named ecovillages as being one of the top 100 best practices as models for sustainable living. One of the ecovillages closest to Penn College is located in Ithaca, N.Y., a 176-acre site that includes housing, organic agriculture, cottage industries, an education center and natural areas.

Students in the sustainability course at Penn College are participating in the Agents of Change program. This is a federally funded program involving students from numerous architectural schools throughout the United States over the next five years to evaluate building performance through case studies. These case studies will be posted on the group’s Web site to promote understanding of how design decisions and detailing influence building performance and comfort. Penn College students are using various instruments such as infrared heat sensors, data loggers and light meters to study the new Student and Administrative Services Center.

Penn College has offered information concerning sustainable issues for several years through its free, public Green Building Fair. This year’s event was held at the Field House on April 14-15, offering a builders’ show of sustainable materials; workshops and presentations addressing various aspects of energy efficiency, solar design and air quality; and displays by Penn College students concerning various issues of sustainability – a wonderful chance to learn about building and living green!

For more information on the organizations named in this article, consult these Web sites:

- Penn College’s Green Building Fair: www.pct.edu/green_building
- U.S. Green Building Council: www.usgbc.org
- American Institute of Architects: www.aia.org
- Pennsylvania Governor’s Green Government Council: www.gggc.state.pa.us
- National Association of Home Builders: www nahb.org
- GreenWorksTV: www.greenworks.tv
- The Global Ecovillage Network: gen.ecovillage.org and www.ecovillage.ithaca.ny.us
- Green Mountain Energy: www.greenmountain.com
- Agents of Change: aoc.uoregon.edu

“Green is not just a color – it is an attitude...”
Students Address Sustainability Issues

As part of One College Avenue’s look at environmental concerns, five students in Dorothy J. Gerring’s “Sustainability: Building and Living Green” course were asked to briefly address a specific related issue and suggest resources of interest to anyone desiring more information. Their comments follow:

White House Energy
Christine Seward
Lower energy consumption is an issue that the world needs to direct its attention to; this attention not only will be good for the environment, but will contribute to the unity so desperately needed in this world.

For the first time, the White House is employing a photovoltaic system – a system that uses the generation of voltage when radiant energy falls on the boundary between dissimilar substances. Evergreen Solar was selected to supply the panels for the White House because not only are the panels made in the United States, they also offer superior quality.

Waste Management
Dave Reynolds
Construction waste accounts for approximately 40 percent of what goes into our landfills. Most of what goes into trash bins is recyclable or reusable. Wood, drywall, and cardboard account for 60 to 80 percent of job-site waste, most of which can be recycled. If builders would just take the trouble to separate materials, and recycle and reuse what they can, it definitely would pay off in the long run. One other contributor to job-site waste is the “drive-by contaminator” – someone using the trash bin who is not supposed to. Contractors should keep an eye on waste containers, as drive-by dumping can account for up to 30 percent of on-site refuse.

Salvage and Reuse
Megan Johnson
The idea of salvaging and reusing building products addresses the need to reduce landfill space, while eliminating energy and resource use that would be needed to create new products. A good Web site, www.recycle.net, has a large selection of general items for reuse, as well as a large selection of building products (under Used Building Materials) with many of the merchants being accredited by the Used Building Materials Association (bcn.boulder.co.us/environment/ubma/index.html). To maximize “green” choices, one should look for materials already located in your area. The Pennsylvania Resource Council can help find local resources across the state (www.prc.org; Pittsburgh office: 412-488-7490; Philadelphia office: 610-353-1555). The organization also has information about Construction Junction, a nonprofit retail warehouse for used and surplus building materials, as well as the Paint Reblending Program. While it would be ideal for manufacturers to design with reuse in mind, creative ways can be found to reuse just about everything.

Kaila Williams
It is becoming more apparent that the need to preserve resources is a necessity. Because of the excessive use of resources, it is not enough to just do things like recycle cans and use less water; we now need to do more to save what we have left. Current developments allow for recycling and reuse of building products so that, when something is replaced or no longer used, it has a new use and function rather than being taken to a dump.

Alternative Energy Sources
David Hodgman
The use of alternative means of energy is becoming a very important issue. The use of “green electricity” has wonderful benefits for our environment. Green electricity is energy produced from alternative sources, such as solar energy, wind, water or rapidly renewable resources. There are numerous ways you can use green electricity in your home to cut down on the use of nonrenewable resource-produced energy. Below are a few Web sites for information on how you can use green electricity and promote the use of sustainable energy sources.

www.oca.state.pa.us/Default_IE.htm
www.solarbuzz.com/Links/Government.htm
www.eere.energy.gov/greenpower/mkt_enviro.html
www.windenergynow.org/links/
www.epa.gov/greenpower/gpresources/gpresources.htm
The Personal Automobile: Fuel Consumption, the Environment and Alternatives

by Dr. Ronald A. Garner
associate professor of automotive technology

The creation of suburbs in the 1950s and current expansion of urban areas into what once was agricultural space probably would not have been as dramatic without the evolution of the personal automobile as the main source of transportation. Today, this change means much of society lives farther away from work, social activities and the economic resources they desire or need to survive. This is an important detail because it helps explain why there is an increase in both the number of vehicles and the distance each is driven every year.

To improve the situation, the government imposed mandates to improve each vehicle’s emissions output and fuel economy through manufacturer regulations and state emission-inspection and maintenance programs. While the mandates helped improve each vehicle’s emission output and fuel consumption, the amount of fuel needed by society continues to increase because vehicles are driven farther, and more consumers prefer to drive larger sport utility vehicles. Therefore, even with the technological changes to improve each vehicle, the total amount of fuel consumed and total volume of emissions produced by personal vehicles have increased.

From a technical point of view, there are three viable design options to help reduce the amount of gasoline consumed and total emissions produced. The first is an electric motor-powered vehicle, which uses batteries to store energy, such as Ford’s electric Ranger pickup truck. While electricity eliminates the pollution emitted from the vehicle, the electric company must produce the energy needed to recharge the batteries. Therefore, pollution is transferred from the vehicle to the electric-generation stations.

A second option is to build a new type of vehicle power source, which gets better fuel economy and produces a lower volume of emissions. Currently, hybrid electric technology combines a small gasoline engine and an electric motor. Toyota’s Prius uses this technology and is a true innovation because it does not require electricity from a generation station. Rather, the vehicle’s gasoline engine produces the electricity needed to recharge the vehicle’s batteries, and the vehicle is propelled with the electric motor, the gasoline engine, or a combination of both. This produces much-better fuel economy and a lower volume of emissions for every mile driven. While this is a great alternative in the short term, the design still requires some gasoline to operate.

“Gasoline is not a desirable fuel because the oil needed to make it must be transported from far-distant countries at considerable risk and difficulty.”
Gasoline is not a desirable fuel because the oil needed to make it must be transported from far-distant countries at considerable risk and difficulty. In addition, the process to make gasoline is complicated and requires many chemical additives.

Therefore, a third option is continued use of the relatively advanced and cost-efficient internal-combustion engine, but with a fuel other than gasoline to run it. Alternative fuels such as ethanol and natural gas can be used in current automotive engine designs with minimal modifications. These fuels both provide improved emissions compared to gasoline, and neither uses oil in the manufacturing process. Ethanol is produced from corn and is considered a renewable source of energy. Natural gas comes from under the ground and does not require processing; it is delivered directly to homes and businesses by an existing pipeline. Once the gas is compressed so it can be stored in a special tank mounted to the vehicle, it can be burned in an internal-combustion engine. When the engine is adjusted properly, it will produce lower emissions. In fact, an engine can be customized to use either natural gas or gasoline with a flip of a switch. Vast amounts of natural-gas pockets are located in Pennsylvania, West Virginia and Ohio – enough for one West Virginia University geologist to suggest these areas are “the Saudi Arabia of natural gas.”

Pennsylvania College of Technology’s Advanced Automotive Technology Center offers students the opportunity to study natural-gas vehicles and perform vehicle conversions to natural gas. Colin Williamson, dean of the School of Transportation Technology, obtained funds for equipment to compress the natural gas. He also was able to obtain three conversion kits, which allowed students in the Automotive Technology Management major to convert two vehicles and one engine on an engine dynamometer to natural gas. The study of the conversion process helped students obtain hands-on experience with a fuel other than gasoline and allowed them to systematically collect the data needed for class projects – for some, their senior project. From their conversion experiences and data-collection efforts, students found some interesting facts about the relatively little-known conversion process.

Fred Glazewski (Class of 2001), found there was a statistically significant improvement in the vehicle’s carbon-monoxide readings collected on the chassis dynamometer before and after the installation of the Compressed Natural-Gas hardware when the vehicle was still fueled by gasoline. He was surprised because he did not expect to find a difference, much less an improvement, since the only change was the addition of the hardware to the engine. He reviewed the conversion process and the data analysis to conclude that, among a number of factors specific to the engine, the conversion technician must be skilled and knowledgeable when the conversion is performed. This means much of the improvement was because the students had the skill and took the time to make minor repairs to the aging engine components.

The conversion of an existing engine to an alternative fuel is possible; however, the skill and knowledge of the technician is important. This means an unknowledgeable person could overlook something or install a part unprofessionally, which would cause results different than those Glazewski found. Therein lies one problem with widespread conversions: the skill and knowledge of enough technicians to perform enough conversions to become economically feasible for society. While Glazewski studied the conversion component-installation process, other students have collected data to study emissions output, drive-wheel torque and horsepower output. Others have done part and repair-cost comparisons for the natural-gas vehicles, and some tested a new natural-gas Crown Victoria on loan in 2001 from Ford.

In the end, people need their automobiles to collect the economic resources they need to survive and to drive farther distances for the resources they desire. This has caused the amount of gasoline consumed to increase. With the increase in the amount of fuel consumed comes a greater volume of pollution. This article examined three options to reduce gasoline consumption and the volume of emissions produced. Each of the options examined – electric vehicles, hybrid technology, and ethanol or CNG alternative fuels – currently are available to society. Perhaps, one day, an abundant and affordable fuel that does not harm the environment can be used in the personal automobile. Fuel-cell technology, which uses hydrogen and produces safe emissions, may be the key. However, no matter what the alternative, the new fuel or system must be widely accepted by society. This means the cost must be competitive compared to current technology, it must not limit a person’s mobility, and the vehicle must not be limited in its performance or design when compared to vehicles currently available. Therein lies the challenge and the reason why the three options listed above have faced limited acceptance.
Student Stream-Testers Seem to Be Everywhere

Water quality is a serious concern in any community—and Lycoming County is certainly no exception—which is why Penn College students have been working with the Greater Nippenose Valley Watershed Association in assessing the quality of streams in the area. Since August, students in the Environmental Technology program (a degree in the School of Natural Resources Management) have taken samples from eight testing sites within the Nippenose Valley.

There are numerous streams within the valley, and among the testing sites are Antes Creek, the Rattling Camp Stream, the Morgan Valley Run Stream and Rauchtown Creek. Because the Nippenose Valley is characterized by karst geology, a lot of groundwater must be monitored and tested. Karst is defined as “irregular, pitted topography characterized by caves, sinkholes, disappearing streams and springs, and caused by water solution of underlying limestone, dolostone or marble.” Because karst topography is formed by the underground dissolution of rock, it is closely associated with groundwater, and, by its nature, lends itself to the storage of large quantities of water.

Once per month, the students, in conjunction with members of the watershed association, collect samples, splitting up the testing responsibilities. The students are responsible for testing the waters for alkalinity, nitrogen compounds (nitrates, nitrite and ammonia) and phosphorus. The latter two are particularly important to track, as the presence of both nitrogen and phosphorus in surface waters can cause a condition known as eutrophication, which can lead to oxygen depletion in the water. Sources of these chemicals include fertilizer.

In addition, once per month, the students take samples to test for fecal and total coliforms, and, every six months, they perform biomonitoring—a process that involves collecting macroinvertebrates (such as insect larvae) from the stream, and using the types of organisms present as a gauge to determine its health.

The students bring collected samples back to the Environmental Technology lab at the Earth Science Center for analysis using wet chemical methods and an ultraviolet Visible Spectrum spectrophotometer.

So far, the data collected has indicated no significant problems with the streams of the Nippenose Valley. The students and the local association will continue with regular testing to ensure the consistent quality of the area’s water reserves.

Bachelor’s Degree Now Offered in Environmental Technology Management

This fall, the School of Natural Resources Management will offer its first four-year bachelor of science degree in Environmental Technology Management.

The 140-credit major offers students the opportunity to improve the environment through proper management of waste. Course work in environmental regulations and compliance, source reduction and pollution control and treatment, sampling and analysis, hydrology, Global Positioning System, site remediation, risk management and assessment, hazardous-waste operations, and emergency response planning and execution will provide technical skills needed for success in the field.

Coursework will allow students to build their resumes by preparing them to pass exams as Certified Hazardous-Materials Managers, Qualified Environmental Professionals, Environmental Professors Interns, Registered Environmental Scientists and Certified Environmental Systems Managers.

The BEV degree also includes an internship and senior project opportunities, allowing for additional hands-on application of skills. Through this degree, graduates will find employment as compliance officers, laboratory technicians, hazardous-materials managers, wastewater operators, project planners and managers. The degree also will offer additional career opportunities within state and federal governmental agencies, such as the state Department of Environmental Protection and the Department of Conservation and Natural Resources.

For more information, call the School of Natural Resources Management at (570) 320-8038, send an e-mail to naturalresources@pct.edu or visit www.pct.edu/schools/nrm on the Web.
**Penn College Offers New Planned-Giving Program**

While the view from Dr. Clarence Burgher’s rural home truly is breathtaking, it can’t match the retired veterinarian’s foresight in establishing Pennsylvania College of Technology’s first charitable gift annuity – a new planned-giving option for the institution’s friends and supporters.

Dr. Burgher relocated here after a 40-year practice in New Jersey, and his fondness for the area (he has friends in Sullivan County and has hiked the length of the Loyalsock Trail) has only improved since the move. Penn College’s Le Jeune Chef soon became his choice for fine dining, and Dr. Burgher’s regard for the restaurant opened his eyes to the vitality of the entire College community.

“Along with enjoying the good food and service, I soon realized what an active and vigorous college Penn College is,” he says. “The news of its orderly growth, improvement and activities are consistently in the local news.”

Dr. Burgher shares his home, an extremely cozy refuge on a winter’s day, with a hide-and-seek cat; a nearby barn houses a majestic mother-daughter team of Belgian draft horses. A frequent traveler, his walls show the souvenirs of his journeys. And under the stubborn snow lies a model-railroad route, a project for another day.

He has wasted no time in assimilating – joining the Rotary Club, flirting with community theatre and tinkering with the baritone horn in a local band of rookie instrumentalists. And, we’re happy to say, he is leaving his mark on “Pennsylvania’s premier technical college,” right in his newly adopted back yard.

“I am pleased to be the original donor to the College’s Charitable Gift Annuity program, a program that will help to continue with its mission of providing a good education to its students,” Dr. Burgher said.

**How Do CGAs Work?**

“Simply put,” says Barry Stiger, vice president for institutional advancement, “a CGA is a contractual agreement between donors and Penn College. In exchange for a gift, Penn College guarantees to make specific payments to one or two beneficiaries, as long as either is living.”

CGAs offer attractive rates, he notes, and they’re becoming more and more popular.

“The donor can receive immediate tax benefits and periodic annuity payments, while gaining personal satisfaction from making a gift that will make a difference for Penn College, its programs of study and, most importantly its students,” Stiger explains.

A minimum gift of $5,000 is required to establish a CGA with Penn College. Individuals wishing to do so must be at least 55 years old, and at least 65 to receive payout. The CGAs can be established in one of two versions, according to Stiger: “single life” agreements, paying to only one person for their lifetime; or “two-lives in succession” agreements, paying to one individual for their lifetime, then to the second-named individual if that person survives.

Gifts to establish CGAs can be in the form of cash or negotiable securities. Payment rates are determined by the age and number of income beneficiaries, and the time between when the gift is made and when payments begin. At the start of 2003, the American Council on Gift Annuities set recommended rates for single-life CGAs ranging from 6.3 percent at age 65 to 11.5 percent at age 90 and over. Two-lives CGAs also offer high rates of return. (Rates normally are set once each year, but may be revised more frequently.)

The rate for each new CGA is permanently fixed at the time it is established.

Penn College CGAs can be set up as an Immediate Gift Annuity, with the donor (if he or she is at least 65) receiving payments during the period immediately following the contribution, or a Deferred Gift Annuity, under which payments begin at a future date, chosen by the donor and more than one year after the date of the contribution.

Anyone interested in establishing a Penn College CGA, or receiving more information, can write to the Penn College Office of Institutional Advancement at One College Avenue, Williamsport, PA 17701-5799; call toll-free 1-866-GIVE 2 PC; or e-mail bstiger@pct.edu.

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**I soon realized what an active and vigorous college Penn College is.**

*Dr. Clarence Burgher’s regard for Penn College’s fine-dining restaurant led to a broader show of appreciation.*
College, Longwood Gardens Collaborate on Degree Offering

Participants in Longwood Gardens’ Professional Gardener Training Program can receive up to 36 credits toward an associate’s degree at Pennsylvania College of Technology as part of an agreement between the College and the world-renowned horticultural display garden.

The arrangement will allow students in Longwood Gardens’ rigorous training program to transfer 30 credits, with the possibility of receiving six more credits by examination. As a result, the Longwood trainees will be able to earn an associate’s degree in Penn College’s Landscape/Nursery Technology program in just two additional semesters.

Although Longwood Gardens does not award academic credits for its Professional Gardener Training Program, the academic rigor and on-the-job-training component within the two-year, residential program provide students with an extensive background in greenhouse crop production, botany, pest management, landscape design and plant materials, and turf management.

“Penn College has long recognized the quality students Longwood Gardens produces in its training programs,” said Dr. Mary A. Sullivan, assistant dean of the School of Natural Resources Management at the College. “This articulation agreement allows us to recognize that quality by offering students an opportunity to earn a degree in a minimal amount of time. We’re pleased that this collaboration can produce a win-win situation for everyone.”

Bill Simeral, student programs coordinator for Longwood Gardens, said: “The staff of Longwood Gardens is pleased to be able to continue to enhance their long-standing relationship with Pennsylvania College of Technology. For years, Longwood has benefited from Penn College students who have come to work with Longwood as interns. This articulation agreement clears the way for Longwood students to benefit from the excellent educational opportunities that exist at Penn College.”

(A more comprehensive article is available on the Internet at www.pct.edu/pctoday/news/coursoff/LongwoodGardens0103.htm)

Gala Dedication Celebrates Newest College Facility

Publicly greeted with an echoing “Wow!” – and characterized as a “jewel” by the chairman of Pennsylvania College of Technology’s Board of Directors – the Student and Administrative Services Center was officially dedicated Feb. 20.

Exactly 17 months after ground was broken for construction, Dr. Robert E. Dunham joined Dr. Davie Jane Gilmour to cut the ceremonial ribbon strung across the impressive main staircase.

In addition to spotlighting the first “conception-to-delivery” building of Dr. Gilmour’s presidency, the evening showcased students and faculty in floral-design and culinary pursuits, whose creations clearly dazzled those in attendance. Civic leaders and other invited guests toured the building, which consolidates 11 student- and public-focused offices in one convenient location on Main Campus.

Dr. Gilmour put the accent on the words “student” and “services” when discussing the aptly named building, and thanked all those involved in the planning, construction and day-to-day operation of the facility and its many offices.
College Hosts Delegation of Russian Librarians and Managers

Five librarians from Russia observed how their American counterparts function when they visited Pennsylvania College of Technology, Lycoming College and the James V. Brown Library in Williamsport as part of the Open World Russian Leadership Program, an initiative of the Center for Russian Leadership Development at the Library of Congress.

As host to the delegation from Jan. 28 to Feb. 1, Penn College was responsible for showing the Russian librarians and information managers how American libraries work. The Russian librarians also had the opportunity to interact with government, local businesses and civic organizations, as well as experience local culture.

(A more comprehensive article is available on the Internet at www.pct.edu/pctoday/news/events/Russianlibrarians0103.htm)

New Library to Be Named in Honor of Sen. and Mrs. Madigan

A new $13 million library to be constructed on the campus of Pennsylvania College of Technology will be named the Roger and Peggy Madigan Library and Learning Resources Center, in honor of the state senator and his late wife.

Concurrent with word from Harrisburg that $7 million in capital budget redevelopment assistance will be provided by the Commonwealth of Pennsylvania to support the project, Rep. Brett O. Feese, a member of the Penn College Board of Directors, announced during a regular meeting of the directors at the College that the funding had been approved and the facility would be named in honor of the Madigans.

Madigan, of Bradford County, represents the 23rd Senatorial District. He was first elected to the Pennsylvania House of Representatives, serving from 1977-84, then elected to the Senate in 1985. He is chair of the Transportation Committee, vice chair of the Game and Fisheries Committee and a member of the Agriculture and Rural Affairs, Appropriations, and Labor and Industry committees in the Senate. He also is a Trustee Emeritus of The Pennsylvania State University, as well as a member of the Penn College Board of Directors.

Peggy Madigan passed away unexpectedly in January 2002, following a brief illness. She had a long and distinguished career of service to the Republican Party at the local, state and national level. She served as president of the Pennsylvania Council of Republican Women in 1989-91 and, in 1998, was chosen “Woman of the Year” by the organization.

The new facility will be constructed on vacant land near the College’s Main Campus entrance. It will be situated to the east of College Avenue, across from the Bush Campus Center.

“The Roger and Peggy Madigan Library and Learning Resources Center will be student-focused and responsive to all instructional needs,” Dr. Gilmour told the College’s Board of Directors. “Its design will take into consideration the diverse needs of our student body, as well as the needs of the modern world of work and our local community.”

Construction is expected to begin this year, with an opening anticipated in 2005.

(A more comprehensive article is available on the Internet at www.pct.edu/pctoday/news/construction/madiganlibrary1202.htm)
In Touch With ALUMNI

'50
Wilmont Robert Raymond, tool and die design, retired from Textron Lycoming as director of quality assurance and resides in Lock Haven.

'62
Ronald Lee Garber, automotive technology, retired from the Letterkenny Army Depot in 1993, after working there for 28 years assembling hydraulic systems for missiles. He resides in Chambersburg.

'63
William G. (Bill) Peck, automotive technology, is a truck driver and resides in Georgetown, Del.

'71
Thomas C. Austin, printing, received a bachelor’s degree in organizational management from Eastern College in 2000. He is senior purchasing agent for Merck & Co. Inc. and resides in Trumbauersville.

'82
Jean (Schwanke) Kelly, dental hygiene, earned bachelor’s and master’s degrees in health administration from Penn State University. She resides in Carlisle and is employed by United Concordia as product compliance manager.

'83
Milton Packard, electrical technology, is an engineering/development technician for Corning Inc. and resides in Hampstead, N.C.

'84
Michael L. Manning, general studies, received a bachelor’s degree in secondary education from Lock Haven University in 2002. He is a science instructor at Red Rock Job Corps and resides in South Williamsport.

'86
Brenda A. (Robinson) Frantz, accounting, received a bachelor’s degree in business administration and accounting from Bloomsburg University in 1988. She resides in Allenwood.

'91
Michael Everette Golden, graphic communications, is manufacturing supervisor at R. R. Donnelley Financial. He lives in Airville.

'92
Richard A. Lupold, computer information systems, is employed by the U.S. Postal Service and resides in Trout Run.

'96
Laura V. (McWilliams) Chubb, dental hygiene, is employed at Dental Care Associates as a hygienist. Chubb, who lives in Richfield, also is co-owner of Dental Solutions, a new temporary agency in Central Pennsylvania.

'97
Wilmont Robert Raymond, tool and die design, is chief pilot and airframe and powerplant mechanic for Kufta Associates Inc. and resides in East Berlin.

'99
Missy Sue Forry, accounting, is an accountant for Century Small Business Solutions and resides in Mohrsville.

'00
Michael Gibble, architectural technology, received his bachelor’s degree in architectural design from the Catholic University of America in 2002. He is an architect technician for the U.S. Department of the Interior. Gibble, who resides in Washington, D.C., currently is producing drawings of and for the White House.

'01
Matthew Althobeli, aviation maintenance technology, is chief pilot and airframe and powerplant mechanic for Kufta Associates Inc. and resides in East Berlin.

In Memoriam
William C. Butler, dean of the School of Hospitality, died Sunday, Dec. 29, 2002, at the age of 51.

“To viewers of Pennsylvania College of Technology’s television cooking series, ‘You’re the Chef,’ (he) was just an anonymous name on the show’s closing credits,” said Tom Speicher, the show’s co-host, in a heartfelt tribute. “To anyone who interacted with him, ‘Bill’ was a signature personality who deserves credit for a job well done.”

It was announced in January that Bill’s closest friends and colleagues, the school deans and Hospitality faculty have recommended that he be memorialized through the establishment of the “William C. Butler Visiting Lecture Series,” reflecting his influence in bringing in so many visiting chefs and pastry artists to share their experience and knowledge with students.

Contributions to this fund may be directed to the Penn College Foundation.

Contributions to this fund may be directed to the Penn College Foundation.
CONSTRUCTION & DESIGN TECHNOLOGIES

Jeffrey “J.D.” Mather, assistant professor of drafting and CAD technology, received an Award for Innovative Excellence in Teaching, Learning and Technology at the 14th International Conference on College Teaching, held April 1-5 at Florida Community College, Jacksonville, Fla. In nominating Mather for the award, Tom F. Gregory, dean of the School, said Mather deserved the honor because of “his mindful integration of technology into his courses, his dedication to student learning and his career-focused curriculum.”

INTEGRATED STUDIES

Dr. David L. Evans, professor of biology, has been named to the editorial advisory board of the HAPS Educator. This quarterly scientific education journal is the publication of the Human Anatomy and Physiology Society.

Dr. Abdul B. Pathan, professor of economics, attended the American Economic Association annual conference held from Jan. 3-5 in Washington, D.C. Dr. Pathan served as a member of a focus group organized by Addison-Wesley, an educational publisher, for an upcoming economics textbook.

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Thriving poinsettias fill the shelves at the Earth Science Center greenhouse.