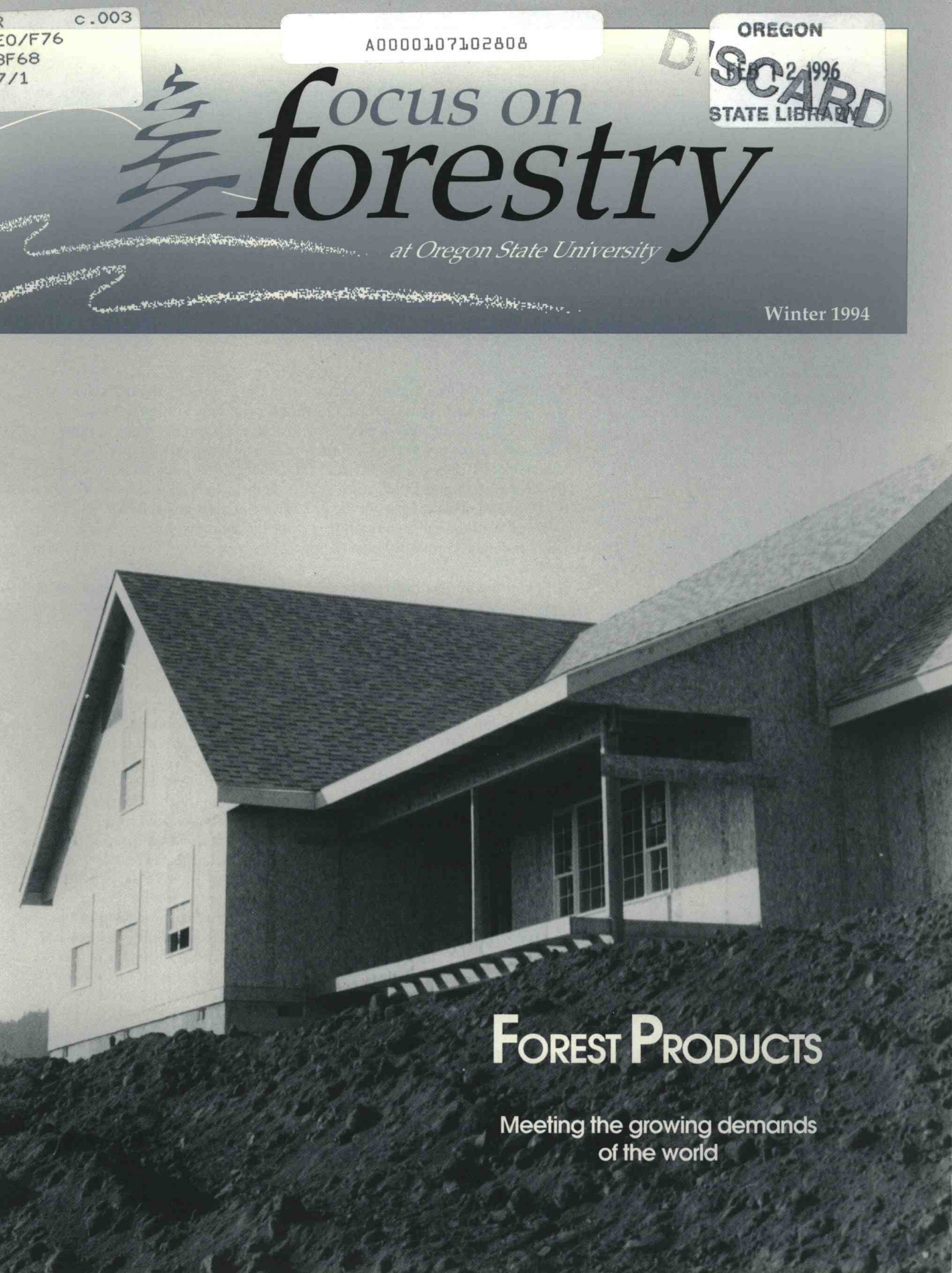
focus on forestry

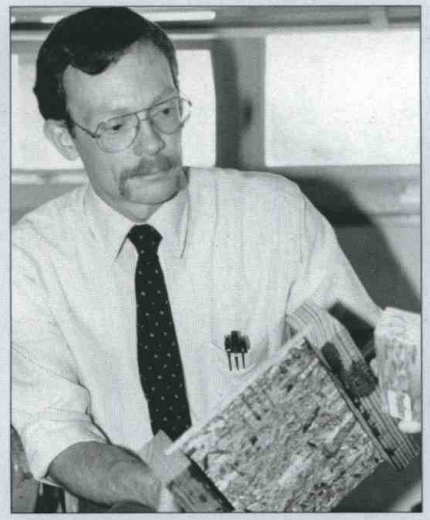
at Oregon State University

Winter 1994



Forest Products

Meeting the growing demands of the world



Beyond lumber and plywood. *Dr. Bob Leichti examines a sample of composite I-beam.*

focus on **forestry**

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from the Dean

Winter 1994

One of the things I enjoy most at the beginning of each school year is to give the opening lecture for our new students. I try to challenge these fresh, new foresters by forcing them to think about the future and their role in shaping it. What will our world be like by the time they reach mid-career? What issues will they face?

Everyone's vision for the future is likely to be different. But there are some very stark realities staring us in the face. These are not possibilities—they're certainties. And the most compelling is this: by the time our new students reach mid-career, our world population will have doubled to about 10 billion people.

Think of the implications for resource use and quality of life! The pressures on our forests will be immense. So will the pressures on our forest products manufacturing industry.

Developing the knowledge for rational decisionmaking is another important role we play at the University. This issue of *Focus on Forestry* features our Forest Products Department and its many contributions to the future of the forest industry. The efforts of these scientists in extending forest resources through more efficient use of wood, improved manufacturing processes, advanced composites, wood extractives, and environmentally acceptable preservatives are clearly focused on this challenging future.

There is a great sense of urgency about all we do here in the College to prepare our students and to develop new knowledge for the next century. And we have been working hard to convey that same sense of urgency to policymakers. As our nation reduces the production of wood from its public forests, we need to decide how we will accommodate a growing population's demand for natural resources, and we need to clarify the role that forests and forest products will play. This is a conversation long overdue.

Unless we get our house in order, we, as the world's most consumptive nation, will contribute to the global degradation of forests and other natural resources. But if we are able to craft integrated, holistic policies for natural resource production and consumption, we will set Northwest forest issues in the national and global context in which they need to be considered.

Our College hopes to play a role in helping provide the knowledge for rational decisions about what to preserve and how to preserve it, and what to manage and how to manage it.

George Brown

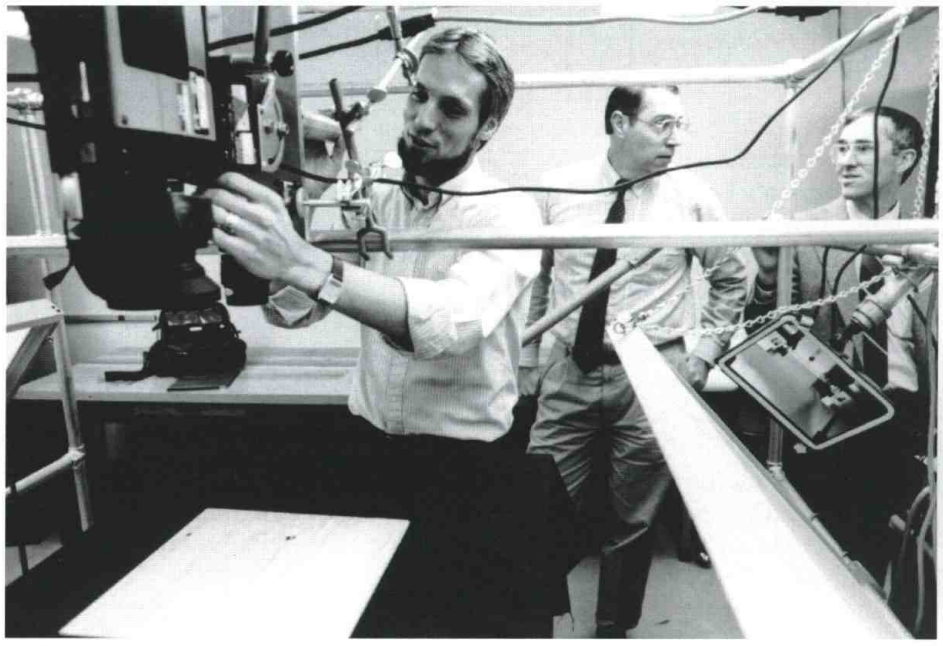
George Brown
Dean, College of Forestry
Oregon State University

DESIGNING THE FUTURE

Change has characterized the Northwest forest products industry ever since the first tree was felled in the Oregon woods. Forest products research and teaching at OSU have in many ways helped lead this dynamic evolution. Today more than ever, the OSU Forest Products Department is a place where rigorous science is being applied to some important real-world problems.

Until just a couple of decades ago, the manufactured output of the Northwest's forests could be pretty well summed up in four words: lumber, plywood, pulp, and paper. And the attitude of most people toward these products, and the processes that created them, could be summed in another four words: we like these things.

In the past generation, though, the industry and society have undergone profound and widespread changes. An environmental awakening in the developed world—and in the United States in particular—has heightened society's awareness of limits on the Earth's natural resources. Partly as a result of this, the former friendly relationship between the forest products industry and many people of the Northwest, the sense of a shared interest, has been eroded by widespread suspicion and hostility on both sides. Even as consumption of wood products continues to spiral upward, there's much societal *angst* about past and current forest management practices. And there's little agreement about how forests ought to be managed for the future.



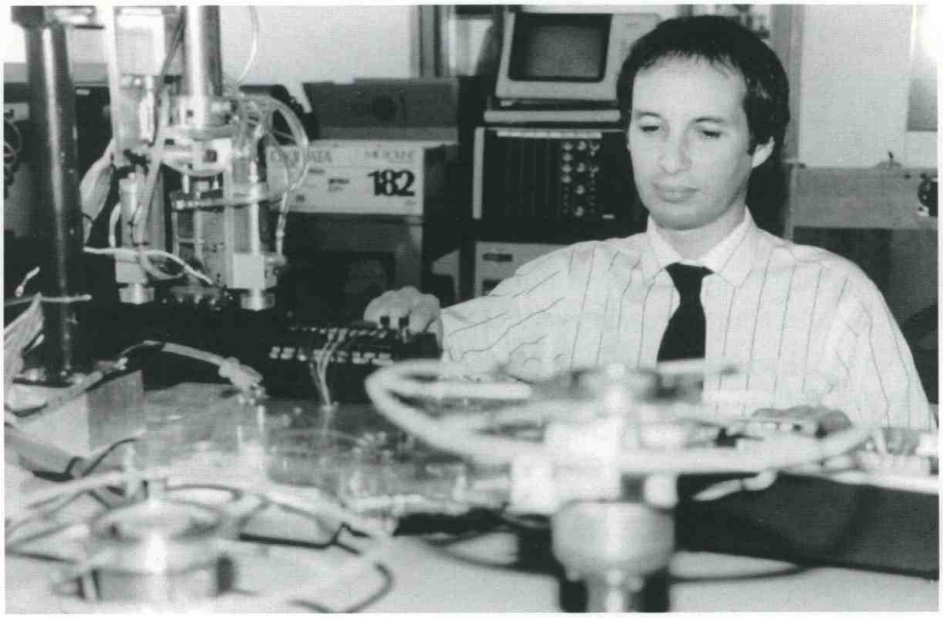
Harnessing the computer's power. *Jim Funck gets ready to scan a piece of veneer. The process-optimization work of Funck and colleagues Charles Brunner (center) and David Butler helps manufacturers improve their competitiveness.*

Withdrawals of land from the timber base for environmental and other reasons have laid heavy constraints on timber supply in the Northwest. These have forced some manufacturers out of business and prompted others to become more efficient by substituting expensive technology for even more expensive labor. Meanwhile, in the rest of the world, population growth is on an exponential curve, and worldwide demand for wood products (and for many other things) is following the upward trajectory.

These changes make up another chapter in the evolution of an enterprise that has always been dynamic. Contrary to some current opinions, they do not spell the death knell for the forest products industry in the Northwest. The industry is alive and, if not exactly well yet, recovering from a metamorphosis that will leave it a smaller but still vibrant part of the Northwest economy.

And this is a good thing, for the beneficiaries of this industry are the ones who use the wood—in houses, in furniture, in paper, in a myriad of other things that make our lives easier. We're all better off because of wood's reliable performance and the low environmental impact of its manufacture and use, relative to that of alternative materials.

It is with this in mind that the Forest Products Department at OSU supports forest products manufacturing—not because the manufacturing industry is a special



We in the United States already use more wood, by weight, than steel, portland cement, aluminum, and plastics combined. Wood is energy-efficient—it takes less energy to manufacture logs into wood products

Pursuing precision. *Philip Humphrey studies the hot-pressing process, used in making wood-based composites. Below, Chris Biermann in the papermaking lab.*

interest, but because it is a means through which vital needs are met for Americans and the world, and a means through which prosperity is created for Oregonians. Scientifically sound manufacturing processes and innovative products contribute to a thriving forest economy in Oregon, one that gets the most value out of the wood fiber, produces the least waste, and leaves the forest in as healthy a condition as possible.

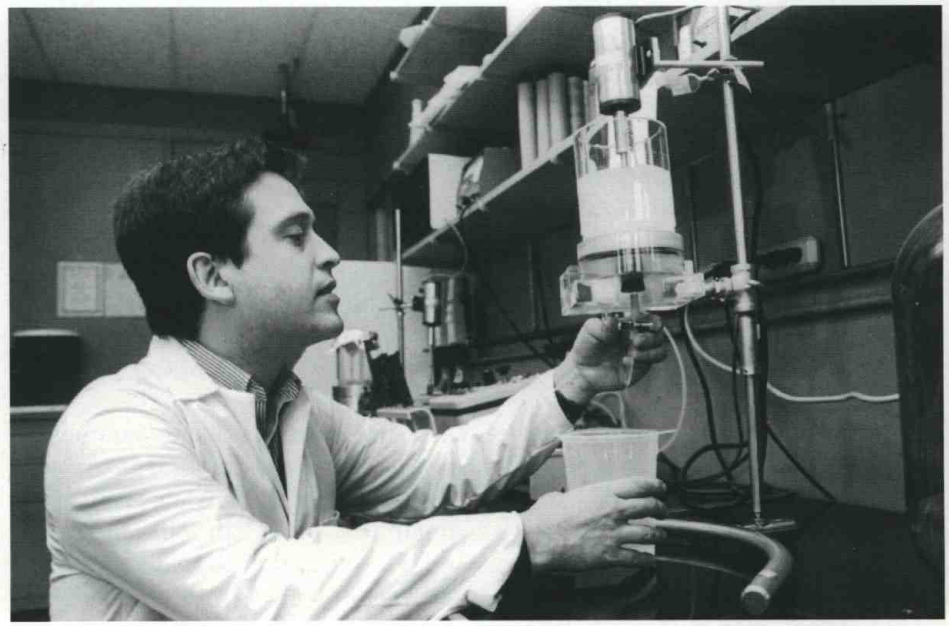
"Forest products research is the shock absorber between the growing demands of society and the resources of the forest," says Forest Products department head Tom McLain. "Improvements in manufacturing technology have enabled us to utilize wood more efficiently and with less waste than ever before. If we were using the same technology as we were 50 years ago, our standard of living would be far lower than it is, and we'd be consuming enormous quantities of the forest. We would clearly not be on a sustainable path."

The material of choice

WE LIVE IN A TIME OF UN-precedented demand for material goods, especially in the developed world. The United States is the world's leading importer of industrial raw materials—including wood fiber—according to Jim Bowyer, president of the national Forest Products Society and head of the Forest Products department at the University of Minnesota. In the United States, per-capita use of wood has grown by more than 30 percent in the past two decades. And as world population doubles from the current 5.5 billion to 11 billion by the middle of the next century—a staggering increase—there will be greater and greater demand for wood, and for all the world's resources, from the rest of the world as well.

In the face of this mounting pressure, it's easy to make a case for wood as the material of choice, both economically and environmentally. than it does to produce any of these other materials. Wood is renewable. It is recyclable. It is widely available.

The polarization of the debate between proponents of a sound economy and of a healthy environment has reached the point, in the Northwest at least, where the argument seems irreconcilable. But it must be reconciled, for it poses a false dilemma. "The world can't afford to choose between a healthy economy

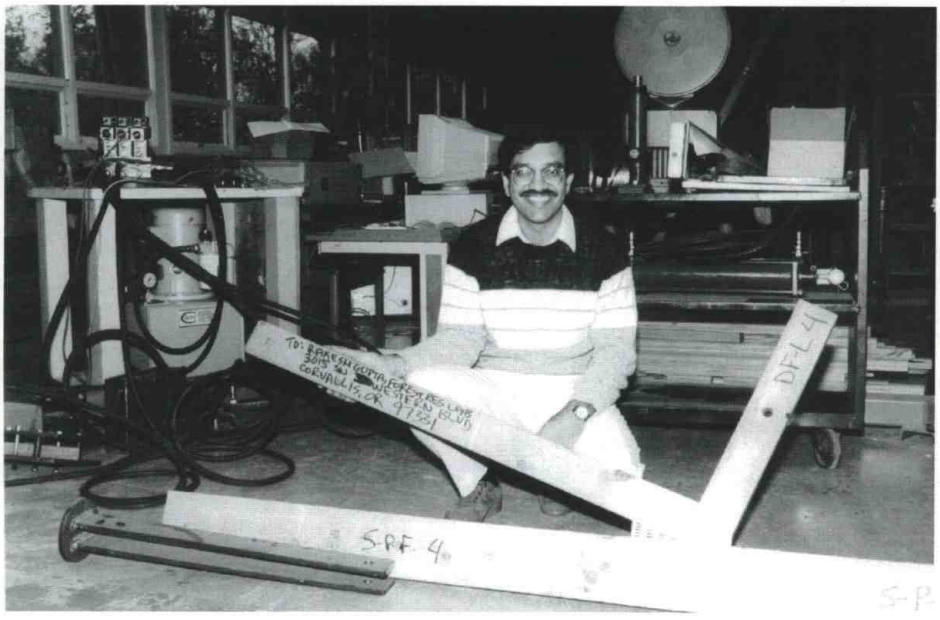


and a healthy environment," says George Brown, Dean of the College of Forestry. "We have to have both. We must reconcile our material and our environmental needs. That means we have to manage carefully, with all the knowledge and all the science and all the good tools we've been able to develop.

"This is our greatest challenge as a society. We can't afford to turn aside from it."

The technologizing of wood

IF THE WORLD HAS BECOME MORE complex and challenging, so has wood itself. It's the same material it's always been—heterogeneous in form, complex in structure, appealing to human sight and touch—but it's been adapted to a wider range of needs, and shaped into a broader array of products, than ever before. For the scientists who study it, its properties are interesting on many levels, from its surface visual characteristics to its cell structure to its chemistry.



Toward more efficient design. *Rakesh Gupta's work on wood connectors contributes to more-precise engineering of wood buildings.*

When Oregon Agricultural College began offering courses in timber technology and lumber manufacture in 1908—curricula known as "wood technology"—the teaching and research were practical and basic. The observation that wood is a good building material was the end, not the beginning, of the theoretical discussion. But after World War II, builders and engineers began to be interested in wood as a material with engineering properties. "Wood technology" became "wood science" at OSU, and researchers began investigating the anatomy, physiology, chemistry, and mechanical properties of wood. Meanwhile, in the marketplace, old products were refined and new products developed: plywood assumed a greater share of the market, and particleboard, hardboard, and other composite products were launched.

Today the definition of "wood products" has expanded to include very high-tech products—laminated beams, structural panels made from wood flakes, oriented-strand board, laminated veneer lumber, wood-plastic composites—as well as increasingly fine-tuned manufacturing processes achieved with the aid of computers.

As a result, the demand for knowledge of wood and related technology—adhesives, hot-press manufacturing, wood preservatives, engineering methods—has never been greater. All these areas and others are being investigated by faculty in the Forest Products Department. No longer only wood technologists, they are scientists of several disciplines—chemists, physicists, engineers, statisticians, process analysts—who turn their specialized knowledge to the problems of this common, complex, beautiful, and economically important material.

Here are some of the things they do:

Improve manufacturing processes

• Drs. **Charles Brunner** and **Jim Funck,** of Forest Products, and Dr. **David Butler,** statistician in the College of Science, are working on ways to get a computer to identify surface features on wood products, such as a pitch stain on a sheet of veneer. Today, such defects must be marked and removed by a human operator. Fully automating the process could yield both lower manufacturing costs and improved recovery of the raw material.

The three scientists are also refining computer simulations for wood-products manufacturing processes to help manufacturers improve the layout of their mills and determine the best product mix for a given mill and log supply. The team is working on models that will run on microcomputers, making the information more accessible to hands-on managers who may not be computer experts.

• Dr. **Philip Humphrey** is studying the basic mechanisms of the hot-pressing process, both to improve the design and manufacture of existing wood-based composites and to help develop new, high-performance engineering

components. These new products would consist of natural and man-made fibers spatially oriented and then molded using new pressing techniques. Light and strong, these products could eventually challenge markets now dominated by aluminum alloys, steel, and plastics. "This is long-term, high-risk research," says Humphrey, "but if realized, it could have significant impacts on engineering practices and raw material demands."

• Dr. **Terry Brown** has helped managers and employees of hundreds of manufacturing plants, both in the United States and overseas, save millions of dollars a year by showing them how to improve efficiency and raw-material recovery. Now that raw logs account for 70 percent of the total cost of finished wood products, Brown says, mills must maximize quality and value, not just production, if they're to survive. His 1982 book, *Quality Control in Lumber Manufacturing,* has become an industry standard.

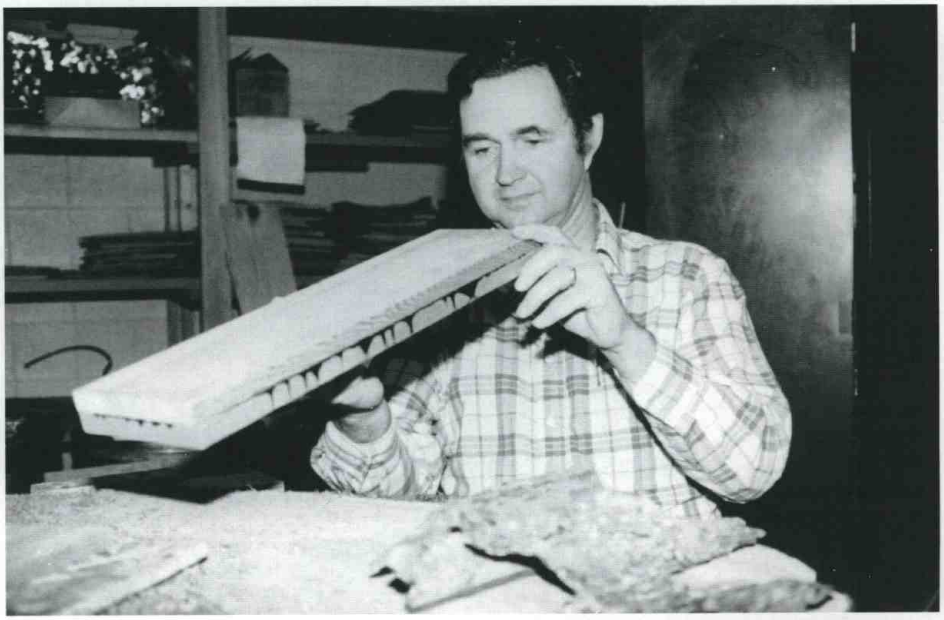
Improve wood utilization and recovery

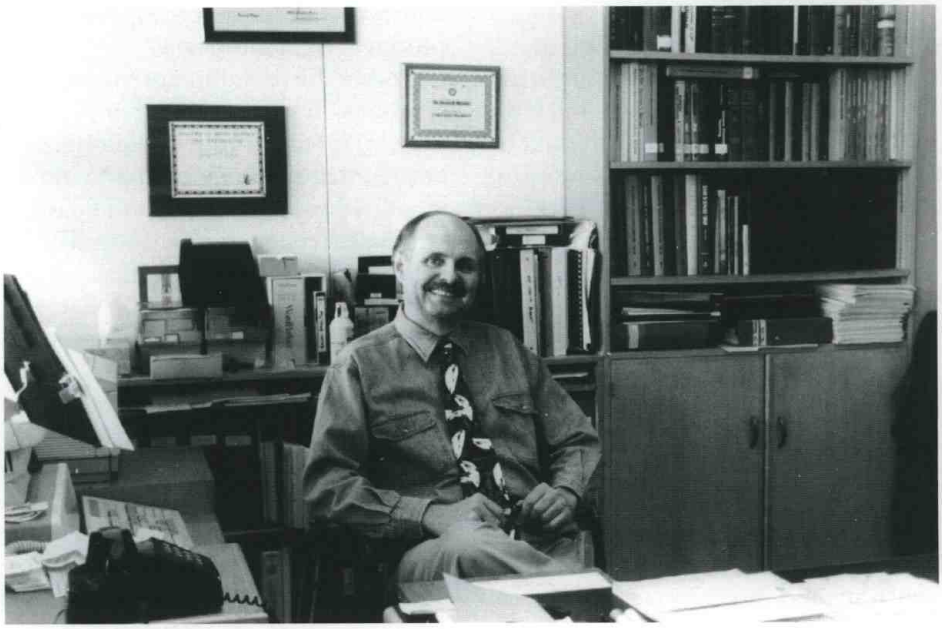
• Dr. **Jim Wilson** studies the materials science of advanced wood composites such as laminated veneer lumber (LVL), oriented-strand board (OSB) and composite I-beams. These materials are stronger, stiffer, and more uniform than their solid-sawn counterparts, and yet they can be manufactured from lower-grade, smaller-dimension logs. As wood supply remains constrained, advanced composites will become more important in both residential and commercial construction. Wilson is also developing methods of nondestructive testing of these materials to enable manufacturers to inspect each piece for uniformity and product quality.

• Dr. **Bob Leichti** studies the engineering properties of wood and wood-based composites and the behavior of structural systems. In one project he is working with a manufacturer of glue-laminated lumber to produce a reinforced beam that uses a high-strength, fiber-reinforced plastic to add strength and stiffness. Beams made in this way would not only require lower-grade wood but would use less of it (by about 35 percent), and still perform better than solid-sawn wood equivalents.

• Dr. **Rakesh Gupta** is looking into ways of designing wood structures more efficiently, using less wood and still maintaining quality and safety. His investigations include both computer modeling and physical testing of wood connectors such as metal plates used in trusses, to see how to improve their design efficiency. More-precise engineering of wood buildings would make it unnecessary to overdesign for safety and thus would help conserve wood.

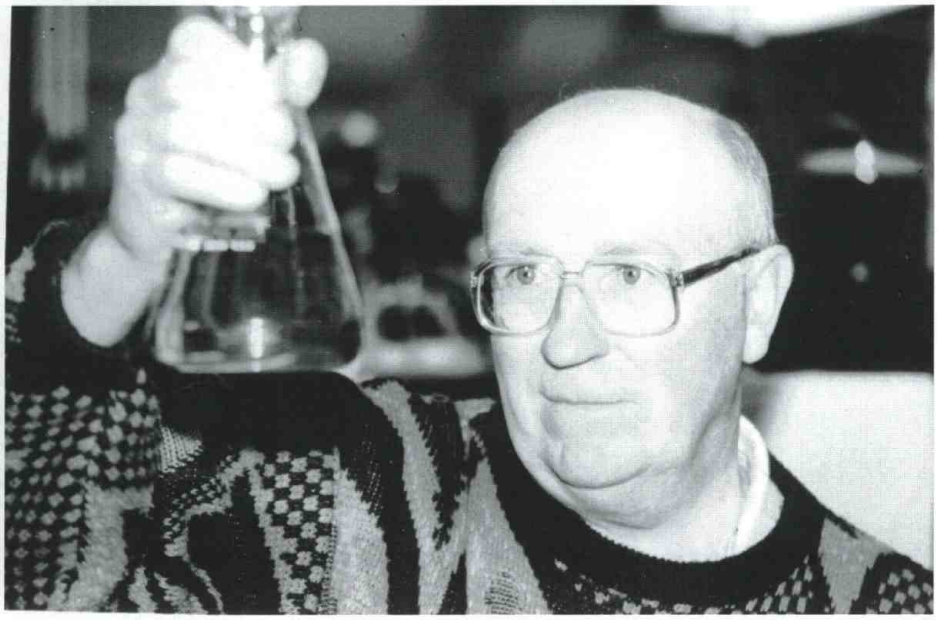
• Dr. **Mike Milota** is investigating the basic mechanisms of drying





Taking wood apart . . . *Joe Karchesy explores adhesives and other nontraditional wood products.*

. . . and putting it back together *Below, Jim Wilson, an expert on advanced composites. They'll get more important as wood supply remains constrained.*



Wood under the microscope. *Barbara Gartner is looking at the cell structure of wood at different growth stages. Below, Murray Laver is studying wood tannins to find out why some wood stains after it's cut.*

lumber in a kiln. His work will result in better kiln-operating techniques, allowing for drying that is both faster and more energy-efficient.

• Dr. **Chris Biermann** is working on improving papermaking processes. In one project, he is looking at the effects of pretreating wood chips with steam before pulping them to make paper. Rapid steaming should significantly reduce the amount of pulping chemicals used, and it might also reduce the length of time and the temperature required to make paper. Such a process would lessen the environmental impact of pulpmaking and cut costs for manufacturers.

• **Stanley Niemiec, Dr. Terry Brown,** and others in the Department and the College are helping build up Oregon's secondary manufacturing base, a sleeping giant that could add thousands of jobs to Oregon's economy. Value-added products—hardwood flooring and furniture, cabinets and pallets—accounted for about 5.5 percent of Oregon's industry employment in 1991, compared to 31.7 percent nationally. Niemiec is developing and presenting workshops for current and potential manufacturers on how to plan and start a business, how to get raw materials, what products to make, how to develop the market, and where to get help.

Develop recyling technology

Dr. **John Simonsen** is working on various processes that combine waste wood with recycled plastics. Decay-resistant plastic lumber, both with and without wood as a filler, is already on the market; it's used for highway guard rails, marine decking, picnic tables, and other nonstructural uses. Simonsen is looking at ways of incorporating wood to improve the strength, stiffness, and other material properties of these new composite materials. Increased use of plastic wood should both relieve pressure on the forest resource and lend value to a material that would otherwise go to a landfill.

Extend wood's service life

• Dr. **Jeff Morrell** heads the Department's largest sponsored research program, one that studies the effectiveness, cost, safety, and environmental impact of various wood preservatives (please see the Faculty Feature on page 10). Wood decay costs American consumers several billion dollars a year. Safe, effective, and economical wood preservation means not only savings to consumers but less pressure on the forest.

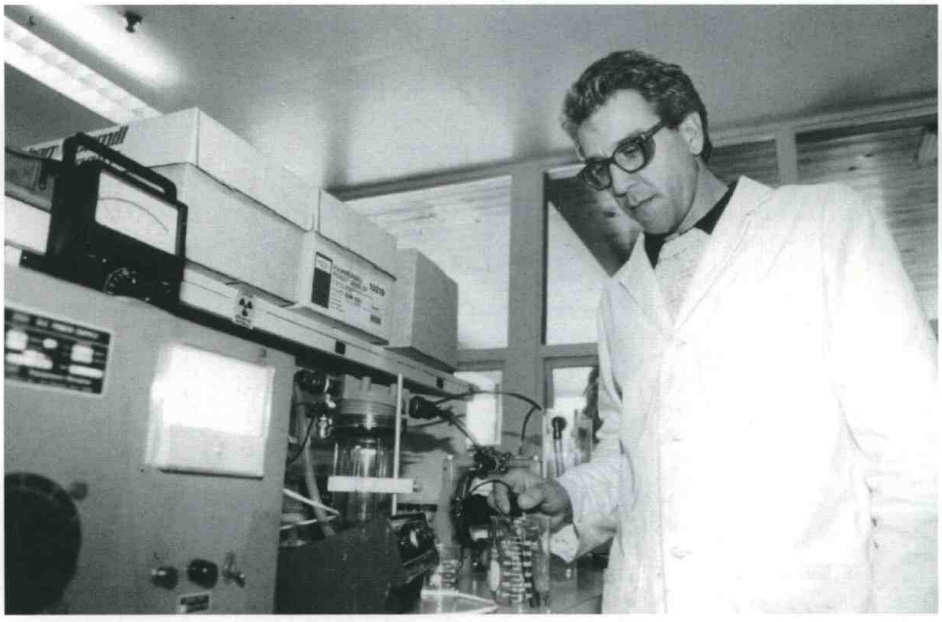
Improve international trade

• Drs. **Bob Ethington** and **Rakesh Gupta** are testing lumber made from Siberian larch for its structural characteristics. Some Northwest industry people would like to import Siberian lumber, but right now it can't be used for construction in the United States because U.S. standards don't cover foreign species. Ethington and Gupta will use the results of the tests to fine-tune

standards for grading and grademarking to make them consistent with current practice for domestic species. The findings will then be made available to various industry and regulatory agencies responsible for grading lumber. (This issue is not the same as the one surrounding the import of Siberian *logs,* which is now banned because of fears that logs will bring in foreign pests and diseases. Others in the College of Forestry are working on that problem.)

Research basic processes

• Dr. **Barbara Gartner** is studying the physiology of wood at the cell level, trying to determine why different stages of growth produce wood of different structural character. She is looking at the three-way relationship among the cell structure of a given portion of a tree's trunk, the contribution of that particular portion of wood to the tree's functioning, and the physiological mechanisms that prompt the wood to grow the way it does. One possible benefit: more efficient, product-specific tree plantations that would take pressure off native forests.



Once is not enough. *John Simonsen works on new wood-plastic composites that will pay off in new opportunities for recycling of wood.*

Develop alternative products and species

• Dr. **Joe Karchesy** is studying the feasibility of producing several nonwood forest products. For example, certain extracts from softwood bark can be made into adhesives that might be used in wood-based composites. Oil of juniper could be a lower-cost replacement for expensive cedar oil, which is manufactured mostly in Turkey and used in decorative lamps and as a fragrance base. And certain forest plants contain healing compounds in their bark, roots, and leaves. Karchesy has identified plants used in traditional Native American medicine; he's now analyzing these plants to determine the chemistry of the active compound.

• Dr. **Murray Laver** is working on ways to halt the staining of Douglas-fir wood after it's milled. Some Douglas-fir develops blotchy red stains that make it unacceptable for decorative items like wood panels and Venetian blinds. Laver is looking at the tannin extractives of the wood to see whether enzymes are responsible, and if so, how to stop their action. Solving the problem could help Douglas-fir become more suitable for high-value secondary manufacturing.

New ways with an old friend

WOOD IS THE MOST FAMILIAR OF materials. We live in wooden houses, sit in wooden chairs, and read newspapers made from wood pulp. Our money and checks and receipts, our grocery bags and table napkins and toilet paper all come from wood—even our toothbrushes have bristles made of rayon, a wood byproduct. Our electrical power, telephone service, and cable TV come to us courtesy of wood poles. Without wood products, our lives would be very different.

To transform trees into all these things, and to do so in a cost-effective and environmentally benign manner, requires technology based on rigorous science. The technology developed so far has already improved utilization and reduced waste by orders of magnitude.

Perhaps this technology, like wood itself, has been taken for granted. "The same amount of wood needed to build a historic 320-square-foot log cabin," says Tom McLain, "can be used to build a modern 3,500-square-foot home—and the wood fiber that's left over will supply the owners with paper products for years. That's incredible technological advancement."

In turning their attention to some of the pressing challenges of wood manufacturing, Forest Products scientists aren't helping just the forest products industry. They are helping to design a sustainable future for the people of the Northwest. ■

Technology Transfer

Putting the knowledge into the right hands

Forest products research at OSU is important in helping manufacturers adapt to today's volatile conditions. "Industry has cut back tremendously on their research programs," says professor Jim Wilson, "and things are changing so fast now that they critically need technical input to make good decisions."

To make sure the knowledge is getting into the right hands, the Forest Products department has a comprehensive system of technology transfer. Scientists keep in touch with their clientele through a range of relationships—face-to-face meetings, site visits, telephone conversations, articles dealing with both theoretical and applied topics, newsletters, short courses, and industry-sponsored research. Here are a few examples:

• Dr. **Terry Brown** teaches short courses in quality control and total quality management in lumber manufacturing, one of many continuing-education courses offered regularly at the College of Forestry. He also spends a lot of time on the phone and on site at manufacturing plants. And, like several faculty members here, he's written a book. His *Quality Control in Lumber Manufacturing* is widely used in the industry.

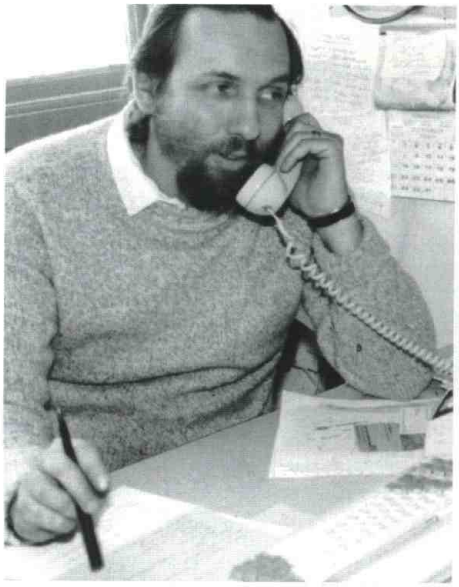
• Senior research assistant **Stanley Niemiec** keeps on top of developments in Oregon's timber region so that he can offer technical information in response to specific needs. He works extensively on economic development with people in timber-dependent communities to improve existing operations and help wood products businesses diversify. Among other activities, Niemiec offers short courses for small and medium-sized businesses on establishing secondary manufacturing operations. The workshops address product development, hardwood utilization, and improved processing techniques, as well as special topics like utilization of juniper, the subject of a recent popular session.

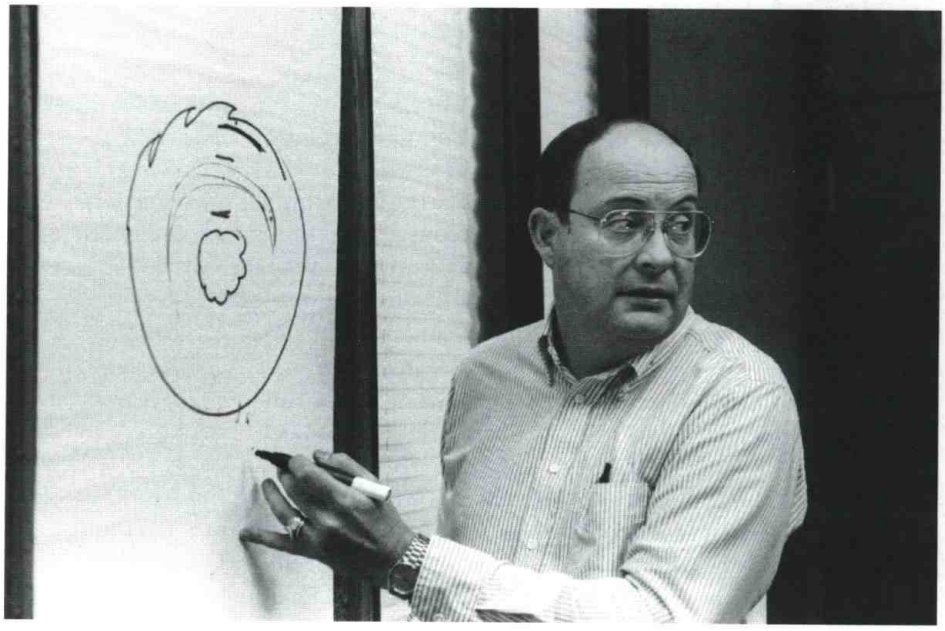
• Dr. **Bob Leichti,** like all College faculty, publishes regularly in journals in his field. He also edits a quarterly newsletter, *Wood Design Focus,* for architects, engineers, and building-code personnel. The newsletter, covering the applied aspects of wood engineering, is intended to help these professionals solve practical problems in designing and maintaining wood structures.

• Dr. **Mike Milota** teaches two workshops on lumber drying, one dealing with softwoods and the other covering the special problems of drying hardwoods. The courses are designed to mesh with the technology in use at state-of-the-art new mills and at older ones, too.

• Preservative treatments developed by researchers in **Dr. Jeff**

Please turn to Outreach, page 15





Getting the word out. *Right, Stanley Niemiec; below, Terry Brown. Outreach from Forest Products scientists helps clients in many fields.*

AN APPETITE FOR LEARNING

Hard work and humor help, too

In the fall of 1981, Jeff Morrell was hired by a biology laboratory to study synthesis of chicken cartilage—something for which his brand-new doctorate in forest pathology had not prepared him. "It was really frenzied," he says. "I spent 70-hour weeks trying to understand what I was doing."

But he kept at it, and the job became a confidence-builder. "It was interesting work," he says. "I learned a lot—and one of the things I learned was that I would come up above water eventually."

Morrell's appetite for learning and hard work, combined with a self-deprecating sense of humor, came through for him again two years later when he was hired at OSU to take part in the Forest Products Department's research program on wood preservation. He was a 27-year-old forest pathologist with scant wood-products background and no management experience—he had never supervised a staff, organized a research program, or managed a budget. "They hired me because I was cheap," he jokes, but clearly the department had more positive attributes in mind.

In the decade he's been here, Morrell has distinguished himself as a researcher, with more than 100 papers published in scientific journals. He has built a close-knit and productive team of scientists who investigate a wide range of wood-preservation topics. He heads an important research effort, the Cooperative Pole Research Program, the largest sponsored research program in the Forest Products department. The cooperative, with a $220,000 annual budget provided by a group of electrical utilities and chemical companies, funds studies on agents of decay and methods of preserving wood utility poles. Morrell also teaches undergraduate and graduate classes in the Forest Products Department and supervises the work of six graduate students.

His accomplishments have been widely noted. A significant honor came in 1990, when Morrell received the Scientific Achievement Award of the International Union of Forestry Research Organizations (IUFRO).

Teamwork. *Jeff Morrell with his research team (that's him in the white shirt, fourth from right) and by himself (far right) in the wood-preservation lab.*

Not bad for someone who almost didn't apply for the job. "They wanted an associate or full professor, and I figured they wouldn't consider me," he says. "But my wife said it was worth the risk—it was just a 54-cent stamp." Still, there was an adjustment period after he was hired. "It was pretty scary. I'd come from a postdoc (a postdoctoral fellowship), making nothing and having no responsibilities. For the first year or so it was an unnerving experience. And yet it was a neat time. There were so many things I didn't know—it was exciting to learn them all."

JEFFREY JOSEPH MORRELL GREW UP on Long Island, New York, "when it was rural." A Boy Scout and hockey player, he enjoyed outdoor recreation, especially hiking, all through high school. He began to think about forestry as a career.

The closest university that had both a forestry school and a hockey team was the State University of New York at Syracuse. Morrell started in the forest management program, then switched to forest biology. His first really challenging class, forest pathology, awakened his interest in research. "The professor gave me a C in the class," Morrell says, "but he really made the subject interesting, and I got hooked on it."

Morrell went on for a master's in plant pathology at Penn State and then a doctorate at SUNY in forest pathology and mycology, receiving his degree in 1981. In the course of earning both degrees, Morrell worked with electrical utilities, an

experience that proved useful when he began working in the pole research co-op at OSU, started in 1980 by now-emeritus professor Bob Graham.

Graham and two other long-time Forest Products faculty, Don Miller and Ted Scheffer, helped bring Morrell up to speed. "They had all the files and had dealt with a lot of problems before," he says. "I was glad to have all their years of experience. They were able to tell me, for example, 'Well, we tried that in 1940 and it didn't work.'" Miller and Scheffer too are retired, but Scheffer still serves on Morrell's research team.

A sampling of their current studies:

• Satish Kumar is looking into the possibility of using carbon dioxide in a "supercritical" state—something between a liquid and a gas, but not quite either—as a safer, more effective way to deliver preservative chemicals deep inside wood cells. The supercritical CO_2 would be used in a pressure chamber to treat all kinds of wood products, from logs to composites. The work is being done in cooperation with Keith Levien in the OSU Chemical Engineering department.

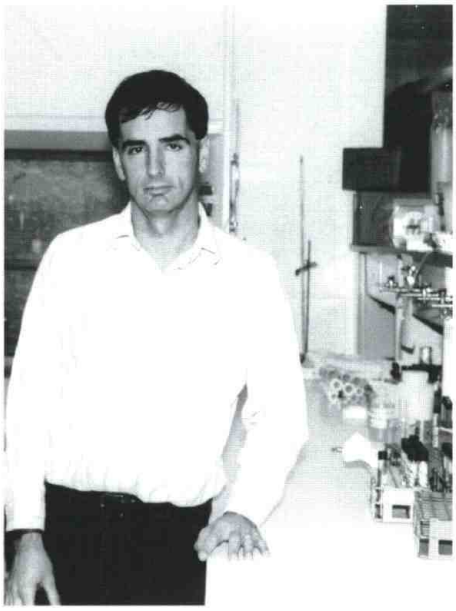
• Camille Freitag is devising methods of identifying common wood-decaying fungi from cultures grown in a laboratory. Fungi are most readily identified from their fruiting bodies, yet by the time these appear on wood, fungal damage can be extensive. Knowing how to identify them from a culture helps in early detection of decay.

• Rama Velicheti is looking into the basic mechanisms governing the growth of certain bacteria and fungi that seem to be able to halt the unsightly staining that sometimes appears on the surface of cut wood. These organisms may permit stain prevention without the use of chemicals.

• Ron Rhatigan and others at OSU are testing methods for treating Siberian larch logs for pests. Some Northwest wood products manufacturers are interested in importing logs from Siberia, but importation is now banned because of the risk that logs may bring in insects or disease organisms. The researchers are testing fumigants and other techniques on samples of Siberian lumber (known to be pest-free) already here for another Forest Products study.

• Susan Smith is working on a computer model to predict the movement of fumigants inside wood. Fumigants are typically applied by inserting the chemical into drilled holes. Better knowledge of fumigant movement will make possible more efficient and effective distribution.

• Paul Forsyth is testing the efficacy of a new solid fumigant, called Basamid. Most wood



fumigants are toxic gases, which can be difficult and dangerous to work with. This solid product, when it's licensed, will be easier and safer to apply.

All this research contributes a great deal to safer, cheaper, and more effective preservation of wood, thus helping stretch the supply of this valuable natural resource. It has also helped build a data base of information about how preservative chemicals behave—a crucial tool to lawmakers and government agencies that must make accurate safety decisions.

MORRELL GETS EXCITED BY THE cutting-edge nature of his work. Studies of supercritical carbon dioxide, for example, hold long-term promise because this technique could solve some of the problems of current treatment processes. "Wood is not a very permeable medium," says Morrell. "But supercritical CO_2 can move through the wood cells very quickly, carrying the chemical deep inside the wood. It offers an opportunity for getting the wood completely treated, and it's also promising as a way to use new chemicals that don't work well in current treatment systems—they're not soluble, for example."

In short, it's an example of a giant step forward in the technology. "Most of the processes used today were developed before 1906, and even as long ago as the 1830s," says Morrell. "There haven't been any significant improvements in the technology of treatment since that time. It's fun to be working on things that hold this kind of promise." ■

Gift of land received

John F. (Jack) Morgan, Corvallis resident and long-time logging contractor, has given OSU 17.5 acres of land adjacent to McDonald Forest. The tract, valued at almost $680,000, will eventually become part of the College's Research Forests.

"This is a wonderful gift," says Dean George Brown. "McDonald Forest plays a key role in our research and in providing students with hands-on experiences in every aspect of forest management. We are delighted that Jack Morgan decided to give us this land."

Morgan, 68, attended OSU briefly in the 1940s after serving in the U.S. Marine Corps. He has been active as a logger for over 50 years. Most of his operations have focused on the Coast Range near Corvallis. ■

Former student donates software

The College recently received a substantial donation of computer software from a former student who spent only a year here.

Vikram Nagaraj enrolled at the College as a freshman in 1985, just after he arrived in this country from India. At the end of the school year he transferred to Harvard University and majored in computer science. Now he's working for Microsoft Corp. in Redmond, Wash.

However, his interest in forestry and related issues has remained strong, he told Dean George Brown in a letter.

"When I was enrolled in your college," he wrote, "I had occasion to use the superb computer facilities in the lab at Peavy Hall. Would you be interested in a donation of Microsoft software to that lab?"

Nagaraj's $4,000 donation was matched 100 percent by Microsoft. It enabled the College to add or upgrade such software as Windows, FoxPro, MSWord, Excel, and Powerpoint. The software is now installed in computer labs in Peavy Hall, the Forestry Sciences Lab, and the Forest Research Lab.

Many companies match their employees' gifts, says Lisa Mattes, the College's director of development. "We're grateful for the generosity of these companies. We like to tell our prospective donors, if you're thinking about making a gift to us, find out if your company is a matching company. If it is, that's a unique way for you to increase your gift."

■

Conference attracts a diverse crowd

About 175 students representing a wide variety of ethnic and cultural backgrounds came to OSU last fall to take part in MINFORS II, a nationwide conference to recruit minority students into natural-resource careers and science education.

The conference, co-hosted by the College of Forestry, featured speakers and discussion sessions focusing on the future of forestry, research and job opportunities for minorities, and the relationships among science, social policy, and natural resources.

The students toured McDonald Forest and laboratories at the Forest Science department, attended a career fair, and took opportunities to talk with foresters, biologists, ecologists, and researchers.

Research and job opportunities. *Marion Page (second from left), a Forest Service entomologist and MINFORS presenter, chats with students between sessions. At right is Kevin Davis, who served as an intern in Page's laboratory.*

Kevin Davis, 21, an African-American biology major and senior at Kentucky State University, said MINFORS helped him with "networking, meeting people, and learning what you can do in various fields." Davis intends to go on to graduate school, he said: "I definitely want to follow a science career."

Catrina Bradley, 21, an agribusiness major and senior at South Carolina State University, came to MINFORS to get "a broad knowledge of forestry and natural resources." Also African-American, Catrina hopes to go to graduate school, perhaps in business and finance.

Willy Schuster, 24, a student at Yakima Valley Community College and a member of the Yakima Nation, said he was glad to find a diversity of viewpoints at the conference. "I feel that it's a whole bunch of different cultures coming together—different backgrounds, different thoughts, different perspectives," he said. "The way I look at it, we're all humans, and the more points of view represented, the better the chance of sound decisions."

The first MINFORS conference, sponsored by Alabama A&M, was held two years ago in Huntsville, Ala.

■

The Path of Constant Improvement

Craig Groner's job title says a lot about where he, his company, and the forest products industry are headed right now.

Groner (Forest Products '82) is manager of the fiber optimization department at P&M Cedar Products, based in Stockton, California. Before Groner's 1992 promotion, no such department existed.

Not sitting tight. Craig Groner combines study and action to keep things moving at P&M Cedar.

"We're getting squeezed, as everybody is, by log supply," says Groner. "There's tremendous pressure on us, and we're really gearing up to maximize recovery of our resource. We decided we needed a new department to deal with recovery on an integrated basis."

Improving the way things are done is something Groner likes and is good at. Since joining P&M as a quality-control analyst in 1982, fresh out of OSU, Groner has studied and improved processes ranging from scheduling of shipments (he increased on-time shipments from 75 to 95 percent during a record sales year) to the sawing operations at the company's four sawmills (he's installed scanners to cut logs more efficiently and thinner saws to reduce saw kerf, saving the company an estimated $1 million a year).

His job boils down to one important mission: constant improvement of the company's recovery of its raw-material resource.

"The way I see it," he says, "we have two choices. We can sit tight, remain conservative, hope the log supply holds out, and try not to lose too much money. Or we can be aggressive and do everything we can to maximize the recovery of our fiber. That's the way we've decided to go."

P&M Cedar's main product is incense-cedar pencil stock, the three-by-three-inch squares that other manufacturers mill into the grooved "slats" from which pencils are made. P&M Cedar doesn't make the slats or the pencils, but this is how it's done: two slats of a thickness of .190 inch are sandwiched and glued together with nine parallel pieces of graphite in between. These sandwiches are cut apart into nine pencils.

In one major efficiency-enhancing project, Groner made an exhaustive study of the headrigs—the complex of saws that breaks down the logs. The company was thinking about adding scanning capabilities. Scanners use computers to measure a log, calculate the different ways of breaking it down, and choose the one that best meets a given set of objectives.

"We knew headrig scanners were available," Groner says, "but we weren't sure what difference they'd make in cutting incense-cedar into pencil stock. It's such a different product from everything else."

Groner visited mills where headrig scanners had been installed and measured the difference they'd made in recovery—how much more of the raw material was being used instead of wasted? He took those measurements to vendors of scanning equipment and had them run simulations—how would this particular scanning setup handle these logs? Then he made some computer simulations of his own using the vendors' simulated results and P&M's actual log mix—what recovery could the company expect from a given scanner, and what would be the value of that recovery in dollars?

All this number-crunching yielded a green light. At Groner's recommendation the company installed a certain type of headrig

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forestry Currents

New FS Chief speaks

A day after his appointment was announced, **Jack Ward Thomas** delivered his first address as Chief of the U.S. Forest Service to an overflow crowd at Peavy Hall.

Thomas, a LaGrande wildlife biologist and lead author of the controversial 1990 report that triggered protection measures for the northern spotted owl, was named by the Clinton administration to replace Dale Robertson as Chief.

The November speech, scheduled months in advance, was the last in the College's 1993 Starker Lectures series. Because of his elevation to the Chief's post, Thomas attracted a bigger crowd than expected. Some audience members had to watch the talk on television monitors set up elsewhere in Peavy Hall.

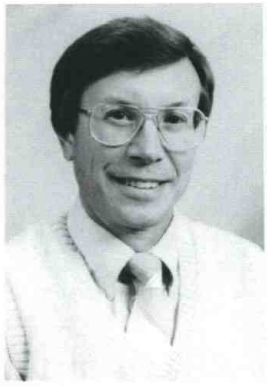
In a 50-minute speech punctuated by flashing camera strobes, Thomas called for a landscape-level approach to managing forests in order to accommodate the needs of both the natural environment and the people who live in it. He spoke of the need to find an alternative to "gladiators" jousting in an adversarial climate, and as Chief, he promised to listen to all points of view.

Jack Ward Thomas

Research Forest director named

David H. Lysne, a Forest Service planner, has been named director of the Research Forests for the College of Forestry.

Lysne comes from the Rogue River National Forest, where he worked in forest planning. He holds a Master of Forestry degree in forest engineering from OSU. He worked for the College in 1980-82 as a harvesting specialist and assistant professor in the FIR (Forestry Intensified Research) program.



David Lysne

Lysne, who assumes his duties in January, will administer the College's 14,500 acres of research forests. The centerpiece of this forest land is the 11,500-acre McDonald-Dunn Forest, for which a comprehensive long-range plan was drafted this year. More than 60 research projects are in place on McDonald-Dunn, and more than 40 classes of forestry and other students receive part of their instruction there each year.

Lysne will supervise a staff of ten whose duties include silviculture, inventory, geographic information systems, surveying, harvesting, recreation, and public education.

Student SAF is the best!

OSU's student Society of American Foresters chapter was named the outstanding chapter in the nation at the annual SAF convention in Indianapolis in November. Current chair Matt Mattioda and past chair Debbie Anderson traveled to the convention to accept the award.

The chapter's Adopt-A-Classroom program was one of several activities recognized by the national SAF. Adopt-A-Classroom, begun last year, pairs forestry students with elementary teachers to help them incorporate lessons about forestry and related issues into their classrooms.

The student SAF has also begun an annual job fair for forestry students. In addition, the chapter held a Project Learning Tree workshop this year. The chapter makes a point of inviting interesting people, such as U.S. Rep. Mike Kopetski, to speak at meetings.

Kudos for faculty

Carl Stoltenberg, dean emeritus, received the 1993 Gifford Pinchot Medal at the Society of American Foresters convention last November. Stoltenberg was honored for his outstanding contributions to the administration, practice, and professional development of forestry in North America. "Congratulations, Carl, on a well-deserved honor!" says Dean George Brown.

Susan Stafford, professor of Forest Science, has been named director of the Biological Instrumentation and Resources Division at the National Science Foundation. She will oversee a $45 million annual budget and manage competitive grant programs focused on instruments, computers, databases, laboratories, fellowships, and other support of biological sciences.

"This is a very exciting opportunity," says Stafford. "I'm hoping to help give this important division a clearer identity and better organization within the scientific community."

Stafford will serve in Washington during the 1994 calendar year.

Paul Adams, professor of Forest Engineering, has been chosen as a Norman A. and Ruth A. Berg Fellow for 1993 by the Soil and Water Conservation Society (SWCS). He is one of 14 conservationists who participated in a one-day forum in Washington, D.C. to discuss conservation policy and how natural resource professionals can influence the policymaking and appropriations process.

Paul Adams

Greber departing

Brian Greber, forest economist and Forest Resources associate professor, has left the College faculty to take a job at Weyerhaeuser Co. as an economic researcher and forecaster.

"Brian is a gifted scholar and teacher, and he'll be missed," says Dean George Brown. "But we congratulate him and wish him the best as he embarks on the next stage of his career."

Outreach

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Morrell's program have increased the service life of some utility poles from 30-40 years to 60-70 years and have saved at least one utility $7 million a year. Some of this research is sponsored by a group of private and public utilities, but findings are not proprietary—anyone who wants to use them may do so. This technology makes possible better preservation methods that save money anywhere wood is used.

Technology transfer also takes place in more indirect but potentially far-reaching ways—for example, through the teaching itself. Each year, Forest Products graduates take their knowledge straight into the workplace, continuing a flow of up-to-date information from the university to industry. International students in particular bring an opportunity for cross-fertilization of ideas, helping foster two-way communication beyond national borders.

■

A milestone for the College. *Dean Brown cuts the cake at the College's 80th birthday celebration, July 19. On that day in 1913, the state Board of Regents authorized a School of Forestry at Oregon Agricultural College.*

Groner

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scanner at one mill. Because of the excellent results, another installation quickly followed. The scanners paid for themselves in six months.

Such attention to quantitative detail not only saves the company money but helps shield it from costly mistakes. "The information I provide to management isn't always what they want to hear," Groner says, "but I've seen how easy it is to fool yourself if you don't use quantitative information. Some new process or direction may sound really good," but if a rigorous analysis doesn't confirm the hunch, caution is advised.

As an example, a few years ago P&M Cedar branched out into a different sort of business, a saw-maintenance service. Because poorly maintained saws can be very costly in wasted raw material, the company had already improved its own saw maintenance, updating the technology and centralizing the equipment at one mill site. P&M formed another company to offer precision saw maintenance as a service to other mills. "We believed we had a competitive advantage in sawing technology," Groner says.

But there were problems from the beginning, and the company began losing money. Groner was pulled from his production-planning job at P&M to diagnose the troubles and determine whether process improvements could turn things around.

After several months of study, Groner concluded that the problem was deeper than inefficient operations—the concept was flawed in several significant ways. For one, transportation costs put the service out of reach of what many clients were willing to pay. For another, Groner says, saw maintenance is more than simply filing the saw blade—it's fine-tuning the whole sawing operation, which involves altering the interaction between the saw and the machine that makes it move. "You have to adjust the whole system," he says, "and that's not feasible with an outside operation."

He put things at a break-even point by reducing the sales force, streamlining the shop, and improving the inventory flow. "But I couldn't see that business getting any better." At his urging P&M abandoned the venture and focused on continued improvement of their own sawing systems—a much more profitable approach.

GRONER'S WORK IS A HAPPY marriage of his bent for quantitative accountability, his fascination with how things work, and his desire to make a difference in his world. When he started community college after graduating from Oregon City High School in 1977, he chose accounting as his major. He soon decided it didn't allow enough scope for creative change. He switched to forestry in part because of his strong environmentalist leanings. Transferring to OSU as a junior, he entered the Forest Management program.

He changed to Forest Products after taking a lumber manufacturing class from Terry Brown. "I got a chance to see what mills did, how they operated—the business end. I began to realize that I liked solving technical problems." He also realized, he says with a smile, "that the forest products industry was not this big, bad wolf that I had always perceived it to be."

He got a thorough grounding in business principles with his Forest Products degree, and that's proved useful, he says. "I've fallen back on it time and time again. The accounting, the quantitative business methods, the financial analysis—these have been very valuable to me." ■

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