he neutrino is an abundant, interesting and mysterious subatomic particle. It has no charge and until recently, was thought to have no mass. These “ghost particles” can go pretty much anywhere and through anything. “If you shot neutrinos through a brick of lead a light year thick,” Patricia Vahle said, “most of them would come out of the other side.”

Vahle is an assistant professor of physics at William & Mary. She is an important part of NOvA, an experiment that will bring about a greater understanding of the neutrino—and of the universe itself.

Ground was broken on May 1 for NOvA’s detector, a lab of the University of Minnesota. The detector will catch and identify neutrinos that have traveled 500 miles underground from the U.S. Department of Energy’s Fermi National Accelerator Laboratory outside Chicago.

The properties of neutrinos hold the key to a number of questions, such as a fuller understanding of nuclear fusion and fission mechanics and the mystery of why antimatter is so rare in the universe.

“If you want to understand how the universe began and how it evolved and how it is working today, you need to understand as much as you can about the neutrino,” she said.

Neutrinos are difficult to study, but it’s not because they are scarce. In the time you took to read this sentence, an enormous number of neutrinos have passed through your body. “They’re difficult to study because they don’t interact very much,” Vahle explained. “To study a neutrino, you have to make it interact with matter so you can see what comes out.”

The NOvA experiment is designed to make those neutrino-matter interactions happen. On their way to Minnesota, the neutrinos will be counted at a Fermilab detector. Neutrinos come in three “flavors,” Vahle explained: electron, muon and tau. A predecessor experiment to NOvA, known as MINOS, used a similar scenario to verify that the neutrinos were oscillating—or changing flavors. A better understanding of neutrino oscillation will yield a better understanding of neutrino mass, she said.

“We make a beam of muon-type neutrinos and what we found in MINOS is that some of those neutrinos just go away,” Vahle said. “We can’t tell what they’re going into. They can either go into tau-type neutrinos or they can change into electron-type neutrinos.”

NOvA is designed to identify just how the neutrinos are oscillating. “We think that these muon neutrinos turn into tau neutrinos,” she said. “But they could turn into electron-type neutrinos.”

Vahle’s part in the project is to lead a team responsible for the calibration of the detectors. “It doesn’t sound very sexy, but it’s a fundamental step that you have to do in order to understand what you’re seeing when a neutrino interacts in your detector,” she said. “What happens is this: The neutrino comes in, it gets close to a nucleus in the detector and it will interact with that nucleus. It’s going to spit out a shower of daughter particles that form in that interaction.”

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She explained that NOA scientists will measure the energy of each daughter particle and add them up to determine the energy that the neutrino had to begin with.

“In order to figure out how much energy each one of those daughter particles has, you need some reference to compare it to, some sort of ‘standard candle,’” she said. “So, I’m leading the group that figures out what that ‘standard candle’ is and what sort of process we need to go through to figure out what the energy of the neutrino was in the first place.”
ideation
research & scholarship at william & mary

FROM THE PRESIDENT

Along with the lush greens of a William & Mary spring and the annual rites of commencement comes another recurring feature of campus life—news of important work done by our faculty and students. This issue of Ideation celebrates the career of Joyce VanTassel-Baska, one of the university’s most productive and influential professors. The issue also describes how the geology department, a longtime leader in faculty-student research, provides its majors with hands-on field experience. There is news as well about how our new student-funded “Green Fee” and the work of our newly created Sustainability Committee are making a real difference for the better in the campus environment; dozens of ideas are afoot—SCORS is one (Solar Cells On the Roof of Small). And there is an engaging account of an important discovery by a cohort of our freshmen. A group of them, working in the Sharpe Community Scholars Program, actually unearthed a cache of lost documents about an early African American entrepreneur, the great Maggie Walker.

As always, this issue of Ideation is well worth our time!

Cordially,

Taylor Reveley

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The College of William & Mary
in Virginia
Chartered February 8, 1693, by King William III and Queen Mary II of Great Britain. Phi Beta Kappa, the nation’s premier academic honor society, and the honor code system of conduct both were founded at William & Mary.

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A gift to gifted education
Joyce VanTassel-Baska has spent a career making sure that tomorrow’s Mozarts and Einsteins get what they need today

by Erin Zagursky

Joyce VanTassel-Baska is not a person who is afraid of trying new things. As a high school teacher with no basketball experience, she decided to coach the girls’ basketball team because she thought it wasn’t fair that the girls did not have a team due to the lack of a coach. In two years, her team became city champions.

Now, nearly four decades later, VanTassel-Baska, the Judy and Layton Smith Professor of Education, is preparing to retire from her position as executive director of William & Mary’s Center for Gifted Education. She is recognized as a pioneer in the field of gifted education, and her research has directly affected students and educators around the world.

“I recognize that it’s a small pond, but it’s been my niche for a long time, and I think that once you find your niche, you are able to do things at ever-increasing levels and produce more because you know the field deeply and well,” she said.

Before coming to William & Mary’s School of Education in 1977, VanTassel-Baska served as the state director of gifted programs for Illinois.
JOYCE VANTASSEL-BASKA
AN OVERVIEW

Since 1974, Joyce VanTassel-Baska has served as principal investigator of 60 separately funded projects, totaling almost $15 million in grants from federal and state agencies. Some of those grants brought about Project Clarion and Project Athena, which were funded for $3 million over five years. Project Clarion was an initiative that promoted scientific conceptual understanding in gifted children between ages 4 and 8 through interactive activities and projects. Project Athena examined the effect of William & Mary English/language arts curriculum units designed to increase the reading and critical thinking skills of Title I elementary school students. Five states—Ohio, Virginia, Colorado, South Carolina and Illinois—have presented VanTassel-Baska awards for her contributions to the field of gifted education. She has also received numerous other awards for her work, including the National Association for Gifted Children’s Early Leader Award in 1986, the State Council of Higher Education for Virginia Outstanding Faculty Award in 1993, the Phi Beta Kappa faculty award in 1995 and the National Association of Gifted Children Distinguished Scholar Award in 1997. She has published 36 books, more than 450 refereed journal articles, book chapters and scholarly reports. Her most recent book is Comprehensive Curriculum for Gifted Education (3rd Edition, 2006).

VanTassel-Baska has served as a consultant on gifted education internationally, in all 50 states and for several national groups, including the U.S. Department of Education, Cambridge University in 1993 and a Fulbright lecturer in New Zealand in 2000.

Although she has been very successful and productive in her research efforts, VanTassel-Baska said that at heart, she is a teacher.

“I think why William & Mary has been such a good fit for me is that teaching is fundamentally where my values lie,” she said. “Yes, I’ve done research, and I’m not ashamed of my research, but if you were to ask me about the William & Mary dual credo for faculty—teaching and scholarship—I would always put teaching first and scholarship second. Even though I have been working on teaching, I’m still teaching.”

In the latter part of my career here I’ve very hard on scholarship, it’s been because of the importance of leaving some kind of legacy behind of the work done here. The legacy of that work also lives on in my graduate students as they make their own unique contributions to the scholarship of the field.”

Joyce VanTassel-Baska works with children during one of the summer enrichment programs sponsored by the Center for Gifted Education.

Four areas of research concentration

• curriculum effectiveness
• gifted students from low-income and minority backgrounds
• teacher effectiveness
• talent development in eminent individuals

During one of the summer enrichment programs sponsored by the Center for Gifted Education.

Among the plaudits at a March festschrift celebrating her career: “Joyce VanTassel-Baska has been such an important force in gifted education. I mean, she’s our empress,” said Frank Worrell, faculty director of the academic talent development program at the University of California, Berkeley.

“Joyce VanTassel-Baska has served as principal investigator of 60 separately funded projects, totaling almost $15 million in grants from federal and state agencies. Some of those grants brought about Project Clarion and Project Athena, which were funded for $3 million over five years. Project Clarion was an initiative that promoted scientific conceptual understanding in gifted children between ages 4 and 8 through interactive activities and projects. Project Athena examined the effect of William & Mary English/language arts curriculum units designed to increase the reading and critical thinking skills of Title I elementary school students. Five states—Ohio, Virginia, Colorado, South Carolina and Illinois—have presented VanTassel-Baska awards for her contributions to the field of gifted education. She has also received numerous other awards for her work, including the National Association for Gifted Children’s Early Leader Award in 1986, the State Council of Higher Education for Virginia Outstanding Faculty Award in 1993, the Phi Beta Kappa faculty award in 1995 and the National Association of Gifted Children Distinguished Scholar Award in 1997. She has published 36 books, more than 450 refereed journal articles, book chapters and scholarly reports. Her most recent book is Comprehensive Curriculum for Gifted Education (3rd Edition, 2006).

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Joyce VanTassel-Baska works with children during one of the summer enrichment programs sponsored by the Center for Gifted Education.
Learning, training and practice

VanTassel-Baska’s favorite area of research is in talent development. It grew out of her personal interest in reading biography. In 1993, she received research leave from the College and went to England to study the lives of Charlotte Bronte and Virginia Woolf, focusing on their talent development processes. She has many fond memories of the trip, such as her visit to the Bronte parsonage. She read Charlotte’s letters while her daughter, then 11 years old, sat next to her and read Jane Eyre for the first time. She also fondly recalls attending a seminar on Virginia Woolf at Cambridge in the same room where Woolf gave the lecture that became the essay “A Room of One’s Own.”

“VanTassel-Baska found that early experiences—both educational and relational—greatly impacted the talent development of many people who went on to be notably high achievers. Additionally, the influence of family can play an important part of the process. I think that internal characteristics are also very powerful in the lives of these individuals,” said VanTassel-Baska. “They had tremendous motivation. They had tremendous capacity for hard work. They had the zeal that Darwin was talking about, the enthusiasm to keep going in the face of failure. Those characteristics matter a lot. Passion matters a lot. It isn’t just that they’re interested in things; they’re passionate about things.”

She also found that the lifestyles of the accomplished and famous often include a capacity to work on something for long periods of time, getting so engrossed in it that they lose track of time.

“That’s probably where the ‘absent-minded professor’ label came from,” she said. “A lot of professors engage in their work that way. It’s indicative of the mental state necessary to do important work.”

VanTassel-Baska said that there is a general rule that says that it takes an individual in years of very hard work in a field in order to make a breakthrough.

“So this notion of learning, training and practice in a talent development area is critical in order to produce something of worth in any area,” she said.

Although VanTassel-Baska enjoys the archival research, she hasn’t pursued it as much as the other strands of her research because she thought the other areas would be more useful to people, and she received federal grants to support the school-based research efforts.

“There is this pragmatic streak in me that research ought to mean something, and in particular, research in education ought to mean something, to be able to help people in schools do a better job. That’s my research ethos. If you work in a field like education—which is applied—then your research should in fact benefit that profession,” she said.

However, now that she is retiring, she plans to more thoroughly pursue her interest in archival research and talent development. Right now, she is interested particularly in the life of Sir Francis Galton, who is considered by many to be the father of gifted education. He was also an accomplished explorer, a pioneer in the field of statistics and the cousin of Charles Darwin. VanTassel-Baska travelled to the University of London last year to conduct research in the Galton archive.

The importance of gifted education

Although gifted education has come a long way from where it was when VanTassel-Baska started her career, it still has significant strides to take, she said.

“Unlike when I came into the field in the 1970s, we have a much more systematized field than we had before,” she said. “But even within that systematized area, we still have what I call a ‘patchwork quilt’ of opportunities.”

For example, the services available to a child depends on the state—and in many cases the school district—the gifted child calls home. VanTassel-Baska advocates a more uniform availability of services.

“I think there is a real need to provide a much more systematic guarantee that no matter where you live, no matter how much money your family makes, if you’re bright, you will have opportunities to grow and develop in ways that are appropriate for your needs,” said VanTassel-Baska.

She supports a model which is based around a university’s gifted-ed program. K-12 districts could work with the university program in cooperative arrangements, developing programs and services, creating a sustainable, systematic training mechanism for teachers and establishing a source of ongoing professional development.

“My wish there would be that in every state, there would be at least two universities offering coursework in the education of the gifted and running centers like this one to be sure that there were good opportunities for students at all age levels,” said VanTassel-Baska. “Gifted students have many unmet needs.”

However, in the country’s current financial situation, many critics of gifted education question the need for it and accuse it of merely taking the smart kids out of the classroom. But VanTassel-Baska said that putting gifted children together in these programs is vital.

“I think schools have to think about what are the best kinds of opportunities that they can offer students who are so promising intellectually or academically or in the arts or leadership,” she said. “What are the opportunities that we can provide in any given context that can optimize those abilities? Once you can answer that question, the second question becomes how can we least costfully do that? The reality is that if you want to optimize the abilities of students in specific domains, then you have to put students together with others who share their level of learning, their interest and their passion.”

Benefits of peer grouping

“There’s never a question about putting the best basketball players together to make a team or never any question about the development of musical talent and putting the best players together and giving them first chairs in orchestras or first soprano in a chorus because we understand and accept that it is necessary to have the strongest performers,” she said. “And yet, when it comes to academics, we become much more skittish about putting the best students together to work to their optimal capacity. Yet, peer grouping is essentially basic to the development of high-level talent. In the absence of that, these students will not prosper.”

VanTassel-Baska said that not having strong gifted education programs is to our detriment.

“We have other societies around the world who now see this as a national priority. Korea sees it as a national priority. Singapore, China—many societies are willing to put their resources into the best and the brightest, and the United States so far has not been willing to do that, providing less than a penny per student in funding at the federal level,” she said.

VanTassel-Baska said that it is often hard for people to understand what not having gifted programs would do.

“But 50 years down the road, we will know that we have made a mistake by not developing our best minds,” she said. “We will know it because we will no longer be preeminent in the world. We will know it as we don’t enjoy the quality of life that we have enjoyed over the past 50 years. We will know it in the fact that certain break-throughs in medicine have not been made, certain social problems have not been solved; we will know as it life becomes ever-more complex and we don’t have sufficient numbers of people who are able to meet the challenges of those complexities and solve problems in important ways.

The lack of attention to gifted and talented students as a group will cause us to suffer in the long run as a society for not nurturing the new Tori Morristons, the new Newtons, the new Hawkins who could be making huge contributions to future generations. But can we at the moment see that? No, because we’re not looking for the right outcomes from schools which should be differentially calibrated to the capacities of students. We should be raising the money for all learners and increasing the variance for our top learners, not closing the achievement gap by holding them in place. Our instructional approaches must be based on the talent development processes of higher level thinking and problem solving, not the lower level skills currently drilled on for performance on state tests.”

Legacy, personal and professional

VanTassel-Baska said that what she is most proud of from her career are her doctoral students. “They are out around the world starting gifted education centers of their own at different higher education institutions or doing good work in other educational contexts for gifted students.”

She is also very proud of her daughter, a William & Mary alumna who, following in her mother’s footsteps, is a Latin teacher pursuing a master’s degree in gifted education at George Mason University.

“To the final analysis, it’s the people I’ve influenced that matter the most to me,” VanTassel-Baska said. “They give me the greatest satisfaction that they have gone on, or are going on, to do good work in gifted education. I know in the case of many of them, these career opportunities would not have happened had William & Mary not been here, had the program not been here, had I not been here.”

VanTassel-Baska has written or photographs of their families or cinated with,” she said. “To pick up letters they people whose works you have read, whose works same room where Woolf gave the lecture that 11 years old, sat next to her and read to more thoroughly pursue her interest in archi 1970s, we have a much more systematized fe the lives of these individuals,” said VanTassel-Baska. “They had tremendous motivation. They had tre every state, there would be at least two universities offering coursework in the education of the gifted and running centers like this one to be sure that there were good opportunities for students at all age levels,” said VanTassel-Baska. “Gifted students have many unmet needs.”

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You have to keep reminding yourself that you're inside what used to be Rogers Hall. The venerable chemistry building has been gutted and transformed into a state-of-the-art working space now known as Phase 2 of the Integrated Science Center. The chemists aren't around, either; they moved to new quarters in the first phase of the Integrated Science Center last summer.

The lion's share of the psychology department is on the first floor of ISC 2. The second floor is occupied by biologists, whose new department headquarters is in the adjoining ISC 1. ISC 1 is being converted to lab use.

In late April, there was still some unpacking and setting up going on, but actual science was going on in most of the labs. The biologists had moved over from Millington Hall, as had most of the psychologists. The departments aren't yet percent consolidated, though: there are a few psych people left in the Bell Building and some biologists remain in Millington. In the ISC 2, much of the talk in both departments had to do with how much better things were.

"This is a nice, big open space," psychologist Peter Vishston said, looking around his new lab. Vishston, who moved his lab over from cramped quarters in the basement of the Bell Building, works on studies involving visually controlled actions, especially in infants. "The parents will be more comfortable, that will make the babies more comfortable— and that will give us better data."

Joseph Galano, a psychology professor at William & Mary, said he usually works with seven or eight undergraduate students, researching prevention of child abuse and neglect, often involving visually controlled actions, especially in infants. "The parents will be more comfortable, that will make the babies more comfortable—and that will give us better data."

Joseph Galano, meeting with a graduate student ("For the first time, we have a window"), said he usually works with seven or eight undergraduate students, researching prevention of child abuse and neglect, often involving visually controlled actions, especially in infants. "The parents will be more comfortable, that will make the babies more comfortable—and that will give us better data."

constance pilkington, psychology chair, paused outside the department conference room where a group was assembling to hear a senior’s honors project presentation.

"our new seminar rooms provide us with a lot more space to host invited speakers and to have research meetings," pilkington said.

the ISC 2 benefits go beyond better, more pleasant and more convenient workspaces. Like the adjoining first phase of the Integrated Science Center, the ISC 2 was built with the needs of the scientists in mind. The psychologists, for example, now have a dedicated computer-driven research lab, no longer having to make do with a patched-together collection of machines.

"Computers are our microscopes and our test tubes," pilkington said. "I know everyone uses computers, but we use computers to collect so much of our data. Using a computer, we can get reaction time and that tells us all sorts of things about what goes on in the brain. We collect physiological and psychological data and that tells us about your emotional state."

Psychologists and biologists move in—and get a move on

Lisa bateman '09 stands behind the podium with advisor Janice zeman, associate professor of psychology, as she begins to present her senior honors defense. the department has between 250 and 300 majors each year, more than 100 of whom are involved in research with faculty members at any given moment. this year, 18 seniors present honors theses in psychology. Bateman's work is in children's emotional expression.

the psychology department's new computer infrastructure even extends to a pair of Faraday chambers, electrically shielded booths that allow researchers in the EOG lab to get better data when they monitor brain activity in human subjects.

"right now these fluorescences are flickering at 60 hertz—that's for times a second," assistant professor Paul kieffaber explained. "All the out lies in the walls, they are pulsating with alternating current. All of this creates electrical noise. The sensors that we use to record brain activity are so sensitive that they pick up on all this kind of environmental noise; in fact that noise is much louder than the kind of activity that we're able to record at the surface of the scalp."

kieffaber said until the Faraday chambers were installed, researchers used software to filter out the electrical noise. "It's easy. And," he said, "it distorts your data." pilkington said that the shielded booths are almost never seen in a school the size of William & Mary, but will be valuable for a large part of the psychology faculty.

"the cool thing about this is we've got cognitive psychologists, clinical psychologists, social psychologists, pretty much the whole spectrum of psychology can come in here and do brain recording," she said.

like the EOG lab, pilkington said the department's new dyadic interaction lab will see wide use. a suite of four interaction rooms are connected to an observation room by video as well as two-way mirrors.

"because we have these four rooms in the suite, we can have people interacting together, then break them out into separate rooms," pilkington said. "we can watch everything that's going on from the central control room.

On the second floor, a similar metamorphosis was underway in biology labs.

"it's bright, it's open. It's a great place to be. This is really a great change," said matt wawersik, a biologist who works with stem cells in fruit flies. "we have our own microscope room. Before, we just had this makeshift shelf that was really a box we went into. We have the rooms across the way that are colloborative space that we can meet for teaching and for lunches or lab meetings."

opening of the Integrated science Center phase is the latest milestone in the development of a science precinct at William & Mary. the first phase of the ISC opened for business in summer of 2006. Taken together, ISC 1 and 2 provide a total of 70 teaching and research laboratories (plus faculty offices and support facilities) for the departments of chemistry, biology and psychology. Plans are being developed for the third phase of the Integrated Science Center.
ECOFASHION

by Lillian Stevens

Regina Root looks into exactly why green will be the new black next year...and the year after.

S ome view ‘sustainable fashion’ as the ultimate paradox. Sustainability aspires to preserve the environment for future generations, Fashion, on the other hand, is constantly in flux and has long represented luxury and waste,” says Regina Root.

Root is associate professor of Hispanic studies at the College of William and Mary and also teaches courses on environmental and material culture. She is making a name for herself in the world of ecofashion academic, first as the editor of a special ecofashion-themed issue of Fashion Theory.

“Fashion Theory is one of the world’s leading sources for the field of fashion studies,” says Root, “so it was also a little intimidating to know that this volume was going to help define the role of sustainability as a category for analysis in fashion studies.”

The ideas that constitute ecofashion include attention to sustainable textiles or other materials, the emphasis on living wages for workers and the integration of local forms of knowledge into the design process and the terms of consumption—all in the service of personal expression.

Following the UK publication of Fashion Theory—a U. S. edition appeared three months later—colleagues at the London College of Fashion, along with an academic, publisher, invited Root to co-edit a forthcoming international professional handbook. This work will outline the field of fashion studies, particularly as they relate to sustainability issues in a globalized world.

The ecofashion concept begins with the realization that we are, indeed, what we wear. But we’re also how it was made and how long it will last. We define ourselves through the clothes we wear and when we opt for disposable clothing, we all pay the price.

Increasingly eco-savvy consumers

Consumers are increasingly eco-savvy about the choices they make and how they spend their clothing dollars. Designers and the fashion industry at large are paying attention.

“Designers are pushed by consumers,” says Root. “The multi-billion-dollar fashion industry employs some 26.4 million people worldwide. Some think of fashion as haute couture—and it can be—but it can also be about change and innovation and renovation.”

In recent years, the visibility of ecofashion has been raised through various initiatives, including the United Nations’ Environmental Program, which promotes “cool green lifestyles that do not strain the planet or exploit people.”

“The idea is to educate the world about the impact of our lifestyles and consumption practices in particular,” says Root.

The choices are not always easy and rarely clear-cut. For instance, consider cotton. This natural fiber, the basis of denim and T-shirts, remains a popular fabric choice. Root pointed out that Europe and the United States consume almost half of the world’s cotton and also subsidize cotton production to keep clothing prices low.

“Interest in organic cotton is growing exponentially, in part due to an awareness of the effects of the pesticides used to grow conventional cotton, which deplete soil and can devastate the health of agricultural workers,” Root said.

But, for the ecofashionista, wearing organic cotton is not a no-brainer nor a slam dunk. First, there’s little matter of supply and demand: “There is simply not enough organic cotton to satisfy the demand for the fibers,” she says.

Organic isn’t necessarily better

“Moreover, when you factor in the manufacturing and dyeing process, some scholars argue that the entire life cycle of organic cotton may not be any more sustainable than its conventional counterpart,” Root explained. “So it’s important to remember that there are plenty of alternatives to cotton. We need to educate ourselves.”

Social and political forces shape culture; fashion is no exception. Root believes that the flows of international tourism and globalization have made it all the more necessary for design to be relevant to the communities it represents and serves. In short, sustainable communities to behave sustainably on any given day. We all learn from them.

We all learn from them. Artistic and scientific innovations respond to them.

Artistic and scientific innovations respond to them.

When engaging the process, root said, “this, in turn, has changed the whole sense of a designer’s authority and vision—and sometimes even the outcome of the final product.”

A prime example involves Brazilian designer Carlos Miele, who has collaborated with a women’s cooperative from Latin America’s largest shantytown, Rocinha, on the outskirts of Rio de Janeiro. The Rocinha Cooperative of Women’s Artisans and Seamstresses, or COOPA-ROCA, was initially founded in the 1980s by Brazilian sociologist Maria Teresa Leal. Women in thecontinued on page 10

Professor Root’s ECOFASHION Do’s and Don’t’s

DO...

• educate yourself.
• The label might say it’s organic and eco-friendly, but was it made in a sweatshop?

• follow a garment’s life cycle—from inception to finish.
• When engaging the process, find out all you can about the materials used to create your garment, the people involved in its manufacture and how you might recycle it when you are finished wearing it.

• re-create an old garment.
• Why give up an article of clothing when you can re-use the collar or sleeves and create something new?
• Repairs can be decorative or functional, so go ahead and “upcycle” those old clothes.

• buy second-hand or try ‘swishing.’
• Consumerism is so out. Invite your friends to a “swish” party and swap usable clothes and accessories.

• avoid garments that need dry cleaning.
• Enough said.

• use clean. Embrace wrinkles!
• The consumer-use phase of everyday clothes often impacts the environment much more than the pre-consumer phase. Be sensible about what gets tossed into the hamper. Wash clothes with cold water, air dry or use the warm. Forget your iron ever existed.

• shop as if buying heirlooms.
• While synthetic dyes can produce environmental disasters, both in their production and application. Be aware, too, that some natural dyes get sourced from unsustainable resources or are used along with toxic chemicals for setting the color.

• throw away old clothes.
• The average American consumes 70 pounds of textiles annually. Most of this ends up in landfills. Consider recycling or donating the clothes, accessories and shoes that you no longer wish to keep.

• obsess about mistakes.
• We all learn from them. Artistic and scientific innovations respond to them. R. The ethical fashion challenge—use your creative agency to experiment with passion and purpose.

• don’t get intimidated by trends.
• Shop as if buying heirlooms for future generations.

• don’t think that all fibers are the same.
• Organic alternatives are usually best, but do your homework. ECOFASHION reveals that bamboo fabrics sold as “natural” sustainable alternatives sometimes were processed in the same ways as the most polluting fibers, like viscose rayon. Technological advances are quite fashion-forward these days: There are human-made, biodegradable fabrics that feel as soft to the skin as natural fibers.

• buy clothing colored with synthetic dyes.
• Synthetic dyes can produce environmental disasters, both in their production and application. Be aware, too, that some natural dyes get sourced from unsustainable resources or are used along with toxic chemicals for setting the color.

• throw away old clothes.
• The average American consumes 70 pounds of textiles annually. Most of this ends up in landfills. Consider recycling or donating the clothes, accessories and shoes that you no longer wish to keep.

• obsess about mistakes.
• We all learn from them. Artistic and scientific innovations respond to them. R. The ethical fashion challenge—use your creative agency to experiment with passion and purpose.
"Ecofashion inspires local connections..." — William & Mary deat i on

Ecofashion continues to evolve and inspire local connections and sustainable practices around the world. In this issue, we explore how ecofashion can be a force for change in various aspects of the fashion industry, from production to consumer behavior. Join us as we delve into the latest trends, innovations, and case studies that showcase the potential of ecofashion to make a positive impact on our planet and society.

Several companies are discovering what Boone described as "powerful synergies" among environmental concerns and apparel supply chain management systems. "For example, as a part of their sustainability strategy, Central Textiles—a cooperative to produce haute couture to the Brazilian version of a quilting bee. During his work with the Rocinha Cooperative, Carlos Miele received a UN Development Grant. "He worked closely with members of the cooperative to produce haute couture to the precision-industry standard, ensuring living wages and thereby elevating them from poverty," says Root. "In essence, the project has helped create the authorship of the indigenous worldview. Today, the cooperative works with other prominent designers and labels throughout the world and truly serves as a model for what can happen when you have a greater sense of interconnectedness."

No longer just about the designer

Carlos Miele’s signature use of transparent and flowing silk chiffon is evident in this mustard blouse worn by Katherine McNamara ’10. "Clothing produced at a sweatshops makes the consumer feel environmentally_urls."

"When it comes to fashion, we now have several countries working towards international standards to certify what constitutes organic, fair trade, ethical and sustainable," says Root. "Sustainable fashion continues to articulate new relationships to material culture. In fashion, this means that the entire creative process is changing, with more designers recognizing the significance of their role as facilitators to a larger production process that requires sustainable materials and sustained livelihoods for the people involved."

Ecofashion in the classroom

This fall, Root will import her ecofashion research into the classroom, as she will lead a freshman seminar on ethical fashion through the Sharpe Community Scholars Program, a William & Mary service-learning-based program. The course will focus on Latin American fashion and apparel products that have adopted informational labeling—not unlike nutritional labeling on grocery store items—on garments. "Some companies already provide this information," says Root. "In the current Chronicles. Patagonia has truly led by example, having switched from virgin to recycled polyester, cotton and conventional to organic cotton well over a decade ago," Root said. "They map out every aspect of their lines, starting from the fleece made from a PET plastic bottle or the cotton seed. Consumers can even return their products when they are done using them. This all then gets recycled into the next line of clothing. It’s quite remarkable." Not all designers or companies provide this kind of information, however. There is, quite likely, change on the horizon for the eco-conscious clothes shopper.

WHAT’S SO ‘ECO’ ABOUT THESE FASHIONS?

It’s not always a simple question. Regina Root points out that when it comes to sustainable fashion, there are a variety of labels, certifications and standards. But, by any reasonable standard, the three pieces shown on pages 10 and 11, on loan from Brazilian designer Carlos Miele, make the grade. Here are Root’s comments on each:

• The studio. “Miele’s work has been showcased on the Ethical Fashion Forum and is regularly recognized as an example of best practices in ecological and social responsibility.”

• Material. “Miele is known for purchasing organic materials and engaging ethical and fair trade practices. The dyes he uses are described as eco-friendly in some reports, although I do not have the specifics on these particular garments.”

• Construction. “Ecofashion inspires local connections that contribute to social change and environmental stability. These particular garments exemplify a design process that has brought into dialogue an emblem of cultural identity, specifically the fuxico from northern Brazil, and ethical labor practices. The fuxico for Miele’s collections are fashioned from old fabric swatches—which currently numbers about 150—helped create these garments by hand.”

“Those garments are examples of what scholars call ‘slow fashion.’ Their creation involves a meaningful process focused on preserving the environment and the dignity of workers. For these reasons, I think they make the cut,” Root said.

Business and supply chain models

Last year, Root began to collaborate with associate professor Torjea Boone from the Mason School of Business, an expert in sustainable operations and supply chain management. Their work links business and supply chain models to the processes for creating sustainable fashion. This includes an examination of the role of international agencies such as the United Nations and non-governmental organizations like Raíz Dourada, a transnational network of Latin American designers who view design as a useful tool in the struggle to acquire voice, power and market share in the international marketplace.

“I think that we will see the interest in sustainable fashion grow as more consumers in general become engaged around these issues, says Boone. “Research suggests that while many consumers want sustainable goods, they are often not willing to pay premium prices for them. Still, I’ve seen estimates that indicate around 80 percent of the U.S. public are actively engaged in sustainable issues. This represents a considerable market segment.”

Boone predicted that as sustainable fashion supports consumers’ self-expression and self-expression, they will seek out sustainable fashions. “We plan to develop models of sustainable design process, and then examine their effect on the fashion supply chain,” she said.

“Clothing, which our designer can do to behave more sustainably,” says Root. “The research shows that the most unsustainable stage of the lifecycle of a garment is when the consumer uses it. Washing, drying and ironing clothes takes a lot of energy. In response, some designers are engaging new technologies to manufacture clothing that is stain- and odor-resistant, so that we wash them less. There are also designers introducing clothing that can be reconfigured if it tears or has a stain. Choosing washable fabrics over those which must be dry-cleaned is also a fairly inexpensive step in the right direction.”

Boone said it’s not clear what effect the economy to forecasts publishers, she stressed, that the goal was to bridge disciplines and represent various world cultures for the emerging field of sustainable fashion studies.

The resulting work outlined some of the problems in the worldwide fashion industry. Root pointed out that “big fashion” employs lots of millions of people—many of whom do not receive living wages. The industry also has a strong and fast carbon footprint. Fashion still relies on dangerous chemicals to produce textiles for clothing and further exhausts limited resources, have always gathered to sew together, of stress, have always gathered to sew together, of tradition with a deep cultural history in Brazil. Fuxico is a lovely way to work with and recycle pieces of fabric that might get thrown away otherwise. These cloth rosettes might be called “yo-yo” by U.S. quilters or clothes. Like quilt squares, fuxico rounds are sewed individually then pieced together. The name comes from the verb fuxicar—to gossip—which is what often happens when you sit around a table in this Brazilian version of a quilting bee. During his early work with the Rocinha Cooperative, Carlos Miele received a UN Development Grant. "He worked closely with members of the cooperative to produce haute couture to the high-end-industry standard, ensuring living wages and thereby elevating them from poverty," says Root. "In essence, the project has helped create the authorship of the indigenous worldview. Today, the cooperative works with other prominent designers and labels throughout the world and truly serves as a model for what can happen when you have a greater sense of interconnectedness."

No longer just about the designer

Carlos Miele wears a strapless power dress of silk Fuxico that grow as they reach the earth.

This strapless raspberry dress of champagne silk, modeled by psychology graduate student Kristin Beardon, ends with a glamorous train.
Sharpe scholars walk into an old building, walk out with a cache of lost documents

Without so much as a map or an “X” to mark the spot, a group of Sharpe Scholars uncovered a historical treasure.

Their find will shed new light on the lives of early 20th-Century African Americans.

The group discovered a cache of original documents related to the life and work of Maggie L. Walker, the first female to found a bank dedicated to helping improve the lives of African American women, teaches them about community issues and empowers them to exist.

Third year of a freshman seminar

The discovery comes three years after Huyck, a former National Park Service employee, began teaching a freshman seminar on the St. Luke Building and its historical context. The seminar is part of the College’s Sharpe Community Scholars Program. The program takes freshmen, teaches them about community issues and then asks the students to address those issues through student-generated projects.

Huyck began teaching the seminar in hope of preserving the St. Luke building just off I-95 in downtown Richmond. During the early 20th Century the building served as an economic powerhouse in the Jackson Ward community. Through the Independent Order of St. Luke, Maggie Walker used her entrepreneurial skills to fill needs otherwise denied to African Americans during that era, creating insurance, a bank and a newspaper—“the tools and institutions that helped people be middle class,” Huyck said.

Under Walker’s 35 years of leadership, the order grew to include more than 100,000 members in 24 states and provided professional jobs for African American women and safe meeting places for African Americans “in the middle of Jim Crow, which sought to thwart their aspirations in every way it could,” said Huyck.

Walker’s home, at 725 E. Leigh Street in Richmond, is a National Historic Site administered by the National Park Service, but the four-story St. Luke building, boarded up and vacant, has been largely ignored. Huyck and her students have been trying to change the building’s status by working toward getting the site designated as a National Historic Landmark.

With permission from the Stallings family, which owns the building, Huyck’s students have been inside St. Luke’s before. However, because it is vacant and deteriorated, they had not done much exploring. Huyck knew there were boxes in the attic of a former National Park Service employee, who signed her letters, sealed them and worked to prepare for scanning one of the scores of recovered historic documents related to the life and work of Maggie L. Walker, the first female to found a bank dedicated to helping improve the lives of African American women.

The students were exploring the attic of a building in Richmond when they came across piles of 1920s and ‘30s documents associated with the Independent Order of St. Luke.

The documents include letters from Walker, insurance papers and rare copies of the organization’s newspaper, doubling the number known to exist.

“Just doing a video’

At the end of February 2009, a group of Huyck’s students were in the St. Luke building with Ron Stallings as he gave an oral history.

“We were just doing a video of the owner walking through the building,” said Huyck. “We were literally just pointing out documents to people and working on the website to show the collection.”

Among their findings, the students discovered four copies of the St. Luke Herald. Previously, only four were known to exist. They also discovered stacks of death cards, letters from Walker to other organizations and various other documents from the businesses that once existed in the building.

“We went from a delirious Amy Clinger to being sacrosanct, and we’re trying to figure out how to make that transition. We want to do what’s best for the documents and for the students’ education,” Huyck said.

As the Sharpe seminar starts cataloguing and copying the documents, it becomes clear that the find will illuminate scholars’ understanding of life under Jim Crow. Correspondence to Maggie Walker—as well as copies of letters she sent out—will show the links the St. Luke organization had with other social and political organizations. The paperwork of the insurance arm of the order reveals data of a more personal nature.

“Documentation is important for historians and for the general public. It will help us better understand American history,” Huyck said.

So everyone decided to climb the narrow stairway and look at the attic. At first, they saw some old props and an aisle seat from the building’s original center auditorium. They also saw boxes full of documents from when the building housed a daycare in the 1970s. As they continued to explore the space by the light of their flashlights, a cell phone and a light for their video camera, one student picked up a piece of paper that would change everything.

It was a 1920s “death card”—an insurance card that recorded someone’s death and the related payout information.

“We got really excited, and we started moving boxes out of the way and picking up stuff,” said Amy Clinger, a Sharpe Fellow who was leading the group of students that day.

When the students began moving aside the boxes of 1920s documents, they revealed stacks of loose papers from the 1920s and ‘30s.

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“It tells us where people died. It tells us where people actually were. It tells us how everything actually worked,” Huyck said.

Clinger said that going through the documents—seeing the information on the death certificates, seeing the handwriting, seeing the names—“has helped her and the other students see the personal aspects of both Walker’s life and her business.”

“I know history can be kind of boring to people sometimes,” she said. “But this brought a sense of adventure for the students. History can be exciting, not just in researching it but in these kinds of finds and processing them and getting to know this historical figure as a person—someone who did write letters, someone who signed letters, sealed them and worked with those people that were going through these really difficult times.”
Discovery of a new bacteriophage means Crim Dell isn’t just for photos anymore

It’s a new form of life. It was discovered by a lab full of freshmen... and it came out of Crim Dell. The organism, a strain of bacteriophage, was found in the muck at the edge of Crim Dell, so the students agreed to name it CrimD. It’s undoubtedly the only new form of life to be discovered at a campus landmark.

The discovery was part of a project sponsored by the Science Education Alliance of the Howard Hughes Medical Institute. The HHMI organized freshmen at 12 select colleges into two-semester research courses on the genetics of bacteriophages—or just plain phages—which are viruses that infect bacteria. The lead scientists in this research-oriented lab are Margaret Saha, Mark Forsyth and Kurt Williamson, all faculty in the biology department.

Bacteriophages are one of the hottest topics in biomedical and clinical research circles. These bacteria-attacking viruses show immense potential as alternatives to antibiotics.

“This sort of discovery could lead to possible therapies,” Saha said, “particularly for tuberculosis.”

It gets even better
There’s even more to the CrimD discovery. As the phage lab begins to examine individual genes of CrimD, the participants are finding genes that have never been found before in any virus.

“Some of these genes are clearly much more closely related to bacterial genes than viral genes,” Forsyth said. “This has led to some wonderful student hypotheses on the acquisition of host genes during the infectious process.

Finding new genes in a genome this small really underscores a major point of a study like this—the genetic diversity that exists in the world surrounding us may be unfathomable.

It’s hard to imagine how many novel genes must be out there just waiting to be examined.”

It all began in the dirt and mud near Crim Dell, just a stone’s throw from the new Integrated Science Center. The students collected soil samples in the fall semester of 2008. Then, they walked back to the ISC to execute state-of-the-art lab techniques to isolate phages and prepare the phage DNA for sequencing—or genetic blueprinting—at Los Alamos National Laboratory.

Preliminary results from Los Alamos indicated that CrimD was a novel virus strain, previously unrecorded—but nobody could be sure. Forsyth said in January that the Los Alamos findings were “what’s as a draft.” He explained that the draft contained all the units of the CrimD genome in three contiguous parts. An organism’s genome contains the order in which the four building blocks of DNA—adenine, thymine, cytosine and guanine—are arranged in couples known as base pairs, which make up the rungs of the spiral DNA ladder.

CrimD, with 59,798 base pairs, has a small genome. By comparison, Forsyth said the specific bacterium that CrimD infects has four million base pairs. The human genome consists of some three billion base pairs.

Filling in the genomic gaps
As the second semester started, the lab began using a number of sophisticated bioinformatics techniques to verify their discovery, filling in gaps of the Los Alamos sequencing, and examining CrimD’s individual genes.

“One of the first things the students did was to analyze the data to identify weak spots,” Williamson said. “In other words, there are points in this genome that have been sequenced a few number of times. Typically you want ‘8x coverage,’ so each region of the genome is sequenced eight times and at least seven of those eight times need to agree.”

The students used various techniques to get the CrimD genome in proper order and to address CrimD’s weak spots, segments of 500 to 4,000 base pairs that didn’t make the 8x cut at Los Alamos. The weak segments were examined using techniques such as the polymerase chain reaction, a DNA amplification tool common in molecular biology labs. All members of the phage seminar learned to use state-of-the-art bioinformatics software supplied through HHMI to process the CrimD genome in silico.

“There’s in vivo and in vitro, which everybody knows,” Saha explained. “In silico is becoming much more commonly used to describe things done on a silicon chip in a computer, rather than at the lab bench.” Saha said that the sheer amount of data in even small virus-sized genomes such as CrimD make in silico bioinformatics techniques necessary in today’s research labs.

“You absolutely need computer computational power to analyze and make sense of these hundreds of thousands of bases and how they fit together or don’t fit together to make up proteins and form genes,” she said. “This can’t be done easily by the human mind, but the computer programs make all the possible combinations and come up with the best series of alignments. This happens in microseconds. Then, of course, we have to curate that and look at it to make sure it makes biological sense.”

By comparison, Forsyth said the Los Alamos sequencing, and examining CrimD’s individual genes.

Between January and mid-March, the phage lab was able to establish CrimD’s singular pedigree, although no one realized the particular point at which “looking good” had solidified into a certainty.

Looking (in vain) for eureka

“The problem with science is that there’s rarely this ‘eureka’ moment,” Saha said. “It’s gradual. By the time you get to what should be your eureka, you realize that there was no one moment where you don’t know, then one where you do know.”

Even if the scientists can’t always recognize the eureka moment, they do know that they have passed it.

“Oh, it’s a new virus all right,” Forsyth said. “In fact, it is not falling into any of the known clusters of the viruses that infect this species of bacterium.”

In late March, the phage lab hosted a gathering of other freshman phage labs, which included a visit from Graham Hatfull of the University of Pittsburgh, HHMI’s lead scientist on the project, and his staff. Hatfull’s people took an immediate interest in the William & Mary phage.

“CrimD,” one of them said, “is cool!”

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Freshmen in the phage seminar have excellent mentors in the form of Kurt Williamson and also Mark Forsyth (left) and Margaret Saha, who are helping Kasi Hartman with a preparation early in the process.

Students in the HHMI bacteriophage seminar learn a range of scientific techniques and practices, beginning with the importance of marking the site of a field sample and continuing through bioinformatics.

At Crim Dell, Sam Harvey and Kasi Hartman take samples of soil and muck. Soil sampling was the low-tech beginning of a process that included state-of-the-art techniques such as DNA sequencing.

Phage hunters (from left) Shartania Askew, Carolina Ruiz and Alexandra Barnes go through the process necessary to isolate bacteriophage from soil samples taken from various campus sites.
Waiting for the Word

Anthologist hopes ‘appraiser’ booklets spur demand for book

Henry Hart nods wryly at the paper-clamp-studded stack of manila folders, nearly a foot thick, sitting on the floor of his Tucker Hall office. “That’s all of it, down there,” he said. “The anthology is supposed to be about 1,200 pages long. That’s the whole manuscript, with my introductions, photocopies of different texts—plays, poems, short stories, essays and whatnot.”

The manuscript represents an anthology of American literature following World War II—and also more than two years of work for Hart, professor of English at William & Mary. His manuscript is the last in an omnibus series of five volumes that together were to comprise the Thomson Anthology of American Literature. Publication of the entire anthology is being held in abeyance in the wake of a series of corporate go-ahead for the whole project, they will go ahead with an online version at this point. I’m really not sure.”

Little to do... but wait

For now, there’s little that Hart can do other than trade snippets of news with the editors of the other volumes, hope the “appraiser” booklets do their job, and continue to wait for word from the project’s director.

“I really do hope that the anthology will go forward,” Hart said. “But I’m fatalistic about it. Because of the financial crisis, I know that this is a terrible time for the publishing business.”

13 MUSTS

Henry Hart lists 13 works that absolutely, positively should be included in any post-WWII anthology of American literature. (He also explains why one didn’t make it.)

“The Quaker Graveyard in Nantucket.” Robert Lowell’s allegorical poem in which Captain Ahab plays the role of a violent American that will stop at nothing to achieve its goals.

“A Good Man is Hard to Find.” Flannery O’Connor’s story set in the South that juxtaposes grace and violent crime.

“Howl.” Allen Ginsberg’s poem about the American counterculture—its visionary quests and mad excesses—before it officially became the counterculture of the 1960s.

“The Swimmer.” John Cheever’s short story that documents the epic journey of a suburban American that turns out to be a kind of alcoholic delusion.

“Sonny’s Blues.” James Baldwin story that recounts the different ways two African-American brothers cope with racism.

“Death of a Salesman.” Arthur Miller’s classic play about the tragic consequences of the American dream (and especially the dream of financial success).

“I Have a Dream.” Martin Luther King’s stirring speech that urges all Americans to abide by their country’s founding principles of freedom and justice for all.

“Saint Marie.” Louise Erdrich’s tale of a young woman’s conflict between her Native American community and Christian obsessions.

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“Saint Marie.” Louise Erdrich’s tale of a young woman’s conflict between her Native American community and Christian obsessions.
New research reveals a new paradigm for the neural origins of the rhythm of respiration.

The interaction of the calcium ebb and flow with the cells in the CPG not only instigate the electrochemical burst that triggers inspiration, but also saws the biochemical seeds to turn the burst off.

“That was the innovative breakthrough,” Del Negro said. “The reason we got motivated on this project is that the respiratory system can’t be attributed to canonical, classical mechanisms of rhythm generation. This system is different from all the others that we know of.”

Del Negro said this concept of collective network properties that drive rhythmic breathing may serve as a model for understanding the cellular bases of other rhythmic behaviors and functions.

“We believe that the essence of breathing comes from this network in the preBötzinger Complex, which generates the rhythm to inspire. That rhythm then is distributed to the muscle groups, like the diaphragm, that do the dominant work to breathe in. But, it’s not just about breathing,” he said. “There are so many different mammalian and human behaviors that are rhythmic: locomotion, chewing, swimming, breathing. The preBötginger Complex provides us a model for us to study them.”
near Rockfish Gap, Virginia’s Shenandoah Valley, Blue Ridge Mountains and Piedmont all come together, creating what amounts to a geological smorgasbord in a relatively small area. It’s the perfect venue for the geology department’s annual Senior Research Adventures field trip. Supported by the Mellon Foundation, these trips are a chance for the department’s more advanced students to discuss their research projects in situ and for the younger geology majors to learn techniques, inspect a variety of formations—and learn that there is no such thing as Afton Mountain.

On a crisp weekend in late March, three vans of geologists made the trek. The vans made a handy surface for the map-assisted overview that began each presentation (1) as Graham Lederer ’09 (center) shows what to expect in “basement” rock below Beaver Creek Dam while faculty Greg Hancock and Chuck Bailey hold the map. Bailey said the shear zone below the dam is a contentious one: “This is the kind of a place that makes geologists get hot under the collar, but I think Graham’s studies have nailed it down pretty well.”

The geologists climbed two peaks during the weekend, including a scramble out to the high tor of Turk Mountain (2), where Jenny Whitten ’09 (pictured) talked about her work on erosion rates in the Blue Ridge and Ali Snell ’10 spoke on strain analysis from deformed sandstones. After the descent, soil geologist Jim Kaste began the first of a few soil-coring parties.

Faculty and older students taught newbies the basics of using a Brunton Pocket Transit (3), a compass equipped with a bulls-eye level, allowing you to measure the dip of a geologic feature as well as the direction it’s running. There were plenty of opportunities to examine fossil tubes of skolithos worms, including this sample (4) in a piece of Antietam quartzite. Geologists use the deformity of the normally round worm holes to assess rock deformation from pressure and other forces.

Just off the Skyline Drive, Drew Laskowski ’10 spoke about Blue Ridge structural analysis/ancient rift basin at the Moormans River Overlook (5). On the Piedmont, the group visited the Solite slate quarry, where Sarah King ’09 spoke about the geochemistry of the Arvonia Formation and Bailey led the group in the “hand game” (6), a rough-and-ready method to determine how forces have shaped rock. Great vistas and impressive formations, but geology can be up close and personal, too (7) as Corbett Wicks ’12 watches Mary Kate Kearney ’12 inspect a gneiss-bearing sample of rock through a hand lens.

—text and photos by Joseph McClain
William & Mary Center for Archaeological Research held an open house in December to celebrate both its 20th anniversary and to show off its new lab in the basement of Trinkle Hall.

Open-house attendees looking for golden skulls or other Indiana Jones-type artifacts would be disappointed, says Joe Jones, center director—and no relation to Indiana. “The thing about Indiana Jones and the Hollywood version of what archaeologists do blurs the lines between artifacts that are worth money and the kind of artifacts that have value to archaeologists,” he said. Archaeologists typically see the information value of artifacts as very different from their monetary value or what antique collectors think of. “We’re interested in things like nails and brick fragments and patterns of those things in the ground and what it tells us about what was there. We get excited about stuff that most people will look at and say, ‘Huh?’”

First step

“The Center for Archaeological Research functions as William & Mary’s archaeological consultants, working on grants and contracts,” Jones explained. “A typical WMCAR project begins with governmental sensitivity to the past. Laws stipulate that if a city or other project built with federal or state funding was constructed in a way that will not destroy significant archaeological resources. “The first step in all of that is to get archaeological consultants like us and send up a copy of the plans,” Jones said. “We sample the area where they’re proposing to build the road—doing shovel tests at regular intervals—to make sure there’s nothing significant there. And if there is, then it is all done far enough ahead of time so that they may be able to make management decisions to incorporate some sensitivity to the resources.”

Not all WMCAR projects are advance work on roads, however. Center archaeologists have worked at sites near the Colonial Parkway and at the Northern Neck homestead of James Monroe. Whether they’re from shovel tests at a road site or the childhood home of a U.S. president, artifacts come into the lab in paper bags. Each bag is labeled with information related to the object’s provenience—contextual data about where and when the item was found. The bags are turned over to lab manager Debbie Davenport, who processes their contents and prepares them for curation and storage. The curation process begins with cleaning of the artifacts. “I simply wash them,” Davenport said, although some materials just get a dry brushing. After cleaning, the objects are placed in partitioned drying trays, each item in its own square. Davenport makes sure the provenience information for each item stays with it—in the drying tray and throughout the entire curation process.

“I did some historical artifacts today that dated from 1775 all the way up to the 20th Century,” Davenport explained. “The appropriate person will get those artifacts, put them in plastic bags and then we catalog them according to a hierarchical system. That is then put into the computer. We generate inventories that are sent along to the archaeologists who study them and write reports.”

Tens of thousands of artifacts

Davenport presides over a collection that usually includes some 50,000 individual artifacts on a given day. The new lab in the basement of Trinkle Hall provides more storage space than the center’s old facility, which was at the edge of the old Common Glory parking lot. The old building was removed during construction of the new Alan B. Miller Hall at the Mason School of Business.

Jones and Davenport both said the additional space in the new Trinkle Hall lab will come in handy, especially in times which the excavations are more fruitful than usual. “There was one project that we did that generated more than 100 artifacts unexpectedly,” Davenport said. “We did not know that was going to be part of our data recovery on that particular project.”

Joe Jones unrolls a set of plans for expansion of a road. Many of the center’s projects involve investigating potential archaeological significance of areas slated for construction.

Show us the lab

“The open house, Jones said, was partially due to the urgings of colleagues at the College who kept asking to see the new lab. As part of the observances, the staff prepared a comprehensive index of all WMCAR technical reports produced since 1988.

“Someone who might be interested in the archaeology of 19th-Century farmsteads can go through the index and right away find everything we have about sites like that,” Jones said. “This would lead them to a chronological list of reports.” Reports themselves are on file either in the lab or in the WMCAR offices on Richmond Road. Copies of the index were distributed at the open house.

A 1630s tobacco pipe factory

The open house also featured a poster session depicting some of the center’s more significant projects. One poster outlined the discovery of evidence of a commercial manufacture of tobacco pipes dating from the 1630s at what is now City Point in Hopewell.

“We found lots of fragments of these stylized craftsman clay tobacco pipes that were made locally in Virginia. It was a craftsman society almost. They were trading those pipes back and forth around the mid-Atlantic,” Jones said. “The pipemakers got very artistic in decorating the bowls. They appear in funny places, but you can trace them back to who the pipemaker was, based on the decorations. Archaeologists are only starting to understand these types of artifacts, because they weren’t well-documented. It was common knowledge at the time, but a couple hundred years later, there’s not a lot written about it. So it’s kind of lost, except for the archaeology.”

‘These artifacts came in from the field in paper bags with all the provenience information on them. I process them, catalog them and curate them. You can see how each separate provenience is separated in these trays. Most of these are prehistoric artifacts. Most of what I usually work with are historic artifacts. I did some historical artifacts today that dated from 1775 all the way up to the 20th Century.’

—Debbie Davenport, lab supervisor

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by Joseph McClain
The newest version of Google Earth contains hundreds of new features, as well as hundreds of new features. The new version of Google Earth includes many new features, as well as many new features. The newest version of Google Earth contains hundreds of new features, as well as hundreds of new features. The new version of Google Earth includes many new features, as well as many new features. The newest version of Google Earth contains hundreds of new features, as well as hundreds of new features. The new version of Google Earth includes many new features, as well as many new features.
Two William & Mary students are recipients of the 200th anniversary of the birth of Charles Darwin-Wallace Medals

Two William & Mary faculty members are recipients of an award for their research on ocean chemistry.

A new analysis of the worldwide scientific literature shows VIMS focusing on the cutting edge.

A survey of recreational boat owners who make up the largest segment of Hampton Roads' economy.

Howard, Allison receive Outstanding Faculty Awards

Two William & Mary faculty members earned the state's highest honor for professors.
The idea is to harness the sun to generate electricity, but first the people in SCORS had to know which photovoltaic technology is best to use. And to determine that, they first had to know more about the weather. “We found out that depending on the conditions—the humidity and the temperature—different types of solar cells will work better or worse,” said Irina Novikova.

“We haven’t seen that number yet—and for that reason, I think we are getting barely 50 watts at peak,” he said.

“There are several technologies and all of them will tell you they are the best,” Novikova said. “So to really make an educated choice about what kind of system is best, we need to know what kind of weather we expect. That’s why we need a weather station.”

**An eye on the weather**

The need for detailed, local weather data became clear early in the process. SCORS received COS funding in December and soon got started, meeting with Alan Compaan, a photovoltaic thin film researcher from the University of Toledo. Five test panels arrived over winter break. Four of the panels are small five- or six-watt devices, such as you might see attached to an illuminated roadside highway sign. The largest, the one rated for 176 watts, is about the size of a tabletop. The test panels represent a range of vendors and technologies, from multicrystalline silicon to thin-film copper indium gallium diselenide.

The weather station was installed in February, with data transmitted to a computer inside the Small Hall, the physics building at William and Mary. SCORS is approaching the problem with an open mind regarding what the final product might be. “As scientists we think that the most efficient mounting is perpendicular to the sun, but we know more about the weather. That’s why we need a weather station.”

**A model for solar power**

Once the best system is found, the goal is to incorporate a large-scale solar station into the scheduled renewal of Small Hall, thereby establishing a model for other solar projects across campus. The task of identifying the best photovoltaic panel for the unique weather conditions of Williamsburg should have been a straightforward evaluation of manufacturers’ literature and technical specs, but it didn’t work out that way. For example, the largest panel being evaluated by SCORS has a manufacturer’s rating of 176 watts, which Mikhailov explained represents peak power on a sunny day.

“We haven’t seen that number yet—and for that reason, I think we are getting barely 50 watts at peak,” he said. “So to really make an educated choice about what kind of system is best, we need to know what kind of weather we expect. That’s why we need a weather station.”

SCORS will use the data in calculating the final design. Mikhailov said the final design will likely consist of an array of 100 to 250 solar panels. The number of panels is limited by budget, rather than the rooftop area of Small Hall, he added. There are a number of practical, as well as scientific, considerations yet to be addressed. For example, SCORS will have to work with the requirements of maintenance personnel and the wiring system is a project all its own. The final design may or may not include a battery system, as well. “At the current rate, Small will eat up everything we can provide,” Mikhailov said, “but we might consider battery storage for the power interruption cases. Our scientific equipment demands peak power. Otherwise, we have to provide backup power for 24 hours.”

SCORS is one of a number of campus sustainability projects, funded through a student “Green Fee” that was announced by William & Mary President Taylor Reveley in the Spring of 2009. The solar project was one of the first five projects approved by the Committee on Sustainability, chaired by Lynda Butler, Chancellor’s Professor and interim dean at the School of Law and Dennis Taylor, professor at the School of Marine Sciences.