ideation
RESEARCH & SCHOLARSHIP AT WILLIAM & MARY

Seize the Bay!
GRAPPLING WITH THE ISSUES OF THE CHESAPEAKE

plus:
SHOW US YOUR TITIAN GENETICS OF GLOBAL WARMING EVALUATING FOREIGN AID
Teaching, in all its forms, has been our lodestar at the College of William and Mary. At the same time, we are also a university with high scholarly aspirations and accomplishments. When I came to Williamsburg a little over a year ago, I feared that we were providing inadequate assistance for the scholarly work that is both expected and celebrated within our halls. It seemed to me, that although we have every bit as powerful a set of research aspirations as our competitors, we have frequently been unable to match the infrastructure of research support available at those institutions. I worry that continuing on such a path will threaten both the quality of our faculty and our historic commitment to unparalleled teaching.

Accordingly, I am anxious to move forward quickly to help secure more powerful and sustained footing for our essential research programs. Early this fall, I announced to the faculty a set of initiatives that will help to correct our course.

First, through concentrations of private funding and the development of other university and ancillary resources, we will move to fully fund the College’s Summer Research Grant program and its new Scheduled Semester Research Leave program—which together draw almost a million dollars per year from other funds—eating, in effect, much of our research seed corn, the money that has fed our remarkable acceleration in the advancement of knowledge.

Secondly, we will create, through a combination of annual gifts and foundation and endowed support, a William & Mary Faculty-Student Research Fund of at least $25 million. This fund will support, to name a few, start-up packages, travel funds, conference support, more generous graduate-student stipends, technology expenditures, exhibitions in the arts, stipends for undergraduate student projects and many other scholarly activities.

This two-pronged initiative to support our research and scholarship will develop over the next five years. I hope we can count on the support of the entire College and many other scholarly goings-on.

Go Tribe. Hark upon the gale.

Gene Nichol
President
The College of William & Mary
A portion of this issue of Ideation is devoted to the relationship of the College of William and Mary with the Chesapeake Bay. The Bay predates us all. What the Sages of Baltimore, H. L. Mencken, called an “immense protein factory” has also been a playground, thoroughfare, burner, battlefield and, sadly, a sewer.

The Chesapeake region also includes the surrounding land and tributary watersways, not just the great rivers—James, Potomac, Susquehanna—but also the hundreds of smaller rivers, creeks and tidal estuaries. It likely was Mencken’s protein factory that attracted the first inhabitants, native groups that predated Wahunsenacawh (Chief Powhatan) by many hundreds of years. Even though the Jamestown Colony had a famously rocky beginning, the Chesapeake Bay region has proven to be a fine place to live.

The College of William and Mary is not on the Chesapeake, but it has always been here. The College only makes sense that many of the College’s contributions to the advancement of knowledge center on the history and anthropology. The scope of our studies range from the immense to the detailed. At one end of the spectrum are scientists at the Virginia Institute of Marine Science (VIMS), using their Gloucester Point facilities as a base for conducting cutting-edge research on the state of the Bay and its flora and fauna. On the other end, our researchers examine every detail of the human ecology of the region. A good example is the work of Sarah Glosson, a graduate student in American studies who is studying the sheet music collection at Shirley Plantation near Richmond. The Chesapeake is also our laboratory and our classroom and our home.

The issues of the Chesapeake Bay, one way or another, revolve around people, past and present. Many of the features that enticed early inhabitants to live here are still enticing people to settle in the area, and that creates problems. For example, Bryan Watts, director of William and Mary’s Center for Conservation Biology, fears that the success story of the comeback of the Chesapeake’s bald eagle—some of the most fragile land is also the most expensive. "Some of the most fragile land is also the most expensive," Watts said. "Property values on the Eastern Shore are skyrocketing. Everybody wants to live near water and when more people live near the water, the environment starts to get stressed."

Other forms of stress come from non-native species. You may have read about snakeheads in the Potomac, but perhaps the spread of phragmites in the Chesapeake is beneath the radar of most people. Phragmites is a species of grass that grows up to four feet tall and can take over a wetland. It is invasive and thrives in tidal environments with up to 50 percent seawater. Randy Chambers of the Kusk Environmental Field Lab at William and Mary and Kirk Havens, assistant director of the VIMS Center for Coastal Resources Management, have been among those studying the spread of phragmites, which (other than the Eastern Shore) isn’t the problem in Virginia that it has been to the north. Yet.

Some of the most important and pressing issues of the Chesapeake Bay are the most complex to solve—even to grasp. The former great abundance of finfish and shellfish isn’t what it used to be and that creates problems. For example, Bryan Watts, director of William and Mary’s Center for Conservation Biology, fears that the success story of the comeback of the Chesapeake’s bald eagle (the most important reason being its success story) has made the elevation of the tide. Then at the surface we have what is called a CTD—a conductivity, temperature and depth recorder. The depth part is not so important here because it is sitting in the surface, but the unit measures temperature and conductivity which also gives you the salinity. The data are sent by radio modem back to shore. Then at the top of the buoy there is a weather station, an anemometer, for wind speed and direction, and it has some other sensors—such as temperature or at least very close to real time. All that’s needed are questions, and the questions are as varied as the water conditions.

One of the major early sources for the study of the Chesapeake was the Coast Guard,” Friedrichs said. “They were interested in applications for real-time measurements for search and rescue because if you have the real-time currents and you know when someone has gone overboard, it’s much easier to find the person where you think they may have ended up.”

Since many of the same measurements that give the Coast Guard an edge in a search can also be used for predicting the course of a maritime oil spill or the effluent resulting from an industrial incident, the buoys have attracted funding from a number of sources, including the Commonwealth of Virginia, NOAA and the Office of Naval Research. “What interests Friedrichs most, though, is sediment and the effects of sediment. The study of sediment, ultimately, is the study of the health of the bay.”

There are three main criteria that the EPA uses to evaluate the health of the Bay: water quality, oxygen levels and chlorophyll levels,” he explained. “Clarify is determined mainly by suspended sediments, because if the water is cloudy the light does not get to the submerged aquatic vegetation—seagrass—which is so important to habitat for economically valuable
components of the ecosystem like blue crab and fish larvar.

COMPLEX AS MUD

The York River estuary is a great observation point because, well, there is so much sediment. Water clarity readings are the simplest measure of turbidity, but alone they don’t even begin to tell the whole story. An acoustic instrument on the bayou—similar to a fisherman’s fish finder—provides water clarity data using sound waves to create a picture of sediment concentration throughout the water column. The cloudiness in the water, Friedrichs says, could be algae, zooplankton or just plain old mud. But in the world of sediment dynamics, there is no such thing as plain old mud. There’s a big difference, he explained, between more suspended silt or clay and the same thing mixed with the goopy, adhesive polysaccharides secreted by bacteria and/or plankton.

“Mud is very important to water quality,” he said, “but our ability as scientists to model and predict the transport of mud by currents is pretty poor. A big factor is trying to understand the nature of how mud transport changes when biology interacts with mud. Most of the mathematical models that try to predict simple transport of mud don’t distinguish yet between biologically- and physically-dominated suspensions.”

The importance of mud extends to tracking pollution. Often, Friedrichs said, pollution adheres to the mud. “So where the mud goes is where the pollution goes. That has been the case in the Hudson, where a lot of deposited sediment is contaminated with PCBs.” As for the York, its tidal action as a “conveyor belt” for sediment, resulting in a strange situation.

“Presently, the largest source of new sediment entering the York might not be the rivers at the top of the system, but rather the mouth of the system,” he explained. “Because of how the circulation works, the heavier salt water moves upstream along the bottom. The surface water coming downstream is fresher and doesn’t interact with the sediment as much, so the water near the bottom is muddier.”

VIMS is preparing a new buoy for deployment in the York near Clay Bank, a little less than halfway between Gloucester and West Point. “The water is a lot muddier up there, the currents are stronger, and there is less biology on the bed,” he said. 

www.vims.edu/realtime

It’s not just for scientists. Click on “Real-Time Data” to get a continually updated report from the buoy off Gloucester Point. Recreational boaters, fishermen, sailors, watermen and weather buffs all can make use of the current conditions and 24-hour records (inset, below).

Menhaden by the thousands

If they swim in such large schools, why are they so difficult to count?

by Joe McClain

hey swim in schools of thousands—maybe hundreds of thousands—but there’s some concern that the Chesapeake Bay’s population of menhaden may not be as healthy as it should be. Menhaden are important to the Chesapeake Bay in more than one way, according to Rob Latour, assistant professor of fisheries science at VIMS.

“They’re somewhat unique in that they serve three functions,” Latour said. “The first being that they support a large-scale industrial fishery that has high value and high economic value to the state of Virginia. They perform an ecological service in that they’re a filter-feeding species in the Bay, so they can impact and improve water quality. They also serve as a forage base for the fishes that are also commercially, but more importantly, recreationally important—striped bass, weakfish, bluefish.”

In general, the populations of menhaden along the Atlantic coast don’t seem to be in trouble, Latour said. Routine stock assessments conducted in 2003 and again last summer by the Atlantic States Marine Fisheries Commission (ASMFC) have shown no indication of overfishing, but, Latour says, “The key assumption there is this analysis is conducted on a coarse scale and doesn’t address regional population.”

Bait & Pharmaceuticals

There are two fisheries for menhaden. The smaller one, which Latour says accounts for less than 20 percent of landings, is for bait and chum for crabbers, lobstersmen and recreational fishermen. “The dominant fishery is the purse-seine fishery,” he said. “The fish are effectively reduced and hauled down to their oil and fatty acids that go into a number of products like women’s makeup, but the most recent use is in pharmaceuticals—Omega-3 fatty acids.”

Over the past half-century, menhaden processing plants have shut down from Maine to North Carolina. The only one left, Latour says, is a plant in Creedville, Virginia. In addition, he said, Atlantic coast states have passed laws banning purse seining in coastal waters.

“In fact, the only states that allow purse seining now are Virginia and North Carolina,” Latour said. “All the commercial menhaden fishing is taking place in the Bay or just outside the Bay, leading to some concern that the stocks may be regionally depleted.”

To regulate the catch intelligently, it is important to have a good grasp of the number of menhaden in the Chesapeake. The industrial harvest of menhaden in Virginia’s portion of the Chesapeake is subject to a five-year restriction. But, because of their schooling habits, determining the abundance of menhaden is tricky, Latour says.

“When we use traditional fishing sampling methods, we’d go out and catch no menhaden a few times, then all of a sudden come up with a bazillion of them. You have to think out of the box a little about how you’re going to do this,” he added.

Latour and a group of researchers from the Maryland Department of Natural Resources and the National Oceanic and Atmospheric Administration (NOAA) are working on an “out of the box” way to achieve a reliable count of the menhaden in the Chesapeake. Last summer, they began a pilot program, funded by ASMFC, to investigate a high-tech method of calculating the abundance of the fish.

ENTER LIDAR

The method uses LIDAR (flight detection and ranging), essentially a laser beam aimed from the belly of a small airplane. “The laser will reflect off the school. Given some calibration of the reflective properties of menhaden, you can obtain a density figure of what that school would be,” Latour said. A group of NOAA physicists from Colorado came to VIMS to try out LIDAR apparatus on some menhaden swimming in a tank. In September, the researchers conducted some test flights over the Chesapeake, with the cooperation of purse seiners from Omega Protein.

“Omega Protein was very cooperative,” Latour said. “Our pilots talked to their pilots. We had people on the vessel and they were going to turn over the catch abundance figures to us.”

Carl Friedrichs looks over a newly-outfitted buoy ready for deployment.

Entering the Chesapeake, the LIDAR operators began a pilot program, funded by ASMFC, to investigate a high-tech method of calculating the abundance of the fish. The method uses LIDAR (light detection and ranging), essentially a laser beam aimed from the belly of a small airplane. “The laser will reflect off the school. Given some calibration of the reflective properties of menhaden, you can obtain a density figure of what that school would be,” Latour said. A group of NOAA physicists from Colorado came to VIMS to try out LIDAR apparatus on some menhaden swimming in a tank. In September, the researchers conducted some test flights over the Chesapeake, with the cooperation of purse seiners from Omega Protein.

“Omega Protein was very cooperative,” Latour said. “Our pilots talked to their pilots. We had people on the vessel and they were going to turn over the catch abundance figures to us.”

“The value of LIDAR as a fish-counting tool will be determined by testing over the next couple of years. ‘We’re just working out the bugs,’ Latour said. ‘But LIDAR does have some potential.’”

LIDAR has been used with some success in fresh water environments, he said. But the VIMS pilot work is the first time the technology has been used in a marine or estuarine environment, which pose challenges due to the plankton and other particles and the increased density of the salty water.
It’s certainly “low tech,” but it’s also “lost tech.”

The manufacture of bloomery iron basically consists of cast iron, which requires a blast furnace. The journeyman blacksmith in the CW smithy, Steven Mankowski, a journeyman blacksmith in the CW smithy. “One of the processes that we are experimenting with is the direct method in the CW smithy. ‘The idea at Colonial Williamsburg was to try to rediscover the process of converting local ore to a workable material—wrought iron,’” said Steven Mankowski, a journeyman blacksmith in the CW smithy. “One of the processes that we are experimenting with is the direct method of making iron with what is called a bloomery. We have been curious about this technology for years, and for the 400th anniversary of Jamestown coming up, it seemed like a good idea to try to rediscover the process of converting local ore to wrought iron. At right, Dina Abdel-Fatah, a freshman at William and Mary, assisted Trofimova in analysis of carbon content while still a student at Tabb High School.

The smiths were especially interested in the carbon content of their iron. Browder explained that low-carbon iron is more plastic, therefore easier to work on the anvil, but that some uses might call for a higher carbon content. Dina Abdel-Fatah of Yorktown, now a first-year student at William and Mary, assisted Trofimova in analysis of carbon content while still a student at Tabb High School.

“I really like to see the excitement that they show when they discover something in the lab. It’s real. You can see it in their faces...”

GO ON, TRY THE BELLOWS!

It’s been an ongoing win-win relationship, characterized by learning on both sides. Christopher Hendricks, a William and Mary senior from Baltimore, was put in charge of making 17th Century tests. The ARC lab team compared the newly smelted iron with samples of old iron provided by the smithy, using techniques such as energy-dispersive X-ray spectroscopy. Trofimova reported early results that showed the bloom had higher carbon content than expected, plus a mystery—presence of copper, despite a complete absence of copper in her analysis of ore samples used in the bloom.

“We know where that’s coming from,” Browder said, exchanging knowing looks with Mankowski. He explained that the tuyere—supplying the oxygen to the bloomery is a heavy copper pipe—the only possible source of the trace metal in the samples. Theoretically at least, the copper should hold up to the intense heat of smelting as long as the supply of air is uninterrupted.

CARBON CONTENT IS CRUCIAL

The smiths were especially interested in the carbon content of their iron. Browder explained that low-carbon iron is more plastic, therefore easier to work on the anvil, but that some uses might call for a higher carbon content. Dina Abdel-Fatah of Yorktown, now a first-year student at William and Mary, assisted Trofimova in analysis of carbon content while still a student at Tabb High School.

“I really like to see the excitement that they show when they discover something in the lab. It’s real. You can see it in their faces...”

COVENANT OF THE ARC

The analysis of new bloomery iron is in the very early stages. There are a number of analytical tools in the Surface Characterization Lab that have yet to come into play. As the smiths learn to refine their understanding of the ancient technology, Christopher and Dina and the other students in the ARC’s Surface Characterization Lab have the opportunity to participate in real-world research.

“Instead of getting a sample off the shelf and learning to do analysis, the students can see exactly how their work will be of benefit,” Wilkerson explained. “And they don’t spend their time wondering why they’re doing what they’re doing. I really like to see the excitement that they show when they discover something in the lab. It’s real. You can see it in their faces—‘Hey! I did this!’ They gain self-confidence, and it’s the kind of self-confidence that they wouldn’t get from working in a restaurant or some other job.”

Attaching the technology of bloomery iron is only one of the projects going on in the Applied Research Center. The Surface Characterization Lab is one of 27 labs in the ARC, a facility in Newport News operated by a consortium of four universities, including William and Mary, and the Thomas Jefferson National Laboratory. A research powerhouse in the Chesapeake Bay region, the ARC occupies a seven-story, 122,000-square foot office and lab facility anchoring a 200-acre research park.

www.jlab.org/ARC/
James Monroe’s Northern Neck birthplace could reveal more than the early years of the fifth president

by Joe McClain

**IS THERE A DOCTRINE IN THE HOUSE?**

James Monroe’s Northern Neck birthplace could reveal more than the early years of the fifth president.

**SUMMER SHOVELING**

In contrast to Ash Lawn-Highland, the birthplace of James Monroe, on the Northern Neck, is an overgrown piece of property in rural Westmoreland County. The James Monroe Memorial Foundation hopes to change all that as it moves forward with plans to build a replica of the Monroe farm on the site. As a preliminary step to establishing this project, which began in the summer of 2006, the foundation brought in field archaeologists to conduct a systematic shovel testing.

Field archaeologists from the William and Mary Center for Archaeological Research study a metric control grid across the Monroe birthplace site prior to systematic shovel testing.

Jones said that they will respond to any hole in which period artifacts are found by digging a supplemental set of shovel tests at half the standard interval around the initial positive shovel tests to gain a more refined understanding of the content and extent of any subsurface artifact scatter.

"Then we'll select four or five of the hottest spots—the ones that hold the best potential for being Monroe-era activity areas, and we'll come back and do a more intensive controlled excavation within those areas," he said. A typical excavation at the "hot spots" will be a one-by-two-meter rectangular test unit, excavated with careful attention to soil stratigraphy, so that the workers can keep track of where the artifacts are found both horizontally and vertically. The results should provide an informed sense of features across the site that will help us understand the farmstead layout and activities during the Monroe occupation," Jones said.

The site was partially excavated in 1957, but Jones explained that the previous work concentrated on the foundation remnants of the house itself, only one of several buildings that made up what might be called the Monroe farmstead. Much of the activity within such an agricultural entity would have involved a number of outbuildings on the property.

**BEYOND THE HOUSE**

“These types of farmsteads would have comprised a cluster of buildings, with the house being the core of that cluster. You’d expect to find other components of the domestic complex in that time period—the kitchen would have been a separate building, for instance. There could have been slave quarters, horse barns, little outbuildings like smokehouses, and such,” he explained. There is archival evidence of the presence of such work buildings, including a cyclus classified ad from the Virginia Gazette listing the property for sale. “One of our aims is to take a careful look at this property immediately adjacent to the house, to see if we can find the remains of some of these other activity areas and outbuildings.”

The Center for Archaeological Research has been planning the testing phase of the field work as an opportunity for them to call a “public dig.” Effort will be devoted to advance of time to advertise the field work and invite interested public to participate in the excavations. David Lewes, project manager at the center, said the testing phase of field work at the presidential birthplace was scheduled to take place in October. It will be among a series of public archaeology events scheduled to coincide with what is celebrated annually as Virginia Archaeology Month.

"As information on the Monroe property comes to light and the James Monroe Memorial Foundation comes closer to their goal of building a reproduction, the archaeologists caution the public not to expect a Tera, a Monteillo or even a Carter’s Grove. Considerable evidence compiled by researchers indicates that the Monroes were “what we might call upper middle-class today,” Jones said.

---

**Considerable evidence compiled by researchers indicates that the Monroes were “what we might call upper middle-class today.”**

---

**VIRTUES OF PLAINNESS**

“You might have expectations of kind of a grand house, a brick structure, that’s very commanding,” he said. “By all accounts, however, this was a more common type of farmstead for a fairly well-to-do family in Tidewater Virginia in the mid-eighteenth century. The dwelling was a wood-frame structure that would probably appear to be surprisingly modest on the inside and out by today’s standards, especially for a family who owned as much land as the Monroes.”

---

**THE MOST-ASKED QUESTION ON THE DIG**

Work at the James Monroe birthplace site began in the summer of 2006 under the supervision of Project Archaeologist Elizabeth Monroe, one of the senior staff at William and Mary’s Center for Archaeological Research.

“No, she’s not related to the late president. “She probably will be talking to folks about the project, so she’s a little bit braced for that question,” said David Lewes, project manager at the center. Monroe is supervising a crew of five field technicians on work that began in the heat of August on the Northern Neck site.

“In the summer, the field crew will often shift their daily work schedule during periods of extreme heat, which has been the case at Monroe’s birthplace during this initial study. Specifically, they’re working from 6 in the morning until 3 p.m. in the afternoon. Postponing the initial survey work until a cooler season is not an option in a case like this because we’ve got subsequent stages of work that depend on milestones of completion before that so we really have to be prepared to work under all kinds of conditions,” said Joe Jones, director of the center. “There’s always going to be something that you have to contend with on a field survey like this, whether it’s cold weather, bugs, poison ivy or questions—so this kind of goes with the territory.”

---

"What we might call upper middle-class today,“ Jones said.
On a pleasant October afternoon, the York River beach at Gloucester Point made an ideal venue for culling and counting several test bags of oysters by staff of VIMS’ Aquaculture Genetics and Breeding Technology Center (ABC). Six bags of specially selected families of native oysters, *Crassostrea virginica*, were removed from homes on aquaculture racks in the York River after 28 months of testing.

The test oysters made their way from bags into baskets (A, B, C), then onto a sorting table set up on the sand. Lionel Dégremont D, breeding research manager for ABC, took charge of culling dead oysters and counting the live ones. Spat—young wild oysters—were removed from the shells of adults using a culling knife (E).

The work is part of several ongoing studies to improve the genetics of the native oysters, especially to breed in resistance to the diseases MSX and Dermo, which have seriously depleted stocks of the wild shellfish. Early indications showed the test group very resistant to MSX, Dégremont said, while resistance to Dermo varied. “We are going to keep the 10 best families in order to produce the next generation,” he said. “We are going to select for survived.” These oysters are part of a cohort of 50 families deployed in the York and in a site off the Northern Neck. “We have two more cohorts, which were produced in 2005 and 2006,” Dégremont added. Along with disease resistance, ABC is developing other characters through the domestication process. Among the desired traits are faster growth and triploidy—a genetic manipulation that creates non-reproductive oysters, which are marketable year-round and have an even higher degree of disease resistance. ABC’s overall goal is to enable an industry of oyster cultivation that will produce a bay full of plump, healthy *Crassostrea virginica* (F). The understanding of oyster genetics being developed at VIMS also benefits breeding programs for other shellfish species.
For the past two summers, a particular townhouse in Waynesboro attracted a certain amount of attention from the neighbors. A mix of characters, mostly young, came and went at odd hours. A glance into the garage, whenever the door was open, revealed mysterious puttering among some strange-looking equipment.

“I’m sure some people thought we had a meth lab in the garage, because we had so many people living in this rented townhouse, which was kind of weird, and we had all these syringes and test tubes and incubators,” Dan Cristol said. It was a different kind of meth lab, one devoted to the study of the effects of methylated mercury on birds—not the manufacture of dangerous drugs. Cristol, an associate professor in William and Mary’s biology department, has been leading a two-year study of mercury levels in birds living in a stretch of the Shenandoah Valley. The South River was polluted with mercury in Waynesboro prior to 1950, and since the 1970s, mercury has been detected in fish and sediment in the South River and the South Fork of the Shenandoah River. Mercury levels in these birds were unknown before Cristol and his team compared stretches of river that vary from uncontaminated sections to stretches with elevated mercury content with similar, but lower levels.

Methyl mercury is a widespread pollutant. It gets into the environment from a number of sources, including runoff from small-scale gold mines, old batteries leaching out of landfills, and the smokestacks of coal-fired power plants. The environmental culprit isn’t the silvery elemental mercury, Cristol said, but a highly toxic form of methylated mercury that seems to get stuck in the food chain after entering it at the bacterial level:

“Once bacteria work on mercury and methylate it—eating it basically—it can go right through any cell membrane, straight into your blood stream and it will adhere to protein and it may stay with you forever,” he said. Methylated mercury not only gets stuck in the food chain, but it also accumulates in higher amounts in the animals higher on the chain through a process called biomagnification. Insect larvae and small crustaceans in a contaminated area usually have low mercury levels, around a part per billion. When a small fish spends its life eating larvae, the mercury piles up in the cells of the fish, which in turn may be eaten by a duck, kingfisher or a larger fish. Fish and birds are large enough and high enough on the food chain to accumulate dangerous levels of mercury in their bodies of a part per million or more. The phenomenon of biomagnification isn’t unique to methyl mercury, nor is mercury contamination endemic to the Waynesboro area, near where the South River joins the North and Middle Rivers to form the Shenandoah proper. The Shenandoah, of course, is a tributary of the Potomac, which flows into the upper Chesapeake. The river downstream of Waynesboro was contaminated by a polyester fiber manufacturing plant there, but Cristol said there are mercury advisories on waterways throughout the nation, including a number in Virginia. In September, he said, a new mercury advisory was released for the Chickahominy River, west of Williamsburg. There have been a number of studies of methylated mercury in the Shenandoah’s fish—fishermen have been warned against eating the smallmouth bass they catch—but Cristol’s group was the first to study mercury levels in birds. The Waynesboro region was a nearly ideal place for the study. There were long-known contaminated stretches of river, along with nearby “clean” areas to use as a reference, and plenty of birds. The valley also offers upland habitat immediately adjacent to the river, for monitoring species such as bluebirds that aren’t generally part of an aquatic food chain. An examination of the upland birds would give insight on the degree to which methyl mercury is invading the food chain of the Shenandoah flood plain.

“When you get a mix of wetting and drying like in a riverbed, you get both anaerobic and aerobic conditions, and you’ll get a lot of methylation,” Cristol explained. “Methyl mercury will eventually move up the food chain, get into the little fish, the big fish, and the people who eat them, and that’s where we get most of our mercury—from eating fish. Birds can get it the same way, of course, from eating fish, but not that many kinds of birds eat fish, so we are examining whether it’s getting into other kinds of birds besides the few that eat the fish.”
Finding kingfisher nestlings takes some digging; kingfishers tunnel under embankments to build. Master’s student Ariel White, her head in a hole, approaches the nest one way while Sean Knohe’08 hangs over the embankment blocking the nest’s entrance. The nest isn’t harmed in the process.

“Mystery hot spot”

Master’s student Anne Condon removes a radio transmitter from a juvenile bluebird that has been out of the nest for about two months. She has followed the bird weekly and the transmitter battery needs to be replaced.

“With the nestlings, you have to dig your way down,” she said. “You fill a couple of small capillary tubes with blood, and a feather is all that were needed, except in special cases.”

Friedman explains. “The baby can breathe just fine, but it can’t swallow the food, so then you get it and you can find out how much mercury is in it.”

As suspected, results showed that a quarter of the wrens’ diet is insects, which in turn can eat mercury-laden aquatic insects. A plausible explanation of how aquatic mercury is working its way up to these terrestrial birds.

“Wrens don’t eat insects that fly, so they are not eating the bugs coming out of the river,” Friedman said. “The parents come in and deliver the food.”

In a separate analysis that provides a longer-term record of mercury exposure, the team led by master’s student Ariel White used mist nets at night to capture and sample the nocturnal raptors.

“Everybody loves working with screech owls. They are really cool!” Cristol said. “I snapped pictures of all five of my undergraduate researchers holding owls, and every one is grinning ear to ear. We were able to work with lots of them but couldn’t get any data on their reproductive success because—despite the fact that everywhere around the country, you use nest boxes—they won’t for me.”

There was better luck with bluebirds, which readily accepted the team’s nest boxes. In the first year, only 10 of the 188 boxes were visited. The researchers found that the adult bluebirds had elevated levels of mercury in their blood, while the young had none, even though they were being fed insects that researchers suspected were high in mercury content. The young birds were getting rid of their mercury through feather growth, Cristol believes.

“You are really a Goldilocks altitude for the plane to fly. Down here in the lower part of the Bay, a large portion of nests are likely gone and are over 100 years old,” Watts said. “As you go further up the tributaries, you begin to see the transition to hardwood and the pines begin to peter out. Another characteristic of these trees is that they tend to stick out above the surrounding forest and that gives the birds what we refer to as crown access. They are really big birds and they don’t like to fly in enclosed spaces and so it’s important that the nest site be elevated above the surroundings so that they can fly into the nest without having to go through these other trees.”

---Joseph McClain
The work was prompted by an article by a scientist named Brian Jackson which proposed that oyster depletion was the root cause of many of the Bay’s environmental problems.

NOT ENOUGH OYSTERS

“He argued that if humans hadn’t overharvested oysters, the oysters would still be filtering the water in the Bay, filtering out the algae, and we wouldn’t have the kinds of problems that we have now,” she said. “And it occurred to me, well, one of the things that we really ought to be looking at is what the oyster and other shellfish populations looked like over time in the Bay. We can’t just rely on the 20 years that we’ve been getting from ecological surveys.”

Lockwood has enlisted a number of William and Mary undergraduates to assist in the project—or projects—since her examination of the fossil record of shellfish in the Chesapeake has been twofold. The first aspect is to examine the quality of the record. Are there enough fossil shells out there to work with?

“Any time you do a fossil study you have to ask the question, how good is the fossil record? Is it good enough to ask the question that I want to ask? Am I getting a strong enough signal?” she explains. “So, over the last couple of years I’ve had a total of six students that have worked with me on this question—for two of them, we’ve already published papers. What we found—actually, much to my surprise—is that the fossil record for the Bay, or the record of the last 9,000 years in the Bay, is much better than what I expected it to be.”

Lockwood and her students

Professor Rowan Lockwood (standing, left) watches Natasha Hunter ‘06 sort shell fossils small enough (top, right) to require a microscope. Sarah Kolbe, below (right), works on larger specimens.

To know what the natural Chesapeake ecosystem should look like, we have to consult the fossil record.

“People are starting to realize that the fossil record is this wonderful sample of what life was like before humans got involved.”

“This is good news for us. This means that the fossil record is faithful enough to the original community that we can now begin to ask some of these questions about comparing the 6,000-year-old climate change to human disturbance,” she said. Lockwood and her students are beginning to bring the picture into focus, by determining which kinds of shellfish tend to thrive after an ecological disruption.

“They do see a distinctive change in the shellfish. You go from shellfish that are more saline-tolerant to shellfish that are less saline-tolerant and are associated with a warmer and wetter climate,” she said. “We also have what I think of as weed species that tend to pop up after climate change. They’re also the species that pop up as soon as deforestation and sedimentation start in the Bay.”

LOATHING A CLAM

What Lockwood calls “the classic weed species, the one my students absolutely loathe” is the dwarf surf clam, Mulinia lateralis. Growing to a maximum shell size of just over half an inch, Mulinia lateralis is not suitable for eating on the half shell or steaming, frying or chowing—but it tends to displace shellfish that are.

“They are absolutely amazing. They are much more tolerant of salinity and oxygen changes than some other shellfish are, and so they seem to indicate any kind of interval of disturbance,” Lockwood explained. “And they can out-compete other shellfish, but only if there’s been some kind of disturbance.”

She said that some of the core samples, provided through the cooperation of the U.S. Geologic Survey, contain mostly fossils of Mulinia lateralis. “Sarah Kolbe did her project during her sophomore year, and there were some layers where she took an inch by 1 inch chunk and found over 6,000 Mulinia in there,” she said.

The metal ax heads that came ashore at the Bay, and that deforestation started along the Bay, and that deforestation caused a whole cascade of problems that the Bay is facing today. Too much sediment has been deposited, and that sediment is smothering animals living on the bottom. Too many nutrients are entering the watershed; those nutrients are causing algal blooms. Those algal blooms are robbing the water of oxygen, she said. “There are all kinds of invasive species, including introduced predators and diseases, that have gained a foothold through shipping and the pet trade. Most of this happened prior to 20 years ago, so the fact that we have detailed ecological data from the last 20 years doesn’t help us figure out what the Bay was like before the disturbance.”

To get a picture of what the Chesapeake Bay was like before deforestation, industrial pollution and other human-caused factors, there’s nothing like a fossil record stretching back thousands of years. Lockwood explained that about 20 years ago, paleontologist Grace Brush began sketching out a rough outline of the picture by studying the fossil record of algae cored from the bottom of the Chesapeake.

AGRICULTURE CHANGES EVERYTHING

“Shall we see everything. She started taking sediment cores and looking at the last 10,000 years of algae in the Bay and found that the Bay was nothing along quite nicely in its development until agriculture got going,” Lockwood said. “Then you see this massive change in the algae—their abundance and what kinds are living in the Bay. The Chesapeake Bay, after human disturbance, is very, very different from the Bay before human disturbance."

In other words, none of us knows what the truly “natural” ecosystem of the Chesapeake is like. Actually, Lockwood says, the Bay formed at least three times in geologic time, the most recent incarnation beginning 8,000 to 9,000 years ago. Humans began putting serious stress on the Bay about 2000 years ago, when colonists got agriculture going on a large scale. 21st Century ecologists, she says, can best reconstruct the individual components of an ideal Chesapeake ecosystem through examination of the fossil record.

“People are starting to realize that the fossil record is this wonderful sample of what life was like before humans got involved,” she said. “There’s a whole field of what life was like before humans got involved.”

The fossil record is this wonderful sample of the Chesapeake.

“Three hundred years ago, deforestation started along the Bay, and that deforestation caused a whole cascade of problems that the Bay is facing today. Too much sediment has been deposited, and that sediment is smothering animals living on the bottom. Too many nutrients are entering the watershed; those nutrients are causing algal blooms. Those algal blooms are robbing the water of oxygen, she said. “There are all kinds of invasive species, including introduced predators and diseases, that have gained a foothold through shipping and the pet trade. Most of this happened prior to 20 years ago, so the fact that we have detailed ecological data from the last 20 years doesn’t help us figure out what the Bay was like before the disturbance.”

To get a picture of what the Chesapeake Bay was like before deforestation, industrial pollution and other human-caused factors, there’s nothing like a fossil record stretching back thousands of years. Lockwood explained that about 20 years ago, paleontologist Grace Brush began sketching out a rough outline of the picture by studying the fossil record of algae cored from the bottom of the Chesapeake.

AGRICULTURE CHANGES EVERYTHING

“Shall we see everything. She started taking sediment cores and looking at the last 10,000 years of algae in the Bay and found that the Bay was nothing along quite nicely in its development until agriculture got going,” Lockwood said. “Then you see this massive change in the algae—their abundance and what kinds are living in the Bay. The Chesapeake Bay, after human disturbance, is very, very different from the Bay before human disturbance."

In other words, none of us knows what the truly “natural” ecosystem of the Chesapeake is like. Actually, Lockwood says, the Bay formed at least three times in geologic time, the most recent incarnation beginning 8,000 to 9,000 years ago. Humans began putting serious stress on the Bay about 2000 years ago, when colonists got agriculture going on a large scale. 21st Century ecologists, she says, can best reconstruct the individual components of an ideal Chesapeake ecosystem through examination of the fossil record.

“People are starting to realize that the fossil record is this wonderful sample of what life was like before humans got involved,” she said. “There’s a whole field of what life was like before humans got involved.”

The fossil record is this wonderful sample of the fossil record.

“Any time you do a fossil study you have to ask the question, how good is the fossil record? Is it good enough to ask the question that I want to ask? Am I getting a strong enough signal?” she explains. “So, over the last couple of years I’ve had a total of six students that have worked with me on this question—for two of them, we’ve already published papers. What we found—actually, much to my surprise—is that the fossil record for the Bay, or the record of the last 9,000 years in the Bay, is much better than what I expected it to be.”

Lockwood and her students

Professor Rowan Lockwood (standing, left) watches Natasha Hunter ‘06 sort shell fossils small enough (top, right) to require a microscope. Sarah Kolbe, below (right), works on larger specimens.

To know what the natural Chesapeake ecosystem should look like, we have to consult the fossil record.

“People are starting to realize that the fossil record is this wonderful sample of what life was like before humans got involved.”

“Any time you do a fossil study you have to ask the question, how good is the fossil record? Is it good enough to ask the question that I want to ask? Am I getting a strong enough signal?,” she explains. “So, over the last couple of years I’ve had a total of six students that have worked with me on this question—for two of them, we’ve already published papers. What we found—actually, much to my surprise—is that the fossil record for the Bay, or the record of the last 9,000 years in the Bay, is much better than what I expected it to be.”

Lockwood and her students

Professor Rowan Lockwood (standing, left) watches Natasha Hunter ‘06 sort shell fossils small enough (top, right) to require a microscope. Sarah Kolbe, below (right), works on larger specimens.

To know what the natural Chesapeake ecosystem should look like, we have to consult the fossil record.

“People are starting to realize that the fossil record is this wonderful sample of what life was like before humans got involved.”

“Any time you do a fossil study you have to ask the question, how good is the fossil record? Is it good enough to ask the question that I want to ask? Am I getting a strong enough signal?,” she explains. “So, over the last couple of years I’ve had a total of six students that have worked with me on this question—for two of them, we’ve already published papers. What we found—actually, much to my surprise—is that the fossil record for the Bay, or the record of the last 9,000 years in the Bay, is much better than what I expected it to be.”

Lockwood and her students

Professor Rowan Lockwood (standing, left) watches Natasha Hunter ‘06 sort shell fossils small enough (top, right) to require a microscope. Sarah Kolbe, below (right), works on larger specimens.

To know what the natural Chesapeake ecosystem should look like, we have to consult the fossil record.

“People are starting to realize that the fossil record is this wonderful sample of what life was like before humans got involved.”

“Any time you do a fossil study you have to ask the question, how good is the fossil record? Is it good enough to ask the question that I want to ask? Am I getting a strong enough signal?,” she explains. “So, over the last couple of years I’ve had a total of six students that have worked with me on this question—for two of them, we’ve already published papers. What we found—actually, much to my surprise—is that the fossil record for the Bay, or the record of the last 9,000 years in the Bay, is much better than what I expected it to be.”

Lockwood and her students

Professor Rowan Lockwood (standing, left) watches Natasha Hunter ‘06 sort shell fossils small enough (top, right) to require a microscope. Sarah Kolbe, below (right), works on larger specimens.
Ghost pots can be scary things. Fish, like these crabbers, and other organisms can find a crab pot to be a haven from which there is no escape. Scientists have a name for the phenomenon: "self-baiting." "It's scary, that is, to consider how many fish and shellfish must die each year after finding their way into crab pots that are baited, set and then—for one reason or another—left to lie on the bottom of the Chesapeake Bay and its tributaries.

The Virginia Institute of Marine Science (VIMS) at the College of William and Mary was selected in August by the National Oceanic and Atmospheric Administration (NOAA) to implement a project to remove deadly derelict crab pots and other "ghost" crab pots in the Chesapeake Bay. "NOAA is proud to be involved in projects like this one that work to develop solutions to environmental problems," said William and Mary Provost P. Thomas Jefferson, who will soon celebrate 200 years of service to the nation.

"NOAA is a leader in developing a wide range of cutting-edge technologies to address 21st-century challenges," said General Jack Kelly (Ret.), NOAA deputy undersecretary for oceans and atmosphere. "Data gathered by VIMS and NOAA's Chesapeake Bay Office since November, 2005 in a pilot study suggest that ghost pots identified in the surveyed area of the York River trap up to 8,000 crabs per year.

"It's clear from recent studies at VIMS that last crab pots can affect the commercial and recreational fishery in the Chesapeake Bay," said John Wells, dean and director of VIMS. "By sharing resources and data, VIMS and NOAA's state and federal partners will be able to implement practical solutions to this and other environmental problems."

Ghost crab pots are a persistent problem in the Bay. Last December or accidentally cut loose from their buoys, the pots continue to catch crabs and other important living bay resources without ever being retrieved.

"There are a lot of ghost pots out there, as many as 30 per kilometer for the York River in Virginia and 120 pots per kilometer for the South River in Maryland, according to pilot studies. Researchers used side scan sonar technology to location ghost pots on the riverbed.

"The new study will expand current data by sampling additional areas, investigating how the pots 'self-bait,' looking at the long-term efficiency of the pots and developing a Bay-wide removal plan.

"We hope through this collaborative effort that William and Mary and VIMS can help NOAA and the state rescue this critical resource," added Feiss.

Through the project, VIMS and NOAA scientists also hope to assist in the creation of an improved management plan and policy for blue crab stock in the Chesapeake Bay while reducing economic hardship for working watermen and fishermen and engaging them in Bay restoration.

NOAA, created in 1870 as the U.S. Coast and Geodetic Survey by William and Mary alumnus Thomas Jefferson, will soon celebrate 200 years of service and science to the nation.
Inspired by students and driven by their involvement, Project PLAID is a shining example of the power and benefits of undergraduate research. “We can make ‘cookbook’ research projects for lab classes, but it’s not the same as being on an original research project where you keep doing it until you are satisfied and there is no known answer until you get there,” said Timmons Roberts, professor of sociology.

PLAID is an acronym for Project Level Aid, an ambitious ever-expanding database of donors and recipients involved in thousands of international-aid projects. The goal is to develop the initiative into a globally recognized, authoritative guide for the international-aid community. A British non-governmental agency, for instance, which is considering lending money to a proposed Nepalese erosion mitigation project, could check the PLAID database for information on the past success and failure of such projects. And, of course, such groups also will be able to check the track records of their projects on PLAID, which is on its way to becoming accepted as a sort of “seal of approval” for aid projects.

Roberts is one of three William and Mary faculty members guiding PLAID, along with Brigham Young University political scientist, Daniel Nelson. The project grew out of an honors thesis presented by undergraduate Brad Parks to Roberts and faculty members Rob Hicks of the economics department and Mike Tierney, of government. Parks, who graduated in 2005, based his thesis on an examination of environmental assistance to developing countries. “He wrote the best honors thesis I have ever seen in my life,” noted Roberts. “It was 400 pages, 400 footnotes, 400 references or something like that—it was better than a master’s thesis, close to a doctoral dissertation.” So impressed were the professors with the paper they encouraged Parks to turn the thesis into a book—Greening Aid: Understanding Environmental Assistance to Developing Countries. Parks asked the professors to participate as co-authors.

Parks’ book, due out in fall of 2006, required far more additional research than the foursome anticipated. Tracking development assistance can be a challenge. There is a lot of money to follow, countless donor countries and organizations involved and very few tracking entities available.

**FOLLOWING THE MONEY**

Annually, more than $100 billion flows to countries across the globe in the form of development assistance from bilateral donors, including the U.S., Sweden and Germany, and from traditional multilateral donors such as the United Nations and the World Bank. The primary tracking agency for this money is the Organization for Economic Cooperation and Development (OECD). The OECD gets its data from its member nations, maintaining a database on their annual reports of aid funding.

While the OECD data is useful, it doesn’t tell the whole aid story. As Parks and the professors began to write the book manuscript, they realized that the OECD didn’t have all the data the book needed and that they’d have to gather the information themselves—Project PLAID was born.

Missing in the OECD database was a clear guideline of how the projects were classified. Tierney, an assistant professor in the government department, noted that a project funding the clear-cutting of a rain forest might be put in the same OECD forestry sector as a project that funds tree planting.

“For scholars interested in the environmental impact of foreign aid, such measurement errors create serious problems. The obvious, but difficult, solution, is to gather data directly and classify each project individually using a consistent coding scheme,” Tierney said. “The bottom line is that sector codes are simply too tough to capture project-level variation and that different countries don’t use the same criteria over time. PLAID does.”

The aim of the PLAID database is to bridge this gap in understanding. To do this, the researchers have included information from more donors, more information on each project and have compiled statistics from more years.

“This is one of the most exciting research projects we have going on at the College,” said Carl Strikwerda, dean of the faculty of Arts and Sciences. “It is wonderfully fitting that it grew out of a student project and that students have been so fundamental to making it succeed.”

Development assistance data may be tracked on one of three levels—aggregate, sectoral or project. Aggregate is the broadest reporting level, while PLAID data is based on project-level reporting. It provides the greatest detail about the individual programs, explained Tierney, assistant professor of government.

The database has been an enormous undertaking. Thus far, more than 50 William and Mary students have participated in the project guided by the team of three professors. In the course of the project, the student researchers have gone line by line through international development aid grant records for the last 50 years—twice. Each aid project received entries or codes on 71 independent variables—26 more than the projects in the OECD’s database.

**GREEN AND BROWN**

The PLAID team created the codes based on criteria and scales they established, asking not only how much money was involved and who donated it but also where the money went. In addition, they coded each project on a five-point environmental impact scale, rating the project as either “green”—globally, environmentally friendly or “brown”—providing only local environmental benefit. The researchers also continue on next page...
WORKING WITH PLAID HAS PAID OFF FOR THE STUDENTS

The professors, their researchers and the College see endless possibilities for the project. “I think it is the most comprehensive database on international development aid that is out there,” Strikwerda said. It fills a real need, he added, by providing the additional data on aid that makes the information searchable. “We have been able to produce a tremendous database with Charlotte Jackson ‘07, Brad Potter ‘08 and Scott Parks ‘09. Parks is the brother of Brad Parks whose honors thesis became the impetus for PLAID.”

“I have learned that foreign aid is not at all as simple as it appears... there is far more to the successful aid equation than just money.”

“Strategic planning is important because there is quite ridiculous overlap in different agencies... and they don’t even know that the other people are there,” Roberts added. “They are repeating their efforts or they are stepping on each other’s toes and it becomes territorial and counterproductive and extremely wasteful. And for the recipients, for the poor countries, it’s a nightmare.”

“My favorite thing about Psio is engaging our students in the process of discovery,” added Tierney. “It’s just a great feeling when a student figures something out and comes bounding into my office to tell me all about it.”
Everything changes after the surgeons open your skull. Your brain, and the tumor inside it, no longer fully float in the protective bath of cerebrospinal fluid. Gravity comes into play, as does the atmospheric pressure of the operating theater. The brain responds to these foreign forces, the cerebral tissue sagging, repositioning and changing shape. The tumor that the neurosurgeons want to remove also has changed position. The preoperative MRI image is no longer accurate enough for brain surgery. Thus, the brain the surgeons operate on is a different shape from the one depicted in the preoperative MRI. Of course, once the surgeon begins work, the shape of the brain changes even more.

The brain's changing shape is a problem not only of space, but of time. The goal, of course, is to remove as much as possible of the tumor and none of the healthy neural tissue. Today's operating procedure is to keep track of the tumor and none of the healthy neural tissue. Today's operating procedure is to keep track of the tumor and none of the healthy neural tissue. Today's operating procedure is to keep track of the tumor and none of the healthy neural tissue. Today's operating procedure is to keep track of the tumor and none of the healthy neural tissue. Today's operating procedure is to keep track of the tumor and none of the healthy neural tissue.

“...the patient's brain, updated dynamic computer model of...”

In essence, the William and Mary team provides the surgical team with a dynamic computer model of the patient’s brain, updated within a few minutes to show the surgeons, as Chrisochoides describes, “exactly what is where during the operation, even though the shape of the brain is constantly changing.” The process is work even over the summer, and Chrisochoides says his team can render a new model in six or seven minutes, but hopes to be able to do so in under two minutes.

“We want to help the neurosurgeon make an informed decision of what to cut, where the critical paths are, what areas to avoid,” he said. “I'm neither a neurosurgeon nor a doctor, so the contribution of my research is to make this distillation of objects really, really, really fast.”

A POOR MAN’S CAVE

“When I was at Notre Dame, I was called the ‘caveman.’” Chrisochoides remarked, as he ranged about his lab in McGlothlin-Street Hall, “This is a poor man’s cave.” The focal point of his “poor man’s cave” is a projection computer monitor whose screen would not give the audience a striking 3-D effect, showing a tessellated image of a brain appears on a large monitor in McGlothlin-Street Hall (left). The 3-D images that it would run on the multiple-processors linked in a parallel network. “Rather than using one computer, we can use all 300 computers that we have on SciClone and find a way to do it 300 times faster," he said. "We are one of the few to do this fast enough for the doctors to see the result during the surgery. This becomes possible using many, many processes.”

Distance, the hundreds of miles between the operating theater at Brigham and Women's Hospital and the banks of SciClone processors, was not an issue, thanks to high-speed Internet. “The bandwidth connecting here with Chicago or Pittsburgh is much higher than the bandwidth from my office to your computer,” Chrisochoides said.

The team is primarily made up of advanced graduate students, but it contains at least one undergraduate. Robert Staubs from Manassas, Virginia, joined the team shortly after his freshman year at William and Mary. He had taken a course, Discrete Structures of Computer Science, from Chrisochoides and began work over the summer, making modifications on a program that a grad student had written to that it would run on the multiple-processors accelerates the team. Staubs also was charged with installing setting up the remote visualization laboratory—the “poor man's cave.”

This fall Staubs co-published an article related to the work on an online journal.

The most challenging part was getting a handle on an unfamiliar programming," said Staubs, a member of the class of 2009. “And the algorithm I was using was a bit difficult for me to understand at first. It was a bit high-level. But because image processing uses Euclidian geometry, I was able to get that much easier.

Mesh generation has more applications than biomedical modeling. Chrisochoides’ lab has some funding from NASA, which is interested in very large meshes for simulations of conditions to optimize the shape of aircraft wings. Another program, with VIMS, will apply mesh technology to the study of water dynamics in the Chesapeake Bay and the Gulf of Mexico. Chrisochoides said mesh simulation will be especially helpful to VIMS researchers modeling erosion of land.
NEH fellowships support individuals pursuing advanced research that contributes to scholarly knowledge or to the general public’s understanding of the humanities. Recipients usually produce scholarly articles, monographs on specialized subjects, books on broad topics, archaeological site reports, translations, editions or other scholarly tools. Full-term (9 to 12-month) NEH fellowships carry a stipend of $40,000 and allow recipients to take time off from teaching and other faculty duties in order to work full time on their research projects.

Adam Potkay, professor of British literature, is in the final throes of his book, The Story of Joy, from the Bible to Late Romanticism, due for publication by Cambridge University Press in 2007. He anticipates that this book will be of interest not only to lovers of literature, but also to those in philosophy, history, musicology and theology. “It’s chiefly a literary and intellectual history, though to some degree a more broadly cultural one,” Potkay said, “touching on music, opera and film, politics and advertising, memoirs and revelations.”

Potkay, who is celebrating his seventeenth year on the faculty here, notes that this was his third attempt at an NEH Fellowship—his first received—and one he considers a “once in a lifetime” award. “In this book, I offer a history of joy, or more specifically, the ways in which joy has been addressed in Western literature and art philosophy and religion, psychology and statecraft,” he explained.

Potkay is taking a one-year leave of his teaching assignments—which include 18th-Century and Romantic-era literature and the Bible as literature—to finish his manuscript right here in Williamsburg. “I have to get a plug in for the library!,” he said. “Everything I need is here. Our holdings are quite remarkable.”

A large portion of his book concerns 18th- and 19th-Century literature and Potkay can access the early modern and Eighteenth Century holdings of the British Library through ECCO (Eighteenth Century Collection) and EEBO (Early English Books Online).

“Five years ago I would have had to go to London or Charlottesville to finish this book,” Potkay said. “I received the NEH starting July 1 to finish Joy, but I applied for the fellowship two years ago. At that point, I was deep in the midst of the book—which I would have written anyway—but the fellowship makes it possible to work on it full time and finish it sooner than later.”

Sally Price is the Duane A. and Virginia S. Dittman Professor of Anthropology and American Studies. She is on research leave abroad until January and won support from both NEH and the Wenner-Gren Foundation for Anthropological Research. Her project is on the history of art history in France.

Price came to William and Mary in 1994. Her field is American studies and anthropology, with emphasis on the cultural politics of art museums, the African diaspora and the Caribbean. She has been continuing research on gender constructs and other aspects of the cultural life of Maroons in Suriname and French Guiana.

This represents the third NEH grant of her career (during 1992-1993 she also had a Guggenheim Fellowship). She is particularly proud that her daughter, a professor of English at Harvard University, entered the international art market. The Maroons are descendants of slaves who escaped in the 17th and 18th centuries tracking down the story of a world which is the subject of her book, The House that Jacques Built: Art and Difference in France, as well as the focus of heated controversy ever since it was conceived in the mid 1990s. [Price predicts her book, slated for 2007 publication by the University of Chicago Press, “will raise some heated controversy as well.”]

S

ience can only take you so far. There is a seemingly endless battery of scientific tests used in the process of authenticating works of art. But what’s needed isn’t better science, but better art history, better connoisseurship, says Aaron De Groft, director of the Muscarelle Museum in Williamsburg. De Groft has spent the last eight years tracking down the story of a portrait that has been bounced in and out of the acknowledged oeuvre of the High Renaissance master Titian. In late August, as students were arriving on William and Mary’s campus, De Groft, a member of William and Mary’s class of 1988, was preparing to leave. He and the Duke were expected in Paris shortly.

The unsigned portrait of Federico II Gonzaga, the first duke of Mantua, is on loan to the Muscarelle. It was long accepted as a work of Titian, and it could not be the portrait of Federico from the letters. A providential letter from the eye of a Dauphin, suggesting Titian would not have enough time to paint the portrait’s place among Titian’s work, suggesting Titian would not have enough time to paint the portrait.

“Was one of those funny little articles in the Gazette des Beaux Arts,” De Groft said. “I was asked to write the catalog entry.”

As a result of the “funny little article,” the portrait of Federico was shuffled off to the margins of the art world, despite having been a part of several major collections, bringing a high price at 20th Century art auctions and being depicted on the cover of a 1932 issue of Art News. Such was the weight of the word of August Mayer, De Groft notes. He added that Mayer never asserted that the duke’s portrait was not by Titian, just that it could not be the painting referred to in the letters. A providential exhibition this fall may prove to be the venue to lift Duke Federico from obscurity once and for all.

“It’s a big Titian show in Paris. This is a once-in-a-lifetime exhibition. It’s about Titian and the courts of Europe and the show is basically all portraits. The opening will be September 11, in the Musee du Luxembourg, where the French senate sits. The president of Italy will be there, as will the prime minister of France and the mayor of Paris. They won’t have a show like this for another fifty or sixty years,” De Groft said. “The picture was requested to be in this exhibit and I was asked to write the catalog entry.”

Will an exhibition in Paris mean vindication for the missing Titian? IS IT XXXX OR XXXIX?

The duke’s troubles all started with a bad reading of some Roman numerals. De Groft explained that Mayer had apparently based his “Notes on Titian” on an archivist’s notes about a letter from the duke. The letter still exists, and De Groft can demonstrate how the archivist made his mistake.

“X, X, X—four exes is forty. But if you look closely…” De Groft said, zooming in on a scan of the original letter document on his desktop monitor to reveal a short, but unmistakable vertical stroke in front of the final X. “In the 19th Century, they just read the date as 1540. But when you start looking closer and closer, you can read it on, 20, 30—and one before so it’s 1539—a year and two weeks before Federico died.”

He added that another source confirms the date. A copy of the outgoing letter from the Bavarian duke who requested the Gonzaga portrait is dated 1539 and now is part of the collection in the imperial archives in Munich. De Groft has spent nearly nine years working to return the portrait of Federico to the Atal of Renaissance art. After Mayer’s “Notes on Titian” cracked the painting’s reputation, the Federico portrait slipped off the art world’s radar and at some point found its way into the United States.

by Joseph Malcolm McClain

Two William and Mary professors, Adam Potkay and Sally Price, have secured prestigious year-long fellowships from the National Endowment for the Humanities.

by Lillian Kelly

Return of the DUKE

IS IT XXXX OR XXXIX?

26 | William & Mary

Continued on next page
The third component centered around a known Titian miniature painting, now in Vienna, which is a copy of this Titian portrait of Federico and it is inscribed with his name and titles. It was the publication of that inscribed miniature in 1876 that revealed the identity of the first portrait by Titian of Federico (that portrait dates to around 1531), currently in the Prado Museum. The Prado actually had incorrect names on it because they were not sure who it portrayed.

And the fourth part? It’s all about style, and about connoisseurship,” De Groft said. Titian lived into his nineties and had a prolific output, including a large number of portraits of the rich and famous of the day. The Paris show will place the duke’s portrait in the context of his relationship with the painting was based on well-known samples from the studio. These are the high stakes. On the one hand, the recent conservation assessment for the Paris exhibition, there is the growing possibility that the better part of a decade with the duke: “I believe that Titian painted the head and the hands and the workshop painted the body and the background—though after a very recent conservation assessment for the Paris exhibition, there is the growing possibility that Titian painted it all,” he said. “Nobody cares if it’s by Joe Schmoe paint-grinder in Titian’s studio. These are the high stakes. On the one side, just to have the picture accepted and catalogued for this show, that’s a certain step, a certain plateau. How it’s debated after the show, that might be another plateau.”

CONNOISSEURSHIP’S BOTTOM LINE

“The whole point of taking it to Paris is to have it seen with other Titans,” De Groft said. “It was last seen in a major European museum in 1976.” And De Groft’s evaluation, after pursuing the better part of a decade with the duke: “I believe that Titian painted the head and the hands and the workshop painted the body and the background—though after a very recent conservation assessment for the Paris exhibition, there is the growing possibility that Titian painted it all,” he said. “Nobody cares if it’s by Joe Schmoe paint-grinder in Titian’s studio. These are the high stakes. On the one side, just to have the picture accepted and catalogued for this show, that’s a certain step, a certain plateau. How it’s debated after the show, that might be another plateau.”

CRATES ON A PLANE

There’s nothing glamorous about being acourier of fine art, says Aaron De Groft. “It’s just me, some crates and a couple of pilots on a cargo plane,” he said. De Groft, custodian of the portrait of Federico II Gonzaga on loan to William and Mary’s Muscarelle Museum, escorted his charge to the Musée du Luxembourg in Paris.

The portrait has seen nearly half a millennium of ups and downs, including misidentification, being the cover of a collector’s magazine and being barred for legal work. At one point, it was sold for $1.700. For the trip to Paris, the portrait of Federico II Gonzaga was insured for $50 million.

“SCIENCE MEETS THE DUKE”

The resurrection of the reputation of the portrait of Federico II Gonzaga had four elements. First came a scientific analysis of the work in the 1980s by Walter Crane & Associates, to authenticate the date of the picture.

“They looked at the chemical composition of the paint, the size of the particles and the binder, based on well-known samples from various European museums,” he said. “And what that science tells you is that it’s dead on – the late decade of the 1530s. One thing that’s interesting—Titian is using about half the number of raw pigments as he did in his earlier work because he’s painting faster. There were no traces of things like leaf white, which was developed after 1596. But does all this mean Titian painted it? No, the guy next to Titian could have painted it. It’s simply putting it in the right time and right place.”

The second aspect centered around archival documentation. De Groft points out that as a component of major European collections for centuries, the portrait left a hefty archival trail—including a correction of the Roman numeral debacle that set off August Mayer.

“Renaissance Man”

The resurrection of the reputation of the portrait of Federico II Gonzaga had four elements. First came a scientific analysis of the work in the 1980s by Walter Crane & Associates, to authenticate the date of the picture.

“They looked at the chemical composition of the paint, the size of the particles and the binder, based on well-known samples from various European museums,” he said. “And what that science tells you is that it’s dead on – the late decade of the 1530s. One thing that’s interesting—Titian is using about half the number of raw pigments as he did in his earlier work because he’s painting faster. There were no traces of things like leaf white, which was developed after 1596. But does all this mean Titian painted it? No, the guy next to Titian could have painted it. It’s simply putting it in the right time and right place.”

The second aspect centered around archival documentation. De Groft points out that as a component of major European collections for centuries, the portrait left a hefty archival trail—including a correction of the Roman numeral debacle that set off August Mayer.
George Gilchrist opens an incubator in his lab in Millington and gazes with satisfaction on his stash of Spanish flies. “These are from Barcelona,” he smiles, pulling out one of a dozen or so wide-mouth plastic jars. “They might like paella.”

In another life, Gilchrist’s jars might have held two liters of medium salina, but here, stored on their sides, they constitute the living quarters for large numbers of the fruit fly Drosophila subobscura. The species is quite a globetrotter, native to regions of the Old World ranging from North Africa to Scandinavia and introduced to many locales in North and South America. Gilchrist, an associate professor of biology at William & Mary, believes his flies—from Barcelona and 25 other spots on three continents—to be canaries in the global coal mine. He is a member of an international group of researchers that have found that the chromosomal inversions of the insect are varying along with climate changes, but how about the rest of us? Drosophila seems to be able to evolve as the climate changes, but how about the rest of us?

**LORD OF THE FLIES**

by J. M. McClain

Drosophila seems to be able to evolve as the climate changes, but how about the rest of us?

George Gilchrist with several dozen of his thousands and thousands of members of the genus Drosophila.
Bismuth is an element with many uses and many quirks. For example, bismuth’s neighbors in the Periodic Table tend toward toxicity. Among useful but potentially dangerous companions such as lead, antimony, arsenic and mercury, the characteristic pinkish hue of bismuth shines benignly. Although the density of metallic bismuth makes it a suitable non-toxic replacement for lead fishing sinkers and shotgun pellets, you’re more likely to use bismuth as a byproduct of mining some other mineral such as tin or copper. It’s also a very versatile metal to a chemist, offering an array of potential applications.

During a 2002 subbalutetale, Hinkle began investigating the potential of bismuth-based compounds for use as alternative catalysts in a number of industries, including pharmaceuticals. Two William and Mary undergraduates received funding from two separate pharmaceutical companies to expand Hinkle’s investigation of bismuth catalysts during the summer of 2006.

Heather Stevenson of East Lyme, Conn., and Tim Brown of Portsmouth, Va., received financial support from Pfizer and GlaxoSmithKline, respectively. Both are members of the class of 2007. Both won support through a competitive grants process, backed by a letter from Hinkle.

“It was the first proposal I’ve ever written, so it was a little bit challenging for me,” Heather said. The students didn’t exactly start from square one; Tim had worked on a related project in Hinkle’s lab the previous semester, while Heather had already served an internship with Pfizer.

NEW HETEROCYCLES

In a nutshell, their projects revolve around using bismuth catalysts in the creation of heterocycles, compounds widely used in pharmaceutical manufacturing. Heterocycles are molecular structures consisting of a carbon ring containing one non-carbon element. Heather’s work centers on nitrogen heterocycles, while Tim is working on a tandem cyclization-addition reaction, sort of an oxygen analogue of what Heather’s doing.

Catalysts, of course, are not primary ingredients in a chemical reaction, but serve essential roles by accelerating or otherwise enhancing the reaction. A catalyst usually emerges from the reaction unchanged. Hinkle explains that many of the old-school catalysts used in the manufacture of pharmaceuticals are Lewis acids or other kinds of acids, ripe for replacement by a new, cheap, non-toxic alternative.

“Most of those acids are difficult to handle, especially when you get to production scales of hundreds or thousands of gallons,” Hinkle said. He stressed that, as catalysts, the acids are not left behind in the finished pharmaceutical products. “The FDA has very exacting standards about that,” he said. Even though today’s catalysts aren’t contaminating our medicine, there are concerns about their environmental effects.

NOT SO TOXIC

“We like knowing that we use something that’s not as toxic,” Hinkle said. “If you run a lot of reactions, a less-toxic ingredient will mean that you’d have to do a lot less testing for toxicity.”

The students began their summer work by examining catalysts currently in use in the pharmaceutical industry. “We wanted to see what the product should be like, so we could know what to look for before we switch to bismuth,” Heather said.

In early June, Tim was wrestling with some knotty cis/trans issues with his nucleophile—a reaction partner which participates in a chemical reaction by contributing a pair of electrons. Tim wanted the substituent groups on his molecule to be trans, or to form on opposite sides of the heterocyclic ring system. The opposite of trans is cis, which describes a molecular arrangement of the groups on the same side.

“The nucleophile I’m using gives predominantly the trans, but we get enough of the cis that pharmaceutical companies wouldn’t even want to bother with it,” he said.

By the Fourth of July, Heather and Tim each had developed a working reaction and started to evaluate the scope and limitations. The summer fellowships officially ended in early August, but the students, and Hinkle, continue working on their bismuth catalysts after classes started.

Bismuth compounds could enhance the pharmaceutical manufacturing process

“We certainly hope to find a nucleophile that gives us better product ratios. The results seem to hinge upon the strength of the nucleophile, so we’re going to try several different nucleophiles of different strengths,” Hinkle said. “Part of chemistry is luck. No matter how good things look on paper, they don’t always work out that way in the lab, so you have to try them.”

Summer research pays off in many respects. William and Mary’s chemistry department is one of the nation’s top producers of young chemists. American Chemical Society figures for 2004-05 placed the department in the top 25 of the 634 ACS-approved chemistry departments in the country, with 57 bachelor’s degrees.

Even more impressive is the department’s fifth-place rankings for graduates holding ACS-certified bachelor’s degrees. The 49 certified degrees in 2004-2005 puts William and Mary ahead of such institutions as the University of Virginia (42), Georgia Tech (31) and MIT (29).

An ACS-certified degree requires students to meet the minimum curricular standards of the American Chemical Society. More importantly, they must participate in a minimum of three credits of independent senior research, which amounts to a minimum commitment of 180 hours over the course of the academic year. Many seniors opt to take the maximum of six credits, and an average of 45-50 majors stay every summer as well.

“Our department probably runs one of the largest summer undergraduate chemistry research programs in the country with respect to serving our chemistry majors’ research needs,” said Gary Rice, chemistry department chair.
Chancellor O’Connor discusses ‘serpentine wall’

Religious freedom and judicial independence dominated two talks given by William and Mary Chancellor and retired Associate Supreme Court Justice Sandra Day O’Connor during a visit to campus this fall.

Without a clear boundary or definite line, Supreme Court rulings on religious freedom can be compared to Thomas Jefferson’s “serpentine wall,” O’Connor told an audience of about 400 people on Oct. 8 during a seminar at the Kimball Theatre.

Referring to the serpentine wall built by Thomas Jefferson at the University of Virginia, O’Connor acknowledged that Supreme Court rulings on the separation of church and state have not followed a straight line. However, the retired Supreme Court Justice said the system of separating church and state has worked well for this country.

Although each case does not provide a clear cut line or boundary for the separation of church and state, the system has worked as it was intended—to protect the free exercise of religion and to provide government with the establishment of a single religion, O’Connor said. Both clauses are critical to religious freedom, she added.

During the seminar, O’Connor gave opening remarks and then participated in a panel discussion that included USA Today journalist Joan Biskupic, who wrote a biography of O’Connor; Marcia Hamilton, law professor at Yeshiva University’s Cardozo School of Law and former clerk to Justice O’Connor; and David Holmes, a noted religious studies author and Mason Professor of Religion at William and Mary.

The chancellor’s remarks were part of a three-day visit to campus where O’Connor, who was invited as the College’s 3rd chancellor last April, participated in two academic seminars in addition to meeting with students and taking part in a conversation with the campus community, including taking questions from a student panel.

“The principle of separating church and state has worked well for this country. Although each case does not provide a clear cut line or boundary for the separation of church and state, the system has worked as it was intended—to protect the free exercise of religion and to provide government with the establishment of a single religion, O’Connor said. Both clauses are critical to religious freedom, she added.”

Harris’s NEH seminar examines principles of separation

James F. Harris, Jr., Hasenfeld Professor of Philosophy, directed an NEH Summer Seminar last summer titled “The Principles of Separation of Church and State.” Fifteen teachers, mostly high school government or history teachers, hailing from California to Maine, lived on campus for four weeks in July and attended classes in the Wren Building.

“The principle of separation of church and state and its role in a constitutional democracy is undoubtedly one of the most important themes in the history and culture of the United States, but it is also one of the most controversial and least understood,” Harris said. “Issues involving questions about the proper relationship between church and state are currently in the news. Almost daily, court rulings and challenges to those rulings, clashes between individuals and various public officials—even Congressional hearings and debates over Supreme Court nominees—have all served to focus attention of the informed populace on church-state relations.”

Harris’ career at William and Mary has spanned over three decades, from serving as associate professor of philosophy to department chair. He has published three books, dozens of articles and other works on the analytic philosophy of religion. Indeed, he has taught and written on the philosophy of religion his entire career.

In the past five or six years, however, his career has been concentrated more exclusively on public/civic life versus private religious life and the questions surrounding those two spheres of one’s life. So Harris was particularly delighted to win this opportunity to direct a NEH Summer Seminar—a first in his distinguished career.

Harris’ four-week seminar focused on differing perspectives on four major aspects of the principle of separation of church and state. The focus of the first week was on the historical and political environment surrounding the ratification of the Constitution of the United States and the Bill of Rights and the early years of the republic. Special attention was given to the Commonwealth of Virginia and the roles of Thomas Jefferson and James Madison. During week two, the discussion centered on “The Philosophical Basis for the Principle,” and explored the Enlightenment and the philosophical origins of the American Revolution.

“The Principle and Current Events,” during week three, included cases decided by the U.S. Supreme Court involving religion and the state, including a celebrated 1879 case concerning polygamy and the Mormon Church. Harris said from this case until the present day, Jefferson’s “wall of separation” has been at the heart of many important court cases determining exactly how and to what extent the equal protection clause of the Fourteenth Amendment applies to religious freedom on the state level. The final week was devoted to “The Extrapolation of the Principle to Developing Democracies and World Religions.”

Summer seminars and institutes are offered by the National Endowment for the Humanities (NEH) to provide senior faculty members an opportunity to enrich their understanding of significant humanities topics. In addition, these seminars enable the participants to return to their classrooms with a deeper knowledge of current scholarship in key fields of the humanities.

—Lillian Kelly

Separation of church and state
National Cancer Institute funds proteomics study

The College of William and Mary has received a $1.8 million grant from the National Cancer Institute to work in a multidisciplinary collaborative to advance proteomics/bioinformatics technology that ultimately could result in improved sensitivity of cancer detection.

The three-year funding supports a collaborative effort involving around 25 physicians, biologists, chemists and computational scientists and health-care professionals from the College of William and Mary, Eastern Virginia Medical School (EVMS), the Applied Research Center and INOGEN, a Williamsburg bioinformatics firm. Dariya Malysarenko and Tina Rumi, research scientists at William and Mary, are principal investigators on the project, along with Max Hastie of EVMS and John Sementilli of INOGEN.

Proteomics is the study of the myriad of proteins that make up the body’s cells. Some of the body’s proteins can be used as “biomarkers,” indicators of the presence of a certain disease, such as cancer.

Malysarenko explains that the William and Mary collaboration uses a technique known as MALDI-TOF (matrix-assisted laser desorption/ionization time-of-flight)—a variety of mass spectrometry, which is provided by National Board teachers as well as other teachers.

In the second phase of the study, the researchers evaluated the teaching practices of National Board-certified teachers and compared them to those of two other groups of teachers identified solely on the basis of either high or low student achievement gains. While previous studies have examined the student achievement gains of National Board teachers, this was the first time researchers supplemented those results of non-certified teachers. Using a value-added methodology, the researchers found no significant relationship between National Board certification status and student achievement gains.

In the first phase, initial results and reading student achievement results of fifth-grade teachers were examined. The revised proteomics-oriented VIRE-MS teespeo spectrometer toolkit will make cancer biomarker data analysis user-friendly for medical professionals.

Margaret Saha works in her Millington Hall lab with Daniel Teasley of Richmond, a member of the class of 2008 working on a summer research grant from HHMI.

$1.8 million HHMI grant bolsters undergraduate science education

The College of William and Mary has received a $1.8 million grant from the Howard Hughes Medical Institute (HHMI) to support undergraduate science education at the College.

The funding period of the Undergraduate Science Education grant will extend over four years. William and Mary has received previous funding from HHMI, including a $1 million grant in 1998 and two previous Undergraduate Science Education grants of $1.6 million each in 1998 and 2002. Professor Margaret S. Saha of the William and Mary Department of Biology has been the program director of the HHMI-funded activities on campus since 1998.

The latest grant will allow the continuation of a number of science related initiatives at William and Mary, such as expanded undergraduate research opportunities and a number of new and enhanced course offerings. Through the HHMI grants, for example, as many as 20 William and Mary undergraduates can receive funding for individual research projects, which can result in presentation or publication of their results in peer-reviewed journals.

The HHMI grants also have made possible the establishment of a biological mathematics program at William and Mary as well as a science outreach program to benefit pre-college teachers and students.

“We believe it is vital to bring fresh perspectives to the teaching of established scientific disciplines and to develop new paradigms in emerging areas, such as computational biology, genomics, and bio-imaging,” said Thomas R. Cech, HHMI president. “Our grantee universities are providing hands-on research experiences to help prepare undergraduates, including women and minorities underrepresented in the sciences, for graduate studies and for careers in biomedical research, medicine, and science education. We also hope these grants will help in public understanding of the scientific process itself, which can help bring about more widespread interest in science careers.”

End users of the process can either use open-source packages developed by W&M or INOGEN, a Williamsburg bioinformatics firm. Dariya Malysarenko and Tina Rumi, research scientists at William and Mary, are principal investigators on the project, along with Max Hastie of EVMS and John Sementilli of INOGEN.

Proteomics is the study of the myriad of proteins that make up the body’s cells. Some of the body’s proteins can be used as “biomarkers,” indicators of the presence of a certain disease, such as cancer.

Malysarenko explains that the William and Mary collaboration uses a technique known as MALDI-TOF (matrix-assisted laser desorption/ionization time-of-flight)—a variety of mass spectrometry, which is provided by National Board teachers as well as other teachers.

In the second phase of the study, the researchers evaluated the teaching practices of National Board-certified teachers and compared them to those of two other groups of teachers identified solely on the basis of either high or low student achievement gains. While previous studies have examined the student achievement gains of National Board teachers, this was the first time researchers supplemented those results of non-certified teachers.

In the first phase, initial results and reading student achievement results of fifth-grade National Board teachers were compared to results of non-certified teachers. Using a value-added methodology, the researchers found no significant relationship between National Board certification status and student achievement gains.

Four William and Mary Law School moot court members made history when they competed with law school teams on the other side of the world in the first international virtual moot competition this fall.

William and Mary joined four other law schools in the first virtual competition, which was held online and broadcast live. In the competition, the teams debated a hypothetical dispute over an internet domain name.

The most court members representing William and Mary’s law school were Brandon Jordan and Svetlana Khvalina, who served as co-counsels for the complainant, and Elizabeth McElroy and Amy Markopoulos who served as co-counsels for the respondent.

Virtual moot court makes real history

A study of more than 150 fifth-grade teachers in North Carolina found that the distinction of being a nationally certified teacher doesn’t necessarily translate into greater student success in the classroom.

Funded by a $330,000 grant from the National Board for Professional Teaching Standards, William and Mary education professors Thomas Ward and James Strong examined the extent to which National Board certified teachers differ from other teachers in terms of student achievement results and teaching practices.

“We found no significant relationship between National Board certification status and student achievement gains in the classroom,” said Ward, professor and associate dean for academic programs at the William and Mary School of Education. “Students of board certified teachers performed slightly better than those on non-board certified teachers but the differences were minimal.

Jointed by researchers from the University of North Carolina at Greensboro’s SERVE Center for Continuous Improvement and the University of Virginia, the researchers examined student achievement during the 2004-05 school year in three school districts in North Carolina and also conducted in-class evaluations for both National Board teachers as well as other teachers.

The study was conducted in two phases, Ward said. In the first phase,2004-05 a large number of students took a reading achievement test. Students of board certified teachers performed slightly better than those on non-board certified teachers but the differences were minimal.

Joining by researchers from the University of North Carolina at Greensboro’s SERVE Center for Continuous Improvement and the University of Virginia, the researchers examined student achievement during the 2004-05 school year in three school districts in North Carolina and also conducted in-class evaluations for both National Board teachers as well as other teachers.

In the first phase of the study, the researchers evaluated the teaching practices of National Board-certified teachers and compared them to those of two other groups of teachers identified solely on the basis of either high or low student achievement gains. While previous studies have examined the student achievement gains of National Board teachers, this was the first time researchers supplemented those results of non-certified teachers.
Omohundro books win awards

Six books published by the Omohundro Institute of Early American History at the College of William and Mary received major book awards in 2006. Most recently, Steven W. Hackel’s *Children of Coyote, Missionaries of St. Francis: Indian-Spanish Relations in Colonial California, 1769-1850* received the Erminie Wheeler-Voegelin Best Book Award from the American Society for Ethnohistory. The prize was presented at the society’s Annual Conference co-hosted by the college in early November.

“The quality of the editing that the institute offers through its capable and experienced editorial staff under the leadership of our enormously talented editor of publications, Fredrika J. Teute, is truly unique in the world of commercial or academic publishing,” said Ronald Hoffman, director of the Omohundro Institute of Early American History. “This is why our books have won more prizes than those of any other publisher, even though we produce only four to six titles a year, far fewer than the number released annually by bigger commercial and university presses.”

Other prizes awarded to the institute’s books in 2006 were:

- **J. Franklin Jameson Award of the American Historical Association.** Presented to Ronald Hoffman, Sally D. Mason, Eleanor S. Darcy, eds., *Dear Papa Dear Charley*
- **Frederick Douglass Book Prize, Gilder Lehrman Center.** Presented to Laurent Dubois, *A Colony of Citizens: Revolution and Slave Emancipation in the French Caribbean, 1787-1804*
- **Abbott Lowell Cummings Award, Vernacular Architecture Forum.** Presented to Bernard L. Herman, *Town House: Architecture and material Life in the Early American City, 1780-1830*
- **James Broussard Best First Book Prize of the Society for Historians of the Early American Republic.** Presented to Steven W. Hackel, *Children of Coyote, Missionaries of St. Francis: Indian-Spanish Relations in Colonial California, 1769-1850*
- **James Willard Hurst Prize of the Law and Society Association.** Presented to Holly Brewer, *By Birth or Consent: Children, Law, and the Anglo-American Revolution in Authority*

The Omohundro Institute, established in 1943, has published more than 200 volumes in its lifetime that have received more than 100 book prizes. Founded as the Institute of Early American History and Culture by the College of William and Mary and The Colonial Williamsburg Foundation, the institute, which is still jointly sponsored by those institutions, was renamed in 1996, in recognition of a generous bequest pledged by Mr. and Mrs. Malvern H. Omohundro, Jr.

Look for more books and prizes from the institute; in 2006 it published an unprecedented ten books.

—Suzanne Seurattan