A collaboration currently under way between a VMI physics professor and a private inventor could someday avert a looming crisis in cellular network capacity by speeding up cell phone transmissions.

Last year, Col. Stacia Vargas, professor of physics and astronomy, teamed up with Lexington resident Tom Chaffee and his company, Attochron, to develop an application of ultrashort pulse lasers for telecommunications.

All lasers emit light, classified as either continuous wave or pulsed. Ultrashort pulse lasers differ from continuous wave lasers in that the light comes in extremely short bursts, or pulses, of roughly less than a millionth of a nanosecond, which is one-billionth of a second.

Chaffee explained that while interest in using lasers for wireless telecommunications began in the 1960s, continuous wave lasers have proven to be unsatisfactory because fog and clear air turbulence seriously interfere with those lasers’ performance. The use of ultrashort pulse lasers, he believes, will circumvent these problems.

“It’s really about how we’re using the energy,” said Chaffee.

In December 2013, Vargas and Chaffee’s collaboration got under way in earnest after they received a grant for just under $100,000 from the Commonwealth Research Commercialization Fund, with an equivalent match from Attochron. The CRCF program, which is administered by the Center for Innovative Technology, is a state fund designed to advance, in Virginia, targeted areas of research with commercial promise.

With funding secured, Vargas and Chaffee have been hard at work this year in a lab in the basement of Mallory Hall, with assistance from Attochron’s chief technology officer of USPL Systems, Dr. Alexandre Braga, of Albuquerque, N.M.

Together, the three are working to prove that ultrashort pulse lasers could someday complement microwave radios and fiber-optics as a means of communication between cell phone towers. Such tower-to-tower or tower-to-network communication is known in industry parlance as “backhaul.”

According to Chaffee, backhaul is in short supply as more and more individuals use their phones to send and receive vast amounts of data.

Col. Stacia Vargas, Dr. Alexander Braga (center), and Tom Chaffee perform a tabletop test on the receiving circuitry. – VMI Photo by Kevin Remington.

From Mega to Giga
Research Partnership Could Revolutionize Cell Phone Communication

By Mary Price

Casting Bronze

Cadets in Col. Wayne Neel’s History of Technology course, ME 350X, learn about ancient techniques for casting bronze, evolutions of which are still used in modern industries. In addition to bronze casting, Neel, professor of mechanical engineering, shows the class technologies ranging from ancient weaponry to the phonograph. The class is one of VMI’s civilization and cultures courses, a component of the curriculum that gives cadets an opportunity to learn and write about the practices and products of the world’s communities.

– VMI Photos by John Robertson IV.
Period Portrait of Founding Superintendent’s Wife Restored

BY MARY PRICE

Very soon, visitors to the VMI Museum will be able to see the likeness of a woman who not only saved the post from being entirely burned during the Civil War, but later sustained the Institute through some of its leanest years.

Two years ago, a small portrait of Sara Henderson Smith, wife of VMI’s first superintendent, Gen. Francis H. Smith, was donated to VMI. The oil painting had sat for years in the basement of the home of Col. and Mrs. Alexander H. Morrison ’39. Morrison, a longtime faculty member in VMI’s economics department (now economics and business), was the great-great grandson of Superintendent Smith.

Upon Col. Morrison’s death in 2012, his wife, Josephine Morrison, gave the portrait to Col. Edwin Dooley, former executive assistant to the superintendent and a longtime friend of Morrison. Dooley, in turn, presented the 7-by-5.75 inch portrait of Sara Smith to the VMI Museum.

After years in storage, explained Col. Keith Gibson ’77, executive director of the VMI Museum System, the portrait was grimy, as was its ornate gold gilt frame. The likeness of a young woman was clearly visible, but both detail and color were lost to dirt.

“It had all been muted down to a dull gray image because of the soiling of the surface,” said Gibson. “However, there was no appreciative pigment loss and we could tell that it would respond extremely well to conservation.”

Thankfully, Gibson knew exactly where to find a conservationist. By the end of 2012, Cleo Mullen of Richmond Conservation Studio had restored Smith’s likeness to its original state, just as it had appeared in the early 1830s when the portrait was painted.

Dooley, meanwhile, had used his art world connections to solve the one mystery surrounding the portrait—who was the artist? At first, Dooley had thought it might be Seth Eastman, a painting instructor at the United States Military Academy at the time of Francis Smith’s graduation from that school in 1833. Eastman was even a relative of the Smiths, as he married Sara Henderson Smith’s sister, Mary, on the same day that Sara married Francis Smith.

Dooley learned, though, that there was another artist teaching at West Point at the time, Robert Weir. Gibson explained that when a copy of the image was sent to David Reel, director of the United States Military Academy Museum and an expert on Weir, Reel identified it immediately as being Weir’s work.

Like most 19th-century women, Sara Smith lived most of her life within the bounds of home and family. She and her husband had six children reach maturity. Like her contemporary, Margaret Junkin Preston, Smith was a poet, although much of her work was religious in nature and she never gained the fame that came the way of Preston, wife of Col. J.T.L. Preston, one of the founders of VMI.

Smith is remembered most, however, for her successful effort to save the superintendent’s house at VMI from being burned when Union Gen. David Hunter paid his infamous visit to Lexington during the Civil War. At the time of Hunter’s arrival in June 1864, one of the Smiths’ daughters had just given birth to a child in one of the upstairs bedrooms of the superintendent’s quarters, and Sara Smith begged Hunter not to burn the house for fear her daughter and grandchild would not survive the shock of being moved.

“Hunter, uncharacteristically perhaps, acquiesced,” said Gibson, adding that Hunter used the house as his headquarters while proceeding to burn the barracks and academic buildings.

Two decades later, in the early 1880s, the Institute was threatened yet again—but this time the enemy was not one to be reasoned with. A crushing recession, or even a depression, had dried up state funding, Gibson explained, and Superintendent Smith saw little option but to close the Institute. At that bleak moment, Sara Smith stepped forward and offered $5,000 from her inheritance—a vast sum of money at the time—to keep VMI open.

Sara Smith died just a short time later, in May 1884, but her funds had been sufficient to pay the bills. Because of her behind-the-scenes role in saving VMI not once but twice, Gibson said he’s more than pleased to see her likeness placed next to that of her well-known husband in the VMI Museum.

“Because of her significant role in maintaining and perpetuating VMI with her generosity, we’re very pleased to be able to recognize her in the museum,” he commented.
New cadets who matriculated Aug. 23 climbed House Mountain during a Matriculation Week full of activities that culminated with a march down Letcher Avenue after completion of Rat Crucible. They charged the New Market battlefield Sept. 7 after taking the Cadet Oath (bottom left) and then, Sept. 21, traveled to Bedford to visit the National D-Day Memorial (bottom right). – VMI

Photos by H. Lockwood McLaughlin, John Robertson IV, and Kelly Nye.
A VMI professor was among a group of experts brought together by the U.S. Federal Bureau of Investigation to discuss the challenges that emerging technologies will pose in the coming years.

Lt. Col. Dave Cotting, associate professor of psychology, met with the group during the bureau’s second annual Behavioral Informatics and Technology Studies research workshop Aug. 25-29. Cotting, an expert in social-personality psychology, contributed to the group’s understanding of the people who use emerging technologies for criminal activity.

“There are all sorts of new threats that are related to technology such as pictures and video.

“There’s a capacity crunch in backhaul networks,” said Chaffee. “That’s the worldwide number one problem for wireless telecommunications.”

Fiber optics – laser signals inside glass fiber – can carry vast amounts of data, Chaffee noted, but their installation requires digging. That digging, in turn, requires obtaining permits and dodging infrastructure that may already be underground. By instead sending the lasers through the air, these problems can be avoided entirely.

“It’s kind of like getting the fiber optic capacity without the fiber,” observed Chaffee.

A typical speed for microwaves, Vargas said, is 100 to 300 megabits per second, while the speed of USP lasers is measured in gigabits per second. There are 1,024 megabits in one gigabit.

“The big advantage [of going from microwaves to lasers] in wireless communications is going from megabits to gigabits,” Vargas commented.

By the end of this year, Vargas, Chaffee, and Braga hope to send a modulated ultrashort pulse laser signal with a data rate of at least one gigabit per second between an upstairs classroom in Mallory Hall and the press box in Foster Stadium.

“On our previous working session in August we sent just the laser pulses, but on Sept. 19, we sent a 100 Mbps modulated signal, a new record for Attochron,” said Vargas. She explained that a modulated laser signal carries data — and signals used in telecommunications must be able to carry data.

“Just sending the laser is simple, but sending a modulated signal is much more complicated,” Vargas noted.

To prove that ultrashort pulse lasers can work in all weather conditions, Vargas and Chaffee are in the process of having a state of the art weather station installed on the roof of Mallory Hall. This includes a fog monitor on loan from the National Science Foundation’s University Corporation for Atmospheric Research in Boulder, Colo., a precipitation monitor (for rain and snow), and a weather station telling other details such as barometric pressure, humidity, wind speed and direction.

Assisting with this aspect of the project are Lt. Col. Merce Brooke ’94, associate professor of physics and astronomy, and Lt. Col. Tim Moore ’97, associate professor of civil and environmental engineering. Additional assistance has come from Grigg Mullen III, lab mechanic for physics and astronomy, who helped to mount the telescopes used to send the signal from Mallory Hall to the press box.

Both Vargas and Chaffee expressed their appreciation not only to those three individuals, but also to the head of the physics and astronomy department, Col. Tim Hodges, for his ongoing support; Col. John Thompson, who was head of the Department of Physics and Astronomy at the time the collaboration began; to the athletic department for use of the press box; and to members of the information technology department who have helped connect devices used in the experiments. With help from all corners — including many leading vendors who have loaned outright or offered at reduced pricing their hardware for this project – the collaborators are confident they can deliver a product that will revolutionize the wireless telecommunications industry.

“We’re going to demonstrate the link distance and data rates the wireless telecommunications industry wants to see,” said Chaffee.

A VMI professor was among a group of experts brought together by the U.S. Federal Bureau of Investigation to discuss the challenges that emerging technologies will pose in the coming years.

Lt. Col. Dave Cotting, associate professor of psychology, met with the group during the bureau’s second annual Behavioral Informatics and Technology Studies research workshop Aug. 25-29. Cotting, an expert in social-personality psychology, contributed to the group’s understanding of the people who use emerging technologies for criminal activity.

“There are all sorts of new threats that are related to technology such as pictures and video.

“There’s a capacity crunch in backhaul networks,” said Chaffee. “That’s the worldwide number one problem for wireless telecommunications.”

Fiber optics – laser signals inside glass fiber – can carry vast amounts of data, Chaffee noted, but their installation requires digging. That digging, in turn, requires obtaining permits and dodging infrastructure that may already be underground. By instead sending the lasers through the air, these problems can be avoided entirely.

“It’s kind of like getting the fiber optic capacity without the fiber,” observed Chaffee.

A typical speed for microwaves, Vargas said, is 100 to 300 megabits per second, while the speed of USP lasers is measured in gigabits per second. There are 1,024 megabits in one gigabit.

“The big advantage [of going from microwaves to lasers] in wireless communications is going from megabits to gigabits,” Vargas commented.

By the end of this year, Vargas, Chaffee, and Braga hope to send a modulated ultrashort pulse laser signal with a data rate of at least one gigabit per second between an upstairs classroom in Mallory Hall and the press box in Foster Stadium.

“On our previous working session in August we sent just the laser pulses, but on Sept. 19, we sent a 100 Mbps modulated signal, a new record for Attochron,” said Vargas. She explained that a modulated laser signal carries data — and signals used in telecommunications must be able to carry data.

“Just sending the laser is simple, but sending a modulated signal is much more complicated,” Vargas noted.

To prove that ultrashort pulse lasers can work in all weather conditions, Vargas and Chaffee are in the process of having a state of the art weather station installed on the roof of Mallory Hall. This includes a fog monitor on loan from the National Science Foundation’s University Corporation for Atmospheric Research in Boulder, Colo., a precipitation monitor (for rain and snow), and a weather station telling other details such as barometric pressure, humidity, wind speed and direction.

Assisting with this aspect of the project are Lt. Col. Merce Brooke ’94, associate professor of physics and astronomy, and Lt. Col. Tim Moore ’97, associate professor of civil and environmental engineering. Additional assistance has come from Grigg Mullen III, lab mechanic for physics and astronomy, who helped to mount the telescopes used to send the signal from Mallory Hall to the press box.

Both Vargas and Chaffee expressed their appreciation not only to those three individuals, but also to the head of the physics and astronomy department, Col. Tim Hodges, for his ongoing support; Col. John Thompson, who was head of the Department of Physics and Astronomy at the time the collaboration began; to the athletic department for use of the press box; and to members of the information technology department who have helped connect devices used in the experiments. With help from all corners — including many leading vendors who have loaned outright or offered at reduced pricing their hardware for this project – the collaborators are confident they can deliver a product that will revolutionize the wireless telecommunications industry.

“We’re going to demonstrate the link distance and data rates the wireless telecommunications industry wants to see,” said Chaffee.

A VMI professor was among a group of experts brought together by the U.S. Federal Bureau of Investigation to discuss the challenges that emerging technologies will pose in the coming years.

Lt. Col. Dave Cotting, associate professor of psychology, met with the group during the bureau’s second annual Behavioral Informatics and Technology Studies research workshop Aug. 25-29. Cotting, an expert in social-personality psychology, contributed to the group’s understanding of the people who use emerging technologies for criminal activity.

“There are all sorts of new threats that are related to technology such as pictures and video.

“There’s a capacity crunch in backhaul networks,” said Chaffee. “That’s the worldwide number one problem for wireless telecommunications.”

Fiber optics – laser signals inside glass fiber – can carry vast amounts of data, Chaffee noted, but their installation requires digging. That digging, in turn, requires obtaining permits and dodging infrastructure that may already be underground. By instead sending the lasers through the air, these problems can be avoided entirely.

“It’s kind of like getting the fiber optic capacity without the fiber,” observed Chaffee.

A typical speed for microwaves, Vargas said, is 100 to 300 megabits per second, while the speed of USP lasers is measured in gigabits per second. There are 1,024 megabits in one gigabit.

“The big advantage [of going from microwaves to lasers] in wireless communications is going from megabits to gigabits,” Vargas commented.

By the end of this year, Vargas, Chaffee, and Braga hope to send a modulated ultrashort pulse laser signal with a data rate of at least one gigabit per second between an upstairs classroom in Mallory Hall and the press box in Foster Stadium.

“On our previous working session in August we sent just the laser pulses, but on Sept. 19, we sent a 100 Mbps modulated signal, a new record for Attochron,” said Vargas. She explained that a modulated laser signal carries data — and signals used in telecommunications must be able to carry data.

“Just sending the laser is simple, but sending a modulated signal is much more complicated,” Vargas noted.

To prove that ultrashort pulse lasers can work in all weather conditions, Vargas and Chaffee are in the process of having a state of the art weather station installed on the roof of Mallory Hall. This includes a fog monitor on loan from the National Science Foundation’s University Corporation for Atmospheric Research in Boulder, Colo., a precipitation monitor (for rain and snow), and a weather station telling other details such as barometric pressure, humidity, wind speed and direction.

Assisting with this aspect of the project are Lt. Col. Merce Brooke ’94, associate professor of physics and astronomy, and Lt. Col. Tim Moore ’97, associate professor of civil and environmental engineering. Additional assistance has come from Grigg Mullen III, lab mechanic for physics and astronomy, who helped to mount the telescopes used to send the signal from Mallory Hall to the press box.

Both Vargas and Chaffee expressed their appreciation not only to those three individuals, but also to the head of the physics and astronomy department, Col. Tim Hodges, for his ongoing support; Col. John Thompson, who was head of the Department of Physics and Astronomy at the time the collaboration began; to the athletic department for use of the press box; and to members of the information technology department who have helped connect devices used in the experiments. With help from all corners — including many leading vendors who have loaned outright or offered at reduced pricing their hardware for this project – the collaborators are confident they can deliver a product that will revolutionize the wireless telecommunications industry.

“We’re going to demonstrate the link distance and data rates the wireless telecommunications industry wants to see,” said Chaffee.
New Lab Offers Safe Location for Structures Testing

BY MARY PRICE

There’s an old saying that what goes up must come down. But when it comes to structures testing, an integral part of the civil engineering curriculum at VMI, having things come down safely is of utmost importance.

This summer, VMI’s civil and environmental engineering department opened its Built Environment Assessment and Modeling Lab, more commonly known as the BEAM lab, in Morgan Hall, the annex to Nichols Engineering Building. Coordinating the project were Col. Charles “Chuck” Newhouse, professor of civil and environmental engineering, and Maj. Matt Swenty, assistant professor in the same department.

Newhouse and Swenty explained that for the past several years, civil and environmental engineering majors had struggled to find a place for to test weight-bearing structures. At the same time, professors in the department had no dedicated facility where they could safely demonstrate engineering principles for their students.

“The big need we saw was to get something where we could test safely,” said Swenty.

Luckily, neither Newhouse nor Swenty had to look far before they found just what they needed: an 18-by-13 foot section of a much larger room that was designed and built in the mid-1960s specifically for structures testing. In recent years, the area had been used by the mechanical engineering department for a variety of projects.

With walls two feet thick, and a floor three feet thick, plus over 150 anchors for holding beams and columns, the spot Newhouse and Swenty found was ideal for their purposes. Testing is much safer in this room than in classrooms or other labs because energy is directed towards the floor, with its thick layer of concrete, said Newhouse.

Among the classes that will be using the lab most extensively are CEE 301, Structures Theory, and CEE 327, Reinforced Concrete, but both professors stressed that they hope all cadets in their department will benefit.

Cadet research, should benefit from the new lab – and in fact, it already has. The lab was still being refurbished this summer when Cadet Jacob Freeman ’15 moved his materials in to work on a project testing new ways to reinforce the joints on bridge decks. That project was conducted under the auspices of the Summer Undergraduate Research Institute for an outside client, the Virginia Department of Transportation’s research division.

“[Freeman’s project] couldn’t have been done without the lab,” said Swenty. “We wouldn’t have been able to load down like that, certainly not safely.”

Funding for the lab’s refurbishment came from the Jackson-Hope Fund, which supplied a grant of just over $40,000 for a steel frame to hold the structures being tested. Newhouse and Swenty designed the frame themselves, which was then fabricated by Jeff Parrent, lab mechanic for civil and environmental engineering, and Marco Floyd, lab mechanic for mechanical engineering.

“They were a big part of this project,” said Newhouse.

Both Swenty and Newhouse noted that the need for a dedicated structures lab was especially acute because the number of civil and environmental engineering majors at VMI has grown by approximately 50 percent in the last three years.

“We hope to use it for a lot of classes,” said Newhouse. “We’re slowly trying to get more demos and labs in our classes. This just gives us a great space.”

Professor Assists FBI

Continued from page 4

expertise in one domain or another, whether it was biotechnology, energy, or 3-D printing.” Around 50 experts attended the workshop.

“The goal is to support the policing done by the FBI in its various missions,” said Cotting. He is contributing to the development of a group analysis protocol, a system for understanding the methods for recruiting reliable informants from within criminal groups.

During the workshop, Cotting presented a talk on this protocol and how it fits into the context of these emerging technologies.

“This is an analytic tool to aid an agent or analyst in spotting, assessing, developing, and recruiting confidential human sources,” said Cotting.

“It’s not only about who is most likely to turn, but when is the best time for someone to approach him or her.”

Cotting, along with many of the other participants, will contribute to a book that will combine expertise from the presentations with insight gleaned from the workshop’s multidisciplinary collaboration.

“We took part in focus groups after each presentation, so we had computer scientists talking to engineers talking to physicists,” said Cotting. “For the book, the presenters will write about what they presented and add any of the conversations that might have shaped their views.”

OCTOBER 2014, PAGE 5
International Studies Department ‘Riding a Wave’

By Chris Floyd

According to The Princeton Review, political science and government is one of the 10 most popular college majors in the country. That trend is reflected at VMI, where about 18 percent of the Corps of Cadets, an average of 270-300 cadets, is part of the now very large international studies department.

“We’re riding a wave,” said Col. James Hentz, the head of the department, “but we’re doing a really good job riding it.

“Nationwide, we’re the 16th best place to study international politics and national security,” Hentz added, citing rankings published by U.S. News and World Report. “We’re doing something right.”

When Hentz arrived on post 18 years ago, international studies fell under the auspices of the history department. He was one of only three full-time faculty members who, along with one adjunct, taught an offering of courses that was minimal at best.

International studies went independent in 1997, and since then, the number of faculty has tripled, and the department houses an Institute Chair. The department now offers 54 different classes and has become the largest on post.

The popularity of the major is a given, particularly at a military school, where about half of the students will accept a military commission – that number is about 65-70 percent for international studies majors – and, Hentz said, want to learn “about the parts of the world where they are going to put boots on the ground someday.

“What this department does really well, what makes us a little different from other programs, is we do focus on international politics,” said Hentz.

In addition to traditional political science courses, the department offers classes dealing with the politics of individual countries around the world and has added courses dealing with what Hentz called “subsequent issue areas that aren’t confined to geographic areas,” classes like IS 329, Counterinsurgency, and IS 344, Multinational Peacekeeping.

Most recently, the department added a whole new geographic area in classes taught by its newest faculty member, assistant professor Dr. Vera Heuer. Last spring, she taught a class about the Indian sub-continent dealing with issues in India, Pakistan, Bangladesh, and Sri Lanka. This semester, she is teaching a course dealing with riots, protests, and social movements around the world.

“Some of these topics have huge implications internationally,” Heuer said. “Even if they [the cadets] don’t join the military,” she added, “a lot of them have aspirations to join intelligence or other similar career paths.”

It’s faculty like Heuer and Hentz that keep VMI’s international studies department ahead of similar programs around the country. They love research, a must in the international studies field. They are published and attend conferences often. Most importantly, perhaps, they have all traveled extensively, spending a great deal of time in their countries of expertise.

“It’s not that we’re teaching just what we’ve read ourselves in books,” said Heuer. “We can actually relay anecdotes and stories, and cadets love that.”

Class of 1989 Reunion Gift

Members of the Class of 1989 present the initial proceeds of their 25th reunion campaign to the Institute during this year’s first fall reunion weekend. Presenting the $1,729,389.89 check to Gen. J.H. Binford Peay III ’62, superintendent, were Ashley A. Fairchild (left), chairman of the 25th reunion campaign committee, and Stephen M. Chiles, class agent.

– H. Lockwood McLaughlin Photo courtesy of the VMI Foundation.
Days of Work Ready the Stadium for Each Home Game

By Chris Floyd

The home portion of the VMI football schedule opened Saturday, Sept. 13, when the Keydets won a laugher over visiting Davidson. Preparations for that game began long before that, and not just for the players and coaches.

That tarps came off of Alumni Memorial Field at Foster Stadium way back in February, and that is when the work really began.

“It’s a lot of hard work to put it together,” said Robert Wade, a maintenance supervisor in the VMI physical plant. “We are, hopefully, going to give them the best product they could ask for.”

The tarps that cover the field during the winter months are designed to keep the cold from killing off the Bermuda grass laid down in 1998. According to Marvin Clark, the physical plant’s grounds shop supervisor, a fertilization process is followed throughout the summer, and the grass is mowed as many as four times per week right up to game day. Then it gets really intense.

A crew of more than 20 workers, as many as 30 on Saturdays in the fall, works throughout the week to get the field ready for the splendor that is a home VMI football game. The process begins when the lawn mowers crank up, and the football office’s assistant for athletic fields and equipment, Albert “Randy” Ashby, paints all of the lines and coaches boxes, usually by Wednesday. Then Wade and his crew take over.

“It’s a lot of small moving parts,” Wade explained.

Wade and his group of seven helpers are in charge of painting the logos on the field, and they need about six hours on a Thursday to get the colors down on the field. Before that can happen, however, Wade has to get the paint ready.

“It takes most of the day before we paint just to prepare to paint,” said Wade. “It takes several hours to get the paint all mixed up.”

Wade and his crew use a water-based paint to etch in the numbers; Southern Conference logo, which requires a new stencil this year; and, of course, the spider that adorns the middle of the field. In all, he will mix up 30 gallons of white paint and seven gallons each of red and yellow. Then each color has to be strained, twice, to ensure that it won’t clog up the high-pressure paint gun. The entire process will take more than five hours.

The next day, Wade and his crew usually begin about 10 a.m., a little later as fall creeps in and the dew takes longer to dry, and will not finish until late in the afternoon.

“The spider is probably our hardest part,” Wade said. “We have to change the colors in the machine, so we have to flush all of the other color out. It takes 30 minutes or so just to do that.”

When the field is ready for game day, the physical plant bunch is far from finished. On Saturday, their day begins about 5 a.m. as they pull wires, set up mats, and put the finishing touches on their game-day preparations. Then they have to break it all down and often don’t leave the field until long after dark.

“We’ll put in 14 to 15 hours on Saturday,” said Jackson B. “J.B.” Harris, the grounds foreman. “[In all], it’s probably three days involved in the football field.”

In addition to their normally long week for home football games, Wade and the others have been charged with a couple of other projects at Foster Stadium. They recently finished painting all of the black rails in the grandstands, and they are now in the process of renumbering the seats, all 13,433 of them.

“The numbers had worn off in places; it needed to be done,” he said. “That’s a big project we’re trying to get done before the next home game.”

That game was Sept. 27. Once again the physical plant crew put in long hours and hard work to get Alumni Memorial Field looking just right. That, they say, is reward enough.

“When you get up on top and everything is painted, it’s beautiful,” said Clark.

Wade added, “It really is a good feeling. The hard work is worth it.”
New French Curriculum Focuses on Culture

By Mary Price

A recent and still ongoing revision of the French curriculum at VMI has as its goal not only producing more French majors, but exposing all cadets who study the language to the rich linguistic and cultural heritage of France and French-speaking nations.

Maj. Abbey Carrico and Maj. Jeff Kendrick, both assistant professors of modern languages and cultures, were hired last year with the goal of revitalizing VMI’s French curriculum. The move came at the same time that the Department of Modern Languages and Cultures was undergoing a restructuring, with German and Japanese being dropped from the linguistic lineup and Mandarin Chinese added.

For Col. Kathleen Bulger-Barnett, chair of the Department of Modern Languages and Cultures, it was critical that VMI retain instruction in French, despite the fact that some other colleges and universities are cutting classes in that language.

“The military needs people who speak French,” Bulger-Barnett commented. “If we do away with French, there goes a strategic language for Europe and North Africa. We have to have French.”

Carrico echoed this, saying, “Every continent has French. It’s very global and very widespread.”

Carrico noted that most of the course changes came not at the 100 to 200 level, as those introductory courses are similar at most colleges and universities, but at the 300 level, where the focus makes a final turn from learning the basics to reading and writing in the language.

It’s not as if the shift to reading and writing in French occurs dramatically overnight. “[Cadets have] already been writing at the 200 level,” said Carrico. “We’ve had them writing at the 100 level. It’s just expanding it and building on vocabulary and analytical skills.”

Among the new courses designed to help cadets make the transition to a deeper appreciation of French literature and culture is one centered on water and literature, L’eau: Réflexions du présent dans le passé, which Carrico is teaching this semester. This past spring, Kendrick taught a course titled France’s Gourmet Culture. The course filled to capacity immediately.

These culturally oriented courses, which typically include readings from a variety of texts, have replaced genre-based courses such as those focusing on poetry or the novel.

In redesigning the curriculum, Carrico and Kendrick are striving to meet the needs not only of French majors, but also of history and international studies majors, all of whom are required to take a foreign language through the 300 level.

“We wanted to nourish them in their development linguistically and culturally,” said Carrico.

Nor have Carrico and Kendrick limited their efforts to the classroom. This summer, the two professors joined forces with the Department of English, Rhetoric, and Humanistic Studies to take 13 cadets to Paris for studies in art history and French literature. Next year, they hope to begin a five-week summer language program in Paris run by VMI.

Much closer to home, Carrico and Kendrick lead a French table in Crozet Hall each Wednesday at lunch time, with the gathering open to anyone who speaks French. “That’s been a great way to meet students outside the classroom,” Carrico noted. The department also sponsors Spanish, Arabic, German, and Chinese tables.

Through conversations inside and outside the classroom, both Carrico and Kendrick spend much time interacting with their students – first as a way of strengthening French conversational skills and promoting fluency and second as a means of learning about each cadet’s goals and intended career path.

“All of our courses are very interactive and require a lot of participation on the students’ part,” said Carrico. “We really get to know them very well.”

She continued, “There’s a lot in this field that’s very approachable for students and very applicable to their lives. I don’t think people always know that about language studies.”
New Curricular Track Prepares Chemistry Majors for Medical School

BY DANIEL STINNETT ’07

Beginning this academic year, cadets majoring in chemistry will be able to choose one of two degree tracks—a research track, the curriculum all majors have followed in the past, or a pre-med track designed specifically for those interested in pursuing a career in the health professions.

The new, more structured curriculum should better prepare cadets to take the Medical College Admission Test—MCAT—which is expected to be more important than ever in the admissions process.

“The MCAT is changing starting in 2015 to measure not only chemical, physical, and biological sciences, but also adding psychological and social components,” said Lt. Col. Dan McCain, associate professor of chemistry. “Access to health care and socioeconomic issues are becoming big issues in health care.”

The idea for a pre-med track has been in the works for about two years and is a collaborative effort between the chemistry, biology, psychology, and applied mathematics departments. Most chemistry majors will decide which track they will follow prior to their 3rd Class year.

“A lot of the courses they take are the same—only some of the upper level courses are different, and [pre-med cadets] will be choosing a specific set of electives,” said McCain.

Cadets on the pre-med track will be taking more biology courses than a typical chemistry major would. In place of part two of physical chemistry and analytical chemistry, they will take cell Biology and genetics.

“Biological systems are at their heart chemical systems, so you have to understand them on both levels to really understand what is going on,” McCain explained.

The math requirements will also be geared more toward the medical field, with statistics taking the place of Calculus III. Likewise, whereas cadets on the research track have 15 hours of free electives and a three-hour humanities elective, those on the pre-med track—with the exception of a free elective writing-intensive course—will fill those elective slots with suggested courses relevant to the health professions. In the process, they will meet the requirements for a concentration in biochemistry and molecular biology.

“There is flexibility built in for those who are interested in pre-pharmacy or being a physician’s assistant. . . . We can tailor the program for them,” McCain said. For example, cadets with an interest in pre-pharmacy could take microbiology or morphology for their elective courses.

Since VMI’s chemistry degree is certified by the American Chemical Society, one of the most difficult parts of structuring the pre-med curriculum was making sure the degree still met the society’s requirements. Another challenge was making sure there would be room for chemistry majors in the classes offered by other departments.

McCain is extending the focus on better preparing cadet for the MCAT into his classes by incorporating more activities similar to those found on the MCAT—“Not just because of the test, but because they’re good for critical thinking,” he explained.

While he is introducing concepts in formats similar to those seen on the MCAT, the best way for cadets to prepare for the test is still to take practice exams on their own time.

“If you’re going to medical school, you have to be pretty self-motivated,” said McCain. This includes taking the initiative by contacting health clinics or hospitals to set up a shadowing program in which cadets observe a physician for a day, or volunteering for mission work in the medical field during the summer.

“I hope [the pre-med track] will help them become more well-rounded and better prepared for medical school, . . . that it expands their horizons and gives them an idea of how people think in other disciplines,” said McCain. “I hope it prepares them better for their careers.”

Cadets planning to pursue health professions complete assignments in a chemistry lab. — VMI Photo by Kevin Remington.
The 2014-15 sports season opened on post in early September, and already the men’s cross country team is making headlines. After a pair of top-four finishes to start the season, the team has earned a regional ranking for just the third time in the program’s history. The Keydets placed fourth in the Covered Bridge Open in Boone, N.C., to start the season and followed that solid outing with a runner-up finish in the JMU Invitational Sept. 13. As a result, the Keydets were ranked 15th in the Southeast Regional by the United States Track and Field and Cross Country Coaches Association in its Sept. 15 poll.

Six VMI runners finished in the top 20 at the James Madison University meet in New Market, Va., led by Avery Martin ’16, who crossed the line in seventh place. Sean Helmke ’16 turned in an eighth-place effort, while Daniel DeNijs ’16 finished 10th.

VMI football got off to a 1-3 start to open the 2014 season, but the Keydet offense clicked on all cylinders. Led by first-year starter Al Cobb ’17 at quarterback, VMI averaged nearly 30 points and over 400 yards of total offense through the first four games.

A big reason for the gaudy offensive numbers is the 52-24 victory over Davidson in the home opener Sept. 13, when the Keydets exploded for 597 yards and scored their most points since 2008. Aaron Sanders ’17 caught 10 passes for 215 yards in that game, and Jabari Turner ’15 added three touchdowns.

For his effort, Sanders was named the Southern Conference Offensive Player of the Week and received honorable mention consideration from the College Football Performance Award. Cobb was tapped as the SoCon’s Freshman of the Week after throwing four touchdown passes and running for another in a season-opening loss to Bucknell University Aug. 30, and Chris Copeland ’15, who boasts a 3.38 grade point average as a mechanical engineering major, was named the league’s Student-Athlete of the Week Sept. 20 after blocking a punt and returning it for a touchdown in the victory over Davidson.

VMI football is off to a 1-3 start to open the 2014 season, but the Keydet offense clicked on all cylinders. Led by first-year starter Al Cobb ’17 at quarterback, VMI averaged nearly 30 points and over 400 yards of total offense through the first four games. A big reason for the gaudy offensive numbers is the 52-24 victory over Davidson in the home opener Sept. 13, when the Keydets exploded for 597 yards and scored their most points since 2008. Aaron Sanders ’17 caught 10 passes for 215 yards in that game, and Jabari Turner ’15 added three touchdowns. For his effort, Sanders was named the Southern Conference Offensive Player of the Week and received honorable mention consideration from the College Football Performance Award. Cobb was tapped as the SoCon’s Freshman of the Week after throwing four touchdown passes and running for another in a season-opening loss to Bucknell University Aug. 30, and Chris Copeland ’15, who boasts a 3.38 grade point average as a mechanical engineering major, was named the league’s Student-Athlete of the Week Sept. 20 after blocking a punt and returning it for a touchdown in the victory over Davidson.

Ryan Pryor has been named the Institute’s new women’s water polo coach. Pryor, who excelled as a player at the University of Michigan, became VMI’s second coach after brief stints at Brown University and Connecticut College. Stepping in as the interim coach at Connecticut College last year, Pryor helped lead the women’s team to the College Water Polo Association’s Division III championship.
New Program Helps Prevent Concussions

By Mary Price

Ask the average person on the street which college sport causes the most concussions, and he or she will most likely respond with the correct answer – football.

But what’s the college sport responsible for the second-highest number of concussions, according to the NCAA? The answer, women’s soccer, might come as a surprise.

With research increasingly showing that a concussion, which is a form of traumatic brain injury most often caused by a hard blow to the head, isn’t something to be shrugged off lightly, coaches and athletic trainers at VMI are paying increased attention to prevention.

Football has long been a focus for coaches and trainers, but this year, the athletic department has begun a new initiative to prevent this injury among members of the women’s soccer team.

“When I first came, concussions were not a major issue for us,” said Bryan Williams, who’s coached the women’s soccer team at VMI for the past 10 years. He recalled that in his early years of coaching at the Institute, the concussion rate among members of the team was perhaps one or two per year.

Beginning about four or five years ago, though, “We seemed to have this rash of concussions,” Williams said. The causes were dissimilar – one player might slip on wet ground and hit her head hard, while another might run into another player on the field, and yet another might have the ball hit her head – but the result would be the same.

Williams related the story of one player, now an alumna, who suffered a concussion after running into another player during the fall of her 4th Class year. Unbeknownst to Williams at the time, she’d suffered a previous concussion, and the injury at VMI caused six weeks of symptoms, including headache and fatigue. Dr. David Copeland, Institute physician, had to make the difficult and unpopular call that the young woman’s soccer career was over.

“Soccer is a contact sport,” Williams noted. “It’s not American football, but it’s football in the pure form. … You’re going to get hit all of the time in the game of soccer, whether it’s heading [hitting the ball with one’s head] or anything else.”

Last year, though, matters reached a critical state as Williams looked at his roster of players and realized that least 50 percent had suffered a previous concussion. Seeking to protect his players’ health, and their ability to keep playing the sport they love, he agreed to implement a series of exercises recommended by Lance Fujiwara, director of sports medicine, and Jim Whitten, strength and conditioning coach.

“Some of the research that’s coming out now, it’s showing that one of the things to do is increase [players’] circuit strength in the upper neck and shoulder region,” explained Fujiwara.

“[The exercises] are geared to be done with a partner to create accountability,” added Kelsey Croak, a trainer in the sports medicine office, who explained that the exercises are to be done before each practice or game.

Working in pairs, each player takes a turn pushing her head in each direction against the resistance of her partner’s hands. The players then switch places.

As of Sept. 22, almost halfway through the season, the effort seemed to be working; Williams reported that there had been only one concussion, versus five during the regular season last fall.

For Williams, concussion prevention isn’t only about soccer. It’s helping each player achieve success, on and off the field.

“There’s a building effect that comes with each concussion, and there can even be a life-altering effect,” he explained, adding that a history of concussion can keep an athlete from commissioning in the armed services.

“We don’t want to see any of that for any of our players,” said Williams. “We don’t want to limit their career or work options. They play hard and they work hard. We want to keep them healthy and get them back on the field.”

Aaliyah Lyttle dribbles the ball during the Sept. 19 game against Radford University on Patchin Field. – VMI

Photo by Kevin Remington.
Facebook helps people connect with friends and is perceived as a fun diversion. However, according to research conducted by Lt. Col. Scott Frein and cadets in the psychology department, it is actually impairing memory and making users less happy.

“My primary interest in research is the effects of writing intervention on physical and psychological well-being,” said Frein. In his cognition class, he covers studies that have shown excessive electronic media use – television, computers, and video games – is correlated with ADHD.

Over the past few years, cadets in his classes have shown an interest in discovering how this applies specifically to Facebook. Samantha Jones ’12 approached him about studying the effects of Facebook use on cadets. This would eventually become her Summer Undergraduate Research Institute project in 2011.

Cadets participating in the study were divided into two groups – heavy Facebook users – those on Facebook for an hour or more per day – and those who used Facebook for less than an hour. They were then given a memory test in which they were shown words they were to remember and then given a distractor task – in this case, math problems – for one minute.

“Heavy Facebook users did significantly worse on the memory test, ... and honestly I was really surprised by this,” Frein said.

When the distractor task was increased from one minute to five minutes, there was an even steeper drop in heavy Facebook users’ recall. There was no difference in the group with low Facebook usage.

This research was advanced by Tyler Cross ’14 in the fall of 2013 when heavy Facebook users were compared to those who reported heavy YouTube or general Internet usage. Again, heavy Facebook users did much worse on memory tests, while general Internet usage showed virtually no effect on memory.

The problem with this type of research is that it really cannot tell why this is happening, only that there is a correlation between Facebook usage and memory. Nevertheless, Frein has a few ideas on the uniqueness of Facebook.

“We’re teaching people to focus on very small amounts of information for very short times as they go from post to post; ... the more you use Facebook, the more you’re training yourself that ‘I don’t have to remember this stuff,’” he said. “They are becoming less and more inefficient at remembering information because they’re out of practice.”

In addition to memory impairment, another study by Patrick Goulden ’13 in the summer and fall of 2012 sought to discover the correlation between Facebook usage and overall happiness.

For this study, cadets were again divided into two groups – they sat in a room and either checked their Facebook for 30 minutes or they sat in a room and talked to one of their friends for 30 minutes.

“The people that used Facebook for 30 minutes showed a significant drop in their level of positive emotions,” explained Frein. “Those that were in the talking group reported less stress [and] anxiety and an increase in self-esteem.” To gauge this, cadets were surveyed about how they were feeling before and after the 30-minute sessions.

Frein hypothesizes that the reason cadets felt worse after checking their Facebook is the “positivity bias” that exists on the website. Users generally only post the good events and news in their lives, and other users compare their lives to these seemingly perfect standards.

Despite the negative emotions brought on by Facebook, when given the choice, cadets participating in the study almost always chose the scenario that would let them check their Facebook for 30 minutes. When he has visited other college campuses, Frein has observed that this is not unique to VMI.

“When I was in college, it was loud between classes – people were talking,” he said. “Now I see large groups of students walking in total silence as they’re all on their phones or iPads. We’re losing those face to face interactions which make people happier and feel better about themselves.”

“I understand the logic – ‘I’m feeling down so I want to connect with my friends because they make me feel better,’ but the asynchronous timing in the connection is not producing the results people want,” he said.

Frein and his cadet researchers have received positive feedback when presenting the results of their research at conferences the past few years. Jones and Cross went to the national convention of the Association of Psychological Science, while Goulden presented at the Virginia Social Science Association. Their findings have also been published in Computers in Human Behavior.

If there is one take-away from these studies, Frein hopes it is an increased awareness of the power of face-to-face conversation in a world that is becoming more and more reliant on electronic communication.

“If you have a few free minutes, have a conversation with somebody,” he concluded.
Pre-Law Program Helps Cadets Land Internships, Admissions

By Mary Price

Throughout his internship at McGuireWoods this summer, Cadet James Latta ’16 found himself surrounded by attorneys who said that they would either talk or work him out of going to law school.

Neither tactic was successful.

Day after day, Latta recounted, attorneys with the prestigious law firm would tell him, “After [going through] these 20,000 documents, you won’t want to go to law school anymore,” to which Latta would reply, “This is great. I’d like to work here.”

As a seventh-grader, Latta made two decisions that have guided his life choices to this day. The first was to come to VMI, and the second was to attend law school. Now halfway through his cadetship, the international studies major from Midlothian, Va., has already begun studying for the Law School Admissions Test, or LSAT.

If his scores on that all-important exam are high enough, he’ll set his sights on a top-tier law school with the goal of practicing corporate and securities law down the road.

“It’s very high stakes and very competitive,” said Latta of corporate law, which was the major focus of his internship this summer. “That’s what I like about it.”

Helping cadets such as Latta discern their best fit in the legal field is the responsibility of Lt. Col. Ryan Holston, associate professor of international studies and political science, who took over the role of pre-law adviser in 2011.

It’s a job that Holston has taken on with keen awareness that the price tag of a legal education can exceed $100,000 and jobs for newly minted lawyers are much less plentiful than they once were.

Because of this, applications to law schools are dropping nationally, with a 12 percent decline from 2012 to 2013, and a 31 percent decline from 2009 to 2013, according to data collected by the Law School Admissions Council. VMI has mirrored this trend, with only 17 cadets and alumni applying in the 2012-13 academic year, versus 28 in 2008-09.

With costs rising, and a job offer upon graduation no longer certain, motivation is the first factor Holston assesses when he meets with cadets who say they’d like to go to law school.

“You sort of have to prod them with questions and peel back the layers,” he explained. For cadets who are absolutely sure that law school is for them, Holston assists in finding internships and puts them in touch with alumni attorneys through a database he’s created. In Latta’s case, Holston was able to find Chad Welch ’00, an attorney with McGuireWoods, who works under Bill Boland ’73, also a McGuireWoods attorney and a member of VMI’s Board of Visitors.

“We’ve had some success in connecting people,” said Holston. “It’s been slow but it’s been steady.”

For cadets who aren’t as sure as Latta about whether or not law school is right for them, Holston advises a discernment process that usually involves taking time after graduation to work for a year or two.

“Put yourself near lawyers,” Holston counsels cadets who are on the fence about law school. “If you can determine that you like the day-to-day work of being a lawyer in the trenches, that’s a good sign.”

For those cadets or alumni who’ve decided to apply to law school, the falloff in applicants in recent years is a cloud with a silver lining: law schools are competing for a shrinking pool of applicants, and thus an individual’s chances of admission at a selective school have increased.

“You’re competitive at the next tier up, and there’s more money out there, because [law schools are] having to buy their students,” said Holston, who explained that most financial aid at law schools comes in the form of merit scholarships.

To give cadets and graduates even more of an edge when it comes to admissions, VMI has entered into memorandums of understanding with law schools at three Virginia schools: the University of Virginia, the College of William & Mary, and the University of Richmond.

Holston explained that while the memorandums don’t guarantee admission, they do guarantee a second look for VMI cadets or graduates. The Institute can nominate candidates for interviews, Holston noted, which is a major step forward because law schools usually don’t interview candidates for admission.

“It’s the interview that’s the real coup for us,” said Holston. “We’re cultivating relationships with these schools.”

As part of that relationship, Holston arranges visits to law schools at least once a year, and as often as possible, he arranges for cadets to have uninterrupted time with VMI alumni currently enrolled at those schools. This year, cadets will be visiting the University of Virginia Law School on Oct. 8. Prior to that, a law school fair was held on Sept. 29.

As for Latta, the hours spent digging through documents this summer have only made him more eager to return to law firm life. “The case research was interesting,” said Latta. “If you really care about the law, it’s interesting to see those things.”

Cadets talk with representatives from law schools during the Sept. 29 law school fair. – VMI Photo by Kevin Remington.
A project currently under way in the VMI chemistry department could someday save lives that would otherwise be lost to malaria.

Beginning last year, Col. Stan Smith, professor of chemistry, and several cadets have been working to develop new compounds effective against malaria, a mosquito-borne, sometimes fatal disease common in tropical regions of the world. The disease is caused by a parasitic protozoan carried by the female Anopheles mosquito, which transmits the infection when it bites a person or animal.

There are anti-malarial pharmaceuticals currently on the market, but resistance has developed to several of them, Smith explained. There is no vaccine against the disease.

Last summer, Cadet Brent Clark ’15 spent many hours in the lab working to develop and test new compounds that might be effective against malaria as part of a Summer Undergraduate Research Institute project. For Clark, a chemistry major who plans to commission in the Air Force after graduating from VMI, the SURI project has been a way to experience the real life of a scientist, with all of its joys and frustrations. “Some things have been easy and some things have been hard,” said Clark. “The things that we’re currently trying aren’t working, but that’s science, I guess. We’re just trying to get stuff to work.”

Testing the efficacy of Clark and Smith’s creations has been left to the experts at the Walter Reed Army Institute of Research, where a VMI alumnus, Capt. Victor Zottig ’01, is chief of the synthetic chemistry core in the division of experimental therapeutics. In that role, he is responsible for helping to develop new drugs against malaria.

The involvement of Clark and Smith in Zottig’s research is the result of VMI’s famed alumni network — and a bit of serendipity. Zottig attended graduate school with a fellow alumnus, Maj. Dan Harrison ’05, who is now assistant professor of chemistry. Over the years, Harrison and Zottig have kept in touch, and when Zottig expressed an interest in having an organic chemist develop and test anti-malarial compounds, Harrison recommended Smith.

Smith came to the project with a background in medicinal chemistry, as he had done research to find a way to chemically inactivate nerve gas agents during a post-doctoral fellowship at the Research Triangle Institute in North Carolina.

As they completed the synthesis and purification of new compounds, Smith and Clark sent a sample of each to Zottig at Walter Reed. Two months later, Smith receives results showing what worked and what didn’t and then heads back to the lab to further refine the compounds showing the best results. “We’ve found things that are semi-active,” said Smith of the research results so far.

“It’s trial and error,” added Clark. “We have some compounds that aren’t toxic, so that’s good, but they’re not nearly as active as the drugs that are used now,” Smith explained. “The drugs that are used now are probably about 1,000 to 10,000 times more active than our compounds, so there’s still a ways to go. Some of the compounds show promise, so the ones that show promise, we’re making more derivatives of those.”

Clark, meanwhile, has found satisfaction in knowing that if he is persistent enough, he could help produce a powerful drug. “It’s exciting to know that what I’m doing here could potentially help save people,” said Clark.

“It’s kind of exciting but nerve-racking, especially when we get something that should work but doesn’t work, because if we could get it to work, it could be that one thing they need,” he continued. “I’ve just got to keep pushing. It’s kind of exciting knowing that something that I’m doing here could affect somebody eventually.”

Also working on this project with Smith during the 2013-14 academic year were Thomas Bradshaw ’14, Zachary Ratka ’14, and Ryan Miccio ’16.
Post Tours Now Available via Android App

By Daniel Stinnett ’07

Since there is only one post tour per day during the academic year, visitors to VMI who missed the noon start time used to be out of luck. Now they can download the Tour VMI App for free to their Android smart phone and embark on a self-guided tour.

“The market would be for people who are here to look, … potentially anyone who wants to learn the history of VMI. … I imagine we’ll get some downloads from prospective students,” said Col. Mac Baker, a professor of electrical and computer engineering who did most of the programming.

When the app is opened, an aerial map of VMI appears with a blue dot representing the user’s current position. The user can then click on links to read information and view historical pictures of buildings or monuments nearby. It is not necessary to be on post to use the app, however.

“It is fully functional even if you’re not on post. You can click on things and learn. … That was very important because we thought this might be useful as a recruiting tool,” Baker explained.

Col. Troy Siemers, head of the applied mathematics department, kick-started the project, and math professor Maj. Geoff Cox helped with the HTML coding. Lt. Col. Kate Crossman of VMI communications and marketing provided logos.

While the idea for the app has been around for three or four years, Baker has been working intensely on completing the Android version since January and is hopeful that an Apple version will soon follow.

“[The development] is not really that complicated, there’s just such a learning curve to figure out how to do all of it in the first place,” Baker said. He noted that the technology is constantly changing. In fact, once, he was working on it and set it aside for a semester only to find the prior work had to be scrapped when he picked it up again.

Several cadets assisted Baker in the development of earlier versions of the app as independent study projects or as part of their senior theses, including 1st Class cadet Nishant Singh and recent graduates Connor Ross, Charles Bradford, and Zahir Shihata.

Baker worked with the VMI Archives to find historical photos of buildings and of the individuals the buildings were named for. The text in the app was repackaged from the notes given to cadet tour guides, provided to Baker by Col. Keith Gibson, executive director of the VMI Museum System.

“This is a great tool for visitors to the Institute or those wanting to learn about the VMI environment. … It is a great start and looks good,” Gibson observed.

As long as there is an interest, Baker plans to continually update the app with new features and information.

“We’re putting it out there for free to see if there is a demand for it and see if any cadets are interested in working on it [and] … possibly turning it into a class on mobile computer and smart phone development,” Baker said.

The most interesting feature Baker would like to see incorporated is an augmented reality mode, allowing users to point their smartphones’ cameras at buildings or monuments and have information about them displayed automatically. He would also like to include more insight into cadet life and have an option in which the app would suggest the next place on post to visit.

“In the future I’d like the content to be upgradable and more dynamic. … I’m waiting for feedback and suggestions from users,” he said.

To download the app, log into the Google Play Store on an Android phone or tablet and search for “Tour VMI.”
All college coaches, no matter what the sport, face certain difficulties when trying to improve their programs, but there is no question that VMI coaches face unique challenges. Many of them have figured out how to overcome those challenges, however: embrace them.

“We have something to offer kids nobody else can offer them,” said Jonathan Hadra ’04, associate head coach and recruiting coordinator for the VMI baseball team. “We sell that.”

The benefits of the VMI experience are obvious. First, graduates from the Institute almost always find a job in their field after leaving Lexington, and the VMI network extends throughout the country, with other alumni ready to lend a helping hand to the next group of graduates. That often is first on the list of items to share with prospects when VMI coaches hit the recruiting trail.

“We always talk about the [statistic that] 98 percent of graduates within six months of graduation have either a full-time job or [are] in the military or are in a graduate program,” said Hadra. “That’s the number one thing we sell. We graduated 11 seniors last year, and nine of them had jobs before they graduated. That’s just the VMI network working, and that’s something we can definitely sell.”

“It’s tough not to sell a 98 percent job-placement rate,” added VMI head lacrosse coach Brian Anken. “I always tell them our guys are getting jobs in the fields they want to go into. It’s tough for four years, but it opens up some doors for you.”

Those opportunities can be life changing, and the skills cadets absorb — and the rigors they endure — will benefit them for the rest of their lives. This is an important message for the coaches to convey.

“I tell them, ‘This isn’t a four-year decision you are making; it’s a lifelong decision,’” explained Darrin Webb, the director of track and field and cross country. “It prepares them for situations they are going to face. I think getting them to see that is more important than convincing them they can get around it.”

Those opportunities can be life changing, and the skills cadets absorb — and the rigors they endure — will benefit them for the rest of their lives. This is an important message for the coaches to convey.

“Tighten the skills you are making; it’s a lifelong decision,” explained Darrin Webb, the director of track and field and cross country. “It prepares them for situations they are going to face. I think getting them to see that is more important than convincing them they can get around it.”

VMI coaches have found a way to tackle that problem as well. Naturally, they target the best athletes, those who can help their programs, but they also set their sights on those who show a genuine interest in VMI. And when they bring them in for a visit, they don’t try to hide the fact that life on post is far from easy.

“We believe in total honesty, brutal honesty, and we spend the bulk of our recruiting process trying to scare people away,” said Anken. “It’s not a negative picture by any means, but a demanding picture that we paint.”

Those are good selling points, to be sure. However, it has to be hard to convince an athlete, especially those who are good enough to play at the Division I level, to spend the next four years of their lives in a military setting.

VMI coaches have found a way to tackle that problem as well. Naturally, they target the best athletes, those who can help their programs, but they also set their sights on those who show a genuine interest in VMI. And when they bring them in for a visit, they don’t try to hide the fact that life on post is far from easy.

“We believe in total honesty, brutal honesty, and we spend the bulk of our recruiting process trying to scare people away,” said Anken. “It’s not a negative picture by any means, but a demanding picture that we paint.”

“We tell them flat out a lot of guys can’t do what our guys do,” Anken added. “All of a sudden the challenge has been put out there, and we
For only the second time in recent history, the combined VMI Regimental Band and Pipes Band has been selected to appear in the Tournament of Roses Parade, to be held on Jan. 1, 2016, in Pasadena, Calif. “We’re really excited about going again,” said Col. John Brodie, band director, who led the band on its inaugural trip to the Rose Parade in 2008. “It’s a big honor for the band and for the school.”

Brodie explained that because so many organizations want to appear in the Rose Parade, the organizing committee asks that a group only apply once every four years. This time, the VMI band was selected from more than 100 bands around the country.

For the 2016 application, Brodie sent a packet that included a video clip of the band’s 2008 parade performance, along with letters of recommendation from Gen. J.H. Binford Peay III ’62, Institute superintendent, and Ellen Carroll, a retired federal judge who was a member of the 2008 Rose Bowl music committee.

“I think being there before really helped us out,” said Brodie. From the perspective of the Rose Parade, the VMI band is unusual, Brodie explained. The Rose Parade does not have other bands that include bagpipes.

Approximately 140 members of Band Company will be making the trip to Pasadena in late December 2015. Brodie said that in addition to marching in the parade, there will be time for sightseeing, and a gathering with West Coast VMI alumni is planned as well.

Preparations for this parade, one of the oldest and most prestigious in the country, take several months. With Maj. Burt Mitchell, Pipe Band director, Brodie plans to fly to Pasadena to observe the 2015 Rose Bowl Parade. At some point in 2016, Tournament of Roses President Mike Matthiessen and his wife, Ann Matthiessen, will travel to VMI to watch a parade and assist with fundraising.

Athletic Recruiters

Continued from page 16

get a group of kids that are legitimately interested in VMI for what I think are all of the right reasons.”

When recruits do come in for visits to these three programs, all are required to spend a night in barracks with a host from the team for which they are being recruited. If possible, these visits are scheduled during the fall, when the athlete can get full exposure to the Rat Line and all of its challenges.

“In the recruiting process, we tell these kids what they are going to have to do, and more important they’ll see what they have to do,” said Hadra. “Throughout the process, they’ll see everything. They are going to see the Rat Line. They’ll see kids strain, and they’ll probably see kids get yelled at. And we talk about it with them. We say, ‘Hey, it’s not easy. This is a tough six months, but it’s going to help you in the long run.’”

“You can prep somebody all you want, but until you walk a mile in somebody’s shoes …” said Anken. “And that’s what we want them to do. We want them to spend 24 hours in a cadet’s shoes and come back and make a decision if this is really the best place for them.”

Often, the official visit solidifies the recruit’s decision as to whether VMI is the right choice.

“They don’t need to make a decision while they are here, and I don’t ask them to make a decision while they are here,” said Webb. “You may not know if you are coming to school, but you know if you are still interested.”

Does this approach work? If it’s about finding recruits who are the best fit for VMI and vice versa, if it’s about finding players who will embrace the Institute’s values, if it’s about producing productive citizen-soldiers, then the answer is yes. Besides, most VMI coaches are not going to be silent on the uniqueness of the Institute for recruiting or anything else.

“After 21 years,” said Webb, “if I didn’t believe in the system or think that it helped give you an opportunity to be successful, then I couldn’t keep selling it.”
Shepherd Internship Provides Insight into Latino Culture

By Mary Price

One cadet was able to put her Spanish and biology double major to use last summer through an internship in Richmond, Va., where she simultaneously worked at a medical clinic serving low-income patients and conducted a Summer Undergraduate Research Institute project.

Tessa Smith ‘15 interned at CrossOver Healthcare Ministry where she acted as a translator and receptionist for Hispanic families. Her internship was coordinated by the Shepherd Higher Education Consortium on Poverty. Smith was the only VMI cadet selected this summer for one of the prestigious Shepherd internships.

While she was working at CrossOver, Smith completed an online course through the California School of Traditional Hispanic Herbalism designed to help her learn about the practices of curanderos, or herbal healers.

Smith explained that it’s common in Latino culture to visit a curandero, who is likely to recommend herbs or rituals such as bathing as a first resource when health complaints arise, whether they are mental or physical in nature.

Originally, Smith’s SURI project goal had included a survey about Latinos’ use of curanderos, which was to be distributed to patients at CrossOver. Red tape and regulations sounded the death knell of the survey, which was never distributed, but Smith was still able to learn quite a bit from the seven-week online class.

“It was a really eye-opening experience,” said Smith of her studies. She explained that unlike traditional physicians, curanderos often include a spiritual angle in their practice.

Hispanic patients, too, sometimes approach illness from a mindset that differs dramatically from that of a physician steeped in biochemistry. Smith experienced this firsthand over the summer, when a woman with epilepsy had a seizure while at the clinic. Witnessing this, her husband began to exclaim that his wife was cursed.

“This guy was ranting about the evil eye and spirits and such,” said Smith, who explained to the man in Spanish that his wife wasn’t cursed – she had a disease that could be helped with the proper medication.

Both Smith’s internship and her SURI project were designed to help her reach her goal of becoming a physician’s assistant. With that goal in mind, Smith would very much like to see physicians become more aware of the cultural issues that can arise when treating Latino patients.

“My big picture, [my] ‘so what’ goal [for the SURI project] was to publish something that physicians can look at and be like, ‘Hey, this is important,’ and better understand where their patients are coming from,” said Smith. “A lot of the time doctors are totally dismissive. … [Understanding the patient’s culture] is going to help you better relate to your patients and better treat them.”

Overseeing Smith’s SURI work were Col. Kathleen Bulger-Barnett, professor of modern languages and cultures, and Col. Wade Bell, professor of biology.

Bulger-Barnett said that thanks to this internship, Smith would likely be able to “add the cultural piece,” that’s sometimes lacking when physicians treat patients from other cultures.

“If she’s the one doing a lot of the intake for patients, she’ll understand culturally why they do what they do,” Bulger-Barnett commented.

Bell, meanwhile, praised Smith’s choice of majors. “We’ve had several other folks double major or minor in modern languages, and it’s a wonderful thing,” he noted. “A lot of our students do go into health care and our increasingly diverse society demands that students understand other cultures.”

For her part, Smith has had to carry out a lot of independent studies in Spanish because her Spanish courses conflict with her biology labs. It’s been a recipe for exhaustion, and lost sleep, as she’s always carried at least 18.5 credit hours per semester, and sometimes as many as 20.5.

“It’s definitely been a rough road, but once I graduate with the double major it’s definitely going to be worth it,” she commented.

Smith also reflected positively on her experience with the Shepherd internship. “Shepherd is a really excellent program, and more VMI cadets should apply for it,” she said. “It’s not easy to get in, but it’s very rewarding.”
Army ROTC Trains New and Returning Cadets

As the school year began and the Old Corps returned, Army ROTC activities began fast and furious with preparations for the year’s challenges on and off post.

The ROTC cadre administered an Army Physical Fitness Test to 39 four-year national ROTC scholarship winners Aug. 22, followed by a contracting ceremony that afternoon, hosted by Col. Doug Vincent ’92 and witnessed by family and friends. This was the highest number of four-year scholarship winners in VMI Army ROTC history.

Cadet leaders have been planning, preparing, and training fellow cadets for the Fall Leadership Development Exercise this month. Physical fitness training, equipment issue, operations order development, planning, and resourcing of the upcoming LDX was led by the Marshall-New Market Battalion staff and company commanders. Preparations include an emphasis on physical conditioning, as this event will challenge cadets physically and mentally.

The Bold Leader Challenge team began their preparation for the 1st Brigade, U.S. Army Cadet Command, Bold Leader Challenge competition to be held in November at Fort Knox, Ky., where cadets will be tested in military tasks including basic rifle marksmanship, road marching, land navigation and other soldier skills. The VMI team will compete against teams from schools including the Citadel, Norwich, Texas A&M, Virginia Tech, and the University of North Georgia. The winning team will compete at the annual Sandhurst Games.

Cadets Attend Air Force ROTC Field Training

Eleven 2nd Class cadets completed Air Force ROTC Field Training last summer. By the end of the training, five were ranked in the top third of their class and five others in the middle third.

Several of the cadets earned special awards. Daniel Warner, Ryan Miccio, Zachary Robinson, and Zachary Turek received the Distinguished Graduate Award. Andrew Day received the Superior Performance Award, and both Day and Isaac Lewis received the Warrior Spirit Award.

The 23-day program was held at Maxwell Air Force Base, Ala., and Camp Shelby Joint Forces Training Center, Miss.

During the first 11 days, the cadets trained at Maxwell Air Force Base, where they learned about basic functions of the base and foundations of leadership in an academic setting. During the next 12 days, the cadets experienced a mock deployment to Camp Shelby, where they learned and practiced the fundamentals of keeping a base safe and breaching and securing buildings by use of small unit tactics.

To be selected for Field Training, cadets must complete two years of training and face a competitive selection process. While in training, cadets are evaluated on their leadership competency and receive feedback based on their individual and team performance.
VMI High in National Rankings

VMI has retained its place among the nation’s top colleges and universities in rankings released recently by several news outlets.

In early September, *U.S. News and World Report* ranked the Institute fourth among public liberal arts colleges, behind the U.S. Naval Academy, the U.S. Military Academy, and the U.S. Air Force Academy. VMI held the No. 1 position in this category for six years before the federal service academies were reclassified in 2007.

Among all public and private liberal arts colleges, VMI was ranked No. 64, up from the No. 65 spot it held last year.

Among engineering schools whose highest degree is a bachelor's or master's degree, VMI was ranked No. 22, up from the No. 33 spot it held last year. The rankings in the engineering category are based exclusively on the reputation of the program.

The Institute was also included in the unranked list of A-Plus Schools for B Students among national liberal arts colleges. The listing evaluates the quality of the school’s academic program and the academic profile of admitted students.

The *U.S. News* rankings are based on such factors as a college’s reputation as rated by academic leaders nationally; the retention of students; class size; the quality of the faculty; the quality of students; financial resources; graduation rate performance; and the alumni giving rate.

Also giving the Institute high marks recently has been *Money* magazine, which ranked VMI 18th out of the 665 colleges and universities listed in a new national best colleges ranking. *Money*’s ranking system took into account education quality, affordability, and post-graduation outcome in determining the rank of each institution.

VMI’s 18th-place ranking was second in the state, with only the University of Virginia coming in higher, at 16th. The rankings did not include the service academies because of the requirement to serve after graduation.

*Money* magazine also VMI ranked fourth in the liberal arts category, higher than any other liberal arts college in the state. Washington and Lee University was the only other Virginia school among the top 25, ranking ninth.

In addition, *Money* magazine ranked VMI eighth in the category of best value liberal arts schools, behind Harvey Mudd College, Williams College, and Amherst College. The best value category calculates the average net price of a degree by taking a college’s or university’s sticker price and subtracting institutional aid, and comparing it to the average salary of a graduate within five years, as reported by Payscale.com.

VMI also placed fourth in the public school category, behind the University of Virginia, University of California-Berkley, and Maine Maritime Academy.

VMI’s Department of International Studies and Political Science has also earned accolades recently. College Factual, an independent college rankings organization, ranked VMI 18th in the nation in the category of international relations and national security, just behind Brown University and ahead of George Mason University.

CollegeFactual.com also ranked VMI eighth in the category of best colleges for the money in international relations and national security.