



INSTITUTE REPORT

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CPTF Offers Myriad Training Opportunities for Corps, Track Team Obstacle and High Ropes Courses, Climbing Wall, Hydraulic Track Soon to Be in Use

By Mary Price

After more than two years of construction, VMI's newest building, the indoor training facility, recently designated the Corps Physical Training Facility, is now poised to welcome cadets.

On Oct. 28, VMI's construction office received a certificate of occupancy for the vast new building, which has been under construction since the summer of 2014 at the corner of Main and Diamond



Among the features of the Corps Physical Training Facility are a 200-meter hydraulic track, overhead obstacles, a rock wall, a warmup track, and spectator seating. – VMI Photo by John Robertson IV.

streets. By mid-November, the track team had begun using the \$84 million building, and that team's coaches had moved into their offices there. The entire Corps will start using the facility sometime in 2017.

"VMI is still working out the overall operations of the building – how it's going to be accessed, who gets access to it, who gets to use it on a daily basis,"

See Training Facility, page 7

'You Just Have to Keep Going' Math and Physics Major Wins Coveted Spot in Navy Nuclear Propulsion Program

By Mary Price

Displaying VMI's "never say die" attitude, Emma Nobile '17 hung tough through five grueling interviews last month to become the first female cadet in recent memory to be selected for the Navy's prestigious and highly selective nuclear reactors program. She was one of only six midshipmen nationwide to be selected.

"Not many people apply for Naval reactors," said Nobile, an applied mathematics and physics double major. "It's definitely a different part of the Navy than most people are interested in."

The nuclear reactors program, which is command central for the nuclear Navy, is headquartered at the Navy Yard in Washington, D.C. Being selected to work there is quite a coup

– and Nobile will become only the second VMI graduate to work there since Evan Dill '13.

"They are the top of the top, the best of the best," said Lt. Bryan Glock, the Navy ROTC's nuclear propulsion officer, of those selected for Naval nuclear reactors. "We're very proud of her for succeeding."

Nobile had known since high school that she wanted to be in the Navy, but it wasn't until she neared her 1st Class year at VMI that she knew she wanted nuclear reactors.

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Office of Communications and Marketing

Director Col. Stewart MacInnis
Editor Maj. Sherri Tombarge
Assistant Editor John Robertson IV
Graphic Artist Robbin Youngblood
Contributors Scott Belliveau '83
Chris Floyd
Stephen Hanes
H. Lockwood McLaughlin
Kelly Nye
Mary Price

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Campaign Exceeds \$300 Million

By Scott Belliveau '83, VMI Foundation

Donald M. Wilkinson '61, chairman of An Uncommon Purpose: A Glorious Past, A Brilliant Future: The Campaign for VMI, announced at the Nov. 11 Institute Society dinner that this comprehensive fundraising effort had raised \$305 million from more than 14,500 alumni, friends, corporations, and foundations.

The campaign, said Wilkinson, is about making VMI thrive in a "highly competitive" world.

"As financial support from the state dwindles – and this is an enormous problem – the campaign is also focused on enabling VMI to be self-sufficient as it maintains the mission."

The campaign will conclude its work on June 30, 2017, the end of the fiscal year, he said, cautioning that there should be no slackening of effort until then.

"We're not done yet," he said, "We still have a lot of hard work to do. We have high aspirations for continuing to increase these numbers and, therefore, the resources to ensure VMI's brilliant future."

"This effort has made everyone associated with VMI proud of the way that our alumni and friends always rally to the Institute's cause," said Brian S. Crockett, the CEO of the VMI Foundation, who has served as the campaign's chief operating officer since its inception. It has, he added, "filled us with a sense of confidence that the Institute will be able to accomplish its mission in its own remarkable way well into the future."

For more information, visit www.vmi.edu/campaign. 🌟

Leadership and Ethics Conference

U.S. Army Lt. Gen. H.R. McMaster (right) addresses the seventh annual Leadership and Ethics Conference, which took place Nov. 2-3 with speakers and panel sessions focusing on strategic leadership during global transition. Other conference speakers were international policy analyst Linda Robinson and foreign policy professor Michael Mandelbaum. To see more photos, visit VMInews.tumblr.com, post date Nov. 3. – VMI Photos by H. Lockwood McLaughlin.



Psychology Class Meets Murderer, Larcenist

Visit to Maximum Security Prison Offers Insights into Different Life Experiences

By Mary Price

There's a saying that you can't understand another man until you've walked a mile in his moccasins – and a group of VMI cadets recently got a taste of that experience when they took a most unusual field trip.

On Nov. 1, cadets in Maj. Sara Whipple's developmental psychology class visited the Augusta Correctional Center, a maximum-security state prison for men.

Whipple explained that she found the opportunity for her cadets by happenstance during a conversation with a friend who teaches in the Shepherd Poverty Program at neighboring Washington and Lee University. When the W&L professor mentioned that the Augusta Correctional Center offered operational tours, and that she would be taking a class there in the spring, Whipple realized that she too had an opportunity.

"Developmental psychology seemed like a perfect match for that scenario," noted Whipple. She explained that the course focuses on the human life cycle from prenatal development to old age, and while it's natural to reflect on one's own experiences in a course such as this, it's more valuable to meet someone whose life experience is different.

"I wanted students to be able to step outside of their personal stories, ... to take it to another level and see how it could be applied to people very different from us," said Whipple.

A major goal of the trip, she noted, was to "challenge our preconceived notions about these offenders and who they are and how they might have chosen or not chosen the path that they're on."

To schedule the trip, Whipple got in touch with the prison and supplied a list of cadet names to ensure that all were at least 18 years old. Whipple also worked with the Commandant's Office to get

permission for the cadets to wear civilian clothes instead of uniforms so their identities would be protected.

At the prison, cadets had the opportunity to talk to two inmates, one of whom is doing time for murder and the other of whom is serving a life sentence for grand larceny.

"We quickly learned that our preconceived notions might not necessarily be true," said Cameron Jones '19. "They were much more accepting and warm than we thought."

Hayley Freeman '17 concurred, saying, "They got right into it. 'My name is so-and-so and I murdered somebody.' I got nervous because I was sitting right next to him."

As Freeman listened, though, she found herself understanding the man sitting next to her more and more. "For the most part, I found myself sympathizing with [the prisoner]," she said. The murder didn't just happen out of the blue, she learned – the inmate had killed a man as retribution after that man had killed the inmate's 6-year-old son.

"Personally, it changes how you understand the situation," said Whipple. "In the beginning it's more black and white, and then it gets a little more nuanced."

Freeman, whose father is a police officer, said she was glad to see a side of law enforcement that she'd never had the chance to see before. "[The prisoners] were explaining all of the flaws in the system," she said. "It was really eye-opening."

For the most part, Freeman and Jones said, the prisoners said they felt like they were being punished more than rehabilitated. The man serving a life sentence, for example, was well aware that he wasn't learning job skills because those who had a better chance of being released were being given those opportunities instead. His letters to the governor, he explained, have been ignored.

"He was using facts that supported his view," said Jones. "It wasn't just biased opinion."

The cadets found the prisoners to be much more literate than they expected, despite the fact that neither had gone beyond the ninth grade in school. "They were using words I don't use," said Freeman.

"One had extreme knowledge in depth of the justice system," said Jones.

"You adapt to your situation and your environment," explained Whipple. "They may have different skills than a college-educated person, but they've developed their own skills that are adaptive."

For the man serving the life sentence, hope is the best skill and survival strategy he knows, despite the bleakness of his prospects. The inmate told the cadets, "Sometimes I feel like I'm crazy for holding on to hope, because I'm in here for life. ... When do you give up hope?"

Freeman acknowledged that her trip to the prison has made her more aware of her privileged status in life. "It helped me to appreciate my situation a lot more. Somebody always has it worse than you." 🌿



Cadets in Maj. Sara Whipple's developmental psychology class gather in front of the Augusta Correctional Center. – Photo courtesy of Maj. Sara Whipple.

Athletes Lead in Spirit Week Celebrations and Cookout

By Kelly Nye

On the eve of Homecoming weekend, football coach Scott Wachenheim stood on top of the sentinel box shoulder to shoulder with women's soccer players and his own football players. He called upon the entire Corps of Cadets to be part of this "historic athletic season."

Spirits were running high, as the women's soccer players had just defeated the Citadel in a round of Southern Conference playoffs and were preparing to play Samford in Birmingham, Ala., a game they later lost.

The football team, too, was jubilant, having won back-to-back road games for the first time in 35 years.

To keep that momentum going, the S-6 athletics staff joined the football team to hold a pep rally cookout for the Corps of Cadets as part of Spirit Week leading up to the Homecoming football game.

Spirit Week events included upbeat drum lines for marchdown during Supper Roll Call, including one from the movie *Top Gun*. First-, 2nd-, and 3rd-class cadets all received new blender bottles. And on

Wednesday night Aramark provided a steak dinner in Crozet Hall.

"[We wanted to] change the atmosphere of the whole week," said Carter Chatwood '16, assistant commandant of cadets who is filling in this semester while Maj. Chris Perry '05 is on leave.

The pep rally cookout in Old Barracks was a highlight, something S-7 cadet life staff had debuted last year on an unfortunately rainy evening. This year, cadets ignored a light rain, lining the tables for a barbecue provided by Aramark.

Afterward, the cadets on the women's soccer team and the football team filled the courtyard while the regimental band played. From the top of the sentinel box, the soccer team captains thanked the Corps for showing so much support during their game against the Citadel.

Then Coach Wachenheim spoke. Wachenheim emphasized his pride in the entire Corps of Cadets, noting that at VMI it takes "the whole damn team" and that this generation of cadets had already accomplished much. Then he and the

cadets gathered at the sentinel box led the Corps in an Old Yell, followed by a special chant that the football team says before every game.

Coached by the captains of the football team, the entire Corps joined in the chant, as "Rah Virginia Mil" rang out through the courtyard.

All in all, this year's event was a success. "Cadets enjoyed being able to casually eat in the courtyard, and I believe the football and soccer team appreciated the Corps showing their support," said Chatwood.

After Saturday's game, a loss to Furman, the Corps gathered in Cocke Hall for a Halloween-themed Homecoming Hop.

"They put a lot of effort into the hop," said Brandon Conley '17, cadet in charge of Spirit Week. "In years past we've decorated ourselves, and this year we've actually paid a professional decorator to come."

The success of this year's events has led to optimism about the founding of a new tradition. As Chatwick said, "This year's spirit week raised the bar and everyone's expectation for next year." ❄️



Head football coach Scott Wachenheim addresses the Corps of Cadets from the sentinel box during the Homecoming pep rally Oct. 27. His encouraging words were followed by an Old Yell to help support the football team during the Homecoming game. – VMI Photo by Kelly Nye.

Battle of the Barracks a Hit with the Corps

Boxing Team Looks Forward to Nationals on Post; Powerlifting, Runners Also Victorious

By Chris Floyd

VMI's club sports seasons are in full swing, and a number of teams are gearing up for their national tournaments.

The powerlifting squad will be sending 12 athletes to the Collegiate Nationals in San Antonio, Texas, in April. The running team continued its season with some impressive showings at some impressive competitions.

But one of the most exciting of those preparations was over the Veterans Day weekend when the boxing team held its first Battle in the Barracks.

"It was really special," said head boxing coach Larry Hinojosa. "It was one of [my] most favorite things I've done as a coach."

On that chilly Friday night, the VMI pugilists offered a first-of-its-kind exhibition in the courtyard of New Barracks. The crowd that showed up to watch the nine matches was much larger and more boisterous than expected.

"We expected maybe 200 to 300 people to show up," said assistant commandant Carter Chatwood '16, noting that more than 900 were actually in attendance. "The week of, I had faculty coming to me and asking if they could get on the list to get into barracks. The next day at the football game, alumni were asking what happened in barracks. They said this was the best thing they had ever seen or heard of."

"[Members of the Corps of Cadets] have already asked when the next Battle in Barracks [will be]," added Nathan Miller '17, who fought



Members of VMI's club boxing team trade blows Nov. 11 in a ring set up in New Barracks Courtyard surrounded by cadets cheering from the courtyard and the stoops. - VMI Photo by Stephen Hanes.

at 152 pounds. "They had so much fun; they want more.

"We've fought in some crazy places before, but that was definitely the most electrifying atmosphere I've ever fought in," Miller continued. "Just walking out in front of the Corps and hearing all of those goons cheering for me, the best word is electrifying. It's the most fun I've ever had in boxing."

To say the Battle in Barracks was a success would be an understatement. It went so well that plans are being made for a similar event in the spring.

"I think everyone who was involved was glad they got to be a part of it," said Hinojosa, whose team will entertain between 25 and 30 other clubs at the national tournament in March.

A week earlier, the powerlifting squad was putting on a show of its own at the state championships in Cocke Hall, with 15 cadets competing.

On the women's side, Natalie Carroll '17, who is also a member of VMI's first female boxing team and hopes to compete at the boxing nationals, won a state title, finishing with a total of 644 pounds in the 125-pound weight class. Caitlyn Casten '18 lifted a total weight of 688 pounds to win the title, while Virginia Villani '19 won with a total of 764 pounds.

VMI's men boasted six state champions, led by Zachary Holland '17, Morgan Menaker '17, and Ben Gibson '19. Holland dominated the 183-pound weight class with a total of 1,444 pounds. Menaker finished with a total of 1,332 pounds while Gibson totaled 1,270.

The VMI Running Club recently competed in three major long-distance runs and turned in stellar results at each.

Josh Orr '18 finished first in his age group and 11th overall at the Air Force Marathon, held in September at Wright Patterson Air Force Base in Dayton, Ohio, finishing the full marathon in 2 hours, 59 minutes, 43 seconds. Christopher Douglas '17 was second in his age group and 15th overall, while Sarah Dickenson '18 placed fourth in her age group in her first marathon.

At the Chessie Trail 5K in October, Michael Ratt '19 won his age group and placed sixth overall. Douglas and Orr finished sixth and seventh, respectively, in the half marathon.

The Running Club most recently competed in the Virginia Tech Corps of Cadets Veterans Day 5K in Blacksburg. Orr was once again VMI's top finisher, winning the race with a time of 18:46.96. Dickenson finished the race in 22:21.53 to take first in her age group, and Riley Joy Neary '19 was third in her age group.

To see more photos, visit VMINews.tumblr.com, post dates Oct. 17 and Nov. 7. 📷



Caitlyn Casten '18 makes her first-attempt squat at 192.5 pounds. She finished her third attempt with 236.5 pounds, deadlifted 325.2 pounds and totaled 688 pounds to qualify her for Collegiate Nationals. - VMI Photo by Kelly Nye.

POST BRIEFS

Cadets Attend Quadrennial Physics Congress

Ten cadets, accompanied by Col. Greg Topasna and Col. Daniela Topasna, both professors of physics, attended the 2016 Quadrennial Physics Congress (PhysCon) in San Francisco, California, Nov. 2-5. This event was sponsored by Sigma Pi Sigma, the national physics honor society. During their time in California, the cadets participated in workshops, plenary

talks, and poster presentations. They also visited sites of interest such as the SLAC National Accelerator Laboratory and Google X. Those attending were Eryn Daman '18, Marlene Haag '18, Erik Kvenlog '19, Mehmet Kilinc '19, Blake Woodring '17, Evan Richey '17, Thayer Meyer '17, Reed Jones '18, Eric Cedotal '18, and Scott Cox '17.

Biology Professors, Recent Graduates Publish Paper

A research paper titled "The Relationship Between Estrogen and Nitric Oxide in the Prevention of Cardiac, and Vascular Anomalies in the Developing Zebrafish (*Danio rerio*)" was recently published in the journal *Brain Sciences*. Principal authors were Col. James E. Turner '65, Reid '41 Institute Professor of Arts and Sciences and head of biology, and Col.

Wade E. Bell, professor of biology. Co-authors were Benjamin Sykes '13, Peter Van Steyn '13, Johnathan Vignali '14, and John Winalski '15. All of these cadets contributed to the research through their honors theses. An additional co-author was Julie Lozier, VMI biology research technician.

Cadets Attend SoCon Research Forum

Eleven cadets traveled to Wofford College in Spartanburg, South Carolina, Oct. 28-29 for the first Southern Conference Undergraduate Research Forum. While there, they presented research on English, philosophy, international studies, history, civil engineering, physics, biology, exercise science, and psychology. Cadets attending were Reed Jones '18, Brandon

Barbery '18, Michael Griffin '17, Sarah Lemon '17, Theerachat Suvannachote '18, John Kim '19, Edward Olbyrch '18, Trevor Barnes '18, Samuel Hudson '17, Ronald Thelin '18, and Stephen Bernard '17. Accompanying the cadets was Maj. Josh Iddings, assistant professor of English, rhetoric, and humanistic studies and programs coordinator for undergraduate research.

History Professor Publishes Book

Maj. John Matsui, assistant professor of history, has published a book, *The First Republican Army: The Army of Virginia and the Radicalization of the Civil War*. In the book, Matsui draws upon the writings of 25 generals and 250 volunteer officers and enlisted men to examine the political beliefs that shaped the Army of Virginia, a Union force organized in the summer of 1862.

The book shows how officers and soldiers in the Army of Virginia saw slavery and pro-Confederate civilians as crucial components of the Confederate war effort and blamed them for prolonging the war. In his writing, Matsui connects this sentiment with President Abraham Lincoln's eventual issuance of the Emancipation Proclamation, which freed Southern slaves. ✪

Byrd Award

Former White House Chief of Staff James A. Baker III received the 2016 Harry F. Byrd Jr. '35 Public Service Award in Cameron Hall Nov. 2. The ceremony was followed by a parade to honor Baker, who served under three U.S. presidents, Gerald Ford, Ronald Reagan, and George H.W. Bush. – VMI Photos by H. Lockwood McLaughlin and Kelly Nye.



explained Col. Keith Jarvis '82, deputy director of construction, as he led a recent tour of the structure.

Inside, the CPTF features two running tracks, both made of a rubberized surface that's safe for the spiked shoes frequently worn by track athletes. The 200-meter, six-lane lower track, which will be used for competitions, is hydraulically banked so it can be raised or lowered as desired. The upper track is designed for athletes to use for warm up or cool down.

Complementing the tracks are two six-meter sprint lanes, plus venues for field events, including two triple jump pits, two pole vault areas, and two throw areas. Surrounding the main track are seats for more than 1,400 spectators. To keep those spectators informed, there's a large screen connected to the finish line cameras, plus 10 loudspeakers.

"We have this fantastic audio system that's tied into the video screen," said Jarvis.

Soaring 70 feet into the air above the main track is a high ropes course. Though it will be used by the entire Corps, it will be especially useful for ROTC activities and for Rat Challenge events in inclement weather, noted Col. Bill Wanovich '87, commandant of the Corps of Cadets.

Also of interest is the 34-foot rock climbing wall, which has eight climbing lanes. The wall features handholds and footholds that can be altered to make climbing harder or easier, depending on the skills of the climber. A cargo net hanging near the wall provides an additional venue for cadets who want to test their climbing skills, and an obstacle course set up throughout the building is another source of physical challenge.

Nearby is the "cardio balcony" with stationary bicycles and elliptical trainers, plus a large, L-shaped weight room.

The entire building, Wanovich commented, is really all about options. "You can run in there. You can work out. There's ropes, obstacles, climbing walls. There's so many things that the Corps can do."

Wanovich added that the building will provide a venue for physical training, especially during the winter months when the weather gets "pretty brutal."

Instead of canceling training or pursuing it in unsuitable weather outdoors, he said, "people can go in there and use all of that great space."

Downstairs, the CPTF is all about athlete support. Spacious locker rooms, with lockers built to NCAA specifications, are available for both male and female athletes. There's also a cold plunge pool with the water kept at a chilly 50 degrees Fahrenheit, and a zero-gravity treadmill which can be used by athletes to stay in shape while recuperating from injury.

Attached to the lower level is a 126-space parking garage – the first one ever on post. Jarvis noted that while the parking garage will be limited to faculty and staff access on weekdays, it will provide a critically needed source of additional parking for football game days and other events.

Less visible are a number of features designed to mitigate the building's environmental impact, among them underground cisterns that collect rainwater from the roof. This water is used to irrigate the plantings around the building, flush toilets, and

rehydrate the mechanical system to make up for water lost to evaporation.

"We're storing and using the rain water when we need it, so we're not dumping the rainwater into the storm water system," said Jarvis.

Below the building, a small stream, Town Branch, still flows as it always has, but it is now diverted by a wide culvert which should alleviate flooding problems that once plagued the area. Above the building, a section of the roof has been set aside as a "green roof," with plantings of herbs and grasses that will absorb and utilize rain water.

Efforts to be environmentally sensitive continue inside the building, with a light harvesting system that reduces interior lighting costs and an innovative HVAC system that reduces costs to cool the building. This passive downdraft system makes use of convection, so that cooler air falls and then, as it warms up, comes up through louvers on the roof and escapes.

As a result of all of these efforts, the building is on track to obtain Leadership in Energy and Environmental Design Gold certification. "The state mandates silver LEED," said Jarvis. "We're one level above that at gold. We feel pretty good about that." 🌿



Low maintenance plants on the Corps Physical Training Facility's green roof slow storm water runoff and help insulate the facility. – VMI Photo by John Robertson IV.

"It's a way of continuing with the scientific studies I've done here while still being an officer and managing a team of people," she explained. "It's an interesting part of the Navy to be in. They have what they say is 'cradle to grave' control of the nuclear Navy."

Those who aspire to have their fingers on the pulse of the nation's nuclear-powered submarines and aircraft carriers are subjected to a day of interviews designed to be as mentally taxing as possible. They consist of a series of technical problems candidates must solve under pressure, calling upon their knowledge of math and physics. Nobile got through her first two just fine, but then tripped up in the third.

"I was having issues getting the theoretical stuff from the physics ... over to the applied part," Nobile explained. "Everything we do here, a lot of it is theoretical. Sometimes it's hard to get that applied side."

Shortly after that interview had concluded, Nobile learned that she had failed it. There was no time to sulk, mourn, or even think very much, though, nor was there time for lunch, even though others were already eating. Nobile was granted a fourth interview – a courtesy extended to those who fail one of their first three interviews – and she just had to keep pushing forward.

"[The whole day] was pretty much like an endurance test to see if I could make it through without distress overcoming me," Nobile noted. Thankfully, the fourth interviewer thought Nobile could do the job, so he recommended that she be hired. But her day wasn't done, even though it was then close to 3 p.m.

The last step for Nobile was a two-minute interview with four-star Adm. James F. Caldwell Jr., head of the Naval Nuclear Propulsion Program.

"He's very blunt," said Nobile of Caldwell. The admiral wasted no time in asking Nobile some pointed questions, such as what she was good at doing, what she needed to work on, and why he should hire her. In the end, after recommending that she be hired, the admiral also recommended that Nobile take an engineering class to help her bridge the gap between theoretical and applied knowledge. She's now signed up to take heat and mass transfer in the mechanical engineering department in the spring.



Emma Nobile '17 works with Col. Merce Brooke IV '94 on her project to develop an off-axis integrated cavity output spectrometer. – VMI Photo by Kelly Nye.

Those who know Nobile well aren't surprised that she triumphed over adversity. "She's driven, motivated, focused," said Col. Stacey Vargas, professor of physics.

"She's a double major, which is not an easy path," added Col. Tim Hodges, head of the physics department. "She's taking a lot on."

Nobile herself admitted that the late October day when she interviewed at the Navy Yard wouldn't have had a happy ending if she hadn't had so much experience dealing with pressure already.

"Having interviews throughout at VMI really helped me out," she said. "You have to interview for rank and everything else. Every position you have here you have to go

through some kind of interview."

The Rat Line also played a role in Nobile's readiness. "My Rat Line was more mental than physical," she said. "You just have to keep going. ... You have to keep trying and not give up. I wanted this job so bad that I just put my whole into everything I'd done that day."

Now that her first step into the future is assured, Nobile is focused on finishing her honors thesis work with Col. Merce Brooke IV '94, professor of physics. She's helping Brooke develop an off-axis integrated cavity output spectrometer, which can be used to detect the presence of gases.

For Nobile, pursuing new research projects is critical to her growth as a scientist. She'd already done research on nanotechnology with Col. Greg Topasna and Col. Daniela Topasna, both professors of physics. This year, it was time to try something new.

"I wanted to try something different, something on the other side of physics," said Nobile. "That one was about nanotechnology. This one uses more of the optics."

When she's not in physics labs, Nobile can be found giving post tours for visitors to the VMI Museum. She's also the commanding officer for the Navy company unit and plays the trumpet in the VMI Jazz Band and the Brass Ensemble. She's a member of the Equestrian Club and the Powerlifting Team, and, on Sundays, she plays handbells at Lexington Presbyterian Church.

"I have hard time not staying busy," Nobile said. "VMI has such regimented times ... that it's easier than it would be at a regular college. ... And I still have time for a nap every day." ❄️

Driven, Motivated – and Smart

VMI Naval ROTC Unit Exceeds Quotas for Highly Selective Nuclear Officer Career Path

The Naval ROTC office at VMI accomplished an outstanding feat last year – it produced approximately 8 percent of the nation’s newly commissioned ensigns specializing in the nuclear field.

For the 2015-16 academic year, the VMI Naval ROTC had a quota to produce just four nuclear engineers. At the end of the year, the unit had nearly tripled that quota, producing 11 out of approximately 130 nationwide.

“We would have had 13, but two students turned down their nuclear assignment,” noted Lt. Bryan Glock, a former nuclear submariner who is now the Naval ROTC’s nuclear propulsion officer.

This year, six cadets are in the pipeline to become nuclear officers, and three of them have already been selected for the program.

At VMI, the mechanical engineering department offers a nuclear concentration, and the physics department offers a bachelor of science in physics with a nuclear concentration. However, faculty from both departments say that cadets who are hoping to “go nuclear” in the Navy don’t always choose those options.

Instead, aspiring nuclear officers choose a variety of majors. Of the 11 cadets who commissioned into the nuclear program last year, four majored in civil engineering, two in physics, and two in mechanical engineering. The remaining three had majors in applied mathematics, chemistry, and electrical and computer engineering.

Indeed, no particular major is required for an aspiring nuclear officer. “You don’t have to be a STEM major,” explained Capt. Ned Riester ‘78, professor of civil engineering and himself a veteran of a Navy nuclear submarine. “They really look at your physics and your calculus scores.”

Calculus and physics are the backbone of an aspiring nuclear officer’s preparation. To help solidify skills in these areas, Glock regularly offers nuclear study periods on Thursday afternoons, in which cadets who’ve already been selected for the program tutor others.

In addition to this, cadets who want a little extra help with their physics sometimes schedule tutoring sessions with Col. Stacia Vargas, professor of physics and astronomy. These sessions happen informally, on an as-needed basis, but Vargas said that the motivation and interest of the cadets makes the extra demand on her time worthwhile.

“Those cadets who come and want to do it are consistent and motivated,” she said. “I know they are going to show up. I know they’re going to be there and work hard.”

Col. Tim Hodges, head of the Department of Physics and Astronomy, echoed her opinion. “They’re driven,” he commented. “They have a focus that allows them to really be successful.”

For the cadets, weeks or even months of extensive preparation leads to showtime. They must travel to the Navy Yard in Washington, D.C., for a daylong interview process that begins with technical interviews and includes a meeting with a four-star admiral, head of the Navy’s nuclear power program, in the afternoon.

The two technical interviews are a chance for cadets to showcase their math and physics skills – and they may be asked to demonstrate competency in their major field as well.

“They could ask them to derive the volume of a tetrahedral pyramid using multivariable calculus,” Glock offered as an example of the type of question that might be asked. What’s more, cadets must show their work and talk about what they’re doing as they solve the problem. “They can’t just be smart,” said Glock. “They have to be able to communicate.”

After lunch, cadets meet the admiral for a more typical interview in which they discuss their leadership skills and their desire to serve in the Navy. “He’s the bottom line,” said Glock of the admiral. “They may have failed one of their interviews, or even two of their interviews, but if the admiral still likes their responses and the way they respond to him, he may decide to hire them.”

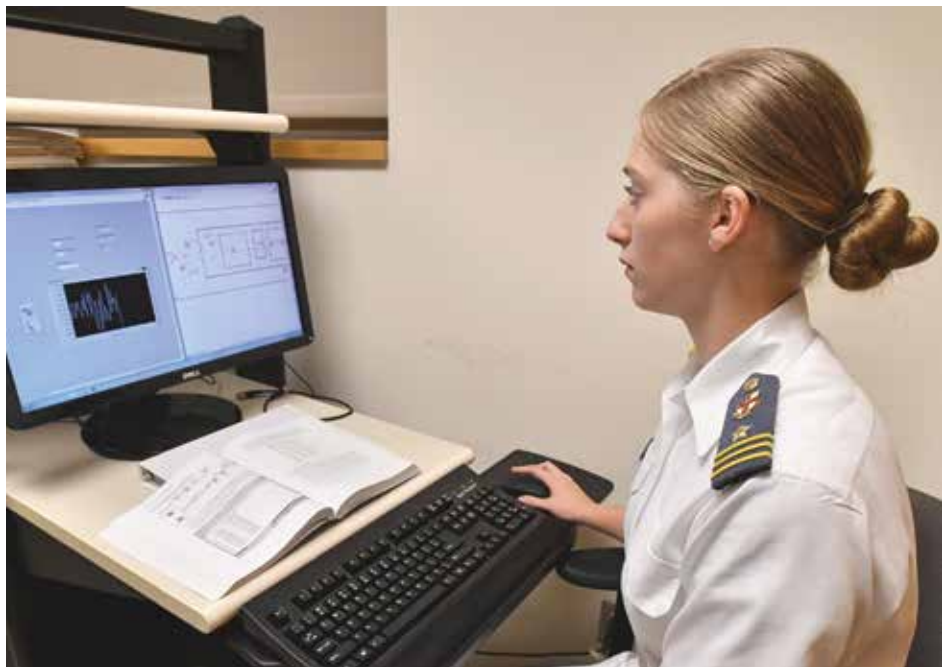
Getting in the program, though, is just the first step. After graduation, newly commissioned nuclear-option ensigns head to nuclear power school, a six-month experience so intense that Glock compares it to “drinking water through a fire hose.”

Nuclear power school is “essentially a master’s degree in nuclear engineering compressed into six months,” said Glock. Those who successfully complete nuclear power school go next to what’s called “prototype,” a six-month experience running a nuclear reactor on land.

Skills learned in the Navy’s nuclear program translate well into civilian careers down the road. Frequently, Glock noted, Navy veterans transition into private sector jobs dealing with nuclear power or take senior management positions with engineering firms.

“People will start seeking you out,” he said.

– Mary Price



Emma Nobile '17 works on the computer program she is writing to acquire data from her experiment with the off-axis integrated cavity output spectrometer she is developing. – VMI Photo by Kelly Nye.

Through the Lens of Poetry: The Chinese Worker Cadets Learn About an Otherwise Unseen China Through Film, Discussion

By Chris Floyd



Dr. Lunpeng Ma addresses cadets and faculty gathered to watch *Iron Moon*. Presenting with him are the movie's co-director, Qin Xiaoyu, and producer, Cai Qingzeng. – VMI Photo by Chris Floyd.

I crawl into the workshop/An execution yard where night and day are one.

My youth was expelled from the butt of a machine/And turned into toys/To sell to blue-eyed children.

These are excerpts of poems featured in the Chinese documentary *Iron Moon*, screened Nov. 12 for a group of faculty and cadets gathered in the Turman Room at Preston Library. The presentation was organized by Dr. Lunpeng Ma, an assistant professor in the modern languages department, and, after the film, those in attendance got the chance to participate in a roundtable discussion with the movie's co-director, Qin Xiaoyu, and producer, Cai Qingzeng.

Xiaoyu and Qingzeng said their goal in creating the documentary was twofold. Of course, they wanted to highlight some amazing poetry, but, ultimately, they wanted the rest of the world to learn about the plight of the Chinese worker.

That, too, was Ma's goal when he set up the event, which was supported by the Jackson-Hope Fund. He particularly wanted the cadets in his Chinese classes to get a taste of what life is like for one of the country's social classes.

"I hope, of course, they can learn some Chinese," Ma said. "In addition to that, what they often learn in the classroom about the Chinese culture is ...[only what] they can ... get from a textbook. This film offers some authentic materials and also a lens through which they can see a China otherwise unseen, that cannot be seen in a textbook.

"I hope they can get a different view," he added, "and also understanding of China right now."

Ma plans on using the movie, which follows the lives of five Chinese workers who also happen to be poets, in his upper-level classes. The film will add another element of Chinese culture to those the cadets are already taking in through television dramas,

newscasts, and music. Ma hopes his students get a sense of what life in Asia is really like.

That, he said, is extremely important for those learning a new language.

"Language cannot be separated from culture, and culture cannot be separated from language," he explained. "They are a pair. By watching this film, I think they not only can acquire some language skills, but they can also get to know what's happening in China."

Even better, he thinks, is that the cadets also learn a little more about themselves and their own country. Seeing the source of many of the products they use and the harsh lives of many of the workers who make them, the cadets may broaden their perspective on these products.

"What's happening in China can be connected to what's happening in the United States," said Ma. "That's the goal of the [Chinese] culture course. The students can have a better sense of Chinese language,

Chinese culture, and Chinese society. I always encourage them to have a dialectical view of what's happening in China and what's happening in the United States."

Certainly those who watched *Iron Moon* know now what the poet means when he says, "The road to development is written in blood." ❀



Timber Framing for a Cause

Col. Grigg Mullen Jr. '76 leads fellow timber framers in assembling an English-style cottage that was auctioned during the Project Horizon fundraiser, Deck the Halls. The event took place in Marshall Hall on Nov. 19. VMI partners with Project Horizon, an organization whose purpose is to reduce dating, domestic, and sexual violence, to keep cadets, faculty, and staff informed about available resources and services. – VMI Photo by Kelly Nye.

Cormack, Cocke Halls Rededicated

Renovated Buildings House PE, Cadet Fitness, Club Sports, and NCAA Teams

By Mary Price



Gen. J.H. Binford Peay III '62, VMI superintendent, and Gen. John P. Jumper '66, Board of Visitors president, cut the ribbon for Cormack Hall during the rededication ceremony on Founders Day, Nov. 11. – VMI Photo by H. Lockwood McLaughlin.

On Founders Day, Nov. 11, two buildings vital to the support of fitness and athletics at Virginia Military Institute, Cormack Hall and Cocke Hall, were rededicated after major renovations. In attendance was a crowd of approximately 50 people, many of them members of the VMI Board of Visitors, their spouses, and other friends of the Institute.

The renovation of both Cormack and Cocke halls was accomplished as part of the Corps Physical Training Facilities project, a \$122 million endeavor that also includes the new indoor training facility, recently designated the Corps Physical Training Facility, now nearing completion.

Cormack Hall, a \$15 million project, is home to the Department of Physical Education, as well as the exercise science minor and the NCAA wrestling team. Work began on its renovation in the summer of 2014 and was completed approximately one year later.

Gen. J.H. Binford Peay III '62, VMI superintendent, offered remarks before cutting a ribbon at each building. “[Cormack Hall] demonstrates VMI’s commitment to confidence building, wellness, athletic competition, toughness, and the historic ideal of a sound mind in a sound body,” he said.

“This renovated and upgraded building retains its historic appearance and improves the main entrance access into the city of Lexington,” he noted.

Those gathered for the Founders Day ceremony toured Cormack Hall, whose interior geography reflects its divided purpose, with

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the southern half dedicated to the PE department. In addition to classrooms and offices for the PE staff, this half of the building features a large weight room and a state-of-the-art lab for VMI’s exercise science minor, which is now in its third year.

“I’ve been in a lot of facilities, and this is about as nice as you’ll find anywhere in the country,” said Col. Jimmy Coale, head of the physical education department, as he led a group touring the building.

The other half of Cormack Hall is home to a spacious facility for NCAA wrestling and other mat sports and PE classes, such as jiu-jitsu and karate, complete with seating for 750 spectators.

At Cocke Hall, named for VMI’s fourth superintendent, William H. Cocke, VMI Class of 1894, Peay again offered

brief remarks before cutting the ribbon. He noted that it’s especially appropriate that Cocke Hall, for many years VMI’s main gymnasium, faces the parapet wall bearing a quote from VMI’s founder, Col. J.T.L. Preston about the Institute, “a healthful and pleasant abode of honorable youth.” Referring to that quote, Peay said, “Cocke Hall has contributed for decades to support of a healthful and pleasant abode and now its role is assured for many, many years to come.”

Work on the \$23 million renovation of Cocke Hall, originally built in 1926, began in the summer of 2015 and was completed in the summer of 2016. Unlike Cormack Hall, whose interior has undergone a drastic change, Cocke Hall’s interior retains much of its original flavor, complete with basketball courts and the elevated track familiar to generations of cadets. Cadet “hops” will continue to be held in Cocke Hall as they have for decades.

What’s new are group fitness rooms on the lower levels for cadets, faculty, and staff, plus a spacious new weight room and strength training facilities. Faculty and staff now have their own locker rooms, separate from those for cadets. And, for the first time, the building has air conditioning.

Outside Cocke Hall, near Scott Shipp Hall, a new, triple-arched memorial invites visitors to reflect while visiting Memorial Garden. An inscription reads, “In remembrance of those who have served the Institute.”

To see more photos, visit VMINews.tumblr.com, post date Nov. 15. 📷

Institute Society Dinner Honors Leaders in Support

By Scott Belliveau '83, VMI Foundation

On Nov. 11, Marshall Hall again was the site of the annual Institute Society Dinner, which is hosted by the VMI Foundation and recognizes alumni and friends who are leaders in support of the Institute through their annual unrestricted gifts to the Foundation Fund. This year, the Foundation welcomed more than 620 guests to this highly anticipated event.

Hugh M. Fain III '80, VMI Foundation president, noted in his remarks that in fiscal year 2016, giving to the Institute had totaled more than \$77 million – a new record.

“The Institute Society’s abiding generosity continues to be a significant force behind these historic numbers and has significant impact on the Foundation’s ability to provide critical support to the Institute,” said Fain. He also recognized the three classes that had conducted reunion campaigns – the Class of 1966, the Class of 1989, and the Class of 2005 – which together raised \$513 million in fiscal year 2016.

Gen. J.H. Binford Peay III '62, VMI superintendent, also addressed the guests, acknowledging the Society’s support and explaining that the Institute’s current progress was founded on private financial support and how its continued progress depends on the continued generosity of the VMI community. He also gave special recognition to the Class

of 1966 for its record-breaking achievement of raising more than \$50 million through its 50th reunion campaign.

Donald M. Wilkinson '61, chairman of An Uncommon Purpose: A Glorious Past, A Brilliant Future: The Campaign for VMI, informed the audience that, as of Nov. 10, the campaign had raised \$305 million with gifts and commitments coming from more than 14,500 members of the VMI community. He stressed that the campaign is “all about enabling the Institute to achieve its mission in the best qualitative way possible: through supporting academic excellence, ... supporting opportunities for cadets in physical training and sports, ... and enhancing Corps and barracks life.”

Outgoing Foundation CEO Brian S. Crockett received praise for his service to the Institute. Fain said that Crockett’s “legacy of seven years of dedicated service has been nothing short of extraordinary.”

In the company of other members of the Campaign Cabinet and on behalf of the campaign, Wilkinson presented Crockett with an engraved silver bowl that commemorated his service. He praised Crockett, saying, “Your commitment to engaging the Institute, the alumni agencies, and thousands



Campaign chairman Donald M. Wilkinson '61 presents VMI Foundation CEO Brian S. Crockett with a gift in recognition of his service to VMI and the campaign. – VMI Photo by Kelly Nye.

of VMI alumni and friends in the work of the Foundation has been truly remarkable. And your tireless dedication to ensuring that this campaign has been a historic success has been an inspiration to the Cabinet and all of us to give our best for VMI.”

“This event is one of the highlights of the Institute’s year,” said Crockett. “It allows us an opportunity to thank many of the people whose generosity to VMI is extraordinary, and it allows these men and women to hear firsthand about the importance of that generosity to the Institute and its future.” ❁



Founders Day Parade

The Corps of Cadets participates in the Founders Day Parade Nov. 11. During the parade, the Cadet Battery fired four howitzers in a 17-gun salute honoring VMI’s founders and the nation’s veterans. The video live stream of the parade is available at www.vmi.edu/livestream. To see more photos, visit VMINews.tumblr.com, post date Nov. 11. – VMI Photos by H. Lockwood McLaughlin.



Athletes Model VMI Ideals in Academics, Leadership

By Chris Floyd

Their exploits on the football field are well-documented.

Al Cobb '17 is VMI's most decorated quarterback, setting numerous school passing records this season. Andrew Lewis '17 has made the transition from tight end to offensive tackle, becoming one of the top linemen in the Southern Conference.

But there is more to these two than just football. They also excel in the classroom and have become the epitome of the "three-legged stool" philosophy at VMI.

In fact, Cobb is the most recent recipient of the Three-Legged Stool Award given annually by the Keydet Club to the 1st Class cadet who best embodies the three pillars of education – academics, leadership/military and athletics – at VMI.

"We hear a lot about how some athletes get ahead of themselves as far as thinking of themselves in ways that are not complimentary, but these two young men are the salt of the earth," said Col. James E. "Jim" Turner '65. "They are hard workers. They are very sincere. They are dependable and respectable. It's just about what you would hope the VMI environment would help a student realize."

Turner should know. As head of the biology department, he has spent a great deal of time with Cobb and Lewis, who are both biology majors and are currently enrolled in his capstone class. In this class, the two athletes, along with other biology majors, are working on a research project they hope will lead to advances in treating, or perhaps even curing, Parkinson's Disease.

In the course of this research, 1st Class biology majors have been studying zebrafish, which have a neurological system similar to that found in humans. They have delivered chemicals to put these fish into a hyperkinetic state and then treated the fish with other agents to find out which might return them to normal. So far, they have come up with a few promising candidates, most notably nitric oxide.

"There are some promising numbers," said Cobb, who currently boasts a 3.6 grade point average. "This is a neat experience."

"They have made some outstanding observations," added Turner, who noted that the cadets will be presenting their findings later this year and could even become co-authors for papers published on the research.

This is not the only research project in which Lewis found himself involved this year. During the summer, he worked with Col. Mike Krackow, a professor in the physical education department, studying how different grips can affect production and susceptibility to injury in weight lifters.

"We did research on grip width and shoulder angles while lifting," said Lewis, who has a 3.4 grade point average. "We were trying to find a certain reliable protocol to perform a proper bench press."

Lewis said that researchers for that study are currently working to get the research published and hope to present their findings at a conference sometime next semester.

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Andrew Lewis '17 anchors the offensive line in the Keydets' matchup against Akron Sept. 3. – Photo Courtesy of VMI Athletic Communications.

That takes care of athletics and academics. But to be a true "three-legged stool," a cadet must also stand out as a leader.

"At VMI, the mission is to train leaders for tomorrow," said Scott Wachenheim, VMI's football coach. "Leadership is also what we try to teach on the football field. The lessons they learn on post and the lessons we are trying to teach them on the football field are very, very similar. I think the two marry hand in hand."

Cobb has taken that to heart. As quarterback, Cobb is an obvious leader on the football field. On post, he is as well, serving as a platoon leader in Company I this year after previously serving as a member of the cadre. It seems that his selection as the recipient of the Three-Legged Stool was well-founded.

"It's an honor to receive that," Cobb said. "A lot of people can do one or two of those things really well. To try to do all three, it pushes you to push yourself."

And that's exactly what Cobb and Lewis find themselves doing every day at VMI.

"Rat year helped me learn to plan ahead and get things done," said Lewis, who is a former member of the S6 staff. "It's being able to work on time management."

That hard work has pushed Cobb and Lewis to excel. And for Turner, they are examples of what every cadet should aspire to become.

"I think the world of our athletes, particularly those in the biology department," said the biology professor. "They are great examples of what life should be like in the classroom and on the field." 🍀



Quarterback Al Cobb '17 looks for a receiver downfield during the Keydets' game against Akron Sept. 3. – Photo Courtesy of VMI Athletic Communications.



This rendering shows the porch waiting area behind the Davidson-Tucker House (left) where tours will begin before heading across the walkway to the Jackson House. – Rendering courtesy of the Stonewall Jackson House.

Renovations, Leadership Change at Jackson House

Changes are afoot at the Stonewall Jackson House and the Davidson-Tucker House.

On Oct. 1, Michael Lynn, former site director at the Stonewall Jackson House, retired after 35 years of service. She had served since 1981, two years after the Jackson House had been restored to its 1861 appearance by the Historic Lexington Foundation. She organized the volunteer training program, which prepared hundreds of volunteers over the years to lead educational tours. She also oversaw the House’s transfer from the Historic Lexington Foundation to the Stonewall Jackson Foundation in 1994 and then to VMI in 2011.

Taking her place is Grace Abele, who began working for the Jackson House as a docent and shop clerk in 2007. In 2013 she became its supervisor of visitor services, and since 2015 she has been the supervisor of interpretation.

“It is always gratifying to be able to recognize proven ability and potential by advancing a staff member,” said Col. Keith Gibson, executive director of the VMI Museum System. “[Abele] brings both proven ability and potential to her new position.”

Abele also has worked with VMI’s Virginia Museum of the Civil War in New Market and is pursuing her Virginia certificate in museum management.

In addition to the staffing change, work will soon begin on upgrades and renovations to the Jackson House and an adjacent property, the Davidson-Tucker House.

The purpose of the work is to relocate the Stonewall Jackson House entrance and ticketing point from the basement of the Jackson House to the first floor of Davidson-Tucker House. The museum shop will also relocate to the Davidson-Tucker House. In addition, a porch will be built onto the rear of the Davidson-Tucker House to give groups waiting for tours a sheltered place to gather. New restrooms and lockers for valuables will also be added.

Once the work is complete, entrance to the Stonewall Jackson House will begin at the Davidson-Tucker House.

Work is expected to be completed by March 1, 2017. The Stonewall Jackson House will follow its usual schedule of closing for the season on Dec. 31 and reopening on March 1.

These improvements have been made possible by a \$300,000 grant from the Mary Morton Parson Foundation, with matching funds from the VMI Foundation. The grant has also funded new gutters and upgrades to the HVAC system at Stono, a historic property owned by VMI that was once the home of early Lexington settler John Jordan. ✿



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Two Hours of Business on \$5 Investment

Money's No Object and Cadet Clubs Benefit in Entrepreneurship Class Project

By Mary Price

It's a Tuesday night at 7 p.m. You've just been given \$5 and instructions to start and run a business for two hours. Your goal is to make as much money as possible. Can you do it?

That's the situation cadets in Maj. DeKuwmini Mornah's entrepreneurship class found themselves in this fall, as Mornah gave them the assignment, "the two-hour entrepreneur."



Sebastian Chavez '17 describes the milkshake business to Maj. Dee Mornah's entrepreneurship class as his business partner, Anthony Izzo '17, looks on. - VMI Photo by Kelly Nye.

"I gave this assignment to my students to push their creativity," said Mornah, who noted that their persistence would also be challenged. Now in his fifth academic year teaching at VMI, Mornah was well aware that VMI's rules and regulations would make it hard for cadets to run businesses, but he decided to try the assignment anyway after meeting up with a group of 4th Class cadets in Carroll Hall one evening.

"Guys, it's five minutes to formation!" Mornah told the cadets. They responded by telling him that they would leave in just a moment, but they'd already learned that being early for formation increased their odds of being disciplined for minor deficiencies. Being late for formation would likewise incur penalties. They'd gleaned from past experience that it was best to show up just on time, with only seconds to spare.

"These guys are very creative," said Mornah. "They migrate and navigate around all of these rules. I think my students can be that creative if you push them out of the boundaries and paradigms within which they were raised."

Cadets in Mornah's class came up with some unique ideas for businesses, many of which included selling food. One group of cadets picked up food from local restaurants and delivered it to hungry cadets as they returned from fall field training exercises, while another sold concessions at the powerlifting state meet, held Nov. 5.

Another group identified a favorite treat of many cadets - milkshakes from a local restaurant - and decided to deliver them to barracks. "We were trying to figure out some type of product, and we couldn't really come up with anything, so we began to think of

a service," explained Sebastian Chavez '17, who ran the milkshake business with Anthony Izzo '17.

For Chavez and Izzo, deciding on a food delivery service was easy, but deciding what kind of food to deliver was not. At first, both tacos and milkshakes seemed equally likely, but further research revealed that tacos have many options, such as hard shell and soft shell, that would make it hard to fill orders correctly, not to mention the wide variety of taco toppings. Milkshakes worked much better, Chavez explained, because all that's necessary is to write each cadet's name on the outside of the cup.

Chavez, who plans to earn a master of business administration degree down the road, said that he'd really enjoyed the assignment so far. "I very much like the idea of having to come up with something on your feet and, given the constraint of only having a small amount of money, trying to come up with something that would be profitable," he commented.

"You really have to think outside the box, especially for the kind of school we go to."

Mornah found himself having to think outside of the box as well as he attempted to design the assignment without running afoul of state regulations. He quickly found out that cadets could not keep any money they earned, so a decision was made to donate the proceeds from the two-hour entrepreneur project to cadet-run clubs.

The assignment wasn't really about the money, anyway. Mornah explained that the start-up funding was on the level of pocket change for a reason. "The essence of the assignment is them knowing that not having money should not be a limitation to starting a business." ❁

AMC-8

Col. Greg Hartman, professor of applied mathematics, performs "Aardvarks Are Our Friends" to a crowd of eighth-graders as part of his presentation on sound and mathematics during the American Mathematics Competition 8. The competition, held on Nov. 15 and 16 in Marshall Hall as well as other locations across the country, gives middle school students the chance to build problem-solving skills and nurture a love for mathematics. - VMI Photo by John Robertson IV.



Zack Scott '89: 'Doing the Right Things the Right Way'

By Scott Belliveau '83, *VMI Foundation*

For Zack Scott '89, the path to a VMI diploma took a little longer to travel than it does for most alumni. As a high school shot put and discus thrower who was ranked in the top 25 nationally, he was recruited by many colleges and universities. He chose to attend VMI because, as he put it, VMI "provided a quality education."

Scott left the Institute after his rat year in order to enlist in the Marine Corps. After serving four years in the intelligence field, he returned to VMI and picked up where he had left off, receiving a full athletic scholarship and becoming a standout athlete.

After graduation, he went to work for a defense contractor in the Washington, D.C., area. In 1996, however, his high school coach, Mark Bendorf, asked him to try his hand at coaching at John W. Robinson Jr. Secondary School in Fairfax County. Scott agreed and coached track and field and football for the next eight years.

Asked what he enjoyed most about the experience, he answered, "helping the student-athletes realize that they have no limits if they work."

In 2004, Mike Bozeman, then director of track and field at VMI, approached Scott with an offer to return to VMI as a coach. "I did not hesitate to take that opportunity," recalled Scott.

Besides being a coach at VMI, Scott has been a consistent donor to VMI for more than a decade, giving to the Keydet Club

Scholarship Fund and to the fund that provides scholarship support for the Institute's track-and-field cadet-athletes.

Like most donors, Scott had numerous reasons for starting to give. He placed a high value on his VMI experience because "it has allowed me to pick what I want to do with my life – as a Marine, defense contractor, or coach."

What he saw upon returning also prompted him to make a gift, "I saw firsthand what the Institute was doing to ensure we prepare our graduates for continued and continual success beyond VMI in whatever field they wanted. Put another way, VMI keeps doing the right things in the right way."

When asked what effect his philanthropy is having on post, he replied, "It helps VMI seek out and recruit quality students and student-athletes and keep providing an education and experiences that instill the traits of success in our graduates." 🌟



Zack Scott '89