



INSTITUTE REPORT

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Cadets Contribute to Defense Development at Aberdeen

By Ashlie Walter and Mary Price

Two cadets spent their summer furlough working at the Army Research Laboratory/ Aberdeen Proving Ground in Maryland on projects to improve today's military.

Col. Joe Blandino, professor of mechanical engineering, said this is only the second

time in recent history that the mechanical engineering department has placed cadets at Aberdeen.

"The internship is a great way to expose a future officer to Department of Defense research and development," Blandino said.

Dr. Carl Krauthauser, a researcher at Aberdeen, approached Blandino in the spring of 2016 because he was interested in having VMI cadets involved in his

See Aberdeen Research, page 18

Class of 2021 Matriculates

Over 500 new cadets matriculated into VMI on Aug. 19 and began their training in the Rat Line. The matriculation welcome ceremony in Cameron Hall kicked off a week of intense training before classes began Aug. 29. Read about the incoming class on page 2.—VMI Photos by H. Lockwood McLaughlin and Ashlie Walter.



An Uncommon Purpose Raises \$344 Million

By Scott Belliveau '83

On June 30, *An Uncommon Purpose: A Glorious Past, A Brilliant Future: The Campaign for VMI* ended its work, having raised the remarkable sum of \$344 million.

The gifts and commitments raised through the campaign will support every aspect of the Institute's distinctive educational mission. For example, the generosity of donors allowed seven new professorships and chairs to be established and provided

more money in support to academic programs. Cadet life programs, such as the Chaplain's Office, marksmanship training, and intramural and club sports teams, were designated for more than \$9.2 million in gifts and/or commitments. Donors also gave \$75.1 million in support of our cadet-athletes and the coaches and staff

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Header photo on page 1 by Kelly Nye

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504 Matriculate into Class of 2021

By Chris Floyd

With hundreds of voices murmuring at the same time—nervous rats trying to shake the jitters; parents, proud and sad at the same time, hoping to hold back tears; professors discussing classes with potential majors; recruiters making their pitches to ROTC candidates—Cameron Hall was a cacophony of indistinguishable reverberations as another Matriculation rolled around Saturday, Aug. 19.

Then there was THE voice:
“If you have numbers 161-170, please come to the floor.”

The group of rats corresponding with those numbers, brandishing placards with their names and company assignments, rose and made their way to the floor. Their VMI journey had begun.

Matriculation Day at VMI has always been about numbers. And Vernon Beitzel '72, VMI's director of admissions and a man whose life really revolves around numbers, loves to share them.



Jocelyn Anop '21 signs the matriculation book in Cameron Hall on Aug. 19.—VMI Photo by Kelly Nye.

“The numbers are almost identical to last year,” said Beitzel. “The most significant difference, I think, is the number of transfer students. We have 58 transfers, and that’s a huge number. We have more transfer athletes than we’ve ever had, and we have a lot of kids who are transfers because they were denied last year but reapplied this year.”

The 504 students who matriculated Saturday hail from 34 different states and four foreign countries, with 60 percent coming from Virginia. There are 110 athletes in the group. As usual, math, science and engineering dominated the choices of major, with 62 percent of the rats choosing one of those fields of study; 38 percent will focus on a liberal arts major.

Beitzel also noted that the SAT scores for the incoming rats is higher than last year's group, jumping from an average of 1158 to 1195. The average high school grade point average for the class of 2021 is 3.66. In short, it was another quality group of rats coming to VMI, a group that has distinguished itself from a pool over more than 1,800 applicants.

Beitzel said that when choosing a new class, VMI looks at “not only their academic record, but the strength of their record. Then there are things like their leadership, motivation and fitness, those intangible things. And some of it’s the interest they’ve demonstrated in VMI. We like kids that have been here for an open house, that have been here for an interview and have been looking at VMI for a while.”



Regimental commander Finn Swenson '18 introduces himself during the Matriculation Day ceremony just before company commanders call the rats down.—VMI Photo by H. Lockwood McLaughlin.

When those rats filed through Cameron Hall Saturday, it marked a special anniversary. It was 20 years ago that women first signed the Matriculation Book and joined the Corps of Cadets

"I commend them," said Yaa Agyepong-Wiafe '18 of the first group of females to come to VMI. "It was a completely different system

back then. Now there are a lot more females, which is nice to see."

According to Beitzel, the number of women entering VMI has steadily grown since the first time they were admitted on post. This year, 63 women walked through, just shy of the record set by this year's first class, which came to VMI more than 70 strong.



Cadre members teach Company I rats how to salute during Matriculation Day training.—VMI Photo by Maj. John Robertson IV.

"Over the last 20 years, we've at least tripled the number of female applicants," said Beitzel. "We've been getting around 300 female applicants."

Laura Davis '18 knows one of the rats personally. She was in Cameron Hall Saturday as her sister processed through the stations on the arena's floor. Davis, who also has two uncles who

attended VMI, knew exactly what her sister was going through.

"I'm a little nervous, but I know she'll do well," Davis said. "She's seen me go through all of it. She's seen me come home from break crying because I didn't want to [return]. My mom said she had a better first day than I did. I think I was a little stressed and nervous."

And that's one thing all new cadets have in common.

"I was really nervous," said Manuel Bloch '18, who was on hand to help guide the new guys Saturday. "It's just scary because it's your first day."

"I came here knowing a little bit about VMI," added Agyepong-Wiafe. "There are a lot of things going on, very stressful. But the first day isn't the worst day."

Agyepong-Wiafe acknowledged that while Matriculation can be nerve-wracking, life at VMI gets tougher, so she offered a bit of advice to the class of 2021.

"You get what you put in," she said. "Try everything. Always ask for help. Put yourself out there and try to be the best you can at everything you do." ❧

An Uncommon Purpose *continued from page 1*

members who guide them, including \$20.2 million to create 57 new athletic scholarships.

An important goal of *An Uncommon Purpose* was to expand the scholarship resources available to cadets, thereby preserving the Institute's great and longstanding tradition of ensuring that financial concerns do not prevent a deserving young person from attending. Alumni and friends enthusiastically responded, giving millions of dollars to already-established endowments that support scholarships and establishing 71 new merit- and need-based scholarships with gifts and commitments of more than \$5.8 million. The legacy and museum programs that preserve and promote VMI's rich history also benefited, receiving \$16.3 million from alumni and friends.

Alumni and friends provided more than \$61.3 million in unrestricted gifts and commitments, including \$5.5 million to 10 new unrestricted endowments, during the campaign.

Donald M. Wilkinson '61, chairman of the campaign, observed, "This success is a clear affirmation of the enduring strength of the VMI spirit."

Wilkinson also thanked the many people who helped achieve these magnificent results. "The credit for this success goes, first, to the 15,340 alumni and friends who came forward with gifts and commitments. However, their generosity would have gone untapped had it not been for the painstaking work, unshakable dedication, astounding professionalism, and boundless energy of my colleagues on the Campaign Cabinet—our vice chairmen, Conrad M. Hall '65 and James E. Rogers '67; John P. Jumper '66; William A. Paulette '69; Walter C. Perrin II '62; and Thomas G. Slater Jr '66—the Institute's leadership,

especially General Peay; and the staffs and volunteer leaders of the VMI Alumni Agencies."

Steve Maconi, the CEO of the VMI Alumni Agencies, said, "I hope our donors take great pride in what they have accomplished on VMI's behalf. Through their generosity, they have done much to ensure a truly brilliant future for our cherished Institute."

More information on the campaign's achievements can be found at its website, www.vmi.edu/campaign. ❧



Hugh Fain '80 thanks donors of *An Uncommon Purpose* during an event in Richmond on June 14.—VMI Photo by Kelly Nye.

Shepherd Interns Learn Real-World Experience

By Ashlie Walter

Two VMI cadets spent their summer gaining practical experience outside the classroom with organizations focused on alleviating poverty.

They worked as interns through the VMI Shepherd Poverty program, which is a branch of the Shepherd Higher Education Consortium on Poverty based at neighboring Washington and Lee University. VMI has been a member of the consortium for several years because the mission of the organization and the mission of VMI are similar, said Maj. Dorothy Hayden, assistant director of the Office of Career Services.

The complexity of the internships fits well with VMI's mission of developing leaders with a strong sense of public service, said Hayden. The interns are tasked with projects that require critical thinking, creativity, and strong organizational skills.

Caroline Wojtas '19, a psychology major, spent her eight-week summer internship at Healthcare for the Homeless, a family health care clinic for the homeless, in Louisville, Kentucky.

Wojtas, an Illinois native, said she was indifferent to homeless people before the internship, but after spending hours each day asking clients detailed information about their lives, she learned not to be judgmental.

"I realized that we judge people so easily when we see them dirty, sitting on the street, trying to ask people for food or money. But what we don't realize is that the story of their life is so different from yours or mine and that's why we cannot understand what we don't know," Wojtas said.

She hoped her summer of learning not to judge a homeless person will help her be an overall better person to everyone.



The Shepherd interns gather in Marshall Hall during the symposium for a group photo.—VMI Photo by Kelly Nye.

Wojtas added she still wants to be a psychiatrist after graduation but is thinking about working at a place like Healthcare for the Homeless or other family health centers.

Several Shepherd interns have said that this internship played a pivotal role in their career decision-making process, Hayden said.

Seth Shank '18 spent his internship with Urban Upbound, a community organization that provides tools and resources for economic mobility and self-sufficiency, as a financial literacy intern in New York City.

Shank, a Lexington native, said he learned an incredible amount during his internship

along with living in a big city for the first time.

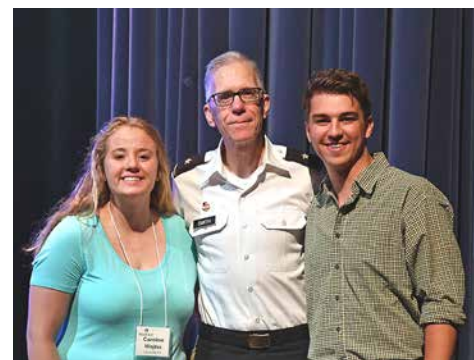
Most days, Shank worked in the outreach department, walking around various low-income neighborhoods to educate residents on what services Urban Upbound provides.

"It was eye-opening for me ... \$30,000 might not seem like a lot of money but, if you don't have \$30,000, it seems like a million," he said.

As an economics and business major at VMI, Shank hopes to go into financial consulting immediately after graduation and, eventually, open his own business working with volunteers and non-profits.

To wrap up their internships, interns gave presentations about their work at the Shepherd Consortium Closing Conference and Symposium hosted by Washington and Lee University and VMI in late July. There, nearly 120 Shepherd interns reported on their internship and the future direction of their studies.

The internship is paired with a class at VMI, Poverty and Human Capability, that the interns will take this fall. 🌟



Brig. Gen. Jeffrey G. Smith Jr. '79 poses with Shepherd interns Caroline Wojtas '19 and Seth Shank '18 during the Shepherd Symposium in Marshall Hall on July 31.—VMI Photo by Kelly Nye.

Community Theatre Summer Production

Characters from Anton Chekhov's humorous stories were featured in the VMI Community Theatre's summer production of Neil Simon's comedy with music, "The Good Doctor." Pictured, from left, standing, are community theatre performers Kiersten Donahue, Donna Pagnam, Tom Oxendine, Linda Gorman, Don Kludy, Kevan Kavanaugh, Ginger McNeese, and Michael Brickler. Seated, from left, Shay Peters, Sarah Hill, Milea Webb, and cadet Jason Bowen. Performers and crew not pictured include Ethan Bedell, Helen Cox, James McElroy, Lee Shepherd, and Jill Watkins.—VMI Photo by Kelly Nye.



STARTALK Provides Intensive, Immersive Arabic

By Mary Price

For the first time in recent memory, VMI offered an intensive program of summer language study this year.

Thanks to a grant from the STARTALK program, a federally funded initiative designed to create more speakers of critically needed foreign languages, 14 students learned to read, write, and speak Arabic. Nine were college students, including two VMI cadets, Ethan Heatwole '20 and Levi Whitt '19. The other five were high schoolers, three of whom attend Rockbridge County High School.

STARTALK came to VMI as a result of the efforts of Dr. Anouar El Younssi, assistant professor of modern languages and cultures, with the help of Maj. Marthe Honts, sponsored programs administrator. El Younssi had taught in a STARTALK Arabic program while he was a graduate student at Pennsylvania State University.

"I like the program a lot," said El Younssi. "It's a nationally recognized, acclaimed program."

Bringing STARTALK to VMI seemed like a natural fit, he continued, so he and Honts applied for a grant to fund the program—and were pleasantly surprised to receive the money on their first try. Thanks to the grant funding of just under \$90,000, VMI was able to offer free tuition for all students.

"[STARTALK] is a great resource potentially for additional cadets and a way to get them into a program when they might not be able to fit it into their regular curriculum," said Honts. She added that more cadets would likely have enrolled in the program if STARTALK's dates, which are partially set by the program's administrators, hadn't conflicted with VMI's summer school dates.

The STARTALK program at VMI ran from June 7 to June 30. Students attended class from 9 a.m. to 2:50 p.m. each day, Monday through Friday, with brief breaks for lunch and restroom visits.

"It's a very intensive program," he commented. "[Students] learn a lot of material in a short amount of time."

But to make the language experience doable, STARTALK also seeks to make it enjoyable for the students. Rather than endless drills, STARTALK offers students the chance to get out of their seats, converse with others, and role play as they carry out



Dr. Anouar El Younssi, assistant professor of modern languages at VMI, engages participants of the summer program STARTALK by asking them questions in Arabic. —VMI Photo by Kelly Nye.

this year's theme—opening and running a Moroccan restaurant.

"STARTALK is unique in that it seeks to present language in a fun environment," El Younssi noted. "Students should be moving a lot and talking a lot, and not just the teacher lecturing."

One of STARTALK's most challenging goals is that the target language—in this case, Arabic—should be used 90 percent of the time. It's daunting, El Younssi admitted, when only two or three students in the class had ever had any exposure to Arabic before STARTALK.

"We rely a lot on visuals, pictures, audio-visual materials, gestures, body language, and the background knowledge of the students," said El Younssi.

He explained that for beginning language learners, a word-for-word understanding of what's being said isn't vital.

"It's not necessary or important that the students understand everything or even most of what you are saying," El Younssi commented. "As long as they hear Arabic being spoken, it's good. Their ears get used to hearing the language ... There's that aural value."

Another unique facet of STARTALK is the number of instructors. While El Younssi was the program director, and also taught, he was assisted by four professors from other colleges and universities: Dr.

Samir El Omari, from the University of Maryland, Baltimore County; Dr. Ahmad Azzam, Virginia Tech; Badredine Idrissi, Bowling Green State University; and Ahmed Saeed, James Madison University.

"This way they are exposed to different teaching styles and different instructors," El Younssi stated. "That's

an advantage."

All of those involved with bringing the STARTALK program to VMI—El Younssi, Honts, and Col. Don Sunnen, chair of the Department of Modern Languages and Cultures—say they would very much like to see STARTALK become part of the Institute's regular summer offerings.

"[STARTALK] is intensive and it's fun," said Sunnen. "I think it could capture the attention of a lot of people."

Sunnen noted that as of 2017, VMI has been offering instruction in Arabic for 20 years, and the language is second only to Spanish in terms of the number of cadets studying it. Commissioning cadets, he and Honts both noted, will find their pay increased if they can demonstrate proficiency in Arabic.

"I'd like for Arabic to be a very poorly kept secret around here," said Sunnen. ❧



Dr. Anouar El Younssi shows high school students an Arabic computer program during the summer language program STARTALK. —VMI Photo by Kelly Nye.

Summer Construction Improves Facilities Across Post

By Ashlie Walter

While the majority of cadets were off on summer furlough, employees in VMI's Physical Plant and Construction Office were managing projects all over post to repair and maintain the Institute's buildings.

Some of the bigger projects tackled this summer were placing a new floor in the cafeteria at Crozet Hall, putting a new roof on Cameron Hall, and fixing several leaks in the Cocke Hall swimming pool.

Crozet Hall



Crozet Hall's main dining area is prepared for the installation of new flooring.—VMI Photo by Maj. John Robertson IV.

This semester, cadets will see a brand-new floor in Crozet Hall. A construction crew was working all summer to pull up the existing floor, which had an old, red tile and was repaired over the years with red-dyed concrete. The red tiles had been in place since the 1930s.

Col. Keith Jarvis, deputy director of construction, said the new tile is a blue-gray, slate color set up to look like natural stone.

During construction, however, the mess hall still had to remain open for cadets attending summer classes. The main room was lined with plastic and the second floor sealed off so dust from the construction would not go into the temporary eating areas, he said.

Jarvis said a future project idea could be increasing the amount of seating in Crozet so the entire Corps could sit in the mess hall at the same time. The goal would be to add partial indoor balconies along the side walls.

"If every cadet came here, there wouldn't be room," he said.

The flooring project's cost was approximately \$900,000.

Cameron Hall

The 36-year-old roof on Cameron Hall, VMI's arena for hosting athletic contests and Corps-wide events such as matriculation and graduation, was replaced this summer.

The roof "has been considered VMI's top reroofing priority for a number of years," according to Maj. Arthur B. "Skip" Dunbar III, Physical Plant staff architect.

The existing roof, which was beyond its useful life, had been leaking badly in recent years.

For this project, which started in late May, the existing gravel roof was removed, along with some asbestos removal. It was replaced with a rubber membrane on the flat-sloped roof.

During construction, the Athletic Department did lose the use of its parking lot in favor of storage and staging for the construction crews.

The \$779,876 project wrapped up by the end of July.



Crews work to reroof Cameron Hall.—VMI Photo by Maj. John Robertson IV.

Clark King Pool

The Clark King swimming pool has had a problem with leaks for years since it was built with no structural connection between the side walls and the pool slab. The estimated leaks were in amounts up to 8 inches of water loss per night, beginning three years ago. The last year saw less than 3 inches of water loss per night with controls, Dunbar said.

"The only thing preventing leaks is back-up rods and caulk at this joint. Based on the movement of the slab when it is filled and emptied, leaks continue to be a problem," he said.

He added that a more recent study of the problem suggested a pool liner, replacement of the existing gutters with stainless steel, and the addition of a balance tank for the 210,000-gallon pool. All of that work was completed this summer.

"Upon completion, these items should prevent any further leaks and also improve pool conditions for NCAA competitions, VMI training, and open swims," Dunbar said.

The \$452,000 project wrapped up in August, and had minor impacts on the Physical Education department.

Barracks

Physical Plant employees painted and water proofed the exterior of barracks this summer, and also worked to restore 56 window sashes on both the Old and New Barracks. Additionally, 40 temporary sashes were constructed and will be put in place during the upcoming school year so the original sashes could be removed and repaired during the winter months.

At the end of this summer's renovation, the department will have completed the restoration of 288 windows with a total cost of \$1.3 million, according to Maj. Barbara Botkin, Physical Plant senior project manager.

Old and New Barracks were designated a National Historic Landmark in 1966 and the windows must adhere to strict considerations for repairs, she said.

In 2014, a survey was conducted on the wood windows in Barracks and windows were classified under three grades ranging from immediate repairs or replacement to primarily cosmetic. This summer's restoration is part of the recommendations for window repairs from that survey. 🌿



Members of Physical Plant use lifts to paint the outside of barracks.—VMI Photo by Ashlie Walter.

STP Training Seeks to Build Resiliency

By Mary Price

It's a given that life is stressful. How individuals respond to stress, though, can differ dramatically, and so can their outcomes.

Helping cadets respond to life's challenges in a positive manner that promotes personal growth is the goal of the Center for Cadet Counseling's resiliency training, which was offered for the first time this year during the Summer Transition Program.

The effort to begin teaching resiliency, or the skill of bouncing back from adversity, began last year when Lt. Col. Sarah Jones, director of the counseling center, went to a conference and learned that an increasing number of colleges and universities are seeking to help their students build strength in this area.

"There's such a need for skill building [in resiliency training]," commented Maj. Tricia Fry, counselor at the CCC. "Schools are finding that it's a necessity."

In the spring, Fry conducted an abbreviated version of resiliency training with mostly 4th Class cadets enrolled in a wellness class. At that point, she and others decided that the Summer Transition Program might be an ideal venue for offering a more in-depth version. Fry was quick to emphasize, though, that resiliency training is for the entire Corps of Cadets, and she's eager to give presentations on resiliency to small groups or to help individuals on a one-on-one basis.

This summer, participants enrolled in the Summer Transition Program were offered the chance to attend four workshops, each having to do with a specific topic related to resiliency. Those topics were psychological flexibility, which includes viewing adversity as a challenge and cultivating a growth mindset; emotional regulation, which has to do with nurturing optimism and cultivating healthy thought patterns; connectedness, or the maintaining of relationships; and cognitive fitness, which includes perseverance and communication.

According to Fry, strengthening skills in all four of these areas can help individuals respond in a positive manner when faced with all kinds of challenges—and that's particularly true for new college students, who are navigating a major life transition.

"Developmentally, they're going through so many changes, and this is a big life transition for them," said Fry. With that transition, she added, there will inevitably be bumps along the road.

"The reality is what do we want [cadets] to do?" she asked. "We want them to bounce back."

And Fry is hopeful that once STP participants learn to apply the tools of resiliency training, they'll remember to use them the next time life throws them a curve ball.

"You're going to get knocked down," Fry noted. "That's life. Life happens. The goal is that you learned a lesson when you got knocked down and that you've grown from that experience." 🌿



STP participants are woken up early for physical training time to do sit-ups and run on the Parade Ground.—VMI Photo by Kelly Nye.

Cadet Projects Explore National Security, Defense

By Mary Price

Working under the auspices of the Summer Undergraduate Research Institute, two cadets spent the summer engaged in research projects focusing on national security and defense.

Intrigued by the longstanding relationship between the United States and Cuba, Benjamin Haus '18 chose as his topic, "Leadership Engagement Orientation and the Warming of U.S./Cuba Relations." He was advised in his work by Col. Dennis Foster, professor of international studies.

"Leadership engagement orientation is the propensity to reach out and try and cooperate with somebody instead of starting a war," explained Haus, an international studies major and a wide receiver on the Keydet football team.

Haus got interested in studying U.S./Cuba relations about the time that then-President Barack Obama took his historic trip to Cuba in March 2016, becoming the first sitting U.S. president to visit the island since Calvin Coolidge in 1928. Prompted by this bold step, Haus wrote a paper for an English class about the rhetorical nature of cultural differences.

"[Obama] was trying to bury that Cold War notion that has plagued U.S./Cuba relations," said Haus. "That's basically what I wrote about it."

Once he'd decided to pursue a summer research project, and ultimately an honors thesis, Haus realized he needed to learn more about how leaders of the two nations have interacted over the years.

To do this, Haus collected spontaneous rhetoric from interviews and press conferences for all 12 U.S. presidents who have held office since Fidel Castro overthrew Cuban President Fulgencio Batista in 1959. He also collected rhetoric from both Fidel Castro and his brother, current Cuban President Raul Castro.

It was vital, Haus explained, to use off-the-cuff remarks and not prepared speeches. "People can't turn on this act all of the time," said Haus. "We have to assume that whenever they are speaking freely, that is how they actually feel."

His hypothesis is that relations between the U.S. and Cuba have been at their worst when two conflict-oriented leaders have been in power, and that they have warmed up when two leaders inclined to engagement have paired up. A look back at history, Foster suggested, bears this out, as the Bay of Pigs invasion and the Cuban missile crisis both took place under Kennedy and a youthful, belligerent Fidel Castro. On the flip side, Obama and Raul Castro were both more open to engagement with other nations.

When asked what's surprised him the most about his research, Haus brought up the learning curve he encountered as he transitioned from an international studies perspective to a political psychology perspective. In international studies, he explained, there is an assumption that human beings always act rationally, whereas political psychology assumes that the way that people view the world influences their behavior.

"One of the reasons that makes this perhaps the most promising student project ... is that there is kind of a new movement toward marrying political psychology and rational choice theory," said Foster. "This is potentially an important contribution toward a growing, relatively new, cutting edge piece of political science."

While Haus was studying U.S./Cuba relations, Brian MacAluso-Stafford '18 was learning more about a little-known program that boosted the United States' national security and military readiness in the years leading up to and encompassing World War II.

MacAluso-Stafford, a history major who plans to commission in the Air Force, is researching the Development of Landing Areas for

National Defense (DLAND) project. This was a joint effort between the Depression-era Works Project Administration and the War Department, now the Department of Defense, that built hundreds of airports around the country in a time span roughly between 1938 and 1946.

"I have a natural interest in aviation," MacAluso-Stafford noted.

Coincidentally, so does Maj. Houston Johnson V, assistant professor of history and MacAluso-Stafford's academic advisor.

Thanks to funding from the VMI Center for Undergraduate Research, MacAluso-Stafford was able to kick start his research by taking advantage of the resources available at the National Archives.

"I got lucky because I ran into a WPA expert and he sent me right to the Federal Aviation Administration files," explained MacAluso-Stafford.

Those FAA files contained material from the Civil Aeronautics Administration, which ran the DLAND project, and the material that MacAluso-Stafford found included lists of airports, locations, and funds allocated. That was just what he needed, as he'd struggled to find anything but the most cursory mentions of the DLAND program online.

"I'm really trying to learn the full range and extent of [the DLAND project's] effects on aviation in general, but specifically military preparation prior to World War II," said MacAluso-Stafford of his research goal.

Both MacAluso-Stafford and Johnson explained that the DLAND project piggybacked off the WPA's National Airport Plan, which was initiated in the late 1930s to promote airport development and provide employment during the Depression years.

Working in the National Archives, MacAluso-Stafford found a letter from President Franklin D. Roosevelt to the secretary of war,



Col. Dennis Foster and Benjamin Haus '18 review Haus's findings on U.S./Cuba relations.—VMI Photo by Kelly Nye.

directing the latter to re-allocate funds from the WPA's airport program toward airports that were considered strategic for national defense.

"It was cool to see the precedence that national defense took, and they could redirect the spending of \$500 million dollars like it was nothing," said MacAluso-Stafford.

As Johnson continues his research into the history of aviation—an interest that began with writing his doctoral dissertation at the University of Tennessee—he is eager to see what kind of scholarship MacAluso-Stafford produces.

"He's doing really well," said Johnson. "He's been a pleasure to work with. He's bright, he's engaged, and he's interested in the topic." 🌿

What is the Caloric Cost of the Rat Line?

By Ashlie Walter

Cadets never forget their time in the Rat Line, but many might not have stopped to think about the exact physical effort that goes into completing the events from Matriculation Day to Breakout.

For her senior capstone project, Bethany King '18 is studying the caloric cost of the Rat Line under the guidance of Capt. Katherine Gorman of the physical education department. She chose the study as her capstone because, as someone who went through the same training while participating in NCAA athletics, she wanted to quantify the physical demands of the Rat Line.

The pair recruited 15 cadets during the Summer Transition Program. Only 14 are actively participating in the semester-long study, while the 15th cadet is an alternate.

During the Summer Transition Program, the cadets went through a fitness test in Cormack Hall's exercise science lab to establish their baseline maximal oxygen consumption or VO₂max—how much oxygen their body can consume during vigorous exercise intensity—and their body fat composition.

"We put them on a treadmill and increase intensity; we look at what is happening to their heart rate and more importantly, to their oxygen consumption, which is directly tied to energy expenditure," said Gorman. The aim of the study is to determine "ultimately, what is the caloric cost of the Rat Line?"

Those levels will be tested again six weeks after starting in the Rat Line, with the study wrapping up the week before this semester's final exams. King added that was a good endpoint for the study because, after finals, the cadets go on Christmas Furlough and then the training changes for them before Breakout.

While participating in Rat Line activities, the cadets will be wearing Polar heart rate monitors to measure their heart rate, steps, and sleep activity.

"That's why this study is so novel, this technology didn't exist 10 years ago. It links the lab and field together," Gorman said.

Past studies of the Rat Line at VMI had cadets perform typical rat activities in a lab setting. The majority of those studies were led by biology professor Col. Tom Baur.

King said the data collected from the study could be used during basic or advanced training in the military which is similar to the Rat Line.



Bethany King '18, left, conducts a VO₂max test on Daniel Hulsebosch '21 in Cormack Hall's exercise science lab.—VMI Photo by Ashlie Walter.

Gorman and King hope to publish the data in an exercise science journal.

"At this point, we are just observing and collecting data to determine the demands of the Rat Line. The hope is that we can better understand VMI and the Rat Line experience. Possibly, this information could be helpful to those designing physical programming in the future," Gorman said.

As for the caloric intake part of the equation, King will take pictures of the cadets' food before and after they eat in Crozet. They will then estimate how many calories the cadets consumed based on the images.

Gorman said when doing research that involves subjects keeping a diary of what they have eaten, there is a greater risk for error.

"These guys are going to be under a lot of stress," she said "We don't want to put that responsibility on them."

All the cadets participating are male and not participating in any NCAA sports. Gorman added they needed a homogeneous group of people at VMI to calculate better data. In the future, she hopes to explore other groups that go through the Rat Line such as a female-only group or NCAA athletes.

King is pursuing an exercise science minor, and she hopes to attend dental school after graduation. King is currently on the women's cross country team at VMI. 🌿



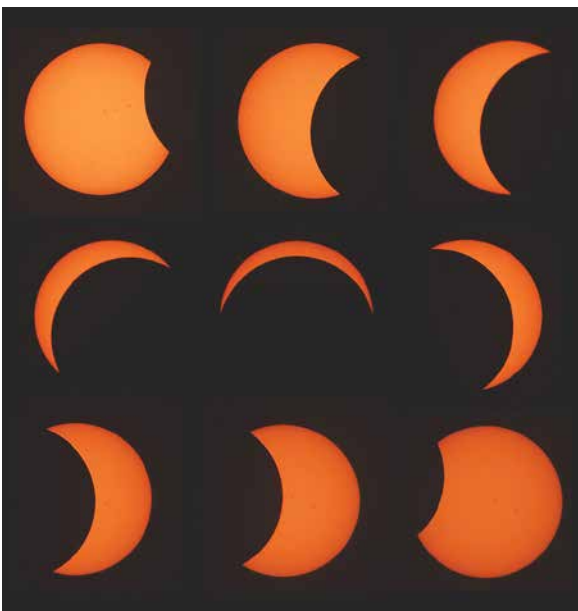
Cadre Week

Members of cadre returned to post a week before Matriculation Day to prepare for training of the incoming rats. Training included practicing march-in, a group run, and company athletics.—VMI
 Photos by Stephen Hanes, H. Lockwood McLaughlin, Ashlie Walter, and Kelly Nye.



Study Abroad

Cadets spent time abroad this summer studying language, culture, and science in countries including France, Germany, Austria, and Belize.—Photos courtesy of the Office of International Programs.



Partial Solar Eclipse Shades VMI

On Aug. 21, the moon aligned with the sun for a partial solar eclipse that was visible from VMI. At its peak the sun was about 87 percent blocked, softening the sunlight on the Parade Ground. The image to the right shows how sunlight passing through the leaves of trees on Letcher Avenue produced crescent-shaped images of the eclipse on the sidewalk. The composite image to the left shows the various stages of the eclipse.—VMI Photos by H. Lockwood McLaughlin and Maj. John Robertson IV.



Basketball Team Builds Camaraderie, Skills in Europe

By Chris Floyd

Summer workouts are par for the course for college basketball teams, but VMI's hoopsters took theirs the extra mile this summer—4,009 extra miles to be exact.

The Keydets traveled to Belgium in early August for a week-long European tour that saw them visit four countries and play three games as they prepared for the upcoming season. While VMI won just one of those games against a trio of professional teams, the trip was a resounding success.

"It was an awesome experience, and I'm really appreciative that everybody did that for us," said VMI basketball coach Dan Earl, who sent out thanks to Dr. David Diles, VMI's athletic director; Gen. J.H. Binford



Members of the basketball team pose in front of the Eiffel Tower in Paris this summer.—Photo courtesy of Sports Information.



The basketball team huddles during an Aug. 8 game in Antwerp, Belgium, against the Gent Hawks.—Photo courtesy of Sports Information.

Peay '62, VMI's superintendent; and the Keydet Club. "We found out some of the pieces we have. We were able to put in some Xs and Os. Hopefully, we're a little ahead of the game."

All 14 players on the Keydet roster got playing time on the trip, and with the extra 10 practices granted by the NCAA prior to departure, VMI certainly received a jump start to the 2017-18 season. But there was an added benefit.

Of the 14 players who will suit up for VMI this winter, seven are rats. The trip to Europe allowed those youngsters a chance to get to know their teammates better, a luxury that is not guaranteed once the new school year begins.

"During the year here at VMI, the guys have a lot on their plate," said Earl. "Most of the time they only spend time together in practice. From a team-bonding aspect, [the trip] was great."

"Half of our team is rats, so it was really big to get close to them," said Will Miller '20, who was one of those rats last season. "To get to know people was really big for our basketball team."

"[The rats] are going to have to be ready to contribute early," added Austin Vereen '19. "It was good to get some games under their belts against bigger and stronger guys, which is what is going to happen when the season starts."

Vereen, a 6-foot-4 guard who played in 27 of VMI's 30 games last season, scored 14 points in an 84-78 victory over Fellows Ekeren in the first game of the European tour.

But this trip was about much more than basketball. It was an experience of a lifetime.

The VMI contingent not only got to see Brussels, but they took day trips to Amsterdam, which was a favorite of many of the players, Paris, and Cologne in Germany. They also visited a number of smaller towns and took a trip to Fort Breendonk, which was a concentration camp during World War II. 🇺🇸

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Cadet Studies Cell Division to Understand Disease

By Mary Price

John Hatgas '19 spent his summer in VMI's biology laboratories, trying to gain a greater understanding of the roots of the mammalian disease process by studying single-celled organisms. These microbes share more common ground with our more complex human cells than they do with bacteria or other small creatures.

Working under the guidance of Col. Wade Bell, professor of biology, Hatgas sought to find a way to inhibit cellular division by inhibiting mitochondrial division. Mitochondria are organelles within cells that help the cells thrive by producing energy.

"We're trying to see what happens when you stop mitochondrial division," explained Hatgas, who conducted his work under the auspices of the Summer Undergraduate Research Institute. "Will the cells still divide?"

It's a question that many scientists would like to find an answer to. Bell, who described himself as "infinitely curious" about the evolution of cells, noted that stopping or even slowing mitochondrial division, and perhaps cellular division as well, could be helpful in the treatment of many diseases, cancer among them.

"In reality, there are all kinds of diseases associated with mitochondrial dysfunction," said Bell. In the case of macular degeneration, which is a leading cause of blindness among the elderly, cells are dividing too slowly, the biology professor explained. In the case of most cancers, cells are dividing too quickly.

Because the cell cannot function without its mitochondria, which supply essential energy in the form of adenosine triphosphate, stopping mitochondrial division could be a key tool for treating disease, said Bell.

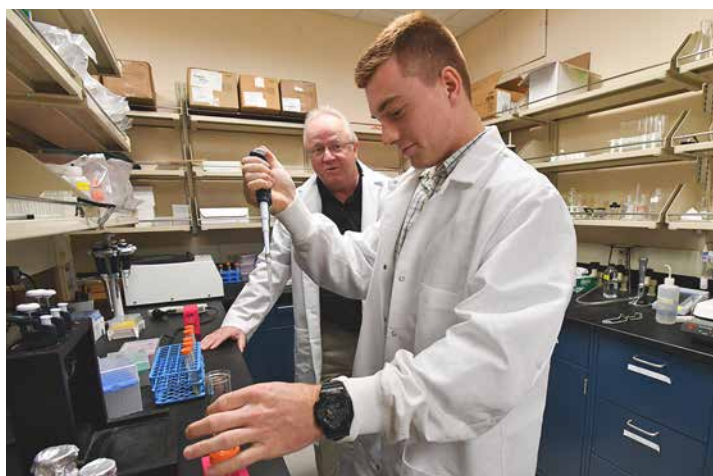
"If you can inhibit mitochondrial division without killing the cells, and that keeps cells from dividing, then maybe you've got a different way to address certain diseases," he stated.

This summer, Hatgas and Bell used a substance called MDIVI-1, which is short for mitochondrial division inhibitor, to see how much of the substance must be used and how often to successfully slow or stop mitochondrial division in a paramecium, a one-celled organism frequently used in scientific research.

"By the end of the summer, we hope to see a significant difference between our treated cells versus our control cells and be able to show that MDIVI-1 can slow down different cellular processes, including mitochondrial division," said Hatgas in late June.

New to in-depth research, Hatgas learned very quickly that what's planned in a classroom or a professor's office doesn't necessarily pan out in the lab.

"Results don't usually turn out like you expect," said Hatgas. "We've had some control groups that have turned out better than the test



John Hatgas '19 adds a molecule to a paramecium culture under the supervision of Col. Wade Bell.—VMI Photo by Kelly Nye.

groups, which shouldn't have happened, but it's interesting to see. Everything's not perfect. It's real life."

For Bell, Hatgas's research is allowing him to learn more about intracellular processes—as is the case with most scientific research, it's raising more questions that will need to be answered down the road, among them the self-awareness and survival mechanism of an individual cell.

"What happens when the cell finds out that there's a problem with the mitochondria?" asked Bell. "Is it aware of it? How is it aware of it? ... Ultimately, what kind of communication exists between a cell and its organelles?"

Hatgas hopes to turn his summer research into an honors thesis later in his cadetship. He plans to attend medical school after graduating from VMI. 🌟



By adding molecules to paramecium cultures—seen here in flasks—John Hatgas '19 can study how the molecules affect the growth and development of the cells by inhibiting mitochondrial division.—VMI Photo by Kelly Nye.

CE Major Interns in Highway Construction

Allan Cratsenberg '18 (left) confers with Mike Mitchell, vice president of Lanford Brothers Inc., during the internship with the highway construction company this summer. Cratsenberg, a civil engineering major and a defensive linebacker on the Keydet football team, spent the last half of May and most of June working as part of a Lanford Brothers crew on a bridge deck repair project on Interstate 81 in Botetourt County.—VMI Photo by Mary Price.



Army Cadets Undergo Specialized Training

By Ashlie Walter

While summer is a break for some VMI cadets, many of those commissioning spent their summer completing specialized training.

According to Lt. Col. John Brown, senior military science instructor, the Institute sent 150 third-class cadets to Army ROTC Advanced Camp and 65 first- and second-class cadets to Basic Camp, in addition to a number of specialized schools for summer training.

"These special schools help our cadets become better leaders," Brown said.

This year, the Institute was offered a seat at the Jungle Operations Training course at Schofield Barracks in Hawaii. Andrew Vaccaro '18 was awarded that seat.

Answering questions during his training at the Jungle Operations Training Center "Lightning Academy," Vaccaro said he wanted to challenge himself in a different and extreme manner.

"It is interesting to interact with actual Army guys who do this for a living. There are even special forces teams, Navy SEALs, and Rangers who come through to prepare for deployment to jungle regions," he said.

His training entailed everything from hasty rappels, waterborne operations, survival, and tracking, to military operations, land navigation, and platoon missions.

Vaccaro said he will bring back the knowledge he learned to expand on the fundamentals of fighting in various environments and use it as well in his future platoon.

"It is an honor to have this rare opportunity and [it] provides an unforgettable experience," he said.

Cullen Godbold '20 completed a Master Fitness Training course this summer to learn how to serve as a physical trainer in a small unit setting.

"My initial interest in [Master Fitness Training] had to do with its potential to give me a better understanding of the Army as a whole, particularly since it will provide me with an opportunity to interact at some level with both junior and senior [non-commissioned officers] throughout the course," Godbold said.

He was also attracted to the uniqueness of the program, as each senior military college only sends one cadet a summer, he said.

Godbold considers himself fortunate to be given the opportunity to attend this training, especially after only one year in Army ROTC.

"The course itself will better prepare me to train soldiers in my platoon upon commissioning," he said.

Hannah Gillan '19 spent her summer completing two missions, one in Vietnam for the Army's Cultural Understanding and Language Proficiency Program, and the second mission at the Basic Airborne Course at Fort Benning, Georgia.

For the language program, Gillan taught English at the Military Science Academy in Hanoi, where she spent three weeks teaching civilians, military cadets, and officers.

"I was able to fully immerse myself in the Vietnamese culture, all while I was learning more about the government, history, and lifestyle of citizens there. This 'soft diplomacy' mission was a good way for



Andrew Vaccaro '18 attended the Jungle Operations Training Center "Lightning Academy" in Hawaii over the summer, a division of Army Ranger training.—Photo courtesy of Andrew Vaccaro.

the United States to better its relationship with Vietnam, which is important seeing as Vietnam plays a vital role in international affairs," she said.

Gillan added it is important for her as a future officer in the Army to not only know how to develop relationships with fellow soldiers but with people of different backgrounds.

Airborne School was also part of Gillan's goal to be a paratrooper, a goal from before she contracted with the Army.

"It has required a lot of dedication and so far has been extremely challenging both mentally and physically," she said.

By the end of her time at Fort Benning, Gillan earned her "jump wings" and completed five successful jumps from military aircraft at 1,250 feet.

"So far it has been one of the tougher courses that I have participated in, but it will all be worth it once I am airborne-qualified. It has been an eye-opening and tough week so far, and I already cannot wait to jump," Gillan said during her training. ✱



Hannah Gillan '19 taught English at the Military Science Academy in Vietnam as part of the U.S. Army's Cultural Understanding and Language Proficiency Program over the summer.—Photo courtesy of Hannah Gillan.

Faculty-Developed Textbooks Improve Accessibility

By Mary Price

VMI's Department of Applied Mathematics now has its sixth electronic textbook.

This summer, Maj. Amy Givler Chapman taught students enrolled in the Summer Transition Program using a pre-calculus textbook that was written by herself, along with Lt. Col. Meagan Herald, associate professor of applied mathematics, and Maj. Jessica Libertini, assistant professor of applied mathematics.

"As a department, we're trying to get more of these low-cost books across our whole curriculum," explained Chapman, assistant professor of applied mathematics.

To say that the books are low cost is a bit of an understatement, especially in light of the fact that pre-calculus and calculus textbooks typically cost anywhere between \$200 and

\$300 per book. All of VMI's Affordable Print and Electronic Textbooks (APEX) are free online for cadets, and the print editions only cost \$15 each. Students in Chapman's STP classes received their books for free, as the pre-calculus textbook isn't officially published yet.

The first in the series of APEX textbooks was written by Col. Greg Hartman in 2012 for Calculus I. Over the past few years, books have followed for Calculus II and III, as well as matrix algebra and Matlab, a computer programming language. All of the books were written by VMI faculty members, sometimes in collaboration with outside authors.

Chapman described the pre-calculus book as "a good next step in this process of getting switched over to more affordable texts."

But not only is the new pre-calculus textbook more affordable, it is hopefully more accessible to students than many standard math textbooks. As they wrote the book, the three authors chose to use inclusive language, addressing the reader with phrases such as, "Next, we will ..." to give a sense of inclusiveness.

"We tried to write it in a more approachable way," said Chapman. She added that the

book is also designed to assist learners who may need some help in reading a math textbook. Rather than simply refer to "equation 3.2," for example, the new e-textbook includes phrases such as, "Look at equation 3.2 at the bottom of page 10."

There is also a full answer key in the back. "The idea behind that is that students need practice problems, but they also need a way to gauge their level of success," Chapman noted.

Chapman's STP students were generous with their praise of the textbook. "We got really good feedback from the students," Chapman said. "A lot of them really liked it."

Even more importantly, the book seemed to improve student learning. Chapman explained that STP students are given the same 25-question test at the beginning of the class and at the end, thus making it easy to see if growth in understanding has occurred.

"We had huge jumps in understanding" she commented. "We had people who were getting 10 to 15 more questions right at the end of the semester than they were in the beginning."

Cadets enrolled in all four sections of pre-calculus this fall will use the new electronic text. More electronic books for math classes are likely to follow, although no specific class has been identified yet as next on the list. 🌟



Lt. Col. Meagan Herald and Maj. Amy Givler Chapman discuss edits this summer to the APEX pre-calculus textbook they wrote together.—VMI Photo by Kelly Nye.

VMI Accreditation Reaffirmed

By Ashlie Walter

The Southern Association of Colleges and Schools—Commission on Colleges reaffirmed VMI's full accreditation for the next 10 years.

SACSCOC is the regional accrediting body for colleges in 11 U.S. states, including Alabama, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Texas and Virginia.

As part of the reaffirmation process, VMI submitted a compliance certification, focused report, a Quality Enhancement Plan, and response report in March 2016.

The documentation was returned with a "very favorable" verdict with a few non-compliance findings.

VMI submitted a focused report along with its Quality Enhancement Plan in Sept. 2016 which was the focus of a committee



Lt. Col. Spencer Bakich teaches in Scott Shipp Hall. The Southern Association of Colleges and Schools validated VMI's academic program following a detailed study.—VMI File Photo by H. Lockwood McLaughlin.

that visited post a few weeks later. The Institute received a positive review from the committee with a few recommendations on faculty.

After another followup report, which was approved, the SACSCOC Board of Trustees found VMI's actions sufficient for compliance.

VMI's next major report to SACS will be a fifth-year report due in 2021. The Institute was first accredited in 1926 by the regional body.

As of January, 794 colleges are accredited by the SACS.

For more information on the reaffirmation process, visit the Office of Institutional Research and Assessment's web page at www.vmi.edu/OAIR. 🌟

Exhibit Shows History of Professional Marching Band

By Ashlie Walter

The VMI Museum unveiled a new exhibit featuring memorabilia from the early days of the band, when professional musicians served in roles now played by cadets in today's Regimental Band.

Prior to the 1940s, the Post Band was made of VMI employees who worked as musicians while also holding positions across post.

"The first VMI Post Band was comprised of two enslaved African-Americans, Reuben Howard, who played the kettledrum, and Mike Lyle, on the fife," according to Col. Keith Gibson, executive director of the VMI museum system.

Many of the early bandsmen were immigrants who were trained tailors and cobblers, skills that were particularly adaptable to their dual-employment roles at the Institute, Gibson said.

The band exhibit on display features items owned by Peter Wray, a young professional drummer from Richmond, who arrived at VMI in 1910 to join the band. Wray was also known as "Peter the Rabbit."

Two years later, when Wray was appointed manager of the on-campus store—the Post Exchange—he nonetheless continued his drummer duties. After the Cadet Regimental Band was formed and employees no longer constituted the band in 1947, Wray continued to work at VMI until his death in 1948.

Wray's personal items were donated by his family to the VMI Museum. Also in the exhibit is a rare double-belled euphonium, a brass instrument that resembles a tuba, played by VMI Post Band member Dan Corsetti. The instrument was popular between 1880 and 1930, Gibson said.

Another famous post band member, Wilbur Swihart, also known as "Bill the Bugler," arrived in Lexington in 1937 via the Tom Mix



The VMI Museum exhibit dedicated to the history of VMI's only Post Band staffed by VMI employees features uniforms from post band members and a special double-belled euphonium.—VMI Photo by Ashlie Walter.

Circus. Swihart stayed after the circus left and became the last active member of the professional band.

"Swihart was well liked by the cadets because he would hold the last note of assembly as long as possible, allowing late cadets to slip into ranks, more than humanly thought possible," Gibson said.

The coronet Swihart played is on display at the VMI Museum.

The VMI Museum is open 9-5, daily and is located in Jackson Memorial Hall on the VMI post. Admission is free. 🌿

Jackson House Offers Map Making Activity

Stonewall Jackson House volunteer Denise Neas shows local elementary schoolers a relief map of Rockbridge County during a map making session hosted by the museum on July 29. Participants also learned how to measure distance using their footsteps, used compasses to determine the cardinal directions, and made their own map of the Stonewall Jackson House garden.—VMI Photo by Kelly Nye.



VMI Honors Speaker Howell

The Institute honored Virginia Speaker of the House William J. Howell with the Meritorious Achievement Award on June 28 for his backing of higher education in Virginia, his 30 years of service in the House of Delegates, and his support for the programs and policies of VMI. The award was given during a luncheon held in Howell's honor, which was followed by a tour through the Institute's newest facilities. Presenting the award were Gen. J.H. Binford Peay III '62, VMI superintendent, and Bill Boland '73, president of the VMI Board of Visitors.—VMI Photos by H. Lockwood McLaughlin.



Reagan Book Discussed at U.S. Diplomacy Center

By Kelly Nye

A panel discussion on the book *Reagan and the World: Leadership and National Security 1981-1989* was held in the State Department's U.S. Diplomacy Center on June 21. The recently published book is the culmination of a project by VMI's John A. Adams '71 Center for Military History and Strategic Analysis. Focusing on Reagan's foreign policies, the book is the first analysis based on the U.S. Department of State's declassified Reagan-era documents.

The panel featured contributors to the book and State Department historians currently working on the Reagan-era volumes, including Stephen Randolph, chair of the Office of the Historian at the State Department. VMI's associate professor of history and director of the Adams Center, Lt. Col. Brad Coleman '95, contributed to the panel discussion as one of the editors of the book.

Several of the contributors to the book also attended the 2014 Adams Center conference on leadership and national security at VMI. The conference, which mostly focused on Reagan, is where the project for the book began.

Kyle Longley, professor of history at Arizona State University, is one of those contributors. His chapter in the book focuses on Reagan's dealings in Central America. Longley admitted during the panel discussion that Reagan's "obsession with perceived communists in Central America almost brought down his presidency."

But there were other contributors with more favorable views of Reagan's foreign



Lt. Col. Bradley Coleman '95 represents VMI's John A. Adams '71 Center for Military History and Strategic Analysis in the panel discussion on the book he helped publish, *Reagan and the World: Leadership and National Security 1981-1989*.—VMI Photo by Kelly Nye.

policy. Ronald Granieri, director of research at The Lauder Institute, University of Pennsylvania, wrote the chapter in the book that focuses on Caspar Weinberger, Reagan's Secretary of Defense. Granieri believes the mixture of personalities and opinions Reagan surrounded himself with is what made Reagan successful.

"Reagan was complicated," said Granieri. "He wanted defense built up and he wanted peace with the Soviets."

Both James Graham Wilson and Elizabeth Charles, State Department historians on the panel, verified Reagan's paradoxical behavior. However, Coleman summarized Reagan's legacy when it came to foreign policy best, "Reagan built bridges, but Reagan built walls too."

During the discussion Coleman also explained to the gathering that academics depend on the historians in the

State Department to identify important documents, advocate for their declassification, then publish them. And since only three of the 58 volumes from the Reagan presidency have been researched and declassified, more information is sure to follow.

"We just finished this Adams Center project on Reagan and still there are so many things I don't know," said Coleman. "And I think it's the work of the historians ... at the State Department, building this documentary history, that's really going to open and answer a lot of questions."

The audience mostly consisted of scholars and informed national policy professionals, since the panel discussion was scheduled around the State Department's historical advisory committee's meeting and the Society for Historians of American Foreign Relations conference.

"It was a unique opportunity to pull everyone together," said Coleman.

It was also an opportunity to use the State Department's new Diplomacy Center. Anticipated to be completely opened to the public by late 2019, the Diplomacy Center will be an educational museum displaying artifacts from critical points in diplomatic history. 🌟



National policy professionals gather in the State Department's new Diplomacy Center on June 21 to hear the panel discussion on *Reagan and the World: Leadership and National Security 1981-1989*.—VMI Photo by Kelly Nye.

Taps—First Lt. Benjamin Cross '13

Marine 1st Lt. Benjamin Cross '13 was killed along with two other Marines when his MV-22 Osprey crashed off the northeast coast of Australia Aug. 5. The accident occurred while attempting to land the aircraft on a Navy ship.

Cross was a Marine aviator, and had been training in Australia for the past three months. The Osprey was part of the Marine Medium Tiltrotor Squadron 265 and the 31st Marine Expeditionary Unit based in Okinawa.

Cross was a native of Bethel, Maine, and attended the Institute on a Naval ROTC scholarship. While at the Institute, Cross held the rank of Company G 1st Platoon lieutenant in the Corps of Cadets, was an economics and business major, and was a member of the scuba club. 🌟



Benjamin Cross '13

research, specifically cadets on the commissioning track.

"This is unique," said Blandino.

"[Aberdeen] sees an advantage in hiring officer candidates. Private companies usually do not want to hire cadets who will be going on active duty into internships since they will not be able to fill a full-time position with the company after graduation," Blandino said.

He added the advantage for Aberdeen in hiring a cadet on a commissioning track is that the cadet often has a security clearance and he or she can contribute to classified programs.

David Tyler '18 interned at Aberdeen for almost 11 weeks on different projects but could not detail many of the projects because of their classified nature.

One project he worked on that was not classified was testing the penetration rates of aluminum armor plating with the Materials Research Directorate Protection Division.

"Since arriving I have had the opportunity to witness some of the armored plates being shot with various caliber weapons. Observing these shots has definitely been my favorite part," he said during his internship.

He added this internship has allowed him to observe how much goes on behind the scenes developing resources that will be used by the armed forces. He shadowed an engineer/technician who showed Tyler how much time and effort is put in by civilians and military alike for research and development.

Tyler is a mechanical engineering major who plans to commission into the Air Force and attend flight school.

Arthur Yee '20 spent a little less than eight weeks interning at Aberdeen. The focus of his project was ballistic clay and how it interacted with projectiles.

He explained that the Army uses a clay similar to basic modeling clay as a backing for body armor when conducting ballistics tests. Armor is placed over a clay mound and then shot at with projectiles such as bullets.

The body armor will stop the projectile, but the resulting cavity left in the clay can be used as a quantitative measurement of the effectiveness of the body armor. The material properties of ballistic clay are difficult to characterize because it deforms easily and is dependent on environmental factors, such as temperature and rate of deformation, he said.



David Tyler '18 spent his summer at the Aberdeen Proving Ground/Army Research Laboratory in Maryland under the mentorship of Dr. Carl Krauthauser, seen on the right. —Photo courtesy of U.S. Army Research Laboratory.

To help his mentors characterize it, Yee conducted compression tests on clay samples at various temperatures and compression rates. Then, he and others at Aberdeen compared the data at different conditions to determine the impact temperature and compression rate had on the ballistic clay samples.

Work is ongoing at Aberdeen to determine mathematical models to accurately calculate their effects, Yee said.

"From my internship, I have gained a newfound appreciation for what I have learned in my classes, especially my materials class, as this is the first time I have been able to utilize my knowledge in a professional work environment and see that what I am learning is the same exact stuff that full-time employees are working with," Yee said.

He added it is not very common for a college student, having just completed his or her first year of college, to be selected for an internship opportunity. But it is gratifying to see what he learned from one year at VMI is already applied to a work environment.

Yee plans to commission into the Army before pursuing a career in the mechanical engineering field.

Blandino said cadets were chosen based on their interest and qualifications, with the final selections made by Aberdeen.

He said the department is working with VMI alumni to build a relationship with the Naval Surface Warfare Center in Dahlgren, Virginia. In the past, cadets have been placed at the Air Force Institute of Technology in Ohio.

"The VMI [mechanical engineering] department produces exceptional engineers who are capable and practical," said Blandino. "We want to get these engineers involved in high-profile research programs within the Department of Defense. These internships help them develop into the successful professional engineers and lead-

ers of [research and development] programs."

The research comes on the heels of another project in the mechanical engineering department that took place in the spring, in which 1st Class cadets completed design work on a small unit riverine craft (SURC) for the U.S. Navy.

Col. Gerald "Jay" Sullivan, professor of mechanical engineering, explained that the project got underway after Capt. Robert "Bob" McMasters, professor of mechanical engineering, heard from a Naval Academy classmate of his that the Naval Surface Warfare Center, Carderock Division, could use some help. McMasters' classmate is now a technical director at the Carderock Division, which is headquartered in Potomac, Maryland.

Tackling that challenge as their required 1st Class capstone project were Tyler Corcoran, Brandon Conley, and Austin Roe. The trio worked under the guidance of Sullivan to design an automated ramp and bow door for the SURC. The SURC is designed to transport an unmanned ground vehicle, which needs to be able to go down the ramp and reach the beach without human intervention—thus the need for an automated ramp and bow door.

"It was an ideal student project—it involved mechanical design; it involved stress analysis; and then it also involved doing a controlled system design," explained Sullivan. "Projects like these are particularly good for our mechanical engineering [cadets] since they serve a critical military mission, and typically involve multi-disciplinary engineering solutions." 🌟

POST BRIEFS

Hentz Releases Volume on Boko Haram

Col. James J. Hentz, the head of the international studies department, co-edited a new book titled *Understanding Boko Haram: Terrorism and Insurgency in Africa*, that explains the nature of the Boko Haram insurgency in Nigeria and the group's place on a global level. The book states Boko Haram's goal to create an Islamic State, or "caliphate," is a rejection of a system forced on it by the West. "With the election of the current Nigerian president Muhammadu Buhari, the insurgency was pushed back into the Sambisa Forest. It is not, however, defeated. Two troubling trends are developing. First, Boko Haram has fractured. When other insurgencies have

fractured elsewhere in Africa, this insurgency has metastasized. Second, one of the splinter groups may be forming closer ties with ISIS," Hentz said. His co-editor was Hussein Solomon, a former senior professor in the political science department at the University of the Free State in Bloemfontein, South Africa. Hentz conducted field research on Boko Haram this summer in Nigeria.



Col. Jim Hentz

Professor Serves as a Science and Technology Policy Fellow



Maj. Jessica Libertini

Maj. Jessica Libertini, assistant professor of applied mathematics, is serving as a science and technology policy fellow this academic year with the Department of Defense's Office of the Undersecretary of Acquisitions, Technology, and Logistics. This program is designed to place scientifically minded individuals into offices

that develop policy so that policy will be influenced by scientific thinking. During her fellowship, Libertini will focus on international armament cooperation. As a result of the fellowship, Libertini hopes to develop contacts in the policy world that could prove helpful down the road for cadets and other faculty members. In addition, she hopes to advise cadets majoring in the STEM disciplines on often-overlooked careers in policy and advocacy. ✪

New Members Named to VMI's Board

By Ashlie Walter

Two new members and the reappointment of two current members of the Virginia Military Institute Board of Visitors were announced over the summer by Gov. Terry McAuliffe.

Beginning their four-year terms July 1 were Hugh M. Fain III '80, director of the law firm Spotts Fain in Richmond, and Thomas R. Watjen '76, non-executive chairman of Unum Group board of directors—a Tennessee-based Fortune 500 insurance company.

Fain graduated from the Institute with a Bachelor of Arts in economics and continued his education at the University of Virginia School of Law. During his 30 years as a litigator, Fain served as president of the Virginia Bar Association, VMI Foundation, Inc., and the VMI Alumni Association. Fain was ranked in Chambers USA 2015 and Best Lawyers in America in 2017 in four categories.

Watjen served as the president and CEO of Unum from 1994 to 2015. Prior to his time at Unum, Watjen was a managing director at Morgan Stanley & Co., a partner with Conning & Co., and worked in the investment and corporate finance areas of Aetna Life and Casualty.

Appointed to their second four-year terms were Bill Boland '73, a partner and chair of McGuireWoods' business and securities



From top left, Bill Boland '73 and Fran Wilson were reappointed to the board while Tom Watjen '76 and Hugh Fain '80 will begin their first four-year terms.

litigation department, and retired Lt. Gen. Fran Wilson, who served as president of the National Defense University. Boland is to assume the presidency of the board.

Boland, of Richmond, was a member, and former president, of the Central Virginia Legal Aid Society board. Boland is also a founder of "Rebuilding Together," formerly Christmas in April-Richmond, a nonprofit organization that rehabilitates homes for low-income families.

Wilson, of Virginia Beach, served at the U.S. Naval Academy as a company officer in the Brigade of Midshipmen and as an assistant professor in the Professional Development Department during her 37 years in the Marines. She holds multiple master's degrees and a doctorate in education from the University of Southern California. Wilson has earned numerous medals including the Navy Distinguished Service Medal, Defense Superior Service Medal with oak leaf cluster, and Defense Meritorious Service Medal.

Leaving after eight years of service to the board are Gen. John P. Jumper '66, retired chief of staff of the Air Force and who also served a one-year term as the VMI board president, and Kimber L. Latsha '77, a founding principal of Latsha, Davis, & McKenna, P.C., a law firm headquartered in Mechanicsburg, Pennsylvania. ✪

Annual Giving Enjoys Strong Support in FY 2017

By Scott Belliveau '83

While a lot of attention was focused on the outcome of *An Uncommon Purpose: A Glorious Past, A Brilliant Future: The Campaign for VMI*, the three components of VMI Annual Giving enjoyed strong support in Fiscal Year 2017 with 4,875 alumni, parents, faculty, staff, and friends giving a grand total of \$6.15 million.

The Foundation Fund, through which donors provide unrestricted money to support the Institute's academic and co-curricular programs, received gifts from 3,656 alumni and friends, which totaled \$2.8 million. This makes fiscal year 2017 the third consecutive year in which donors have given more than \$2.8 million to the Foundation Fund.

"This strong support for the Foundation Fund will translate into a better overall experience for cadets," said John J. Wranek III '85, the VMI Foundation's vice president for annual and reunion giving. "It also demonstrates that the VMI family recognizes the critical necessity of unrestricted money to VMI."

The Foundation Fund was not alone in enjoying success during the fiscal year. Donors to the VMI Keydet Club gave \$3.3 million. Of this money, more than \$2.9 million went toward grant-in-aid assistance through the Keydet Club Scholarship Fund and the Team-Specific Scholarship Funds. Gifts to the Athletic Operations Funds totaled more than \$360,000—up \$38,000 from last year.

"Again, alumni and friends came through with robust support for the young men and women who represent VMI as NCAA athletes as well as their coaches and support staff," said Greg Cavallaro '84, COO of the VMI Keydet Club. "This generosity will translate into amazing opportunities to compete and to grow as leaders for our cadet-athletes."

"We always are thankful that thousands of alumni and friends support VMI in this very important way," said Steve Maconi, CEO of the VMI Alumni Agencies. "Gifts to the Foundation Fund allow VMI's leaders to fund a wide array of strategic initiatives and to meet immediate and ongoing needs of the Corps of Cadets and the Institute as well as afford them the flexibility to seize opportunities to improve the remarkable education available to every cadet."

"Support of the Annual Giving funds of the Keydet Club," he continued, "help maintain the Institute's proud athletic tradition and enhance our coaches' ability to recruit and retain the high-quality young people who represent VMI so well at the highest level of college sports, the NCAA's Division I."

"Finally, gifts to Annual Giving are an expression of the VMI family's confidence in the Institute's direction and its ability to execute its important 178-year-old mission of forming young people into educated, active, and honorable citizen-soldiers." 🌟