



INSTITUTE REPORT

VIRGINIA MILITARY INSTITUTE

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Nearly 500 Matriculate

By Mary Price

Just shy of 500 new cadets arrived Saturday, Aug. 21, for Matriculation Day and the beginning of the Rat Line. The new cadets will become the Class of 2025 early in the spring semester, after Breakout.

This year's new cadets come from 42 states and seven countries, with 59% from Virginia and 41% from out of state. Sixty-six are female, and nearly 150 are recruited NCAA athletes. Fifty-eight percent are majoring in the STEM disciplines and 42% in the liberal arts.

The registration and ceremonial portions of matriculation were held as usual this year in one day, after the need for social distancing caused the Institute to hold the event over two days in 2020. Matriculants were given green bracelets to indicate confirmation of vaccination, approved exemption with negative COVID-19 test, or a negative COVID-19 test for those partially vaccinated. Also in a departure from last year, all military training and athletic activities are being held as usual, without capacity limits, and all classes are in person only.



Regimental Commander Kasey Meredith '22 leads the Rat Mass of 2022 plus 3 towards barracks to meet their cadre. For more photos from Matriculation Week, see page 10.—VMI Photo by H. Lockwood McLaughlin.

The matriculation process continued Aug. 22–29 with the cadre leading the new arrivals in military drills and physical training. Members of the Old Corps returned Sunday, Aug. 29, and classes began Tuesday, Aug. 31. ✪

Summer Construction Advances Institute Goals

By Mary Price

Contractors and Physical Plant staff have been busy across post this summer, as a multitude of projects are underway. Behind the scenes, three other projects are on the drawing board.

The largest, and perhaps most noticeable, of the projects is construction of the \$44.2 million Aquatic Center, which

is taking shape along North Main Street next to the Corps Physical Training Facility. Completion is expected by the end of November 2022.

“It’s going well,” said Col. Keith Jarvis '82, director of construction. “The building foundations are mostly in, so what you see going up there now is the foundation

walls. As the construction progresses, we see the roof trusses coming in mid to late fall.”

Work is also underway at the historic American Legion building, also known as the Knights of Pythias building, which

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English Professor Publishes Second Novel

By Mary Price

By the time most people are just starting to wake up in the morning, Lt. Col. Polly Atwell may have already been writing for an hour or more.

"I usually get up between 4 [a.m.] and 5 [a.m.]," said Atwell, associate professor of English. "Students usually gasp when I say that, but it's the best time of day for me."

Atwell's discipline, dedication, and focus were rewarded this summer when her second novel, "The Good Ones," was accepted for publication by Harper Books, a division of HarperCollins Publishers. It's set for release in the spring of 2023 and will be published under the name Polly Stewart.

It might be appropriate to say that writing and teaching are the bookends of Atwell's life. Both of her parents taught at Hollins University near Roanoke, Virginia, when she was growing up, so an academic lifestyle appealed from an early age. Atwell attended Hollins herself as an undergraduate before going on to earn multiple graduate degrees, including a master's from the University of Virginia and a master of fine arts in creative writing and a Ph.D. in British literature from Washington University in St. Louis, Missouri.

All along the way, she was writing. "I told my parents that I wanted to be a writer at 7, I think, and I was just really lucky that they never told me that that's unrealistic, or you can't do it," she commented.

Atwell describes her first two novels, which she wrote at the ages of 16 and 22, as "not worth reading." Neither was published, but she kept going. In 2012, though, her commitment to her craft paid off when her third novel, "Wild Girls," was published. At the time, she was teaching at Missouri State University—and starting a family as well.

"I actually sold the book while I was in labor with my son," she stated. "I was on the phone with my literary agent while I was in the delivery room, so I think of the book as being born with him. It's probably not a coincidence that it took me 10 years to publish another!"

In the fall of 2015, Atwell began teaching at VMI, specializing in creative writing and British literature. Shortly thereafter, she began the Institute's veteran writers series, "The Other Side of War," which

invites published authors who've served in the armed forces to visit post, read from their works, and talk with cadets.

Atwell especially enjoys teaching writing. "For the cadets, I see it as a chance to access something that they maybe don't get a lot of chances to explore," she noted. "For a lot of them, I think it's exciting but also intimidating, so I try to demystify the creative process. It's a very practical skill, I think, to be able to tell a story."

By the fall of 2018, she was telling another story of her own, as she began work on "The Good Ones." It's set in Appalachia, as was "Wild Girls," and told from the point of view of a woman who's moved home to that area to look for a good friend who'd gone missing 15 years prior.

The setting of both books reflects Atwell's youth spent in Roanoke and Radford. "In the mountains, I feel such an emotional connection to that landscape," she stated. "When I lived in the Midwest, I really missed it."

At VMI, Atwell has found cadets to be a wellspring of ideas that sustain her writing.

"I just love being around the cadets and talking to them," said Atwell. "I think some of the energy I have for writing and even some of the ideas that go into my work come out of those interactions. I get to

come to work every day and talk about books with smart, interesting people. That's an energizing process for me."

Atwell is also grateful that being a member of the Institute faculty allows her to develop all her professional interests. "VMI's one of the very few places that will let me teach both [creative writing and British literature]," she stated. "I get to do all of the things that I enjoy."

This fall, she'll be revising the manuscript for "The Good Ones" while also getting underway with her next novel, set partly in a Wildlife Management Area in southwest Virginia. She's looking for members of the VMI family who'd be willing to take her hunting or fishing, as she'd like to bring the immediacy of that experience to her writing.

Atwell is also taking time to appreciate the moment, both personally and professionally. Son Harry is now 9, and daughter Margaret, 5, began kindergarten this fall. The early mornings allow Atwell to write before her children begin their day, and for now, it's a lifestyle that works well.

"I'm really doing what I want to do right now," she stated. "Teaching cadets, being in this area, and balancing that with my writing is absolutely ideal for me." ❀



Lt. Col. Polly Atwell

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Header photo on page 1 by
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COVID-19 information and current VMI protocols can be found at www.vmi.edu/COVID.

Corps Returns for Fall Semester

By Mary Price

Cadets returned to post in August as the Institute planned for a fall semester as close as possible to its pre-pandemic normal, with all classes held in person and activities such as meals and military training held as they were prior to the coronavirus pandemic.

On June 17, an email went out to cadets, informing them that VMI would require the coronavirus vaccine for all cadets except for those with medical or religious exemptions. On Aug. 5, Virginia Gov. Ralph Northam '81 issued Executive Directive No. 18, requiring all state employees, including VMI faculty and staff, to report their vaccination status. Those who are unvaccinated are subject to weekly testing.

Cadets began to arrive on post in early August, with members of the women's soccer team first to arrive on Aug. 2. Cadre began to return in three phases, beginning Aug. 12, and matriculation saw just shy of 500 rats arrive on Saturday, Aug. 21. Members of the three upper classes not required to return early arrived on Sunday, Aug. 29.

All cadets were stopped as they entered post for a health-related check-in process that involved verifying immunization



Nathan Franchebois '25 is led to his room in barracks by Patrick Cavanaugh '24 prior to the matriculation ceremony Aug. 21.—VMI Photo by H. Lockwood McLaughlin.

status. Vaccinated cadets were allowed to proceed directly to barracks, while partially vaccinated and unvaccinated cadets were tested for COVID-19 before being allowed to proceed farther.

Unvaccinated and partially vaccinated cadets are required to wear masks and practice social distancing.

Prior to the start of classes, an email went out from Brig. Gen. Robert "Bob" Moreschi, deputy superintendent for academics and dean of the faculty, letting faculty members know that, if they chose to, they could require all cadets in their specific classes, to wear masks, regardless of vaccination status.

Masks have been distributed to every cadet, and cadets have been advised to keep

one with them at all times on and off post, as some local businesses have begun requiring masks again.

Some VMI facilities, including Preston Library, the bookstore, and the VMI Museum, are currently open to the general public. Cocke Hall, Cormack Hall, and the Corps Physical Training Facility, though, remain closed to the public. ❧



Capt. Mary Schriver '14, assistant director of admissions, hands out information packets to matriculants as they arrive in Cameron Hall Aug. 21.—VMI Photo by H. Lockwood McLaughlin.

Shepherd Internships Show Challenges of Poverty

By Mary Price

This summer, four cadets took part in internships designed to show them a side of life many had not seen before as they participated in a program through the Shepherd Higher Education Consortium on Poverty (SHECP), which places students with nonprofits serving the economically disadvantaged.

Since 2012, VMI has participated in the Shepherd program, which began at neighboring Washington and Lee University. The program offers eight-week internships to students from colleges and universities across the country, with the goal of encouraging young people to make a difference by serving both disadvantaged individuals and their communities.

Erin Kozlowski '22, a psychology major and a midfielder on the Keydet women's soccer team, worked with STOP Inc. in her hometown of Virginia Beach, Virginia, and also in STOP's facilities in Norfolk and Franklin. STOP, an acronym for Supporting Transformational Opportunities for People, provides a variety of services to low-income individuals in southeastern Virginia.

"I take part in many different activities with STOP like doing wellness checks at a food bank, teaching a summer program of kids about substance abuse and prevention, and taking part in department meetings to brainstorm new activities and talk about the poverty rates in the area," wrote Kozlowski in an email in July.

The wellness checks, which include collecting data such as height, weight, blood pressure, and blood sugar levels, are a way of measuring changes in health as a result of food bank use, Kozlowski pointed out, as the STOP food bank emphasizes consumption of fresh fruits and vegetables.

"The most interesting thing so far to me is how much poverty affects my hometown that I wasn't aware of before the internship," she wrote. "It has been interesting to do research about Virginia Beach and to see how being impoverished affects the community here."

For Kozlowski, the Shepherd internship is a valuable stepping stone to her future career path as a nurse practitioner. "I am doing work in a clinic now with STOP Inc. and learning about health care and how to

treat patients," she wrote in an email over the summer. "I am working directly with a physician's assistant and a nurse who get to introduce me to health care practices I haven't done before."

Like Kozlowski, Sarah Anschutz '22 was attracted to the Shepherd internship program because of her interest in health care. Anschutz, a biology major, is trying to decide between pursuing a career in pharmacy or as a physician assistant, and her work with the Bradley Free Clinic in Roanoke, Virginia, exposed her to facets of both careers.

"I love my internship because I have so many different responsibilities and tasks depending on the day of the week," wrote Anschutz. On Mondays, she worked in the pharmacy, and on Tuesdays, she helped with intake of patients at the medical clinic. On Wednesdays, she assisted in the dental clinic and on Thursdays, she shadowed the nurse practitioner. When time would permit, she made reminder phone calls to patients and assisted with outreach to Roanoke's Spanish-speaking community.

"The most surprising part of my work so far has been what I have learned from interacting with the patients," Anschutz commented. "I have learned that you cannot assume every individual possess the basic health care knowledge that many of us take for granted." As examples, she cited knowing about the importance of maintaining oral hygiene and keeping blood pressure in a healthy range.

As she contemplates her future career choices, Anschutz is grateful for the learning opportunity the internship provided. "In this setting I am able to get my feet wet in both professions and gain experience in both fields," she stated. "I have been able to ask many questions and see firsthand the roles and responsibilities of each career, which has been very insightful and helpful."

Prior to their Shepherd internships, both women had had exposure to individuals in poverty through volunteering at homeless shelters and rescue missions, but both also found that they had more to learn.

"One thing I have learned from my time at the clinic is that poverty is not a choice and that one's health is one of the largest factors



Erin Kozlowski '22 understands the benefits of the community efforts done with her supervisor, Christina Creech, at the STOP Inc. food bank.—Photo courtesy of Erin Kozlowski '22.

that prevents them from reaching their goals," said Anschutz.

"I haven't volunteered locally in Virginia Beach in several years so it was eye-opening to see how the poverty numbers have increased so much since COVID-19 happened," Kozlowski commented. "I know now how poverty can affect people in many different ways and how important it is to get involved to help provide people in poverty with help and new opportunities."

This fall, Anschutz and Kozlowski are continuing their learning in a required class for Shepherd interns, "The Economics of Human Capability and Civic Engagement." In that class, taught by Col. Tinni Sen, professor of economics and business, cadets study human capabilities and how those capabilities can be constrained by factors such as poverty, health, and education.

In addition to Anschutz and Kozlowski, the other cadets completing Shepherd internships this summer were Rachel Mininger '23, who was with Advantage Cleveland in Cleveland, Ohio, and Emily Wells '23, with the Pearl River Public Defender Office in Poplarville, Mississippi.

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VMI Institute Report

VMI faculty and staff members overseeing the Shepherd program on post are Dr. Sabrina Laroussi, director; Col. Tinni Sen,

academic coordinator; Maj. Sara Blake, internship coordinator; and Lt. Col. Sara Whipple, council member.

Cadets who are interested in learning more about the SHECP internship should contact Blake or Laroussi. 📧



Cadre Week

Approximately 200 cadets returned early for Cadre Week, held Aug. 15–20, accompanied on post by roughly 200 more EMTs, cadet government leaders, and athletes preparing for the upcoming academic year. The week's activities included a brief from Superintendent Maj. Gen. Cedric T. Wins '85, an early morning run with Commandant Col. Adrian T. Bogart III '81, and march-up practice for Saturday's matriculation ceremony.—VMI Photos by Kelly Nye and H. Lockwood McLaughlin.



Cadet Project Focuses on South Africa

By Mary Price

In the summer of 2020, Mitchell Masterson '22 needed a history elective, so he signed up for a class on South Africa with Maj. Jochen Arndt, assistant professor of history.

One thing led to another, and by the spring of this year, Masterson was taking Arndt's senior capstone course on the end of apartheid in South Africa. This summer, working under the auspices of the Summer Undergraduate Research Institute, Masterson completed an independent research project on media coverage of South Africa's transition from apartheid to democratic rule, which took place between 1990 and 1994.

"I really liked the question that the capstone brought up, which was, 'How does the media create the first draft of history?'" said Masterson.

To explore that question further, Masterson decided to examine external versus internal media coverage of South Africa's transition. For an external news source, he used the New York Times, which had a reporter or reporters on the ground in South Africa from 1990 to 1994. For internal coverage, he relied on a collection of South African newspapers which he accessed via the Foreign Broadcast Information Service (FBIS), a CIA-operated initiative which monitored, collected, translated, and republished foreign newspaper articles for U.S. government officials. He also accessed the South African Press Association, which printed its own newspaper.

Luckily for Masterson, Preston Library recently acquired access to the FBIS database, which has a specific section on apartheid, making it much easier to do research without having to leave post.

Both Masterson and Arndt were quick to note that while it's commonly believed that South Africa's transition was a bloodless revolution, this was not the case. Thousands of Black South Africans died in a conflict that erupted in the early 1990s, and ethnic tensions between the Xhosa and Zulu, two groups of indigenous peoples, played a role. It was a political conflict as well, with the African National Congress (ANC), supported largely by Xhosas, and the Inkhata Freedom Party (IFP), supported largely by Zulus, fighting for control of the country.

"It was a civil war," said Arndt. "It was a civil war that was, in this case, taking place in the townships, which were essentially segregated living areas for Black Africans ...that surrounded the city of Johannesburg."

Tensions arose over jobs in Johannesburg, which weren't plentiful enough for everyone to have employment, as well as transportation to those jobs. Many township dwellers relied on taxis to get to work, and those too sparked conflict.

"There was violence on the taxis themselves—Molotov cocktails and hand grenades," Masterson noted.

Unsure of the reasons for the violence and unrest, reporters from the New York Times struggled at first to make sense of the situation. At first, they latched on to ethnicity as the root of the struggle—a reaction that could be ascribed to white bias and a tendency to look for a tribal narrative.

"The New York Times didn't really know where the violence was coming from, so they started focusing more on the Zulu/Xhosa

aspect," said Masterson. "It was a bias of seeing Africans as being tribal."

"When you report on a civil war, you hear a lot of different narratives," said Arndt.

Masterson commented that even the best-intentioned journalists can only report what they know and hear.

"Reporters arrive and they hear, 'These are Zulus and they're killing us because we're Xhosa,'" he said.

But at the same time, coverage within South Africa portrayed the cause of the unrest as political in origin. Over time, as its reporters learned more, the New York Times incorporated this view as well.



Mitchell Masterson '22 and Maj. Jochen Arndt discuss Masterson's research on the transition from apartheid to democratic rule in South Africa.—VMI Photo by Mary Price.

Digging deep, of course, takes time. "There's so many revenge killings going on, so many political peace talks, that the taxis kind of get pushed to the margins, but the economic problems—the lack of job opportunities—it's a little harder to report on," said Masterson.

"What's really interesting in [Masterson's] project is that ... it's concerned with the historical aspects of what was going on in the townships," said Arndt. "But then it's also concerned with the history of journalism, in the sense of how do journalists report on civil war? He demonstrates that journalists struggle with the messiness of civil wars because with civil wars, there's never one reason."

In the end, the journalists weren't far off the mark. "Historians do believe that ethnic identity was a factor in the violence, that political rivalry between the IFP and ANC was a factor in the violence," Arndt stated.

For his part, Masterson is looking forward to a December 2021 graduation and the possibility of law school down the road. He plans to present his research on South Africa at the November meeting of the Association for the Study of the Middle East and Africa, to be held in Washington, D.C.

"I really do value what I've learned here at VMI," he stated. "The resources, the people—everything has been incredible." ❁

Army Special Forces Veteran Now Commandant

By Eric Moore and Mary Price

“When I finally graduated from VMI, I decided I wanted to return as commandant, because it appeared to me there was no greater service to the nation at the end of a long career than to serve those that will lead the nation next.”

That’s what Col. Adrian T. Bogart III ’81 had to say about coming back to VMI after retiring from the U.S. Army Special Forces. Bogart assumed the role of commandant from Col. William “Bill” Wanovich ’87, who retired June 30 after seven years.

Bogart hopes to work with the VMI community to build upon the traditions of the Institute to educate and train citizen-soldiers for a changing world.

“There’s a foundation here that is timeless,” Bogart said. “The cadets, the families, the faculty, the staff, the friends, our alumni: they are all genuine people with genuine interest to come here to Lexington, Virginia, and to produce the nation’s leaders. This VMI family should be very proud of what we have here, the contributions that we make to the nation, and where we’re going to go.”

This fall, Bogart is getting to know cadets, a task he’s accomplishing by sitting in on classes, attending athletic practices, and eating with them in Crozet Hall.

“My focus as commandant is to have a professional relationship with every cadet I can to make sure we’re taking care of them—not only their health and welfare, but the good order and discipline of the Corps,” Bogart explained.

As he enters into the life of the Corps, Bogart will draw upon the lessons he learned during his own cadetship.

During his 1st Class year, Bogart faced a challenge of leadership and time management. His company commander broke his leg playing soccer, so Bogart, who had been executive officer, stepped into the role of acting company commander. This leadership opportunity was a “tremendous experience,” but it led to Bogart getting behind in his academics and returning for a fifth year.

“That was a big lesson learned,” the civil engineering major stated. “Where I am today and the things I accomplished in the Army should not be seen as justification for being a five-year cadet. I should have focused more on the academics.

“No one is perfect,” Bogart continued. “Everybody makes mistakes, but if you learn from them, that makes you a better person and a better leader.”

Bogart learned much about leadership during his 38-year Army career, which included 78 months in combat. He deployed as chief of operations, deputy C-9 (forward), with the Combined Forces Land Component Command (CFLCC) in Kuwait, and later took part in the initial planning effort for Operation Iraqi Freedom, deploying to Baghdad, Iraq. He served a total of three tours in Operation Iraqi Freedom and Operation Enduring Freedom, and he was one of the leaders transitioning south-central Iraq to Iraqi sovereignty.

In addition to his service in Kuwait and Iraq, he served three tours of duty in Afghanistan. During that time, he learned Dari, the most widely spoken language in Afghanistan, through the Defense Language Institute. Bogart is also proficient in French and German.

Bogart’s decades of service also included several tours in the

Pentagon and the Washington, D.C., area. Most recently, Bogart completed a 21-month deployment to Afghanistan. He then became chief of the Washington Field Office for the U.S. Southern Command, a position he held until his recent retirement. In addition to his degree from VMI, Bogart holds a master’s degree in diplomacy with a concentration in terrorism from Norwich University.

His awards include two Defense Superior Service Medals, with one for combat service; the Legion of Merit; five Bronze Stars; the Afghan Campaign Medal with two stars; Iraq Campaign Medal with six stars; Combat

Infantrymen and Combat Action Badges, as well as the Special Forces tab; German, Italian and U.S. Airborne wings; and the Presidential Service and Army Staff Identification Badges.

Now that he’s settled into the commandant’s office, Bogart wants cadets to know that his door is open to them.

“I want the Corps to understand this office is all about leadership, this office is transparent, and this office is very much open to the Corps,” Bogart emphasized. “I have a published open-door policy cadets can read, and I have times during the week that will be blocked for the open-door policy. I expect to have very mature and intricate discussions with cadets and cadet leadership on our path ahead.”

Teaching leadership and reinforcing the Institute’s role as the nation’s premier institution for leadership training are of critical importance to Bogart.

“What [cadets] learn here is how to be that genuine, humble, and effective leader that can win in a complex world,” the new commandant stated. “You can go anywhere you want, but if you want to be a leader, then you come to VMI.” ❁



Col. Adrian T. Bogart III '81

Summer Construction *continued from page 1*

was moved in 2014 to make way for the Aquatic Center. At that building, new structural steel framing has been put in to support floor joists, and eventually, Whiting-Turner, general contractor on the project, will move its field office into the building. When the Aquatic Center is complete, the American Legion building will have offices for athletic department staff on the first floor and a classroom/conference room on the second floor.

The Aquatic Center, which will replace the 52-year-old pool in the Cocke Hall Annex, will contain an indoor 50-meter swimming pool, two 1-meter springboards, two 3-meter springboards, and a 5-meter dive platform, plus seating for 570 spectators.

Wrapping up this fall will be the \$43.2 million Scott Shipp Hall project, an initiative which has included construction of a new, 28,000-square-foot addition to the building, plus renovation of the original 1918 portion and a 1955 addition. Construction of the new addition was completed in the fall of 2020, and that, plus the 1955 portion, opened for cadet and faculty use in time for the spring 2021 semester.

Contractors are currently working in the 1918 section of the building, with completion set for October or November 2021. Jarvis estimates that cadets and faculty will use the entire building in early 2022.



Contractors hope to have renovations to the 1918 portion of Scott Shipp Hall done this fall.—VMI Photo by H. Lockwood McLaughlin.

Two additional projects begun over the summer were renovations to both the Superintendent's Quarters and the Maury House, traditionally the home of the commandant. The renovation of the Superintendent's Quarters, the most

far-reaching in over 25 years, will include renovations to the historic home's electrical, mechanical, and plumbing systems, plus painting and other home maintenance tasks.

"A lot of it is just a freshening up," said Jarvis.

A ramp is being built at the Superintendent's Quarters from the sidewalk to the side door closest to the commandant's office, and a first-floor bathroom is being renovated to make it accessible to people with disabilities.

Because the Superintendent's Quarters is one of the oldest buildings on post, and is both listed as a National Register property and as a National Historic Landmark, its renovation has been undertaken in consultation with architectural historians at the state Department of Historic Resources. Work is scheduled for completion in the early summer of 2022.

The Maury House, also on the National Register and listed as a National Historic Landmark, was painted and received some minor



Lackey Park parking lot is located near Hinty Hall.—VMI Photo by Kelly Nye.

Continued on next page

maintenance over the summer before Col. Adrian Bogart III '81, commandant, moved in.

Two projects off post are impacting cadets, and one will have implications for the wider community as well. The first is construction of a new parking lot for cadet cars

at Lackey Park, near Hinty Hall and behind Rockbridge County High School. Work on the lot, which provides spaces for approximately 340 cadet vehicles, began earlier this year and was completed over the summer.

As in years past, one cadet from each 1st Class room will be allowed to park on post,

with the others required to keep their vehicles off post, now at Lackey Park. Plans call for all cadet cars to be kept at Lackey Park during the 2022–23 academic year.

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Plaza Honoring Marshall Placed on Parade Ground

Over the summer, a new project was completed that provides enhanced accessibility to the Parade Ground, honors the sacrifice of Allied soldiers in World War II, and recognizes the international contributions of Gen. George C. Marshall, VMI Class of 1901.

The project, which was completed with the help of architectural and engineering firm Wiley|Wilson and staff from Physical Plant, relocated the visual focus of the Parade Ground to New Barracks. New flagpoles, each 80 feet tall, were placed on either side of the statue of Marshall, and a 21-panel granite hardscape was built in front of the statue. Flanking the statue are two sets of stairs and two ramps, providing access to the Parade Ground for people who use mobility devices.

The entire project was designed with Marshall and his contributions, particularly those during World War II, in mind. While Marshall served in multiple roles after the war, among them secretary of state, secretary of defense, and architect of the European Recovery Program, commonly known as the Marshall Plan, he was instrumental as Army chief of staff throughout World War II as he led the largest military expansion in U.S. history.

"The idea was that the center line [of the Parade Ground] would be directed through George C. Marshall and New Barracks, and that's kind of the way this has been centered," said Aaron Groah, Physical Plant project manager.

Groah went on to explain that the tan color of the concrete on the stairs and ramps was chosen to evoke the sand of the beaches of Normandy, where Allied soldiers landed on June 6, 1944, beginning the long and bloody drive toward Berlin that would ultimately end the war in Europe. Surrounding the stairs and ramps are dwarf boxwood, which are meant to be reminiscent of the hedgerows of Normandy.

For the hardscape plaza in front of the statue, there are 21 panels to represent a 21-gun salute, the highest honor a nation can render.

"We went with a cobblestone look, which was a call-out to the streets of Europe, World War II, and there was also [symbolism] with the cobblestone itself," said Groah. "As you can tell, each stone is

individual in nature. We tied that in with the individuality of each cadet that comes through VMI."

The seven-foot bronze statue of Marshall, the work of Mexican sculptor Augusto Bozzano which was first placed on the Parade Ground in 1978, was cleaned and polished while in storage. Corrosion had damaged the base of the statue, so a bronze conservator was called in for expert assistance with the repair.



The new plaza in front of Marshall Arch features a walkway for viewing the statue up close and stairs for easier access onto the Parade Ground.—VMI Photo by H. Lockwood McLaughlin.

The new flagpoles, three feet taller than their predecessors, are a reminder that the Institute is a part of a much larger world.

"The two flagpoles are central physical elements of post, promoting both our allegiance to the United States and the commonwealth of Virginia," noted Brig. Gen. Dallas Clark '99, deputy superintendent of finance, administration, and support.

"It is here that cadets daily gather in formation and salute for the rising and lowering of the colors," Clark stated. "The completed project appropriately places the flagpoles in the center of the three barracks facilities. Now completed, the flag poles are flanked with other aesthetic beautifications, enhancing both the access to the Parade Ground and the statue of VMI's most distinguished graduate, General George C. Marshall."

— By Mary Price

Matriculation Week

The Rat Mass of 2022 plus 3 took part in many activities during Matriculation Week, among them getting haircuts, participating in company athletics competitions, memorizing their Rat Bibles, and climbing House Mountain. —VMI Photos by H. Lockwood McLaughlin, Eric Moore, and Kelly Nye.





STP Returns

After a year's absence due to the coronavirus pandemic, the Summer Transition Program (STP) returned this year with 158 incoming cadets enrolled. Participants were tested for COVID-19 upon arrival, but in a departure from years past, were not allowed to leave for weekends. During the four weeks of STP, participants completed one academic course, underwent a rigorous physical training routine, and bonded with future brother rats.—VMI
Photos by Eric Moore.



Plastics Reduction Effort Leads to Postwide Changes

By Mary Price

As cadets and other members of the VMI community returned to post for the fall semester, they were met by several changes, including some in areas pertaining to food and concession operations. These changes were made in order for the Institute to comply with Executive Order 77, which directs all state agencies to reduce Virginia's reliance on single-use plastics.

Virginia Gov. Ralph Northam '81 announced the executive order in a speech earlier this year given at the Environment Virginia Symposium, which has been hosted by VMI ever since its inception three decades ago. In making this announcement, Northam stressed the huge volume of trash going into the state's landfills: approximately 22.5 million tons each year.

"Single-use disposable plastic items in particular pose a severe and growing threat to fish and wildlife and to the health of our Chesapeake Bay," said Northam in March. "We know the planet will be better off if we stop using so much plastic. The Commonwealth must and will lead by example."

VMI leadership has appointed a cross-functional committee to implement the research, purchasing, inventory, communications, and future planning that comes with Executive Order 77.

The order offers a detailed road map forward in curtailing the use of plastics by state agencies. The buying, selling, or distribution of single-use plastic bags, single-use plastic and polystyrene food service containers, plastic straws and cutlery, along with single-use plastic water bottles, was outlawed as of July 21. Over the next few years, state agencies are to replace remaining plastics with biodegradable containers or containers with high levels of recycled content.

Staff from VMI Auxiliary Services, which oversees dining, catering, and concessions across post, as well as the VMI Bookstore, spent months this year planning changes necessary to be in compliance with the order.

Already, they've elected to replace plastic water bottles with aluminum bottles. Twenty-ounce plastic soda bottles will be replaced with soda cans, once the remaining inventory of bottles is sold out. By the end of the academic year, plans call for vending machines dispensing plastic bottles to be replaced by machines dispensing soda cans.

Reusable beverage containers that can be filled either in the PX or in Crozet Hall are being offered for sale this fall. Over the past several years, Physical Plant employees have been replacing old-fashioned water fountains across post with fountains designed to allow for the refilling of water bottles, and that effort will continue in the coming months and years.

Some changes had already taken place before the executive order was issued. Styrofoam "clamshells" for takeout food had been phased out and replaced with biodegradable ones, as cadets who received takeout meals during the coronavirus pandemic found that Styrofoam made their food soggy.

At the bookstore, which is managed by Follett Corp., the change to paper bags for merchandise has already been made.

The statewide scope of the change has eased the transition. Because Executive Order 77 applies to all public colleges and universities in Virginia, moving away from plastics "isn't a foreign concept to our vendors," noted Lt. Col. Lee Clark III '93, director of auxiliary services.

Another issue that's been brought to the forefront by the executive order is the use of plastic



Reusable bottles are for sale in the PX.—VMI Photo by Kelly Nye.

bags to line trash cans. While VMI has gotten an extension from the state in order to keep using the bags in the immediate future, plans call for eliminating individual trash cans in offices and classrooms and moving to the use of a shared receptacle for trash in common areas. No changes are planned for barracks trash collection.

Other changes to be implemented in the coming months and years will include buying liquids such as bleach and motor oil in the largest containers possible, to cut down on the number of containers needing to be disposed of.

Those involved with making these changes noted that recycling options in Lexington are limited to non-existent at the present time, thanks largely to the global downturn in the market for recyclables. "Unfortunately, now, everything is trash," said Maj. Eric Schwartz '95, deputy director of Physical Plant. VMI hopes that the recycling market turns around so we can be better stewards of our natural resources.

All involved stressed that adapting to the executive order will take time and a multitude of changes, some major and some minor, implemented over a period of years.

"It's a four-year reduction plan overall," said Schwartz. 🌱

VMI Hosts SMC Cyber Fusion

By Mary Price

Approximately 35 attendees, most students and faculty members from the nation's six senior military colleges, participated in Senior Military College Cyber Fusion 2021, a first-of-its-kind conference held on post Aug. 2-3.

The gathering, which was designed to introduce the field of cybersecurity and stress its critical importance to students from a variety of majors, was modeled on Commonwealth

Cyber Fusion, an event for college students that's been held at VMI for the past five years. Hosting the competition was VMI's Cyber Defense Lab, which was begun last fall thanks to a Department of Defense grant establishing such laboratories at all of the nation's senior military colleges. In addition to VMI, those institutions are Virginia Tech, the Citadel, the University of North Georgia, Norwich University, and Texas A&M.

On the first day of the conference, attendees heard talks from a wide variety of experts within the cybersecurity field, among them keynote speaker Dr. Deborah Frincke, associate laboratory director for national security sciences at the Oak Ridge National Lab. They also gathered into groups in which they were asked to solve cybersecurity challenges from the perspectives of leaders such as a chief executive officer, chief information officer, and chief financial officer.

"They're placing us in real world scenarios by saying, 'You are the leader of your specific organization,'" said John Barker '23, one of the cadet attendees. "It's like trying to virtually run a business without the consequences of making a wrong choice."

On the second day, participants took part in a capture the flag competition. This event was a Jeopardy-style competition in which five teams solved individual challenges of various point values across different categories to score points.

Winning this year's event and taking home the Senior Military College Cyber Trophy was the University of North Georgia. A combined team of students from Norwich and Virginia Tech took second, and the VMI team placed third. Representing VMI were Barker, Jordan Beck



Dr. Mohamed Azab assists Thomas Champion II '23 during the Cyber Fusion conference held in Marshall Hall Aug. 2-3.—VMI Photo by H. Lockwood McLaughlin.



Representatives from six senior military schools, Norwich University, Texas A&M, the Citadel, University of North Georgia, Virginia Tech, and VMI, participate in the Cyber Fusion conference held in Marshall Hall Aug. 2-3.—VMI Photo by H. Lockwood McLaughlin.

'23, Thomas Champion II '23, Joseph Kolly '23, Aidan Noonan '24, and Alex Rodriguez '22. The faculty advisor was Dr. Mohamed Azab, assistant professor of computer and information sciences.

Acting as a facilitator for one of the conference's activities was Bryce Bucklin '17, whose efforts as a cadet led to VMI's first Commonwealth Cyber Fusion event in 2017. Bucklin, now a senior penetration tester at Coalfire, a cybersecurity consulting firm, emphasized that protecting digital infrastructure is vital to the nation's future.

"This field is really, really important," said Bucklin. "You hear about hacking every single week now. It's so tremendously important and needed."

It's especially important for those planning military careers, Bucklin believes. "These [students] are our future military leaders," he commented.

Bucklin can even see a time in which the United States has a standalone branch of the military dedicated to cybersecurity.

"We have so many cyber units that eventually someone is going to want to consolidate them into a branch," he commented. "[Today's

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Lt. Col. Troy Marshall

Lt. Col. Troy Marshall passed away in a tragic accident Thursday, June 17, 2021, at the age of 54.

Marshall was a veteran of the U.S. Coast Guard, and was with the New Market Battlefield State Historical Park since 2001, with half of his time there serving as site director.

“Troy’s admiration for VMI and his love of public history were reflected in his leadership of the Virginia Museum of the Civil War and Battlefield Park,” said Col. Keith Gibson ’77, director of the VMI Museum System. “This leadership extending over two decades will be deeply missed.”

The museum was closed on June 18 in tribute to Marshall, and reopened the next day, as the staff knew that’s what he would have wanted.

Donny White ’65

Donny White ’65 passed away on Tuesday, Aug. 17, at the age of 78 after an extended illness. White served 35 years at VMI, including his final role of director of athletics, in which he supervised ambitious capital improvements, the development of women’s athletic programs, and the move of all sports conference affiliations. He retired in November 2013.

Prior to taking the VMI athletic director post in May 1998, White compiled a distinguished VMI coaching career in two sports—football and baseball—spanning 15 years.

White was a distinguished military graduate and was awarded the VMI Intercollegiate Athletic Award his senior year. He was inducted into the VMI Sports Hall of Fame in 1975. After graduation from VMI, White was commissioned as a field artillery officer in

the U.S. Army and served a tour of duty in Vietnam. His decorations include the Bronze Star, Purple Heart, and Air Medal with four oak leaf clusters.

Peter Maxwell ’21

Peter Maxwell ’21 passed away on Saturday, July 17. Maj. Gen. Cedric T. Wins ’85 expressed the Institute’s deepest condolences to Maxwell’s family at the announcement of his tragic death.

Maxwell was an economics and business major from Bedford, Virginia, and a member of Company F.

Janet Cummings

Janet Cummings, executive secretary in the Department of Modern Languages and Cultures, passed away on May 18 at the age of 81. She was one of the longest-serving employees on record at VMI, working in the same department since 1961—just shy of 60 years. She spent 38 of those years in the same office of Scott Shipp Hall.

Her true dedication to the department was formally recognized with a Distinguished Service Award in 1998, and her years of service were celebrated at a breakfast in 2012, honoring her 50 years at the Institute.

In an article from 1999, Mrs. Cummings was quoted as saying, “When we went to computers here at VMI in the mid-1980s, I thought they wouldn’t amount to anything. I was perfectly happy with my IBM typewriter. ...But there sat the computer, so I started to read all the manuals. I wanted to know exactly how the computer worked. ... Life itself is an ongoing educational experience.” ❀

Cadet Researches Women in Terrorism

By Mary Price

This summer, Alexandra “Allie” Sassaman ’22 delved into research for her national security minor thesis, which will focus on the roles of women in terrorism and counter-terrorism and their reasons for involvement.

For Sassaman, who plans to commission into the Marine Corps, the work is part of her professional preparation. “When I am deployed and abroad, I will probably encounter women combatants, and more so in terrorist organizations, so that’s what struck my initial interest,” she explained.

Not surprisingly, it’s difficult to find information about female involvement with terrorist organizations, either directly or indirectly, so Sassaman has



Alexandra Sassaman ’22 receives guidance on her research on women in terrorism from Dr. Vera Heuer.—VMI Photo by Eric Moore.

been researching women’s participation in conflict over time and across cultures.

“There’s a long history [of women in conflict],” said Dr. Vera Heuer, associate professor of international studies, who is mentoring Sassaman’s work, which was conducted under the auspices of the Summer Undergraduate Research Institute. “They go back quite a bit.”

Sassaman was able to determine that women involved with terrorist organizations usually have some family ties.

Continued on next page

“There’s women who get involved because they’re a bride, or they get involved because their father or brother is involved,” she noted. “There’s very few that join a terrorist organization on their own accord.”

Initially, Sassaman thought she’d just focus on women who are involved with terrorist organizations, but then she broadened the scope of her work to include women who work for counter-terrorist organizations, including the military. Those individuals, she’s found, frequently volunteer for service.

For example, there’s the Jegergruppen, a Norwegian special forces group that was formed in 2014. It’s one of the few all-female special forces units in the world, and one that’s been used to search and communicate with women in Afghanistan.

“There’s a lot of cultural sensitivities to that that men can’t necessarily do, but women can,” said Sassaman.

There are also an all-female Kurdish group fighting ISIS and the Afghan Female Tactical Platoon. “They’re used like the Norwegian group—kind of like the mediators with the women and the children,” said Sassaman of the Afghan unit.

An important difference between the two groups is that the Kurdish one is not state sponsored while the Afghan one was at the time of the study, and that’s raised an interesting question.

“Is the recruitment to counter-terrorism different if you’re basically an expansion of the state, or if you’re fighting in a loose, local fighter group?” asked Heuer.

That’s just one of many questions Sassaman’s research has raised. She described her summer as one of “sorting and reading,” and she dug through a variety of sources to learn more.

“A lot of it has been scholarly articles from specialists in terrorism,” she stated.

“Data availability is a problem because we’re relying on sources put together by other experts and there’s not that many female interviews,” Heuer added.

But as she sorted and read, Sassaman reaped the rewards of learning for learning’s sake.

“There’s a lot to learn, and it’s fascinating to read about,” she said. “As an officer in the military, this is something you could potentially face, and I think that’s intriguing.” ❁

Summer Project Could Lead to Lunar Return

By Mary Price

As a high school student, Jacob Benny ’22 had a natural talent for math, and he’d also discovered an interest in physics.

But work on a project for NASA before he’d even earned a college degree? That seemed to be an out-of-this-world ambition.

This summer, the mechanical engineering major described himself as “a kid in the candy store” as he worked on a project for NASA Langley’s Vertical Solar Array Technology Group in support of the Artemis project, which seeks to return humans to the moon by 2024. Benny’s work, which is being funded by NASA Langley, may someday be used to help power lunar rovers and other devices on the moon.

NASA probes have found evidence of water at both the north and south poles of the moon, explained Col. Joseph Blandino, professor of mechanical engineering, who is overseeing Benny’s work. That bodes well for

human settlement and survival there—as does the fact that much of the water is located at the south pole of the moon, which gets

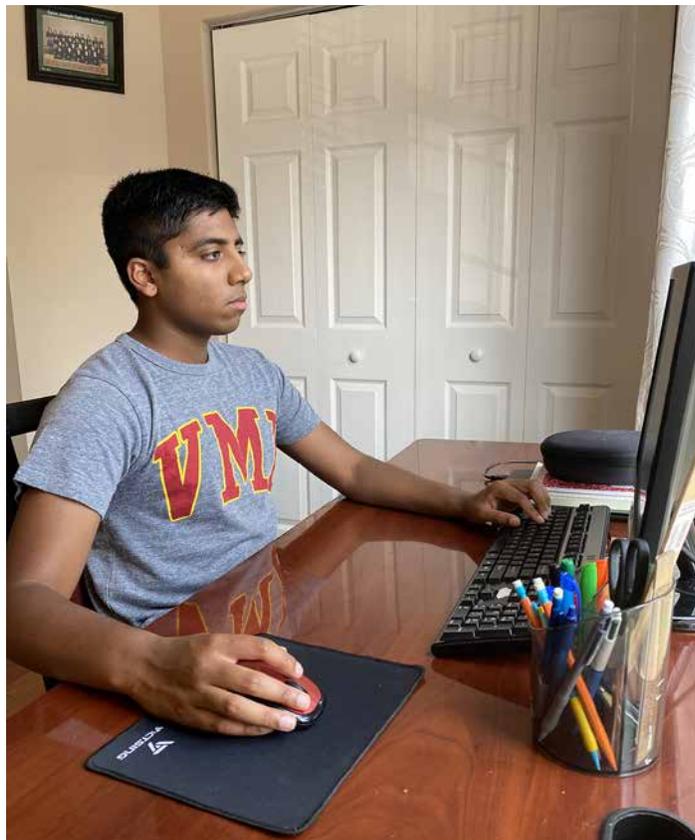
almost constant sunlight. Because of this, it’s possible to charge batteries by means of a deployable photovoltaic solar array.

But it’s never that easy—especially away from planet Earth. Benny described the moon as “a harsh thermal environment” in which one side of a solar array is always going to be hot and the other is always going to be cold. “There will be some kind of thermal bending,” Benny observed.

To prevent this issue, which could lead to problems deploying and retracting the solar array, Benny sought to make two computer programs, Thermal Desktop and Abaqus Finite Element Analysis, talk to each other.

As he did so, he built on the work of Jerry Haste Jr. ’21, whose Institute Honors thesis, “Temperature Profile of a Photovoltaic Array Located at the South Pole of the Moon,” was one of five recipients of the Wilbur S. Hinman Jr. ’26 Research Awards at this year’s Institute Awards ceremony.

“[Benny] is looking at the thermal issues and developing a code where [Haste] started that performs



Jacob Benny ’22 researches the use of solar power for NASA’s planned return to the moon in 2024.—Photo courtesy of Jacob Benny ’22.

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From Brazil to Lexington to Tokyo

Commandant's Staff Member Attended Third Olympic Games

By Mary Price

Col. Marcelo Gonçalves has a well-worn passport, a track record of travel to a multitude of international competitions, and a passion for a lesser-known Olympic sport: modern pentathlon. He's also a native of Brazil whose chance online encounter with a former VMI faculty member led not only to a move to the United States for himself and his wife, but also, in a roundabout fashion, to his current position as a member of the commandant's staff.

At the end of July, Gonçalves traveled to Tokyo, Japan, as a technical delegate for modern pentathlon—a job similar to that of a referee. Unlike a referee, though, Gonçalves and the other technical delegates at the Olympics had to know the rules for five sports, as modern pentathlon is made up of fencing, swimming, riding an unfamiliar horse over jumps, shooting, and running.

For Gonçalves, it was his third appearance at an Olympic-level competition, as he was the main judge at the 2016 Summer Olympics in Rio de Janeiro, Brazil, and also served as a technical delegate at the 2018 Youth Olympics in Buenos Aires, Argentina. He's also been a coach, judge, or technical delegate at six Pan American Games.

The pandemic-restricted trip to Tokyo was short on sightseeing, as Gonçalves and others were only allowed to travel between their hotel and the Olympic venue, but it was long on hospitality.

"The Japanese people were so nice to us," said Gonçalves a few days after he returned to Lexington. "From the taxi driver to the people that were assisting with the competition, they were so nice."

Gonçalves did encounter a language barrier: "Not many people in Japan speak English," he reported. But smiles went a long way towards bridging the gap—and even the taxi drivers gave small gifts to Gonçalves and other Olympic officials.

The Japanese also impressed Gonçalves with their work ethic. "The Games were very, very well organized," he said. "They built a 25-meter, six-lane [swimming] pool in four days."

The only incident marring the longtime official's Olympic experience was one well-publicized instance of misconduct during the equestrian portion of the competition, when a German coach reached over the rail into the competition arena and struck a horse. The individual responsible was issued a black card by the executive

board of the International Modern Pentathlon Union (IMPU) and was thus disqualified from further participation in the Games.

In the wake of international outcry over the incident, the IMPU has formed a riding working group to ensure horse welfare going forward.

A rider himself, since equestrian is a mandatory subject at his alma mater, Academia Militar das Agulhas Negras, Brazil's top military academy, Gonçalves knows that riding is unique among Olympic sports because it involves a partnership between human and animal.

"Horse and rider are a set," he commented. "If they don't match, you're going to have problems."

Gonçalves's path from south of the equator to Old Barracks was one that he'd never envisioned. As a young man, he hadn't considered leaving his homeland, nor did he ever think of becoming involved with modern pentathlon.

Gonçalves's turning point came around 2005, when he was stationed with a jungle brigade in the Brazilian Army and taking a class with a sociological focus. A professor had assigned a paper, and Gonçalves decided to write about how Army officers were trained in the United States versus in Brazil. As part of his research, Gonçalves sent emails to individuals working at military schools in the United States.

One of them was Maj. Neal Messer, who was then teaching Spanish at VMI. As Gonçalves tells the story, it was truly a random choice. "I'm a major, and he's a major. That's a connection, right?" Gonçalves said of his thought pattern at the time.

That email sparked a friendship that endures to this day. Messer replied to Gonçalves's email with the first paragraph written in fluent Portuguese, and the rest in Spanish. Sometime later, Messer came for a month-long visit with Gonçalves and his wife in Brazil, and in August 2006, at the invitation of then-superintendent Gen. J.H. Binford Peay III '62, Gonçalves came to VMI to observe matriculation.

By that time, Gonçalves had become a lieutenant colonel in the Brazilian Army—and while he wasn't entirely sure what the future would hold, he knew he didn't want to try for general.

At that point, Messer planted the seed of an idea. "Why don't you come to the United States and work in a military school here?" he



Col. Marcelo Gonçalves and Russia's Dmitry Menshikov are members of the Modern Pentathlon International Federation Technical Committee and pose at the pentathlon venue in Tokyo.—Photo courtesy of Col. Marcelo Gonçalves.

asked Gonçalves. With Messer's help, Gonçalves created an American-style resume, and in November 2011, he became commandant of cadets at Massanutten Military Academy in Woodstock, Virginia, and several years later accepted a position as cadet life supervisor at Randolph-Macon Academy in Front Royal. Since March 2019, he's been an officer in charge at VMI, taking responsibility for cadets from 4 p.m. to midnight.

But even as Gonçalves has been crossing cultures and borders, he's also been staying involved with modern pentathlon, a sport he first encountered in the late 1990s. An avid fencer, he was initially recruited to help a pentathlon competitor who needed to improve her fencing skills, and his involvement snowballed from there. Since 2012, he's been one of 12 members of the technical committee of the IMPU.

"These 12 technical committee members are assigned to go to competitions not as judges, but more as managers," said Gonçalves. "We supervise the competition as a whole."

While he's never been a competitor in the sport, Gonçalves came to it with a very appropriate background. Baron Pierre de Coubertin, the founder of the modern Olympic Games, established the modern pentathlon to test the skills of Army officers, who at that time needed to not only run, swim, shoot, and fence well, but also be able to ride an unfamiliar horse. An event for men has been a part of each Olympic Games since 1912, and one for women was added in 2000. At the Olympic level, modern pentathlon is an individual sport, and this year, the Tokyo venue welcomed two sets of athletes: 36 men and 36 women.

It's a sport with many challenges, the disparate disciplines being foremost. "For pentathlon, normally the most difficult discipline for judges is the fencing," said Gonçalves. "We used to call fencing, 'chess played at light speed.' You need to have eyes adapted because things happen very fast." To make the fencing event even harder, there's no instant replay as there is for many sports.

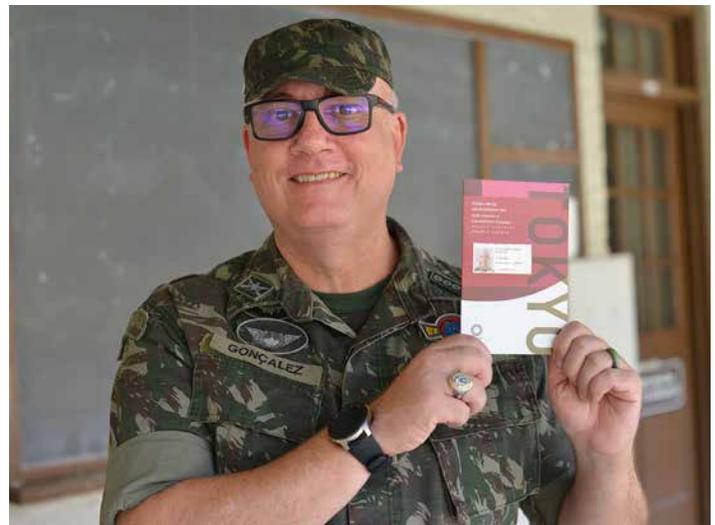
Over the years, Gonçalves has traveled to many foreign countries, including Egypt and Bulgaria. In 2019, he traveled to Japan for a test event, to make sure that everything would go smoothly for the

Olympics, which were then slated to take place in 2020. His knowledge of five languages—Portuguese, Spanish, English, French, and Italian—has come in handy, and he's enjoyed the endless learning that comes with travel.

"We always learn something," he said. "Every single competition—I already have over 50 top-class competitions—in every single one, I learn something new."

Gonçalves has also made friends all over the globe. "It's a very dynamic sport, and everyone knows everyone," he commented. "It's like a big family. It's not a very popular sport ... there's not but that many people attending competitions."

And while he's almost certainly among the few members of the VMI family who've directly participated in the Olympics, he isn't the first involved with modern pentathlon. Gen. George S. Patton, who graduated from the U.S. Military Academy but matriculated with the VMI Class of 1907, competed in the first modern pentathlon at the 1912 Summer Olympics, held in Stockholm, Sweden. ❀



Col. Marcelo Gonçalves shows his credentials as an official at the Tokyo 2020 Olympic Games.—VMI Photo by Eric Moore.

Lunar Return *continued from page 15*

a coupled thermal structural analysis," Blandino explained.

For Benny, the hardest part was learning two software packages—Thermal Desktop and Abaqus—at the same time, plus two computer programming languages, C# and Python.

"The most difficult part of the project has been getting introduced to all of these programs," he commented in July. "It's a lot to handle, but I'm really enjoying it. There's a lot of layers of the onion. You keep peeling, and you go, 'Oh, I need to learn something about this tool.'"

He's also enjoyed his mechanical engineering coursework at VMI. "Mechanical

engineering is super, super fun and interesting to me," said Benny, who plans to commission into the Navy after VMI. "I have a blast in class."

His work may just help others blast off from the Earth's surface. Exploring the outer solar system has been a dream for humankind for centuries, yet despite all of our technological advances, no one has been there yet.

To boldly go where no man has gone before, it's best to start from the moon. Not only does Earth's only satellite have one-sixth of our planet's gravity, but since the moon has water, and water is made up of hydrogen and oxygen atoms, it's possible to

split water molecules apart into their component parts and make rocket fuel.

"If you can produce your fuel on the moon, you're cutting your costs roughly by half to explore the outer solar system," said Blandino. "What [Benny] is doing is an important part of this."

As for Benny? To say that he's amazed at the direction his cadetship has taken would be an understatement.

"I wouldn't have rated myself as a really good candidate coming out of high school, transcript-wise and everything," he commented. "I've taken the opportunities at VMI and just run with them—worked as hard as I could." ❀

Rat Brains and Betta Fish Support Lab Learning

By Mary Price

Maj. Molly Kent's neuroscience lab was a busy place this summer, with multiple cadets working on multiple projects split over the two summer sessions. But despite their wide-ranging projects, the cadets shared a common bond: a desire to learn lab skills and grow as scientists.

Kent, assistant professor of biology, came to VMI in the fall of 2020 from the University of Richmond, where she was involved in a research project in which lab rats were taught to drive tiny, rodent-sized cars. The rats, many of whom became very adept drivers, were allowed to live out their natural lifespans. Since then, their preserved brains have come to Kent's lab for study, so cadets can compare the brains of rodent drivers with the brains of rats who never learned to drive.

Another project in the lab this summer included studying differences between the brains of lead-exposed rats and rats without lead exposure. A third rodent-related initiative had to do with examining the brains of rats who've had plenty of bedding in their cages as youngsters versus those who've had little. It was a way of mimicking high versus low socioeconomic statuses among humans, and learning how scarcity affects brain development, as well as how animals respond in terms of stress and resilience.

Unlike some labs in which specific cadets are assigned to certain projects, in Kent's lab everyone does a little of everything and helps with all of the experiments currently underway. Kent's goal is to allow the students to learn as many techniques as possible during their summer session, specifically during their first summer in the lab.

"I've really been able to learn by doing," said Gabby Handford '24, who began working in Kent's lab last fall, just a few weeks into her 4th Class year. Since she'd developed an interest in neuroscience in high school, signing up for a class with Kent and working in the lab seemed like a natural fit.

This summer, Handford learned new skills as she examined the brains of the rats from abundant versus deprived environments. Using a brain scanning technique, Handford was able to analyze a hormone associated with resilience in the brains of rats.

"It's been pretty cool," she said. "Dr. Kent showed me how to use ImageJ, a software analysis tool, to analyze the images."

She also learned a process known as isotropic fractionation, which Kent and the cadets more commonly call "making brain soup." To make brain soup, students homogenize a brain area called the diencephalon, which includes the thalamus and hypothalamus, both needed for sensory and hormonal

processing. Once the brain area is homogenized into brain soup, the total cells are counted under the microscope. The final step is to identify only neurons in the brain area by examining them under a microscope and counting cells again.

"I'm really glad I'm learning the research skills early," said Handford, who plans to attend medical school. "I've got two more summer sessions and three more years of

research here. I feel very lucky to end up in the lab where I want to work for the rest of my VMI career."

Sam Wolfe '23 was likewise happy to be learning new skills in the lab. He's taken two classes with Kent—endocrinology and neuroscience—and this summer he applied what he'd learned. "All of the stuff we'd been talking about, we're all of a sudden doing and seeing," said Wolfe.

Some of the techniques Wolfe picked up this summer were learning to perform an enzyme-linked immunosorbent assay (ELISA) test, and doing two kinds of stains on brain cells: NeuN and Golgi. The NeuN stain is used to identify proteins found in neurons; the Golgi stain is used for analyze neurons for shape and size. The ELISAs Wolfe and the other cadets did this summer allowed them to measure hormone levels from different animal subjects. They were able to measure the stress hormone cortisol and a resiliency hormone called DHEA to see if the amount of bedding during early life can affect an animal's resilience to stress.

"I think the research skills are important because it's like education—knowing something and not just in a factual way," said Wolfe, who is thinking of becoming an Army doctor. "It's a different type of learning."

Both Enero Ugalde '22 and Jon Tobin '22 found collaborating with others to be one of the most valuable aspects of working in the neuroscience lab. "There's a good vibe in this lab," Ugalde commented. "Dr. Kent is awesome."

"It's one of the pleasant surprises being in the lab this year, knowing there's so many different projects going on," said Tobin. "I'm grateful to be here with my peers and with people who share the same desire for academic excellence. It's nice to have that community in the lab."

Both cadets used the summer to get a head start on research that they'll continue during their final year at VMI. For Ugalde, a double major in biology and psychology, that involves a project having to do with involving cognitive training



Jon Tobin '22 examines a betta fish in Maj. Molly Kent's lab.—VMI Photo by Kelly Nye.

Continued on next page

and neuroplasticity, or the concept that the brain can change in response to experiences. During the academic year, he plans to take a group of cadets, perhaps a sports team, and measure their performance before and after completion of a series of online games designed to improve brain function in certain areas.

Ugalde also enjoyed the chance to try new things this summer. “I’ve just today learned how to make the [brain soup],” he said. “That’s honestly one of the coolest things we’ve done.”

Tobin, meanwhile, worked with betta fish, which live in small, individual tanks in Kent’s lab. He’s planning to write his Institute Honors thesis on how acute stress can induce certain behavioral patterns and genetic expressions among betta fish.

It’s rather easy to stress a fish: all you have to do is chase them around their tanks a bit, or in the case of the aggressive betta fish, show them to each other. Currently, the fish are kept so they can’t see each other, but later on, Tobin plans to position their tanks so they can see, for the first time since they arrived at VMI, that they aren’t the only fish in the room.

Once the fish have seen each other, Tobin plans to measure their levels of a protein



Betta fish allow cadets in Maj. Molly Kent’s lab to perform experiments with live animals.—VMI Photo by Kelly Nye.

called c-Fos, which is an immediate early gene. The gene will allow Tobin to identify which areas of the fish brain are activated after they see another male betta. Along with brain activation, Tobin has also collected hormones to see how the brain, hormones, and behavior correlate with each other. The data will provide the team with a better understanding of how acute stress can affect an aggressive fish.

“This lab has given me the opportunity to work with live animals and study their

behavior,” said Tobin, whose previous experience with fish was limited to catch-and-release fishing. “It’s kind of cool being in here and working with them for a scientific purpose.”

In the second summer session, Wolfe, along with Alex Feher ’23 and Samantha Fee ’23, studied sex-linked differences in the brains of stickleback fish—an initiative that could show intriguing results, since the male stickleback takes all of the responsibility for raising the young of the species. Kyle Tidwell ’22 also began work on his senior thesis project, which will focus on the effect of chronic stress on betta fish.

“I want the students to learn as much as they can in a summer session, so I try to have as many different projects as I can to facilitate that,” said Kent. “Many of my students plan to continue their education after VMI, be that in medical school or graduate school, and I want to help prepare them for those future endeavors by teaching them hands-on techniques that they might not see in class. They also participate in designing experiments, so that they know to always ask questions and strive to understand science.” ❁

Cyber Fusion *continued from page 13*

cadets are] going to be the lieutenants, the majors, the colonels, the generals in this new cyber branch.”

Agreeing with the importance of cybersecurity education was Col. Mohamed Eltoweissy, head of VMI’s computer science department and director of the Institute’s Cyber Defense Laboratory.

“This is the Department of Defense and the senior military colleges coming together to prepare the leaders of the future in cybersecurity,” said Eltoweissy of the conference. “There’s a great gap in cybersecurity talent. ... The senior military colleges are best qualified for developing leaders of the future.”

According to Eltoweissy, cybersecurity is a constant pursuit of trying to outwit hackers. “As we are evolving our defenses, we also know that hackers are evolving their strategies and their algorithms,” he said. “We

are using AI and our data analytics, and they are doing exactly the same thing. We have to develop solutions, assuming and knowing that hackers are inside our networks.”



Col. Mohamed Eltoweissy welcomes participants to the Cyber Fusion conference in Gillis Theater Aug. 2.—VMI Photo by Kelly Nye.

It’s also vital to have a mindset that cybersecurity isn’t just for individuals who work in the field of information technology.

“Students and faculty and almost everyone needs to be immersed in cybersecurity and have the mentality that things have to be protected and secured all of the time,” said Eltoweissy. “Security is like brakes on a race car. It’s not there to make us stop. It’s there to make us have confidence for speed.”

Others who made this conference possible include staff from the Center for Leadership & Ethics, Chelsea Bendick, David Jones, and Sibi Bagavathy ’23. ❁



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Summer Construction *continued from page 9*

The construction of a bridge over the South River on the Chessie Nature Trail will benefit all trail users, including cadets, who frequently use the trail for ROTC marches and other military activities, as well as individual exercise. The project, which has been in the works for several years, is slated to take a major step forward this fall when a prefabricated bridge is put in place.

Three initiatives still in the planning stages are the postwide safety and security project, an expansion and renovation of Nichols Engineering Building, and a phase II of the Center for Leadership and Ethics, which would add another building behind Marshall Hall.

The goal of the postwide safety and security project is to set up a system of vehicular gates and barricades that could be deployed as needed to shut down post in the event of an emergency or the area around the Parade Ground when cadet training demands dictate. Wiley|Wilson, a Lynchburg-based architectural and engineering firm, is working on the \$10 million project, which could be underway by next summer.

A nationwide emphasis on preparing students for STEM careers has created an increase in the number of engineering majors and thus a shortage of lab space. Once the new swimming pool in the Aquatic Center opens, the current pool will be closed, and the Cocke Hall Annex will be demolished to make way for a 22,000-square-foot addition to Nichols, to be complemented by a renovation of the main portion of the building.

Jarvis expects design of that \$57 million project to get underway this fall, with construction tentatively set to begin by the end of 2022 or beginning of 2023.

For phase II of the Center for Leadership and Ethics, a feasibility study has been completed but funding authorization is still pending. Once that's been received, a request for proposals for a design will be issued. ❄



Construction continues on the Aquatic Center, which will contain an indoor 50-meter swimming pool, two 1-meter springboards, two 3-meter springboards, and a 5-meter dive platform, plus seating for 570 spectators.—VMI Photo by Kelly Nye.

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