

VIRGINIA MUSEUM OF NATURAL HISTORY
Board of Trustees Research and Collections Committee

Saturday, Nov. 20, 2021

9:00-9:45 a.m.

A G E N D A

- Call to order: **Dr. Art Evans**
- Roll Call: Dr. Art Evans, Dr. Tom Benzing, Dr. Carole Nash, Lisa Moerner, Melany Stowe, Mark Buss.
- August 2021 Research and Collections Committee meeting minutes (action item)
- July-September 2021 acquisitions (action item)
- Other business: **Dr. Art Evans**
- Adjourn: **Dr. Art Evans**

The mission of the Virginia Museum of Natural History:

To interpret Virginia's natural heritage within a global context in ways that are relevant to all citizens of the Commonwealth.

**VIRGINIA MUSEUM OF NATURAL HISTORY BOARD OF TRUSTEES
MINUTES OF THE RESEARCH AND COLLECTIONS COMMITTEE MEETING
Aug. 21, 2021**

Present at the meeting were Dr. Art Evans, Dr. Tom Benzing, Melany Stowe, Mark Buss, Roberto Quinones Dr. Adam Pritchard, Dr. Kal Ivanov, Dr. Hayden Bassett, Dr. Nancy Moncrief, and Ben Williams. Committee members Dr. Carole Nash and Lisa Moerner participated via phone.

Committee Chairman Dr. Art Evans called the meeting to order.

The minutes were unanimously approved with no additions or corrections.

The members of the committee who attended in-person signed off on the museum's recent acquisitions, which represented a quorum.

Dr. Adam Pritchard provided an update on the recent paleontology trip to Wyoming. The trip, a longstanding museum tradition established by former paleontology curator Dr. Nick Fraser, took place throughout much of July. Pritchard, Paleo Technician Lucy Treado, Dr. Brooke Haiar and several of Haiar's students excavated fossils at multiple sites within Wyoming's Morrison Formation. The majority of fossils in the formation are long-necked sauropod dinosaurs that existed about 150 million years ago. Pritchard said that the team excavated bones from a relatively small sauropod measuring about 40 feet. When asked about challenges faced, Pritchard said that one of the biggest challenges was assuming too much knowledge and experience from volunteers and figuring out how to address these less-experienced team members in a helpful way. Prompted by questions from Dr. Tom Benzing and Mark Buss, Pritchard said that the museum is compensated for these trips in the form of supplies, but he agreed with their assessment that it's worth examining whether VMNH staff could be more directly compensated for the time they spend teaching volunteers during the trips.

Dr. Art Evans asked the curators to highlight some of their work over the previous quarter.

Dr. Pritchard said that a paper he contributed to concerning *Malerisaurus* was recently accepted to the *Journal of Papers of Paleontology*.

Dr. Nancy Moncrief said that she recently published a paper regarding the first armadillos recorded in Virginia, both of which are in VMNH collections. She has a paper about tree squirrel skeletal injuries in review at the *Journal of Mammalogy*, and a checklist of the mammals of the Barrier Islands — the culmination of decades of work — was recently accepted for publication.

Dr. Kal Ivanov said that after a lengthy hiatus from fieldwork during the pandemic, he has visited nearly 50 sites across 24 counties since March 2021. He has also started a

new project examining the terrestrial isopods of Virginia and plans to present data at the Entomological Society meeting in October. He also mentioned that his department has acquired a high resolution imaging system which it has used for photographing small insects. The imaging system is available to anyone in the museum.

Dr. Hayden Bassett discussed the ongoing Smith River Survey, which has been using ground-penetrating radar to find archaeological disturbances in lieu of the much more cumbersome traditional method of digging test pits. The two year effort is funded by the National Park Service and Department of Historic Resources to assess the impacts of flooding on these sites, but Bassett said that the funding also allows VMNH to examine these eight archaeological sites in greater detail than was previously possible. The early results of the ground-penetrating radar will be reported on at the next Research and Collections Committee meeting.

Bassett added that he recently published an article in the Journal of Southeastern Archaeology, has a manuscript in review with the journal Heritage, and is currently working on a manuscript for a large geospatial study conducted for late woodland sites in the counties of Henry, Patrick, and Floyd.

Bassett also said that the museum's Cultural Heritage Monitoring Lab (CHML) has been doing a lot of humanitarian work recently; the CHML has used satellite imaging to assess impacts of an earthquake in Haiti and a hurricane that impacted Honduras. Additionally, the CHML is developing a public/private partnership with Iridium Satellites, which is the largest provider of satellite phone and GPS technology in the world. The company is now a corporate sponsor of VMNH and made an in-kind donation of equipment and satellite air time.

Bassett added that his department has benefitted from a program for virtual interns that was developed with the State Department and the Smithsonian.

Dr. Tom Benzing said that the triceratops skeleton that VMNH recently installed in the Waynesboro Public Library has been well-received and generated a lot of buzz. He added that the Wayne Theater's science speaker series will be kicking off in September with a program from Dr. Art Evans.

Dr. Art Evans moved to adjourn the meeting.

JULY-SEPTEMBER 2021 VMNH ACQUISITIONS FOR APPROVAL BY BOARD OF TRUSTEES RESEARCH AND COLLECTIONS COMMITTEE

RIM* No.	Collector/Donor	Date at VMNH	VMNH Dept.	QTY	Description	Method	To Be Accessioned (Y/N)
RIM 21-2021	Kathryn LeCroy - UVA Blandy Experimental Farm	7/29/2021	RECENT INVERTEBRATES	1822	pinned bee (Order Hymenoptera) specimens identified to genus and/or species	Gift	Y
RIM 22-2021	Ralph P. Eckerlin	8/2/2021	RECENT INVERTEBRATES	10	2 adult <i>Polyplax spinulosa</i> mounted (on separate slides using Canada Balsam) and 2 adults, 4 nymphs and 2 nits <i>Polyplax spinulosa</i> (ethanol- preserved)	Gift	Y
RIM 25-2021	Sandra Ford	4/24/2018	ANTHROPOLOGY	1	large grinding stone	Gift	N
RIM 26-2021	Adam Pritchard	7/26/2021	PALEONTOLOGY	>175	~150 small dinosaur fossils in plastic baggies and foil and 25 plaster jacketed dinosaur fossils	Field Collection	No-BLM Property
RIM 27-2021	James Madison University (Dr. Heather Griscom)	1/13/2021	RECENT INVERTEBRATES	4018	1281 lots of fluid-preserved arthropods and 2737 dry-preserved (pinned/pointed) insect specimens	Gift	Y

*RIM is an acronym for the Record of Incoming Material form

JULY-SEPTEMBER 2021 VMNH ACQUISITIONS FOR APPROVAL BY BOARD OF TRUSTEES RESEARCH AND COLLECTIONS COMMITTEE

VMNH Collections Committee and Executive Director have Approved Recent Acquisitions: RIM 21-2021, RIM 22-2021, RIM 25-2021 through RIM 27-2021

VMNH Board of Trustees Research & Collections Committee Review of Acquisitions: RIM 21-2021, RIM 22-2021, RIM 25-2021 through RIM 27-2021

Arthur V. Evans, Chair

(signature) Arthur V. Evans, Chair

Date

Thomas R. Benzing

(signature) Thomas R. Benzing

Date

Mark J. Buss

(signature) Mark J. Buss

Date

Lisa C. Moerner

(signature) Lisa C. Moerner

Date

Carol L. Nash

(signature) Carol L. Nash

Date

Melany Stowe

(signature) Melany Stowe

Date

VIRGINIA MUSEUM OF NATURAL HISTORY RESEARCH AND COLLECTIONS EXECUTIVE SUMMARY

July-Sept. 2021

July, August, and September of 2021 featured VMNH's first small-scale in-person festival since prior to the COVID pandemic, a new exhibit opening, multiple new publications, and plenty of field work.

On July 24, VMNH staff interacted with roughly 400 guests during the museum's "Bug Day" event, a ticketed event that almost exclusively used existing in-house collections. The event coincided with the public opening of the new permanent exhibit "Lepidoptera of the World," which features specimens of some of the most striking butterflies and moths from around the globe.

Meanwhile, Dr. Nancy Moncrief had three manuscripts accepted for publication, and two recent publications by Drs. Moncrief and Pritchard (regarding armadillos in Virginia and the early flying reptile weigeltisaurus respectively) received widespread media attention.

Additionally, Dr. Adam Pritchard and Research Technician Lucy Treado took part in the Wyoming dinosaur dig, bringing back dozens of new fossils, and Dr. Hayden Bassett continued his ongoing efforts on the Smith River Survey.

Dr. Nancy Moncrief

- Three of Dr. Moncrief's manuscripts were accepted for publication. The topics are as follows: 1) skeletal injuries in tree squirrels, 2) mammals that occur on the Virginia barrier islands, and 3) report of the whole-genome sequence of the eastern fox squirrel.
- In mid-September Dr. Moncrief participated in Roanoke College's Dragon Festival on their campus in Salem

Dr. Kal Ivanov

- Dr. Ivanov and colleagues prepared and submitted a [virtual] presentation for the upcoming annual meeting of the Entomological Society of America.
- Drs. Ivanov and Means and L. Hightower performed the first DNA extractions at VMNH's newly established Molecular Lab.
- Dr. Ivanov participated in VMNH's Bug Day and interacted with more than 400 visitors.

Dr. Adam Pritchard

- Dr. Pritchard helped complete the Wyoming Dinosaur Project 2021, a collaborative project involving Virginia universities and undergrad students focused on excavating Jurassic dinosaurs from a site near Greybull, WY. He transported the fossils back to Martinsville, VA, and has led collaborative efforts to prepare the fossils with Brooke Haiar (U. Lynchburg) and technician Lucy Treado.

- Dr. Pritchard led two fieldtrips in Ashland, Virginia focused on the excavation of Triassic vertebrates in collaboration with local amateur paleontologists. The trip was featured in a segment on the WTVR station in Richmond, VA. The second trip was a collaboration between the VMNH and Virginia Tech paleontologist Ben Kligman.

Dr. Hayden Bassett

- From August to November, Dr. Bassett continued his study of the terminal Late Woodland period (AD 1200-1450) in SW and southside Virginia, as a part of the VMNH's Smith River Survey (a 2-year VMNH archaeological survey of the Smith River in Henry County, VA).
- In collaboration with the Smithsonian Institution, the VMNH's Cultural Heritage Monitoring Lab (CHML), under the direction of Dr. Bassett, made significant progress this quarter on projects in Virginia, California, Haiti, Honduras, Ukraine, and Afghanistan. These geospatial data production projects were initiated at the request of the US Army Reserve 38G/6V (Monuments Men) and USSOUTHCOM, the U.S. State Department, MITRE Corporation, and the Smithsonian Cultural Rescue Initiative, to support their ability to protect global cultural heritage. Through the CHML at VMNH, Dr. Bassett is now leading a team of 6 cultural heritage professionals and 8 virtual interns in data production and satellite imagery analysis.
- Between late August and early November, Dr. Bassett gave 16 presentations on the findings of the VMNH's Cultural Heritage Monitoring Lab (CHML). These presentations were given virtually to the Smithsonian Institution, the US Department of Defense, University of Virginia and University of Pennsylvania faculty, the MITRE Corporation, the US Forest Service, and the Government of Honduras. Additionally, Dr. Bassett and his team delivered 10 reports of findings to key stakeholders for implementation or ground responses.

**VIRGINIA MUSEUM OF NATURAL HISTORY
RESEARCH AND COLLECTIONS ACTIVITIES**

**Report to the Board of Trustees
July-September 2021**

**Kaloyan Ivanov, Ph.D.
Associate Curator of Invertebrate Zoology**

- Dr. Ivanov and colleagues have a manuscript in press at the American Society of Mammalogists' periodical Journal of Mammalogy.
- Dr. Ivanov and colleagues prepared and submitted a [virtual] presentation for the upcoming annual meeting of the Entomological Society of America.
- Drs. Ivanov and Means and L. Hightower performed the first DNA extractions at VMNH's newly established Molecular Lab.
- Dr. Ivanov participated in VMNH's Bug Day and interacted with more than 400 visitors.
- Drs. Ivanov and Means presented a workshop to students from ONE Forest School.
- Dr. Ivanov, and museum staff, completed work on VMNH's newest permanent exhibit "Lepidoptera of the World" which opened to the public on July 24.

Research & Collections

VMNH Curator of Mammals Dr. N. Moncrief, VMNH Biology Technician L. Hightower, Georgia College & State University faculty Dr. A. Mead, and Dr. Ivanov have a paper in press at the American Society of Mammalogists periodical Journal of Mammalogy.

[Moncrief, N. D., L. Hightower, A. J. Mead, and K. Ivanov. Prevalence and location of survivable skeletal injuries in two species of North American *Sciurus*. Journal of Mammalogy. (in press).]

Drs. Ivanov and Means continued work on the "*Nannaria incertae sedis*" project which focuses on the diversity of the *minor* clade of the xystodesmid genus *Nannaria*. Recent field work has resulted in the collection of at least 11 undescribed species, and is ongoing.

Dr. Ivanov, along with Dr. Means and L. Hightower continued work on the terrestrial isopod fauna of Virginia via field work and processing of new and backlogged materials. Currently, 26 species and subspecies of terrestrial isopods are reliably reported from the Commonwealth including 11 native and 15 exotic species. Ten of these taxa were not previously known to occur in Virginia. Preliminary findings will be presented at the upcoming annual meeting of the Entomological Society of America.

Dr. Ivanov attended the [virtual] 11th International Symposium on Terrestrial Isopod Biology (ISTIB) hosted from Ghent, Belgium by Spinicornis (the Terrestrial Isopod Research Group of Belgium) and the Forest & Nature Lab of the Faculty of Bioscience Engineering of Ghent University. (July 12-14)

This quarter, Dr. Ivanov conducted field work at three Virginia counties and independent cities (Alleghany, Giles, and Virginia Beach) and three Bulgarian provinces (Plovdiv, Ruse, and Yambol) in support of ongoing research projects.

In support of VMNH's recently launched "Terrestrial isopods (Crustacea: Isopoda: Oniscidea) of Virginia" project, Dr. Ivanov: 1) identified and curated 142 specimens (of 11 species) from recently collected and backlogged samples. *Ligia exotica*, *Venezillo parvus*, and *Armadilloniscus ellipticus* represent new additions to VMNH's invertebrate collection; 2) is currently working on processing a large number (>200 lots) of new and backlogged samples.

Dr. Ivanov and L. Hightower completed the curation and inventory of 700+ undetermined ichneumonid wasps (Hymenoptera: Ichneumonidae) recently sorted and/or identified by visiting graduate student D. Dal Pos (U of Central Florida). The entire collection comprises 2,128 specimens of which only 28% identified to genus and/or species (114 taxa).

Drs. Ivanov and Means, and L. Hightower processed, curated, and inventoried the recently acquired James Madison University insect collection and Dr. William R. Shealy private collection. The James Madison University collection comprises 1,281 lots of ethanol-preserved invertebrates and 2,737 pinned/pointed insects chiefly of Virginia origin. Dr. Shealy's collection includes 2,086 pinned/pointed and 830 enveloped insect specimens of worldwide origin. The materials are currently temporarily stored in VMNH's "Wet" and "Dry" biology collections awaiting incorporation into the museum's holdings.

Liberty Hightower, with help from Dr. Ivanov, is working on a dataset of the museum's invertebrate holdings to be posted to VMNH's website.

Visiting researchers A. Pandolfi and D. Dal Pos (U of Central Florida; July 5-13), C. Harden (Clemson U; July 23), and Dr. A. Evans (VMNH Research Associate; July 22-23) used VMNH's invertebrate holdings to study beetle, cicada, and ichneumonid wasp taxa from Virginia and Eastern North America.

Dr. Ivanov responded to information requests regarding VMNH holdings: *Ptotinus carolinus* and *Phausis reticulata* (Coleoptera: Lampyridae) (C. Croy; USDA).

Dr. Ivanov responded to information request regarding Manassas National Battlefield Park opilionid types currently on a long-term loan at VMNH to satisfy controlled property inventory for Manassas National Battlefield Park.

Dr. Ivanov satisfied a loan request concerning VMNH's invertebrate holdings: 360 undetermined Ichneumoninae (Hymenoptera: Ichneumonidae) to D. Dal Pos (U of Central Florida).

Dr. Ivanov and L. Hightower travelled to Charlottesville, VA and oversaw the acquisition and transport of 1,822 pinned/pointed bee specimens (Hymenoptera: Apiformes) from various Virginia localities donated by Dr. K. LeCroy (UVA). (July 29)

Dr. Ivanov oversaw the acquisition of 2 slide mounted and 8 ethanol-preserved fleas (Phthiraptera: Polyplacidae) from Highland Co., VA donated to VMNH by Dr. R. Eckerlin (NVCC).

Under the supervision of Dr. Means, Dr. Ivanov and L. Hightower performed the first DNA extractions of various millipede, isopod, and insect taxa at VMNH's new Molecular Lab.

Images of the yellow-faced bee *Hylaeus pictipes* (Hymenoptera: Colletidae) captured at VMNH's newly established STEM Lab were recently featured in a paper by Ostrom and Grayson (2021, *Check List*).

Drs. Ivanov and Means participated in an online meeting with Associate Curator Dr. P. Sirwald (Field Museum of Natural History) and explored possibilities for NSF funding regarding digitization of VMNH's myriapod holdings. (August 30)

Education & Outreach

Drs. Ivanov and Means traveled to Smith Mountain Lake and presented a workshop on arthropod diversity and collecting techniques to students from ONE Forest School. (July 15)

Dr. Ivanov and museum staff participated in VMNH's Bug Day. The 5-hour event was attended by 400+ children and adults from Virginia, North Carolina, California, Colorado, Ohio, and South Carolina. Displays featured live and preserved (modern and fossil) arthropod specimens from the museum's collections focusing on the incredible diversity of this highly successful lineage of invertebrate animals. (July 24)

Drs. Ivanov and Means and L. Hightower gave tours of the Department's lab and collections to students from VMNH's Insect investigations and Busy Bugs summer camps. (July 14 and 30)

Drs. Ivanov, Means, and Pritchard, and L. Hightower gave paleontology and invertebrate zoology lab and collections tour to students and faculty from Averett University's BIO 309 "Natural History of Virginia" course. (August 25)

In early August, Dr. Ivanov, Dr. N. Moncrief, Deputy Director R. Barber, and Education Manager C. Deatherage were notified that their "Scope it Out" proposal submitted to the IMLS 2021 Inspire! Program will not be funded. Following favorable reviewer comments the proposal will be resubmitted in late 2021. If funded, the proposal will allow VMNH to convert and existing, underutilized laboratory space into a modern multidisciplinary research and education facility.

Dr. Ivanov responded to arthropod identification and information requests to individuals from Maryland (Clarksville/Fulton), Virginia (Martinsville, Richmond, Stuart, and Tysons), and elsewhere (not specified). The majority of the requests were submitted to VMNH's FB page by museum patrons with the remainder representing taxa featured in VMNH's online series BenInNature.

This quarter, Dr. Ivanov gave tours of VMNH's exhibits and collections to students from University of Central Florida and Virginia Tech, and visitors from Martinsville, VA.

Exhibits

Dr. Ivanov and museum staff completed work on VMNH's newest permanent exhibit "Lepidoptera of the World", which opened to the public on July 24.

Dr. Ivanov is revising text and working on specimen selection and preparation for the museum's upcoming "Flight" exhibit to open at VMNH in early 2022.

Media

"Virginia Museum of Natural History hosts Bug Day 2021". WFXR Living Local with C. Wright. Roanoke, Virginia (with B. Williams). (July 2021)

Professional Service

Dr. Ivanov copy edited an article for the Virginia Natural History Society's periodical *Banisteria* (Volume 55, 2021).

Dr. Ivanov served as a peer reviewer for manuscripts submitted to *Insects* and *Northeastern Naturalist* (completed August 2 and 16).

Nancy D. Moncrief, Ph.D.
Curator of Mammalogy

- Three of Dr. Moncrief's manuscripts were accepted for publication. The topics are as follows: 1) skeletal injuries in tree squirrels, 2) mammals that occur on the Virginia barrier islands, and 3) report of the whole-genome sequence of the eastern fox squirrel.
- In mid-September Dr. Moncrief participated in Roanoke College's Dragon Festival on their campus in Salem

Research and Collections

Dr. Moncrief's manuscript about mammals that live on Virginia's barrier islands and the adjacent Eastern Shore mainland was accepted by *Northeastern Naturalist* in early August. Her co-authors are VMNH Research Associates Dr. Raymond Dueser and Dr. John Porter, both whom are at the University of Virginia.

In addition, Dr. Moncrief's manuscript that reports the first whole genome of the eastern fox squirrel, was accepted by *G3: Genes, Genomes, Genetics* in late August and published online in September. Her coauthors are Drs. Lin Kang, Pawel Michalak, and Eric Hallerman. Drs. Kang and Michalak are on the faculty of the University of Louisiana at Monroe, and Dr. Hallerman is a faculty member of the Department of Fish and Wildlife Conservation at Virginia Tech. It is available online at: <https://doi.org/10.1093/g3journal/jkab315>

A third manuscript, which provides details about healed skeletal fractures in eastern fox squirrels and eastern gray squirrels, was accepted by *Journal of Mammalogy* in early-September. Many of the specimens for this study are housed at VMNH. Her co-authors are VMNH Associate Curator of Recent Invertebrates Dr. Kal Ivanov, VMNH Biology Research Technician Ms. Liberty Hightower and Dr. Alfred Mead, who is on the faculty of Georgia College and State University.

Dr. Moncrief recently resumed her collaboration with Dr. R. Jory Brinkerhoff (University of Richmond) and Lisa Gatens (North Carolina Museum of Natural Sciences). They are using skin clips of white-footed deermice (*Peromyscus leucopus*) to detect DNA from the Lyme disease pathogen (*Borelia burgdoferi*) in specimens of deermice collected in Virginia and North Carolina before 1990, when Lyme disease was first reported in Virginia.

Dr. Moncrief is collaborating with VMNH Research Associates Drs. Raymond Dueser and John Porter (University of Virginia), along with Drs. Don Young and Julie Zinnert (Virginia Commonwealth University) on a manuscript that details rapid changes in geomorphology, vegetation, and small mammal populations on one of the Virginia barrier islands (Myrtle).

Dr. Moncrief continued working with VMNH Research Associate Dr. Raymond Bernor, Assistant Curator of Paleontology Dr. Adam Pritchard, Education Manager Christy Deatherage, and Deputy Director Ryan Barber to prepare a grant proposal that will be submitted to the National Science Foundation for collections-related research and

education programs. VMNH is participating in this project as a collaborating institution with the University of Oregon, the University of Florida, and several other universities. The VMNH portion of funding totals about \$360,000.

Dr. Moncrief continued working with Biology Research Technician Ms. Liberty Hightower, VMNH Collections Manager Ms. Haley Cartmell and VMNH Registrar Ms. Jill Harris to conduct and coordinate VMNH review activities of a new collections management software system (Proficio) and migration of the VMNH collections databases to that software.

Dr. Moncrief continued working with Mss. Hightower, Cartmell, and Harris to prepare, install, document, and organize (electronically and in archival hardcopies) traditional specimens and frozen tissues of mammals and birds.

Professional Service and Other Duties

Dr. Moncrief continued serving on the Council of the Virginia Natural History Society (VNHS). She also continued serving (with Dr. Ivanov) a four-year term (ends December 2022) as Co-Treasurer.

Dr. Moncrief is serving as manuscript editor for a manuscript about northern bobwhites, which has been submitted for publication in VMNH's series of occasional papers, *Jeffersoniana*. In August she received comments from three reviewers and corresponded with the author about changes that are necessary for the manuscript to be accepted for publication.

Scientific Programs, Exhibits, and Other Activities

Dr. Moncrief continued work on a special exhibit about flight. She wrote and edited text and sourced audio files and videos of birds and bats. She also met numerous times with VMNH Exhibits Manager Ms. Jessica Davenport and VMNH Education Manager Ms. Christy Deatherage to discuss interactive components, specimens, and options for displaying them.

In late July, Dr. Moncrief participated in VMNH's Bug Festival. She discussed insect-eating mammals with about 150 visitors and showed them parts of the VMNH research collections.

In early August, Dr. Moncrief participated in a program (Women in STEM: Inspiring the Next Generation) for 4th through 8th graders in Danville. She served on an expert panel and discussed how she became interested in pursuing a career in science and her current work at VMNH.

In mid-September, Dr. Moncrief participated with Dr. Adam Pritchard in Roanoke College's Dragon Festival on their campus in Salem. They discussed fossil plants and other specimens from the VMNH collections. The fossil plants (called *Lepidodendron*) may be connected to the origins of dragon folklore.

Adam Pritchard, Ph.D.
Assistant Curator of Paleontology

- Dr. Pritchard helped complete the Wyoming Dinosaur Project 2021, a collaborative project involving Virginia universities and undergrad students focused on excavating Jurassic dinosaurs from a site near Greybull, WY. He transported the fossils back to Martinsville, VA, and has led collaborative efforts to prepare the fossils with Brooke Haiar (U. Lynchburg) and technician Lucy Treado.
- Dr. Pritchard led two fieldtrips in Ashland, Virginia focused on the excavation of Triassic vertebrates in collaboration with local amateur paleontologists. The trip was featured in a segment on the WTVR station in Richmond, VA. The second trip was a collaboration between the VMNH and Virginia Tech paleontologist Ben Kligman.
- Dr. Pritchard advanced the paleontology collections by taking in hundreds of fossils from the past 60 million years of the Atlantic Coastal Plain. These fossils included microvertebrate (<1 cm) fossils of invertebrates, fishes, and other vertebrates from Stafford, King William, and Henrico counties. This work was a collaboration with amateur paleontologists working on the Eastern seaboard.
- Dr. Pritchard presented to a number of non-professional audiences. These included a presentation on the Triassic Period to the Richmond Gem & Mineral Society. He also led paleontology collections tours for a class from Averett University and multiple groups from the College of William & Mary. His work was also featured in *Smithsonian Magazine* and on Richmond TV station WTVR.

Research & Collections

Dr. Pritchard collaborated with co-authors Sterling Nesbitt, Michelle Stocker, Martin Ezcurra, Nicholas Fraser, Adam Marsh, William Parker, Saradee Sengupta, Saswati Bandyopadhyay, and Andrew Heckert on an article on a widespread group of Triassic reptiles called *Malerisaurus* for the journal *Papers in Palaeontology*. The final article will be published in Q4 2021.

Dr. Pritchard helped lead the Wyoming Dinosaur Dig Project for 2021. A collaboration with University of Lynchburg Professor Dr. Brooke Haiar and VMNH technician Lucy Treado, the project focused on the Two Sisters dinosaur locality near Greybull, Wyoming. Participants in the trip for 2021 included a dozen undergraduate students from four Virginia colleges and universities and several volunteers from the general public. During the trip, Dr. Pritchard worked on transportation and care of students, equipment, and fossils; training of students and volunteers in paleontology; production of social media posts on the project; and oversight of half of the excavation site. The work was completed in Q3 2021. Following the dig, Dr. Pritchard and Dr. Haiar led an 'unwrapping party' with museum staff to prep specimens for curation.

In September, Dr. Pritchard traveled to the Triassic vertebrate fossil site in Ashland, VA with a group of local landowners and VMNH volunteer Michael Stevens. During the trip, the team collected numerous reptile teeth and invertebrate fossils.

Dr. Pritchard worked with technician Lucy Treado and Science Museum of Minnesota curator Dr. Alex Hastings on the intake and conservation of a complete big cat skeleton from a cave site in the Washington & Jefferson National Forest. The project is a collaborative effort between Virginia cavers, the SMM, and the VMNH. It was funded by the Cave Conservancy of Virginia.

Dr. Pritchard collaborated with Virginia amateur paleontologists Jeffrey Carpenter and Trevor Clarke on the intake of 100s of Atlantic Coastal Plain microvertebrate specimens (<1 cm) for the VMNH collections

Dr. Pritchard continued to evaluate and update information for his role on the NSF FuTRES grant, a collaboration between himself, curator Nancy Moncrief, and Research Associate Ray Bernor. The grant is led by researchers from the University of Oregon and the University of Florida, and it would provide internship funds for the VMNH.

Education & Outreach

Dr. Pritchard presented on the Ashland, VA Triassic fieldwork to the Richmond Gem & Mineral Society.

Dr. Pritchard hosted three collections tours, one for a science class from Averett University (Danville, VA) and two for students from the College of William & Mary.

Dr. Pritchard produced three 'Tales of Ancient Life' videos for VMNH social media. He also produced three field update videos from the Wyoming Dinosaur Dig site. These videos have accrued over 2400 views as of November 1.

Dr. Pritchard completed two manuscript reviews, one for a crocodile-focused manuscript for the journal *Gondwana Research* and one on molluscs for *Jeffersoniana*.

Dr. Pritchard developed table displays for the 2021 Dragon Festivals, one for the Roanoke College event and another for the main VMNH event.

Exhibits

Dr. Pritchard continued to work on content for the Q1 2022 Flight exhibit with Nancy Moncrief, Ben Williams, and Kal Ivanov. The content consisted of text panels about extinct flying and gliding animals and planned displays of extinct vertebrate fliers.

Dr. Pritchard and Research Associate Dr. Bill Schmachtenberg discussed possible displays of the oldest fossils in Virginia for the lobby column cases.

Media

Dr. Pritchard was featured in a segment on the VMNH Triassic field project in Ashland, Virginia on the WTVR station in Richmond, VA (<https://www.wtvr.com/news/local-news/henrico-man-finds-creek-bed-that-may-lead-to-dinosaur-bones>).

Dr. Pritchard's work on the extinct gliding reptile *Weigeltisaurus* was featured in an article in *Smithsonian Magazine* authored by Tess Joose

[\(https://www.smithsonianmag.com/blogs/national-museum-of-natural-history/2021/10/13/the-oldest-airborne-animal-was-a-reptile-with-weird-wings/\)](https://www.smithsonianmag.com/blogs/national-museum-of-natural-history/2021/10/13/the-oldest-airborne-animal-was-a-reptile-with-weird-wings/)

Hayden Bassett, Ph.D.
Assistant Curator of Archaeology

In this quarter, VMNH Assistant Curator of Archaeology Dr. Hayden Bassett focused his efforts on expanding his regional archaeological study for VMNH's Smith River Survey (SRS), moving the VMNH's Cultural Heritage Monitoring Lab (CHML) from its proof-of-concept phase to its sustainability phase, and expanding the mission and output of the CHML's research for key stakeholders.

Research and Collections

From August to November, Dr. Bassett continued his study of the terminal Late Woodland period (AD 1200-1450) in SW and southside Virginia, as a part of the VMNH's Smith River Survey (a 2-year VMNH archaeological survey of the Smith River in Henry County, VA). In the first half of the quarter, this included interpreting the ground-penetrating radar results from one of seven archaeological sites included in the study. VMNH Staff Archaeologist Madeleine Gunter Bassett and Dr. Hayden Bassett used GIS to overlay the GPR results onto the terrain, and previous excavations (1960-1980s). This georeferencing process identified the likely location of the village palisade, among other features, and will serve as the basis for subsurface archaeological sampling in 2022. In the second half of the quarter, the VMNH Archaeology team significantly expanded their settlement modeling study in the greater Smith River valley (covering four counties). This expanded study is now being prepared as a manuscript for publication, and presentation at the Middle Atlantic Archaeology Conference (MAAC).

In collaboration with the Smithsonian Institution, the VMNH's Cultural Heritage Monitoring Lab (CHML), under the direction of Dr. Bassett, made significant progress this quarter on projects in Virginia, California, Haiti, Honduras, Ukraine, and Afghanistan. These geospatial data production projects were initiated at the request of the US Army Reserve 38G/6V (Monuments Men) and USSOUTHCOM, the U.S. State Department, MITRE Corporation, and the Smithsonian Cultural Rescue Initiative, to support their ability to protect global cultural heritage. Through the CHML at VMNH, Dr. Bassett is now leading a team of 6 cultural heritage professionals and 8 virtual interns in data production and satellite imagery analysis. As the producer and curatorial repository of these new digital collections, the VMNH Archaeology Department has expanded its digital collections holdings by nearly 7,000 "objects" since August 2021, and anticipates comparable growth in digital collections with each new quarter. Over 5,000 of these digital objects in the VMNH's CHML collections were requested/accessed by outside researchers between August and November 2021. Additionally, as Dr. Bassett initiates a long-term project to monitor the cultural heritage of Virginia from impacts related to climate change, he anticipates a significant number of requests from Virginia state agencies for these data and digital collections in 2022 and beyond.

Between late August and early November, Dr. Bassett gave 16 presentations on the findings of the VMNH's Cultural Heritage Monitoring Lab (CHML). These presentations were given virtually to the Smithsonian Institution, the US Department of Defense, University of Virginia and University of Pennsylvania faculty, the MITRE Corporation, the US Forest Service, and the Government of Honduras. Additionally, Dr. Bassett and

his team delivered 10 reports of findings to key stakeholders for implementation or ground responses. Noteworthy among these was Dr. Bassett's development of a geospatial model identifying impacts to cultural heritage in Haiti from the August 14, 2021 earthquake, and a predictive model of archaeological sites locations to plan for future natural disasters. Replicating the CHML's success in Honduras, the results of this Haiti study are now being implemented in a combined US-Haiti humanitarian response to safeguard the country's cultural heritage. Second to this, was a new predictive model created by Dr. Bassett to identify California's cultural heritage that is most vulnerable to western wildfires. This is now serving as the basis for a new decision-making process that will be used by firefighters in California. Last, Dr. Bassett's manuscript on the VMNH's CHML as a case study for modern Applied Research Labs was accepted for publication in the *2021-22 CA Issue Papers* journal and will also be presented at a professional conference on November 08, 2021.

The quarter also included new collections acquisitions and several in-person visiting researchers. In October, the VMNH Archaeology Department added 35 boxes of archaeological material from the Hurt Power Plant archaeological site (a contact-period Occaneechi Village on the Roanoke River) to the VMNH collections. This acquisition consolidates a previously multi-repository 150 boxes of artifacts, environmental samples, and site records into a single collection at VMNH. Beyond virtual inquiries, two researchers visited the VMNH archaeological collections this quarter. One accessed the Paleoindian-period Brook Run collection for his academic research, the other studied the historic-period Claremont collection to select specimens for his ongoing doctoral research.

The VMNH Archaeology Department was successful in the awarding of funding, and the submission of a major grant application this quarter. This included the successful award of \$20,000 (funder TBA in late Nov) to support the ongoing efforts of the CHML at VMNH, the in-kind donation of \$8,000 in satellite communication equipment and airtime, and the submission of a \$178,000 grant to the U.S. Department of State Ambassador's Fund for Cultural Preservation (Round 1 selection in December 2021).

Education and Outreach

Dr. Bassett is nearing completion of the direct commissioning processes to enter to the US Army Reserves as one of approximately 8 new "Monuments Men" Army reserve Captains, Majors, and Lt. Colonels. As a major outreach effort for the museum, he continues to position the VMNH's Cultural Heritage Monitoring Lab as the primary research lab for the Army's Monuments Men program.

Between August and November, the VMNH Archaeology department worked with several colleges and universities. Dr. Bassett and VMNH Staff Archaeologist Madeleine Gunter Bassett brought on 8 virtual interns at the undergraduate and graduate level. The U.S. Department of State has provided the VMNH Archaeology Department with these 8 virtual intern positions through the Virtual Student Federal Service (VSFS) program. The interns and associated virtual volunteers have contributed a combined 1350 hours to the CHML at VMNH this quarter. Additionally, the VMNH Archaeology Department continues to host an in-person intern from Longwood University to assist on both the Smith River Survey and Patrick Henry Leatherwood projects. She has contributed 140 hours to the lab this quarter. Last, Dr. Bassett and his team gave a

follow-up presentation to the administration of the University of Virginia. The VMNH's CHML is now in the early stages of a UVA partnership to begin in 2022.

Dr. Bassett responded to three public requests for identification of artifacts, all of them from Virginia. Artifact identifications were made in-person (in the museum lobby, masked, and distanced).

Professional Service

Dr. Bassett continued his duties as Vice President of the Board of Trustees for Falmouth Heritage Renewal, an international historic preservation non-profit. He also continued his appointment as a Research Associate at the Smithsonian Institution to support international efforts and contributions made through VMNH's new Cultural Heritage Monitoring Lab. In October, he continued his duties to the Legislative Affairs Committee of the Council for Virginia Archaeologists (CoVA). Last, he continued his appointments as Visiting Scholar and Adjunct Faculty at the College of William & Mary, where he will be teaching (remotely, once per week from VMNH) in Spring 2022.

From August to November, Dr. Bassett co-organized four meetings of the Culture Conflict Resource Network (CCRN), an NSF-funded group of collaborative researchers working on research surrounding the impacts of armed conflict on cultural heritage. The VMNH, through the Cultural Heritage Monitoring Lab (CHML), is a collaborative partner of the CCRN, along with the University of Pennsylvania, the Smithsonian, and several other institutions. Dr. Bassett presented the findings of his lab at all four meetings.

This quarter, Dr. Bassett and VMNH staff archaeologist Madeleine Gunter Bassett continued to fulfill their duties in the Archaeological Society of Virginia (ASV). In these roles, VMNH Archaeology staff provide direction, technical review, grant approvals, among other tasks for state-wide archaeological research for the foreseeable future. Additionally, Dr. Bassett continued his service with the publications team of the Archaeological Society of Virginia as a peer reviewer for the organization's longstanding (1945-Present) research journal.

From late August through early November, Dr. Bassett was consulted on 6 occasions by VA state and US federal agencies to implement his technical methods for using satellite imaging and remote sensing to document ground disturbance, and/or destruction of cultural heritage in conflict zones and after natural disasters. The consultations included contributions of expertise and virtual delivery of training. These professional services were provided to assist the combined efforts of the Virginia State Police, the Virginia Department Environmental Quality (DEQ), and the Environmental Protection Agency (EPA), and additionally on projects for the U.S. Department of Defense, the Smithsonian Institution, and the U.S. Forest Service for efforts in Virginia, California, the Middle East, East Africa, the Caribbean, and Central America.

Research and Collections

Jill K. Harris, Registrar

Five (5) collections acquisitions were recorded for ~4,745 specimens and 1,281 lots of specimens. These specimens were added to the invertebrate zoology, archaeology, and paleontology collections.

No outgoing loans were recorded this quarter.

Miss Harris also reports that she was able to use Excel to map database fields for 18,332 paleontology records in a database called EGEMS, into a format to import into the newly upgraded Proficio Re:discovery Software, Inc. (RSI) database. All 18,332 records were converted and imported successfully into Proficio.

Haley Cartmell, Collections Manager

Curators and staff modified/updated 31,653 existing records and added 18,670 new records to the VMNH collections databases Proficio (all museum collections) and EGEMS (paleontological collections only). These numbers included importing 18,332 EGEMS records into Proficio so that all records are in one database.

PEOPLE SERVED DATABASE printed 11/3/2021
Summary

# of Activities	TYPE OF ACTIVITY	PROFESSIONALS AND 13+ STUDENTS	K-12 STUDENTS	K-12 TEACHERS	PUBLIC			TOTAL #	
9	Conference presentations (A)	0	0	0	0			0	
5	Meetings chaired (B)	98	0	0	6			104	
3	Review documents/manuscripts (B)	11	0	0	0			11	
1	Requests for information about collections (C)	0	0	0	0			0	
1	Visiting researcher (C)	1	0	0	0			1	
0	Collections tours (D)	0	0	0	0			0	
6	Lab Tours (D)	12	22	4	3			41	
0	Receptions	0	0	0	0			0	
13	Responses to requests for information about specimens at VMNH (D)	2	0	0	11			13	
9	Lectures and presentations at VMNH (D)	219	0	0	9			228	
0	Technical consultations (B, D, & E)	0	0	0	0			0	
8	Display table with specimens	70	0	0	517			587	
1	Off-site education programs	0	22	4	0			26	
1	Lectures Not at VMNH (E)	0	0	0	2			2	
3	Off-site presentations (E)	14	15	0	13			42	
3	Field trips/Field Work	16	0	0	21			37	
63	TOTALS							1092	

TOTAL # INDIVIDUALS SERVED

1092

Research & Collections Facebook Statistics July-Sept. 2021

Total Research & Collections Post Reach

156,256

Total Research & Collections Post Reactions (Likes, Comments, Shares, etc.)

6,201

Total Research & Collections Link Clicks (user clicks on picture/video, link within post, "see more", etc.)

4,024

Top 5 Performing Research & Collections Posts by Total Engagement (Reactions, Comments, Shares)

1. Dinosaur Bones in Virginia? (July 5) - 513
2. VMNH a leader in the global monitoring of cultural heritage sites (August 26) - 373
3. Wyoming Dinosaur Dig: Shoulder blade of ancient crocodile? (July 7) - 351
4. Wyoming Dinosaur Dig (July 2) - 168
5. Giles County Cave Exploration (August 9) - 156

Top 5 Performing Research & Collections Posts By Total Link Clicks

1. Dinosaur Bones in Virginia? (July 5) - 353
2. VMNH a leader in the global monitoring of cultural heritage sites (August 26) - 277
3. Wyoming Dinosaur Dig: Shoulder blade of ancient crocodile? (July 7) - 224
4. Giles County Cave Exploration (August 9) - 195
5. Wyoming Dinosaur Dig (July 2) - 183

Total VMNH Facebook Audience Growth from April 1 to June 30, 2021

- The total number of followers increased by 714 (from 13,097 to 13,811).
- The total number of likes increased by 664 (12,827 to 13,491).