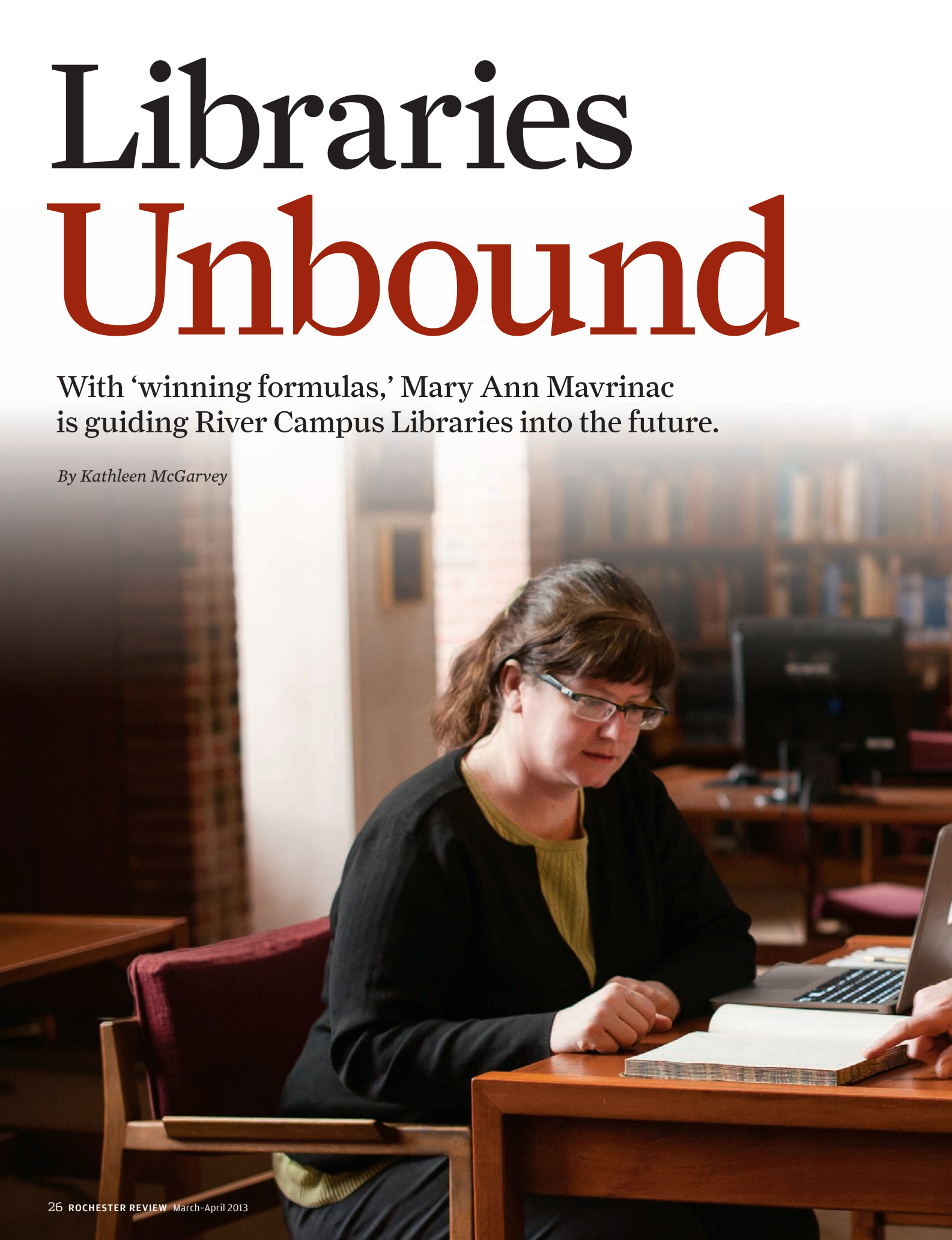
Libraries Unbound

With 'winning formulas,' Mary Ann Mavrinac is guiding River Campus Libraries into the future.

By Kathleen McGarvey



For a glimpse at the future of libraries, at Rochester and beyond, you might want to consult the papers of William Henry Seward. Yes, that Seward—secretary of state to presidents Lincoln and Johnson.

A collection spanning the years 1730 to 1917—public, private, and family correspondence of Seward and his family members, files and records from his long political career as governor and secretary, speeches, diaries, and other documents—was given to Rochester by Seward's son, William Henry Seward III between 1945 and 1951. Now students of Thomas Slaughter, the Arthur R. Miller Professor of History, are bringing those papers into the digital age, transcribing and coding them to make them accessible to scholars, students, and curious readers anywhere in the world. The class—a two-course sequence, The Seward Family's Civil War and The Seward Family in Peace and in War—meets in the Libraries' Department of Rare Books and Special Collections. Designed for undergraduate and graduate students, the course combines traditional efforts of historians—among them, transcribing, editing, and annotating primary historical documents—with intellectual tasks for the digital age: creating and implementing the Seward Project, a website collection of digitized Seward family photos and documents.

Slaughter teaches the class in conjunction with manuscript librarian Lori Birrell; film studies librarian and director of the Digital Humanities Center, Nora Dimmock; and Melissa Mead, the John M. and Barbara Keil University Archivist and Rochester Collections librarian. They have met not only in a conventional classroom and in Rare Books and Special Collections but also in a digital humanities computer lab in the Janis and James S. Gleason Library. "It's the first time the library has had a collaboration on this scale between its different units and between faculty and students," Slaughter says. The course has drawn history majors, computer science and engineering majors interested in technological applications, and master's students from the Selznick Graduate Program in Film and Media Studies at the George Eastman House who are interested in expanding their knowledge of film preservation to encompass manuscript preservation.

"They're working with our content, and learning from the expertise of faculty members and librarians. They're learning technological skills—and it's embedded in the curriculum. That's a winning formula, and that's what our future is in working with students," says Mary Ann Mavrinac, the new vice provost and Andrew H. and Janet Dayton Neilly Dean of River Campus Libraries.

A leader in the creation of learning spaces and the development of digital services, Mavrinac brings a decade of experience as chief

SEWARD STEWARDS: Students of history professor Thomas Slaughter (right), including film preservation graduate student Heather Harkins (left), are digitizing the papers of the William Seward family. An archival collection, the papers will now be broadly accessible—a development characteristic of the 21st-century library.

ADAM FENSTER

librarian at the University of Toronto's Mississauga campus, part of the University of Toronto Libraries, the third largest library system in North America. She was formally installed in the deanship in December, though she began her work at Rochester last summer.

Larry Alford, chief librarian of the University of Toronto, says Mavrinac is "very innovative. She wants to experiment and achieve a high level of excellence for the library in teaching and learning."

"She doesn't grandstand," says Anne Kenney, the Carl A. Kroch University Librarian at Cornell. "She comes out with quite thought-provoking and forward-moving approaches."

Slaughter attests that Mavrinac's presence is already strongly felt. "She's contributing to an atmosphere where collaboration is encouraged and supported, and she's brought creativity to making that collaboration possible in our project."

Mavrinac comes to Rochester at a significant moment in the modern history of libraries. "I don't know if I would call this a pivotal point—it's a constant evolution that's actually accelerating," she says, pointing to "an unrelenting march in terms of technological change and innovation, and the broader environmental trends that, really more than anything, are having an impact on libraries." Her response is both pragmatic and confident: "We could see them as threats—or we can look at these as opportunities to allow us to really engage and collaborate with our constituencies: faculty, students, the broader community, other research institutions and academic libraries, and other cultural organizations."

The river campus libraries—the largest component of the University's library system, along with the Medical Center's Edward G. Miner Library, the Eastman School's Sibley Music Library, and the Memorial Art Gallery's Charlotte Whitney Allen Library—hold more than 3 million books in print and electronic formats, more than 40,000 active journal titles, and microforms, videos, and other formats. It's Mavrinac's task, and that of her colleagues, to help students and faculty make the best use of those resources and navigate an information landscape that, increasingly, exists on a screen as much as in a physical building.

University libraries have changed significantly in the past decade and a half. "If you were a student 15 years ago and you reentered academia, you'd say it's all different," says Suzanne Bell, the business librarian in the Business and Government Information Library. Increasingly, libraries are social hubs on campuses. Food and drink, once forbidden, are now not just permitted but actually for sale on the premises, all in a quest to create a welcoming and comfortable environment for patrons. Digitization is one of the most obvious and far-reaching changes, as libraries become increasingly concerned with information itself and less devoted to the physical objects that contain it.

The most vivid shift in academic libraries between 2004 and 2010 was the number of e-books they hold in their collections—from 32.8 million to 158.7 million, according to data released in 2011 by the U.S. Department of Education. Spending on print books and other non-journal printed materials fell in the same period by nearly 20 percent when adjusted for inflation, from $550.6 million to $515.9 million. According to a report on the data in *Inside Higher Education*, one thing that has held steady, however, is teaching information literacy—though as of 2010, only 20 percent of institutions with a strategic plan for information literacy included libraries in the effort.

It is that kind of disconnect that Mavrinac has already worked to overcome.

Formerly, a library "really was a siloed organization in many ways," she says, bound up in the collection and preservation of printed documents. For even something as simple as an address for somewhere beyond the scope of one's local phonebook, a library was the place to go—a "vertical, hierarchical means by which people obtained information."

The Internet, of course, changed all that. "It's definitely what we would call a 'killer app,'" she says, something with "the power to alter the marketplace, alter how fundamental business occurs. The telephone did that, and the automobile. It changes the whole marketplace, in many cases for the better. And that's what the web was."

Cornell's Kenney says that in the wake of the web, the role of libraries on campuses "isn't as self-evident as it once was. It's a more complex environment."

The key to adapting, for librarians and users alike, is to focus on content rather than format, says Dimmock. "A book, a physical book, is a format. Is it the content that matters? Being a film librarian, I've always had to think about those issues. In my back room, I have 16 millimeter. I have laser discs. I have VHS. I have DVD—and now even DVD is dead. They're just containers. It's the content."

And moving away from that materiality is "a new service model," she says. "We've very much organized around collections, and we have to change the way we think about collections." As digitization brings greater uniformity to libraries' collections—publishers sell journals, databases, and other resources in bundles, much like cable companies do channels—rare books and manuscripts take a special place. "I think that the collections that are going to matter the most to libraries are the special collections, because those are the unique things," says Dimmock.

While the Internet has made address-hunting trips to the library unnecessary, students' need for guidance in navigating libraries' resources is only growing more acute. Students today "have been using technology since they were toddlers," says Toronto's Alford, but they don't necessarily understand how academic information searching works. "There's extraordinary complexity of information access and discovery."

The flexibility of digital holdings makes them more convenient—there's no need to put on your shoes and hike to the library when you can search databases in your pajamas from the comfort of your own couch—but their intangibility is also an obstacle, Mavrinac says.

Libraries "used to be storage, a warehouse medium with user spaces—and now we're almost a convergence space, connecting the content. When things are electronic, students don't necessarily know what's available. When you walk into the stacks, you can see the books—you may not know which ones you need, but there they are, and you're probably pretty sure you can find the right ones with some help." But when those resources are intangible, findable only through well-informed digital sifting, the librarian becomes even more essential. "It's a big role for us, to connect those dots," she adds.

Students like Caitlin Mack '13 (T5), of Essex, Vt., find themselves using the library in both its new and old forms. "I like getting books occasionally. I enjoy the aesthetics of it," says Mack. But her practical side has taken a shine to electronic editions. "I appreciate the convenience of having everything on my laptop."

Yet students at Rochester crowd the library, as they do at campuses across the country. For Mack, the library is a place to gather as much

as it is to work; in fact, the two functions are intertwined. "I find the environment there is a lot more conducive to studying" than working alone in her room, she says. "People go for the atmosphere—you see people doing their work, and you get to see your friends."

As libraries and their resources increasingly become virtual, what becomes of the physical spaces they inhabit? Mavrinac calls it an area "of profound opportunity." At one level, the library fosters interaction—and that draws students. Like most people, "they're hungry for human contact, human connections," she says.

CONNECTIONS: Mary Ann Mavrinac, the new Neilly Dean of the River Campus Libraries, calls libraries "a convergence space, connecting the content."

But Mavrinac is convinced that the library works best when it is more than a gathering space. "We're evolving our learning spaces," she says, and the evolution turns on "the integration of technology, not for technology's sake, but technology that's meaningful for the task at hand."

To look at libraries solely as study spaces, she says, doesn't provide students with the support they need. "Students might come here and think all they need to do is find a table and hang out while they do their studying, but I think it's incumbent on us to step that up a level and provide them with a higher level of support. They might say, this is all I need, but when you present them with alternatives, it's really of interest to them."

She cites the Rare Books and Special Collections project as one example of how library space, technology, expertise, and curriculum can come together. She has experience from Toronto, where she oversaw the creation of an award-winning academic learning center that attracts more than 1.3 million visits per year.

"It's the connection of program, content, expertise, spaces, and technology that I think is a winning formula," she says. "You're basically turning students away at the door when you get into that kind of perfect alignment with the curriculum and with the program." Learning spaces are increasingly being built with a specific need in mind.

The Finance Learning Center at the Mississauga library is an example. "It was almost like a company involved in trades," Mavrinac says. The setting was designed by faculty to work with their pedagogy, and the center was directed by a librarian with a background in finance. Toronto business leaders and bankers would visit to talk to students and judge their trading competitions. Financial literacy programs were offered for college and high school students.

As they map out a strategy for Rochester, Mavrinac and her colleagues are determined to make the libraries a collaborative hub of innovation—not just for student learning but also for faculty research.

A Center for Digital Scholarship, proposed by Mavrinac, would support that collaboration, with expertise, advice, support, and technological tools and resources for scholars and students engaged in digital humanities.

Such models have taken hold in scientific fields. The impact of the digital era is felt more deeply in the sciences, where "e-science" first emerged two decades ago. Scientists collaborate with colleagues in labs across the globe, and the quantities of data they are amassing are transforming data storage and preservation methods.

"Everything we do revolves around what scientists do. And scientists are now doing research in a totally different way," says Zari Kamarei, the Somerville Director of the Carlson Science and Engineering Library. Curating data, storing it securely, and making it accessible to users are what she sees as her library's core tasks.

Mavrinac also sees opportunities in the shift to a more collaborative approach. She's confident that libraries—and librarians—will be at the forefront. Technological developments allow libraries to "operate not just with the output of scholarship but with the entire scholarship process, and the entire learning process," she says. "We can be deeply engaged with student learning, enable their use of technology, embed different literacies in the curriculum. Working with faculty, we can support the life cycle of scholarly research and new modes of scholarship, like digital humanities and e-science. We can be technological hubs for the academy. We didn't have these roles before," Mavrinac says.

"We are transitioning to a digital future, whether we like it or not. There are broad and pervasive trends that no library can duck, and they're informing how we go about our business." R

ADAM FENSTER

One Medicine?

At the University and the zoo, Rochester veterinarians advance human, environmental, and animal health simultaneously.

By Karen McCally '02 (PhD) | Photographs by Adam Fenster

THE RITUAL BEGINS ON THE PATH THAT CURVES ALONG THE NORTHERN EDGE OF ROCHESTER'S Seneca Park Zoo. Set away from the animals, it's a place for deliveries and transport. Early in the morning, a truck has come to deliver a load of willow branches, which now sit in mounds along the path's grassy curb.

Jeff Wyatt '95M (MPH), the zoo's chief veterinarian, and his colleague, veterinarian Louis DiVincenti, each grab a fistful of branches and head up the hill to greet the orangutans. There are three at the zoo: the 33-year-old matriarch, Kumang; her 13-year-old daughter, Dara; and Denda, an 11-year-old male who arrived in 2011.

Wyatt greets Dara first. She bounds toward him. He crouches close to the wire mesh, clutching the bouquet of willow branches, and whispers in her ear.

"She's a big flirt," DiVincenti says, looking on, and handing large chunks of vegetables to Denda. He notes that Dara, rust-colored herself, shows a propensity for redheads.

In the moments since Wyatt and DiVincenti have arrived, a small group of visitors has gathered. Wyatt introduces himself and the orangutans, and begins to chat with the group. Turning to Kumang, he has her open her mouth and say "ah."

"Denda's trained to pee in a cup!" he says next to his audience of rapt preschoolers.

Wyatt and DiVincenti are beginning their usual morning rounds. They'll spend much

SAY 'AH': Jeff Wyatt, veterinarian at the Seneca Park Zoo and the Medical Center, takes a peek at Kumang (opposite), a Bornean orangutan; Wyatt examines an X-ray of Jefferson (above), an olive baboon, before removing a nasal mass.

FOOD AND GAMES: With a bucket of fish treats close at hand, Wyatt and Seneca Park Zoo zoologist Mary Ellen Ostrander lead Flounder, a California sea lion, through some basic behaviors.

of their time talking, feeding, and playing games with the animals. The games will often consist of asking the animals to perform certain behaviors—such as opening mouths and lifting feet—that will make it easier for the veterinarians to perform basic examinations. To deliver care to animals—any animals, but especially ones who are large or ones who are smart, like orangutans, sea lions, elephants, to name just a few—requires building trust. Before the rounds are over, Wyatt and DiVincenti will have looked into the noses, ears, mouths (and other key orifices) of elephants and sea lions, and performed a minor procedure on a baboon.

Their work at the zoo is only part of their job. Wyatt and DiVincenti also serve in the Medical Center's Department of Comparative Medicine, where they join two other veterinarians in overseeing the care of laboratory animals and working "shoulder to shoulder" with researchers, DiVincenti says, as part of biomedical research teams.

They've installed ventricular assist devices in cows. Helped researchers studying the papilloma virus obtain tissue samples across species. Assisted researchers using chinchillas in hearing research. ("A chinchilla has the same number of turns in its inner ear as humans," Wyatt explains.)

Both have completed studies that have earned them Medical Center degrees—Wyatt has a master's degree in public health, and DiVincenti will be awarded a master's degree in clinical and translational research, a new program, in 2014.

Wyatt and DiVincenti both say that their dual role is unusual. And as some public health officials around the world increasingly call for closer collaboration between medical and veterinary professionals, Wyatt's and DiVincenti's breadth of experience may prove invaluable.

In 2006, the American Medical Association, the Animal Veterinary Medical Association, the Centers for Disease Control and Prevention, and other professional and public health organizations built a partnership around the concept "One World, One Medicine, One Health." Representatives from the organizations created a task force to develop what they called the "One Health Initiative." The initiative was to launch "a movement" dedicated to building collaborative alliances among doctors, veterinarians, and environmental scientists.

This past fall, the World Medical Association and World Veterinary Association followed up by signing a Memorandum of Understanding, pledging support for the One Health Initiative and urging cooperation and collaboration in education, clinical care, and research.

From the outset, the One Health Initiative has been driven by two insights. The first is that a large and increasing percentage of infectious diseases identified in humans begin in animals. According to the One Health Initiative Task Force Report, 60 percent of infectious diseases in humans originated in animals and three-quarters of the infectious diseases that have emerged in the past three decades originated in animals.

The second insight is the broader recognition that human, animal, and environmental health are interrelated.

TALK TO ME: With Seneca Park Zoo elephant manager Lindsay Bronson looking on, Wyatt examines the African elephant Genny-C as part of his morning rounds. A highly intelligent mammal, Genny-C responds to more than 50 verbal commands.

Not surprisingly, the notion that the fortunes of people, animals, and the planet are interrelated enjoys widespread currency. But acting on its implications means that institutional and professional conventions must evolve. "We've been siloed for far too long," says Nancy Bennett, vice president at the Medical Center and director of the University's Center for Community Health, of the physician and veterinary communities.

Bennett knows firsthand the kinds of contributions veterinarians can make to human health. In the early 1990s, as upstate New York was experiencing an apparent raccoon rabies outbreak, Wyatt led a study of the epidemiology of human exposure to rabies.

"What we were trying to understand was the nature of the exposures that people had to potentially rabid animals," says Bennett. "Jeff's work really helped us understand the patterns of exposure."

For zoo vets, the slogan "One World, One Medicine, One Health" resonates almost intuitively. For one thing, they're far more attuned than the average physician to thinking about habitat.

Wyatt grew up in Cincinnati, home to one of the oldest and largest American zoos. As a youth, he volunteered in an education program for visitors. "We were conveying conservation messages back in 1972 and 1973," he says.

But that message has changed in important ways. In the past decade or so, Wyatt says, conservationists have begun to recognize that no animal or environmental conservation program will succeed unless it addresses human needs.

It's a message he's used to delivering at the zoo. Back by the orangutan exhibit, Kumang, her fingers wound around the wire mesh, is growing restless as Wyatt's attention has turned to the visitors. Propelled by her 200-lb. heft, she issues an arresting grunt.

"She's tired of this story," Wyatt tells the group.

The story is about the critical endangerment of orangutans. Wyatt talks about measures the zoo is taking, with help from Medical Center physicians, to keep Kumang, Denda, and Dara as healthy as possible. Orangutans are susceptible to heart disease, and in 2011, Dara was examined at the zoo animal hospital by Medical Center cardiologist Karl Schwartz, who gave her an echocardiogram, giving Dara's heart a clean bill of health.

But their counterparts in the wild are facing dire conditions. Members of the family of great apes—humankind's closest kin—their population is falling fast.

While they once thrived across much of southern Asia, orangutans are now found in the wild in only two places: the Indonesian islands of Borneo and Sumatra.

Rapid deforestation on both islands is destroying their habitat. On the island of Borneo, orangutans can be found roaming amidst fallen and decaying trees strewn across muddy stretches of land. Within those same stretches are pools of standing water that have made diseases such as malaria, dysentery, and upper respiratory illness significant challenges to human health.

Two years ago, the Seneca Park Zoo began working with an organization in Portland, Ore., called Health in Harmony. The nonprofit

enjoys official partnerships with Yale and Stanford universities, as well as several zoos and foundations. The group's mission is to improve the health of people, endangered animals, and their shared habitat simultaneously by helping to secure medical care and to build alternative, sustainable industries in areas of environmental degradation.

The organization has been working with villagers in Borneo, where illegal logging and the development of palm oil plantations have destroyed much of the orangutans' habitat, to develop a conservation model that can be used around the globe. Last fall, Wyatt invited the organization's executive director, Michelle Bussard, to the Medical Center to talk with physicians and residents about the organization's work.

Bussard told the group that the reason the environmental destruction is taking place is very clear. "It's a destructive cycle that starts with inadequate health care, which leads to debt, which leads to environmental degradation."

To save a child, for example, or to restore an injured breadwinner to health, an Indonesian family will do whatever it takes to gather the means for care—including assisting industries that are harmful to the environment, illegal, or both.

FISHING: On the Genesee River with Wyatt and Emily Waldt of the U.S. Geological Survey, veterinarian Louis DiVincenti shows a sturgeon thriving in the once uninhabitable river.

As Bussard was in Rochester, DiVincenti was in Borneo, where he brought medical supplies, and where he performed a consulting role with Indonesian vets and an advocacy role for the program. In 2011, Wyatt traveled to the island to help provide care to cattle and goats being raised by small family farmers for milk, meat, fiber, and manure for organic farming. And this fall, he was with Bussard, hoping to recruit physicians to share knowledge with Indonesian physicians delivering care to villagers living on the edge of Gunung Palung National Park, home to 10 percent of the world's last wild Bornean orangutans.

Among the physicians at the gathering was David Adler, an assistant professor of both emergency medicine and community and preventive medicine. A specialist in the prevention of infectious diseases in the developing world, Adler oversees the School of Medicine and Dentistry's international emergency medicine fellowship.

"Jeff contacted me because he was looking to build on this idea of connecting human health with habitat preservation and primate conservation," Adler says.

Initially, Wyatt was seeking to identify physicians who might be willing to go to Borneo to provide health care. Adler knew that emergency physicians would be ideal, because they're trained to work in suboptimal conditions. And in his role as a mentor, he knew that residents would find work in Borneo a valuable experience.

But he grasped Wyatt's broader message as well.

"It's not as if human beings are dependent on a primate for their direct well-being," says Adler. "But they share a habitat, and habitat health is important for both, because habitat provides the sustenance, whether it's nutritional or pharmacologic or environmental."

Wyatt and DiVincenti have delivered that same message elsewhere in the Medical Center. And their efforts, after a few "false starts," according to Thomas Pearson, principal investigator at the University's Clinical and Translational Science Institute, have started to bear fruit.

In his office in the Saunders Research Building, Pearson's face lights up at the mention of the names Wyatt and DiVincenti. He encountered Wyatt for the first time when a proposal for institute funding came across his desk from the Department of Comparative Medicine. It was an application for a small voucher program designed to provide investigator teams with up to 10 hours of specialist consultation in support of a research project. Approvals are virtually automatic, according to Pearson, assessed only for their relevance to the institute's mission. As articulated by the National Institutes of Health, that mission is "to accelerate the process of translating laboratory discoveries into treatments for patients."

The application from the University's veterinarians "created quite a stir," Pearson recalls. "They were looking at ambient nitrogen levels in vivariums, and some of my staff felt that they were not eligible for our funding."

After some deliberations at the institute, the application was approved. "The patients have funny little ears and long tails, but they're still patients, and so from a veterinary medicine standpoint, it's still applied," Pearson says.

Not too long after, Pearson encountered DiVincenti in a grant-writing class he was teaching, designed for Medical Center investigators. The course has helped many University scientists win their first large grants, and he says he was a bit startled when DiVincenti's proposal crossed his desk. "Here I was reading all of these papers about anemia, obesity studies, and cancer treatments, and then here's this study on sturgeon."

Sturgeon are a species of fish that predate dinosaurs and live only in the Northern Hemisphere. Among the varieties of sturgeon are so-called lake sturgeon, which inhabit the Great Lakes and the broader system of rivers and lakes in the region.

As a result of industrial pollution, by the mid-20th century sturgeon had all but disappeared from the Lower Genesee River, the portion of the river that runs from Downtown Rochester into Lake Ontario. As part of a quest to repopulate the river with sturgeon, the U.S. Geological Survey and the New York State Department of

COURTESY OF DAWN DITTMAN/U.S. GEOLOGICAL SURVEY

EXAMINING JEFFERSON: Wyatt and DiVincenti (right) prepare to remove a nasal mass from Jefferson, one of the Seneca Park Zoo's several olive baboons.

Environmental Conservation released a total of 2,000 baby sturgeon into the Lower Genesee in 2003 and 2004 and have periodically gauged the population's growth.

Wyatt latched onto the project as a conservation story for the zoo to tell. After all, the Lower Genesee was right in their backyard. But the survey only involved netting the fish, measuring their length and weight, tagging them, and returning them to the water.

In fall 2010, Wyatt and DiVincenti began talking about what other data they might gather from the sturgeon. For example, they could take blood samples of the sturgeon to gauge the health of the ecosystem. The proposal that crossed Pearson's desk—and later won a $300,000 grant from the Environmental Protection Agency—proposed sampling the sturgeon's blood for a variety of pollutants.

Sturgeon provide a unique opportunity to measure toxicants. They're "bottom-feeders," living and feeding within the sediment where contaminants settle. They live a century, on average, meaning that baseline data can be used to measure progress in the very same animal across a span of 50, and possibly of 100, years.

DiVincenti says they could have applied for a grant through the zoo, but chose the University instead. "It was a very conscious thing to do it through the U of R. It was all about creating a bridge between animal, environmental, and human health—about showing that this is a human environmental health problem, and not a sturgeon problem."

Pearson was impressed. "Only a veterinarian or a wildlife biologist would have understood all of the characteristics of that species in that setting in order to apply it for that application," he says. "You could sample water from now until Kingdom Come, and you wouldn't get a better view of the clean-up of the Genesee. I don't think at this point anyone even blinked that this wasn't relevant to translational medicine."

Pearson, who is a clinical and research physician specializing in cardiovascular disease, says he's worked with veterinarians in his laboratory over the years. Their understanding of animal anatomy, physiology, and disease processes have aided his research on cardiovascular disease in humans. But today, he characterizes their role not only as supportive, but integral.

"They're not only providers of care to their patients, but also key to this whole area of comparative science," he says. That Wyatt and DiVincenti are experienced veterinarians of exotic animal species makes their contribution all the more valuable. "Their role at the zoo is very interesting. If you have a small animal practice, you probably would be able to tell me all about cats and dogs. But these two? Armadillos! Orangutans! All kinds of animal systems."

Reflecting on the One Health Initiative, Pearson says it's right in line with what the Clinical and Translational Science Institute is designed to do. "We're taking basic discoveries and translating them to applications that are relevant to human health. And the subtext to that is to really break out of the usual boxes we're in, where we say, 'Oh, you can't work with the nurses,' or 'Oh, the vets. You can't let them out of the vivarium.'"

"Away with that," he says, flinging his arms wide into the air. R

ADAM FENSTER

Poet & Epistolarian

A collection of letters offers a new look at the life of poet Anthony Hecht.

By Karen McCally '02 (PhD)

OCTOBER 9, 1976
ROCHESTER, N.Y.

My dear young man,

It is, I think, salubrious and worthwhile for us all to meditate, from time to time, on the great theme of mutability and transience, to mortify our overweening vanity, and to say with the preacher, 'What profit hath a man of all his labour, . . .' and so forth. What, after all, is Fame? And what, Celebrity? Fleeting evanescences, mere toys and illusions. I know you will think this simple modesty in me, and dismiss it with a casual wave of the hand. But when you attain to my age and gravity, you will know that some of those goals, which in your youth seemed the only possible or valuable target upon which attention could seriously be fixed, turn out in the end to be gossamer-friendly or utterly illusory. What are we, after all, but a handful of dust, if I may thus express myself?

A 'SECOND LIFE': In a reference to Shakespeare's *The Tempest*, Hecht wrote that with his marriage to Helen D'Alessandro (above), he'd "[r]eceiv'd a second life." Scholar Jonathan Post (opposite) points to the happy union as an important factor in Hecht's productivity in the years that followed.

So wrote the poet Anthony Hecht to his friend William MacDonald, an archaeological historian. The letter concerned Hecht's purchase of a book in the University of Rochester bookstore—on the remainder shelf, at a steeply reduced price. The book had been a classic in Roman history, and in his musings to MacDonald, with whom he enjoyed especially colorful exchanges, the eminent poet expressed the anxieties born of acclaim with his characteristic wit and rhythmic prose. Even the decision to purchase the book, he described with a flourish.

I sighed the sigh of Heraclitean Flux, and a tear from the depths of some divine despair, of which Tennyson speaks, rose to my eye. But I bought it, and took it home.

Anthony Hecht taught at the University for 18 years, 17 of them as the John Hall Deane Professor of Rhetoric and Poetry. Beginning in the 1950s, largely due to the efforts of Hyam Plutzik, who became the first John Hall Deane Professor of Rhetoric and Poetry, the English department had begun to build a culture around poetry writing and performance. In the fall of 1967, when Hecht arrived in Rochester to help continue that tradition, he was already a well-regarded poet.

Then, the following spring, he won the Pulitzer Prize for his second book of poetry, *The Hard Hours*. Whereas the Pulitzer might have been the capstone of his career, it was more a midpoint. He would receive the prestigious Bollingen Prize in 1973, be named the U.S. Poet Laureate in 1982, and publish five more collections of poetry and four books of essays and criticism. Following his death in 2004, he was widely heralded as one of the most significant American poets to come of age in the aftermath of the Second World War.

Professional achievements, of course, occur in relation to a backdrop of personal struggles and triumphs, and it takes some type of record, whether it be a firsthand account or the recorded memories of others, to shed light on the interplay between the two.

Hecht left an extraordinary written record of those struggles and triumphs, a sample of which can be seen in *The Selected Letters of Anthony Hecht*, edited by Jonathan Post '76 (PhD), and released in January by Johns Hopkins University Press.

DOROTHY ALEXANDER (LEFT); BLAKE LITTLE FOR *ROCHESTER REVIEW* (OPPOSITE)

"My poetry is coming slowly," he wrote to his parents in the spring of 1943. "Producing it, even in small quantities has always been for me a painful and laborious process. (I mean painful here not in the sense of unpleasant to do, but only difficult in the extreme.)"

"There's a frankness in the letters which reveals a great deal about him and his character," says Post, "and to some degree that frankness will be a surprise to many people."

Post is Distinguished Professor of English at UCLA and a scholar of English Renaissance as well as modern poetry. He entered the University's graduate program in English in the fall of 1970 and met Hecht for the first time in the spring of 1972, in Hecht's graduate seminar on William Butler Yeats and Theodore Roethke.

"It was a wonderful exploration of poems and also a kind of whirligig of activity," Post recalls. The course was held at the Hecht home. Helen had given birth to a son, Evan, in April, whom Post recalls as a "silent auditor in the class."

That seminar marked the beginning of what would be his lifelong friendship with the Hechts.

Months after Anthony Hecht's death, Helen began what would prove a monumental task: recovering what would turn out to be more than 4,000 letters the late poet had written over the course of almost seven decades.

Helen Hecht recalls the germination of the project in a conversation reported to her by Anthony Hecht's literary executor, the poet J. D. (Sandy) McClatchy. McClatchy had been talking one evening with fellow poets John Hollander and Richard Howard. "They said what a great letter writer Tony was, and the letters should all be collected." A happenstance phone conversation led to Post becoming the editor who would, with Helen's input, whittle those few thousand letters, many of which are now part of the Anthony Hecht archive at Emory University, to the several hundred that appear in the book.

EASTMAN QUAD: A member of the English department from 1967 to 1985, Hecht, who won the Pulitzer Prize shortly after arriving at the University, served at Rochester longer than at any other institution.

The letters begin in 1935, when a young Hecht was writing home from summer camp, and end in the summer of 2004, just months before he died. They chronicle nearly every major phase in between—his discovery of poetry as a student at Bard College, his service during the Second World War, his troubled first marriage, and his joyful second marriage, to Helen D'Alessandro, in 1971.

Post anticipates that scholars and other readers and writers of poetry will be interested in Hecht's correspondence with a host of other luminaries, including Howard, Hollander, and McClatchy, as well as Richard Wilbur, Allen Tate, Anne Sexton, James Merrill, Elizabeth Bishop, and others.

Post finds the collection's greatest significance, however, in the early letters.

"The later poems and the later Hecht is better known because he was something of a public figure then. But the part leading up to *The Hard Hours* is really revelatory. All of that is going to be seen and read for the first time. And I suspect that that will make a significant difference in terms of how people begin to think about the long and substantial career that he had as a poet."

Hecht, born in Manhattan to privileged and cosmopolitan German-Jewish parents, had enjoyed an elite private school education, but had been, by his account, a mediocre student prior to his matriculation at Bard College in 1940. He began college with little confidence in himself academically.

"At first I felt quite self-conscious; I thought everyone was laughing at me behind my back," he wrote to his parents in September of his freshman year. Within a couple of years, he had developed substantially as a student and discovered his love for poetry—as well as the challenges of writing it.

"My poetry is coming slowly," he wrote to his parents in the spring of 1943. "Producing it, even in small quantities has always been for me a painful and laborious process. (I mean painful here not in the sense of unpleasant to do, but only difficult in the extreme.) I have picked a particularly hard job for myself in deciding to write a sestina."

McClatchy says the letters not only offer "a fuller portrait" of Hecht himself, but also "reveal the personality and character of the writer, as he is writing and as he is living, experiencing what he will later transform into art."

Among the experiences he transformed into art was his presence at the liberation of the Flossenbürg concentration camp in April 1945.

"This letter is written primarily to inform you that the war is over, and I have come through it unscathed," he wrote to his parents the following month. "Unscathed, of course, does not mean unaffected. What I have seen and heard here, in conversations with Germans, French, Czechs, & Russians—plus personal observations combine to make a story well beyond the limits of censorship regulation. You must wait till I can tell you personally of this beautiful country, and its demented people."

His wartime experiences were material for some of his most haunting poems, such as "'More Light! More Light!'," which he dedicated to his friends, the German philosophers Heinrich Blücher and Hannah Arendt, both of whom fled from Nazism.

Post is at work on a book about Hecht's poetry that will encompass the poet's entire career.

"The letters shape a number of the chapters. I use the letters oftentimes as springboards," says Post. He adds that the advantage of writing a critical book about Hecht's work is that "I'm freer to investigate more interpretive questions in relationship to the poems and also in relation to the life as I understand it, partially through the letters."

For her part, Helen Hecht is struck most by the consistency and uniqueness of the voice in the letters.

"It was like having him in the room," she says, recalling the first time she read through the letters, one by one. "The voice in the letters was so distinctive and clear and characteristically his own. I would have recognized it anywhere."

UNIVERSITY LIBRARIES/DEPARTMENT OF RARE BOOKS, SPECIAL COLLECTIONS, AND PRESERVATION

FACES FROM YESTERDAY: Daguerreotypes of unknown subjects from the Eastman House's study collection. University and Eastman House researchers are working together to find out how to preserve daguerreotypes in the face of mysterious deterioration.

A Vanishing Past?

Can science save the daguerreotype, the first successful medium of photography?

By Kathleen McGarvey

BRANDON VICK

As the microscopes of the Integrated Nanosystems Center in Wilmot Hall hum and thrum with power, a tiny piece of the 19th century—sharply etched, infinitely fragile—undergoes their inspection.

"There!" says photo conservator Ralph Wiegandt, pointing excitedly to an image on his screen that looks like a giant insect conjured from a science fiction movie. "You're looking at 33,000 times magnification."

The object of his scrutiny is Robert Cornelius's 1841 daguerreotype of chemist Martin Hans Boyè. Cradled within the electron microscope, the daguerreotype begins to give up the secrets of its surface. To the naked eye, it is flecked with small spots. Under the electron microscope's exacting gaze, it is another world.

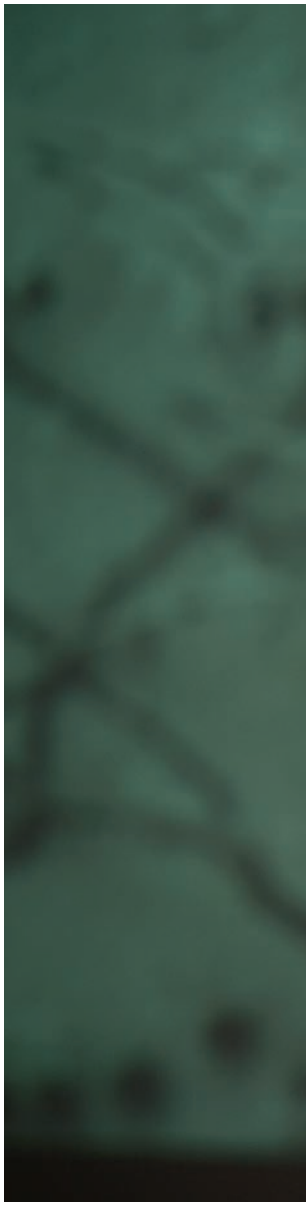
"I'm a daguerreian rover," Wiegandt says, only half facetiously, "and I'm now negotiating myself around the terrain of a daguerreotype."

His adventures there are no lark. Daguerreotypes are the first photographic images, formed by a process Louis-Jacques-Mandé Daguerre invented in 1839. The predominant mode of photography in the United States from that year until the Civil War, daguerreotypes are unique, nonreproducible images of almost confounding clarity—and they may be deteriorating before our eyes. No one knows exactly why, or how to save them.

So Wiegandt—senior project conservator at the George Eastman House International Museum of Photography and Film—together with Nicholas Bigelow, the Lee A. Dubridge Professor of Physics, are racing for answers. Using 21st-century technology, they're trying to learn more about the science of daguerreotypes, the nanotechnology created by 19th-century inventors that makes them possible, and the activities of nanoparticles that may be their undoing.

The Eastman House, just four miles from the River Campus, holds one of the world's largest collections of daguerreotypes, with about 5,000 images. In 2005, the Eastman House organized a major daguerreotype exhibition, *Young America,* a comprehensive retrospective of the works of Boston daguerreotype firm Albert Sands Southworth and Josiah Johnson Hawes. One of the first photographic studios in the United States, it operated for 20 years beginning in 1843 and counted figures such as Ralph Waldo Emerson, Harriet Beecher Stowe, and Daniel Webster among its clients.

The greatest proportion of the 160 daguerreotypes on display came from the Eastman House, the Metropolitan Museum of Art, and the Museum of Fine Arts, Boston. In a review, art critic Holland Cotter of the *New York Times* described daguerreotypes as "diamond-cut empiricism bathed in apparitional light" and called the exhibition "precious in the very best sense: literally beyond price, and almost, but not quite, beyond praise."



NEW TERRITORY: Physicist Nicholas Bigelow is bringing his expertise to bear on the field of photo preservation through research on daguerreotypes as 19th-century instances of applied nanotechnology.

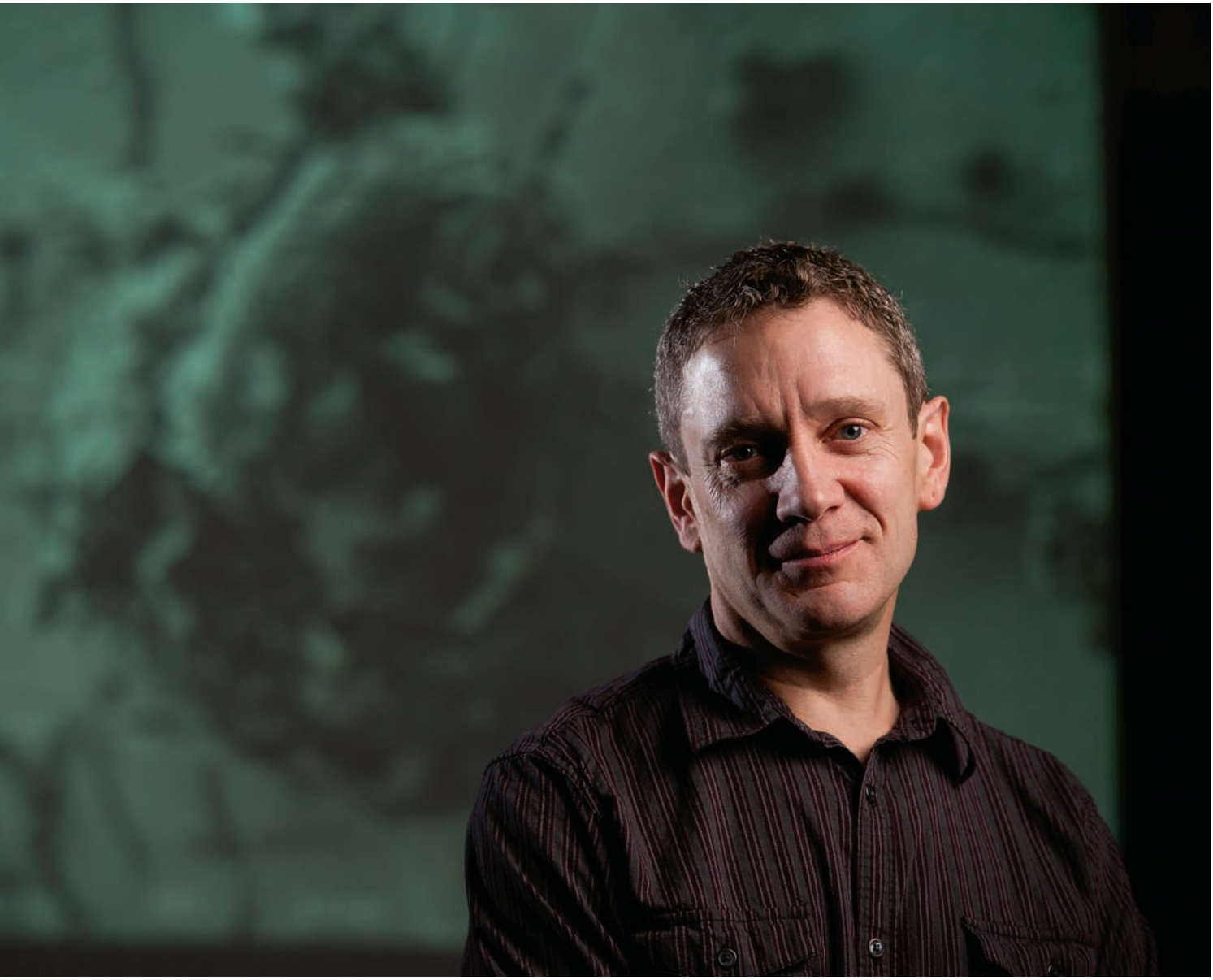
Just one month after the exhibit opened at the International Center of Photography in New York City, curators discovered degradation in the condition of some of the daguerreotypes: a disfiguring bloom or white haze on the surface of the images. It was decay, sudden and unmistakable, that no one could explain. Thirty daguerreotypes showed damage; for five of them, it was critical degradation.

"To an art curator, this is traumatizing," says Bigelow. "The notion that you had just sent these irreplaceable objects on tour and something happened, that overnight you could ruin them—what's going on?"

"We always thought it was okay to shine light on a daguerreotype, unlike paper," because it was essentially a silver surface—"like a silver teapot," says Malcolm Daniel, senior curator of the Metropolitan Museum's Department of Photographs. But for this exhibition, the lighting was "absolutely meticulous," as was the documentation of the daguerreotypes' condition. Lighting didn't cause the "dramatic" degradation, says Daniel, but "light-sensitive photochemistry was there, waiting to be triggered."

One thing that the group's microscopic explorations have revealed is that the silver daguerreotype plate is a biologically active surface, a remarkable finding because silver is naturally antimicrobial. But on virtually every daguerreotype the team has examined, small colonies of fungi are growing—and damaging the surface. "They're not just living out there—they're engaging with" the daguerreotype, Bigelow says, bringing the daguerreotype's metals into the fungi's biological system and then, perhaps, extruding them to the surface, as metallic nodules and other forms.

It's quite an astonishing discovery, "almost like finding life on Mars," says Brian McIntyre, a senior engineer at the Institute of Optics who is collaborating with Bigelow and Wiegandt. Daguerreotypes that have been stored improperly often have visible accumulations of filament-like material on their surfaces. The growths'



appearance suggested fungi to early observers, but later analysis indicated that the filaments were purely chemical. The scans Wiegandt and McIntyre have made, however, show growths "clearly biological in nature," Bigelow says. That was confirmed by a study published last year in which a group of Harvard microbiologists and photo conservators confirmed the filaments were fungal by identifying their DNA.

"There's a miraculous piece of all this—forget about the daguerreotype for a minute: what on earth is going on in the physics that underlies this, and the chemical process that forms this?" says Bigelow.

Through the technology available at the Integrated Nanosystems Center—known more familiarly as URnano, with Bigelow as its director and McIntyre, its director of operations—the team is pursuing answers to those questions. They're using a focused ion beam to extract samples, revealing activity below the surface—"like a biopsy," says Bigelow, and performed only on samples that are not of museum quality. A scanning electron microscope scatters electrons off the surface of the daguerreotypes, providing magnification of 150,000 times and analyzing the elemental composition of any given spot on the image. A transmission electron microscope offers magnification of 250,000 to 300,000 times, and installation in the spring of a new device for X-ray photoemission spectroscopy will offer yet another avenue of investigation.

"Even 10 years ago, what we're doing would have been very different," says McIntyre.

The project has received $450,000 in support from the National Science Foundation, through its SCIART award program that funds projects bringing together science and art. The team's work has also benefitted from an alliance announced in 2010 between the University and the Eastman House. "I always think of art and science as great collaborators," says Thomas DiPiero, dean for humanities and interdisciplinary studies. "This time we're working with a partner institution, and the science is in service to our cultural heritage."

What initially drew Bigelow—chair of the physics department, also a professor of optics, and an expert in quantum optics and quantum physics—to the project was something extraordinary

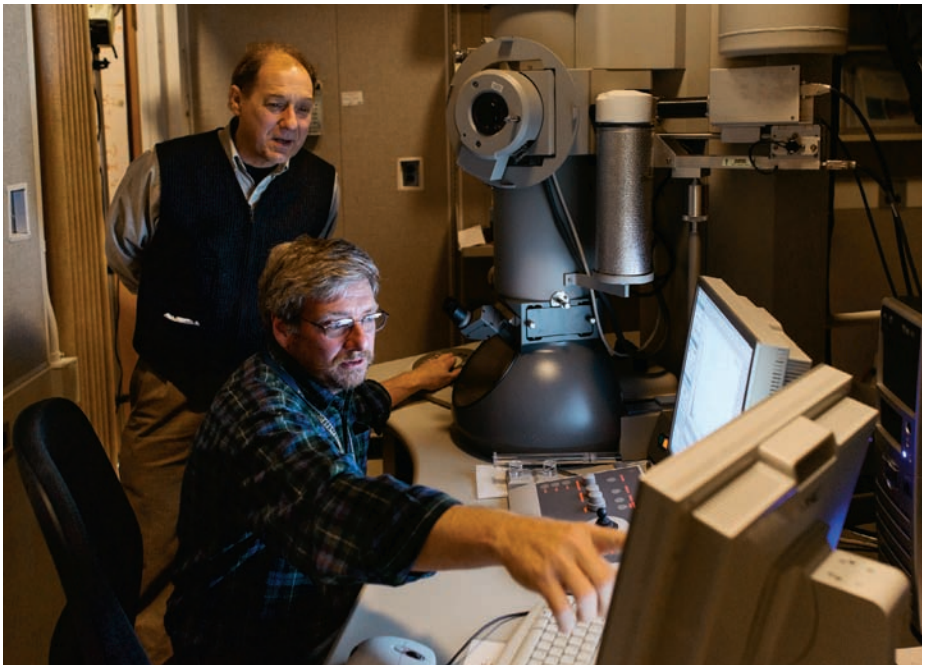
ADAM FENSTER

about daguerreotypes. The daguerreotype isn't only the first form of photography; it may also be one of the first forms of controlled nanotechnology. Daguerreotypists used nanotechnology to create pictures, and now, more than a century and a half later, scientists and conservators are turning to nanotechnology in a bid to save them.

Most people think of nanotechnology as nanochips or tiny electronic circuits, the processor in their computer tablet or phone, the whiz-bang of modern microelectronics. "But it's a much broader field," says Bigelow. Nanoscience is the study and control of materials, biological or chemical, that are between one and 100 nanometers in size. A nanometer is just a billionth of a meter; this sheet of paper is about 100,000 nanometers thick.

One part of nanoscience involves building things on the nanometer scale; another is constructing tools with which to see at that scale and understand how nanoparticles work. Matter behaves differently at the nanoscale than it does when in "bulk."

To create a daguerreotype, photographers treated a silver-plated copper sheet with halogens—reactive elements such as iodine or bromine—in vapor form. Bonding to the silver, the vapor created a light-sensitive surface of silver halide.



IN PURSUIT: Working at the transmission electron microscope at URnano, Ralph Wiegandt (standing) and Brian McIntyre examine the degradation process of daguerreotypes in search of solutions.

Light reflected off the object or person to be pictured in the daguerreotype and created an image on the silver plate. The bromide or silver iodide converted to silver where the light reflected; the images were dark where the silver halide remained. Wiegandt compares the effect to "condensation on a mirror after you take a shower: with no light above, if you then wipe the glass, the wiped area will look black."

Daguerre discovered that he could develop a latent image by exposing it to mercury fumes. Doing so created silver-mercury crystals in tiny, snowlike grains, forming an exquisite direct positive photograph. A wash of sodium thiosulfate fixed the image by removing the unreacted halogen, leaving on the plate a pure silver surface and the silver-mercury crystals—a "mirror with a memory" and a "triumph of human ingenuity," as Oliver Wendell Holmes wrote in the *Atlantic Monthly* in 1859.

In 2011, a research group at the University of Louisville, aiming to create a solution that would yield nanoparticles, stumbled upon precisely the formulation of gold chloride and sodium thiosulfate, heated slightly, that 19th-century French physicist Hippolyte Fizeau developed to make daguerreotypic images physically stronger and visually more lively.

"These guys had discovered how to do nanotechnology—in the 1800s. It was probably one of the first examples of people discovering a nanotechnology and really harnessing it," Bigelow says. "I think all evidence has it that people were thinking like a chemist would think. 'Nano' was just not in the vocabulary."

Nineteenth-century inventors couldn't see the nanoparticles they'd created in the solution or in the finished daguerreotypes—it wasn't possible to do so until the 1990s, when nanoscientists began to use microscopes capable of observing nanoscale objects. The nanoparticles that form the image of a daguerreotype would need to number between 100 and 1,000, if stacked side by side, to equal the width of a human hair. Those nanoparticles make daguerreotype images extraordinarily precise, so sharp that a good example can be enlarged 20 to 30 times—something most photography today can't achieve, Wiegandt says.

"We often say photography was born fully mature," says Daniel.

Daguerreotypes "degrade through a number of mechanisms—the daguerreotype, its container, things happening on the surface," says McIntyre. Exposed to sea air, as those produced by Boston-based Southworth and Hawes would have been, daguerreotypes can experience corrosion similar to the rust a car would acquire in a coastal setting. Other factors in their environment could have equally damaging effects. "The daguerreotype, probably as much as any single object I can think of, is actually an environmental sensor, so it will record, with extremely high sensitivity, events that have occurred to it," says Wiegandt.

"There isn't any one thing. There are many modes of degradation that we observe," Bigelow says. "Some of them are interrelated, and some might be quite distinct."

Thirty years ago, a graduate student at Penn State began the first comprehensive, modern study of the science of daguerreotypes. Using an electron microscope, she scanned daguerreotypes and found that much was happening beneath their surface. On the basis of her scans, she and other experts proposed cleaning methods and restorative techniques that they believed were safe but that Wiegandt says new research has shown to have "altered the surface structure" of the daguerreotypes. It was premature advice, he says.

New technologies for microscopy and nanofabrication now

BRANDON VICK

permit much closer examination, and at URnano, Wiegandt and McIntyre are able to see, at strengths of hundreds of thousands of times magnification, what investigators in the 1980s saw only at 1,000 to 5,000 times enlargement. "What really counts, at some level, are these nanoparticles and what's going on with them," Bigelow says.

The group's work may help pave the way for technological applications far beyond the preservation of the daguerreotype. "Self-assembling nanotechnology" is an area of fervid research, especially in the area of biomedical applications—and self-assembly of nanoparticles is what Bigelow, Wiegandt, and McIntyre are finding in the active surface of the daguerreotype. Even the holes, pores, and cavities that they've found formed beneath some of the particles hold clues to nanoscience's potential. It's a "network of holes through which moisture, or anything in the atmosphere, if it gets in there can actually undermine the image and allow it to decay from within," Bigelow explains. Dire for the daguerreotype, similar hollow particles could be a boon to medicine as medical nanocapsules.

As up to 170-year-old examples of nanotechnology, daguerreotypes, already cultural treasures, may also be invaluable for what they can demonstrate about how nanoscale materials age. "We don't know what's going to happen to these nanoparticles we're making now—but you know, we've got almost 200 years of damage on these daguerreotypes. We can recreate conditions and see what's happening," McIntyre says. "It's got a million applications."

But for now, the group cares, foremost and fiercely, about the fate of the daguerreotypes. In February, Bigelow and Wiegandt traveled to New Zealand to speak to conservators at a conference sponsored by the American Institute for Conservation of Historic and Artistic Works and the International Council of Museums. Their aim was one of urgent persuasion: "to alert the community of photograph conservators to the reactivity of the daguerreotype's highly nanostructured surface composed of silver and gold and their unique nano properties; and to propose new preservation strategies that can halt the virtually undetectable nano-level deterioration before it advances to micro and macro stages," they wrote.

At the Eastman House, under Wiegandt's guidance, those preservation strategies include cases that seal the daguerreotypes in an argon atmosphere, which will hold them in a suspended state. The argon displaces the air from the daguerreotypes' environment, taking moisture out of the system and stopping most of the chemical activity. "It's literally the only action I think we can take," he says.

The tools to restore the damaged daguerreotypes have yet to be invented, Wiegandt says, and he doesn't want to act in haste. For now, he, Bigelow, and McIntyre are engaged purely in exploration and analysis. "Nobody really robustly understands what's happening, either to create the image or what's happening as the image degrades. Understanding the fundamental chemistry and physics of the daguerreotype process is seminal to understanding how to preserve them," says McIntyre.

"We see infinitely more surface structure and what's going on" than earlier analysts could, Wiegandt says. "It's essential that we revisit assumptions that have been made by previous analyses to understand the material object better, and take care of it better."

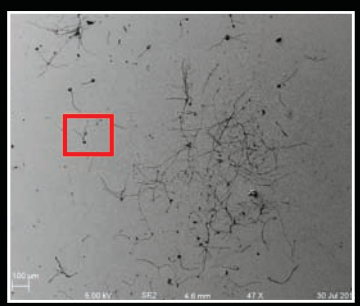
As befits a man who has devoted his career to one of the more extraordinary creations of the 19th century, his prudence is informed by a belief in the power of technology.

"I have enough faith in science that I don't want to preempt what might be done in 50 years." R

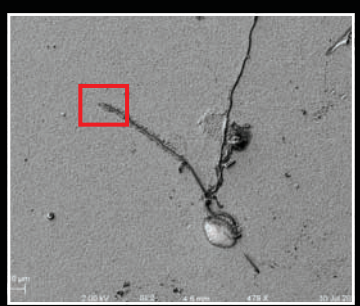
Under the Microscope

Researchers have found biometallic interaction on the surface of every daguerreotype they've examined with a scanning electron microscope.

Biometallic interaction on this daguerreotype of an unknown sitter is highlighted in the red box.



MAGNIFIED
47×
One of the many regions of filamentary biogrowths on the plate.



MAGNIFIED
479×
A detail of the filamentary biogrowth highlighted in the image above.

MAGNIFIED
4,720×
A close-up of the left biofiber branch shown above and the phenomena of particle-crystalline aggregations and interruption of the plate surface.

COURTESY OF RALPH WIEGANDT/EASTMAN HOUSE