Building on Solid Ground

Life in the sunny, arid Southwest is a siren call to thousands of people depressed by gloomy Midwestern skies and wet, freezing Eastern winters. The result is rapid population growth and a booming demand for new home construction in Arizona and other western states. But sunny, arid climates come with dry soils. Building on those soils poses a unique problem for the construction industry.

Sandra Houston is working on a solution. She and colleague William Houston are professors of civil and environmental engineering at Arizona State University. They study the mechanics of soil low in moisture content, the soil most often found in arid or semi-arid climate regions. “Arizona’s climate goes from very dry to very wet because urbanization and landscape irrigation results in the addition of lots of water,” Houston explains. “The problem is the change in moisture and the amount of that change in the soil.”

In Arizona, homes are often built atop concrete slabs. Soil beneath those slabs can move due to the change in soil moisture content. Such movement can lead to structural cracks and other major headaches for builders and homeowners.

The research team also includes Delwyn Fredlund, a leading expert on the study of unsaturated soils, and professor emeritus at the University of Saskatchewan, as well as ASU faculty research associate Claudia Zapata.

“Clay soil is like a sponge. It expands when it takes in water,” Fredlund says. “When the sun comes out and the water evaporates, the soil contracts.”

The group is developing computer models to evaluate different types of soil systems for arid climatic conditions. They also want to create methods for educating builders, homeowners, and engineers on the do’s and don’ts of building on unsaturated soils.

“We have the equipment. The theory is in place. We have great tools,” Zapata adds. “Now we need to combine everything to solve these important problems.”

Research on saturated soils is supported by the National Science Foundation and the Home Builder’s Association of Central Arizona. For more information, contact Sandra Houston, Ph.D. Send e-mail to sandra.houston@asu.edu

Winning the Final Four of Design

Every big city seems to have at least one of these places—an industrial no-man’s land on the edge of downtown. Once booming, these landscapes have fallen on hard times. The scene is eerily familiar: lonely streets of abandoned warehouses and torn-up railroad tracks; empty lots strewn with buckled asphalt and broken glass. Nearby, a river slides past banks choked with weeds. It’s the kind of place where dead bodies turn up on TV crime dramas.

Imagine that it’s your job to come up with a plan that would make this place a hot spot for night clubbers and office workers, park lovers and conventioneers, theater goers and apartment dwellers, store owners and shoppers.

Imagine giving yourself one month to draft the plan before presenting your ideas to national experts in the field of architecture, urban planning and real estate development.

Imagine competing for top honors against talented students from some of the nation’s most prestigious schools.

That’s exactly what five Arizona State University graduate students did with their free time during the spring 2004 semester. It all began in February when their proposal to the prestigious Gerald D. Hines Student Urban Design Competition was selected as one of four semifinalist projects out of 56 entries from around the country. The competition is sponsored by the Urban Land Institute, a Washington, D.C.-based think tank devoted to the study of land-use issues.

The semifinalist teams were given one month to refine their vision for a derelict, 57-acre parcel on the banks of the Allegheny River in downtown Pittsburgh. In April, the ASU team traveled to Pittsburgh to present its ideas to a panel of judges.

Weeks of grueling work paid off. The ASU students beat out competing teams from the Massachusetts Institute of Technology, Harvard University, and a combined team from the University of California-Berkeley and Stanford University. As added reward for their hard work and innovative ideas, the ASU students walked away with $50,000 in prize money.

The project owes much of its success to team leader Prasoon Kumar. An architect by training, he had enrolled in ASU’s environmental planning program to gain additional skills for tackling large-scale urban-development projects in his native India. Little did he know that the competition would turn out to be a crash course in this kind of real-world development.

Kumar’s first task was building a team. But it was no easy matter. Competition guidelines called for student representation from several different real estate-related disciplines. Areas of concentration could range from real-estate development, city planning, urban design, architecture and landscape architecture to fields such as finance and law.

Kumar consulted with faculty in the College of Architecture and Environmental Design (CAED) and the W.P. Carey School of Business. He assembled a group of five students that included Parul Mittal and Timothy Parke, also enrolled in environmental planning; Matthew Muller in architecture; and Mohan Sankrit in business.

The students developed a revitalization scheme, entitled “Destination Allegheny.” Their plan called for a riverfront plaza, a marina and hotel, as well as premium housing, office and retail developments.
The goal of the competition was not just to come up with a pretty design scheme,” explains Catherine Spellman, an ASU associate professor of architecture who served as the team’s official faculty advisor. “The whole point was to encourage universities to start looking at urban design problems in all their complexity. You need the expertise from the architecture side, the business side, the real estate side, the development side, the ecological side. All these people have to work together to solve problems on this scale.”

For example, the students were given a hypothetical budget — $40 million in seed money from the City of Pittsburgh. They were then required to estimate overall costs for four phases of development over a 20-year period. They had to use the city funds to draft a detailed financial scheme for the first phase. The assignment called for juggling a mind-boggling array of variables.

The students estimated how much new infrastructure — such as roads, sewers, and utilities — would be needed to support the new development. They developed working ratios of public open space to private development. And they addressed ecological concerns such as cleaning up polluted soils and routing storm water flows away from the Allegheny River.

To help them prepare for these complexities, Cheryl McNab, former director of external relations for CAED, set up almost daily tutorials with long-time supporters of the college from around the Phoenix metro area. The mentors included real estate bankers and developers, urban planners from the City of Phoenix and private firms, architects and landscape architects, as well as faculty from ASU’s business and design schools.

By the time the ASU team made their final presentation in Pittsburgh, they had consulted some 70 community professionals and faculty members, rehearsing and refining their presentation dozens of times.

“When they presented their project the final time in Pittsburgh,” Spellman recalls, “I almost started crying, they were so good. There was no question in my mind that they had won by a landslide. There was no question in my mind that they had won by a landslide. I almost started crying, they were so good.”

Weitz explores this topic in-depth in her new book, Rapunzel’s Daughters: What Women’s Hair Tells Us about Women’s Lives. The book is based on historical research, observations at hair salons, interviews with 74 girls and women, and a variety of focus groups.

The ASU sociologist shows how hair is tangled up with all aspects of life, including sexuality, age, race, social class, health, power, and religion. The reasons for hair’s leading role can be attributed to three things, according to Weitz. “It is personal, growing directly out of our bodies. It is public, on view for all to see. And it is malleable, allowing us to change it more or less at whim,” she says. “As a result, it’s not surprising that we use our hair to project our identity and that others see our hair as a reflection of our identity.”

During research for the book, Weitz looked at how women change their hairstyles to mark important life passages. She noted changing hair fashions that often reflect social values, such as the resurgence of the Afro in the late 1960s to show black pride. She examined how women use their hair to attract men or show their independence from them. She also explored their relationships with hairdressers, and relates the effects of hair loss through alopecia and chemotherapy on women’s self-image.

Like all women, Weitz has her own personal “hairstory.” One of her earliest memories is watching a Shirley Temple movie and being entranced by the young actress, particularly her curly blonde locks. After the movie, the 5-year-old Weitz hid in a closet and chopped off her straight, waist-length black hair. Somehow she believed that it would magically grow back in golden ringlets.

The magic didn’t work for Weitz, but women often do work a certain transformative magic through their hair. Using dyes and perms, gels and sprays, wigs and razors, women can change the image they project quickly and easily. Hair can make a statement about one’s culture and ethnicity, transformative magic through their hair. Using dyes and perms, gels and sprays, wigs and razors, women can change the image they project quickly and easily. Hair can make a statement about one’s culture and ethnicity, political leanings, religious affiliation, and even professional status.

Weitz explains, “I know a local utility company where there is no need to mention—of all things—hair. Rose Weitz is not surprised in the least.

“Hillary was right,” says Weitz, a professor of women’s studies and sociology at Arizona State University. “Our hair is one of the first things others notice about us and one of the primary ways we declare our identity to them.”

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The Dawn of Galaxies

The Hubble Ultra Deep Field (HUDF) image is the deepest optical view of the universe ever seen by humans. Several expert teams are conducting detailed analysis on the image. One of those teams includes ASU astronomer Rogier Windhorst. The team is led by Haojing Yan, a recent ASU graduate now doing post-doctoral work for the Spitzer Space Center at the California Institute of Technology.

The image is helping scientists identify what may turn out to be the earliest star-forming galaxies. Astronomers think that the collective ultraviolet light from those galaxies was likely responsible for “re-ionizing” the universe back when it was seven times smaller than it is today.

“This is the dawn of galaxy formation,” Windhorst says. “Before this, there were probably just star clusters and giant molecular clouds like the Orion nebula in our galaxy. There were big, massive stars, but probably nothing like the shape of ordinary or even tiny galaxies.”

The HUDF looks back to approximately the first 750 million years after the Big Bang. “Around this time there were finally enough stars to turn all the neutral hydrogen in the universe into ionized hydrogen,” Windhorst says.

During the past few decades, astronomers have amassed evidence that we live in a re-ionized or “refried universe.” Windhorst explains that this so-called re-ionization epoch was a critical watershed for the evolving universe. During that early time, cold hydrogen atoms drifting in space were pumped up with so much energy from the ultraviolet starlight that they were stripped of their electrons. As a result, the universe once again became transparent to light, like the sun burning off a morning fog.

NASA’s new 6.5 meter James Webb Space Telescope is planned for launch in 2011. It will allow astronomers to peer even further back in time to the epoch of first light.
New Spin on DNA

Scientists have long wondered why DNA, the genetic code in all living things, always twists in one direction. Their answer may have fallen out of the sky. Many molecules come in two forms that are mirror images of each other, twisting both clockwise and counter-clockwise. The master molecules that make up life, however, tend to exist in one form or another. DNA spirals clockwise. The amino acids that build proteins, however, spiral counter-clockwise. One way to make these single-direction molecules is by using an opposite “template” molecule.

Sandra Pizzarello is searching for a template that could have been around when life began on Earth. The ASU chemistry professor studied isovaline, an amino acid found in the Murchison meteorite, a piece of rock that fell from space in 1969. The meteorite is more than 4.5 billion years old, just like Earth itself. Pizzarello says that the isovaline and other amino acids found in the meteorite spin predominantly counter-clockwise. To learn more, Pizzarello mixed isovaline in the proportions found in the meteorite with glycoaldehyde and formaldehyde, two carbon-based chemicals believed to have been common on the early Earth.

The reaction produced threose, a simple sugar found in living things. Pizzarello found there was about 5 percent more clockwise threose than counter-clockwise. This might have been the beginning of directionality in the molecules of life. While threose doesn’t exist in DNA, it is part of a similar molecule called TNA. Life may have begun with TNA as a base, later evolving to use DNA.

Pizzarello and coauthor Arthur L. Weber of the SETI Institute published their findings in the February 20, 2004 issue of Science.

Moving With Light

A beam of light comes in handy when looking for lost keys in a dark room. But it also can be a powerful tool for moving molecules of water. ASU scientists recently discovered that ordinary beams of light can be used to move tiny water droplets. Tony Garcia says the finding could have an important impact on the fledgling field of microfluidics.

Garcia is an ASU associate professor in the Harrington Department of Bioengineering. He and his colleagues are the first to demonstrate that a beam of light can be used to move droplets of water around on surfaces. They also used light to move droplets in extremely small channels, and to place them in predetermined positions for analysis.

The ASU researchers used nanotechnology techniques to make their discovery. In nanotechnology, scientists design and build devices one molecule at a time. As the overall size of these devices shrink, the nature of the surface plays an increasingly important role. Why? Because a greater percentage of the molecules in a nanotech device reside on the surface. Garcia says that the ability to manipulate surface molecules using everyday means, such as shining a light or connecting to a battery, is very important. Ordinary tools like pumps and valves are difficult to make on a nano scale.

“This discovery can speed the development of microfluidic devices,” he says. Scientists can use these tiny, sophisticated devices to analyze samples faster and more efficiently. For example, using a microfluidic device, a laboratory technician might need only a single drop of blood to run a battery of 20 to 30 different tests. The patient would get results in the time spent waiting to consult with the physician.

“Theses devices also could help pharmaceutical companies screen for a new drug by allowing for tests to be run on an extremely small scale and in simultaneous fashion,” Garcia adds.

The ASU scientists are now working to design a device that can move drugs dissolved in water, or droplets of water and samples that need to be tested for environmental or biochemical analyses.
Seeing Red...It’s Genetic!

Men often “see red” when angry. Actually, women might see red much better than men. Other colors, too. No matter what the emotion of the moment. Stereotypes about the superior color sense of women may be rooted in genetics. New research suggests that natural genetic selection often gives women the ability to better discriminate between colors.

Brian Verrelli is a researcher with the Biodesign Institute at Arizona State University. He and Sarah Tishkoff of the University of Maryland studied the gene that allows people to perceive the color red. The scientists found that the gene has maintained an unusual amount of variation that is about three times that of other genes. Their results were published this year in the *American Journal of Human Genetics*.

The scientists think that enhanced color perception was important to women in prehistoric times. While men were out hunting meat, women were busy gathering fruits and nuts. Good color vision would have allowed them to better distinguish among fruits, foliage, and insects.

Verrelli explains that variation in the “red” gene is created via the exchange of genetic material with a gene “next door.” That gene detects the color green. The red gene is found only on the X-chromosome. Because women have two X-chromosomes, they can receive one chromosome with the typical configuration of the red vision gene while the other chromosome receives a slight variation. The combination of a normal and variant gene occurs in about 40 percent of all women. This combination may give those women a broader spectrum of color vision in the red-orange range.

By contrast, men have one X-chromosome. If they receive any variation in the single red gene, it usually reduces their ability to distinguish between red and green. While the common term used is “color blind,” the ASU scientist says that “color vision deficiency” is a more accurate description. About 8 percent of all men have a color vision deficiency. That number caught Verrelli’s attention.

“Most detrimental conditions caused by a genetic variation affect a tiny fraction of one percent of the population,” Verrelli explains. “The fact that color-blindness was so common suggested an important mitigating advantage.”

Humans see color because we have the ability to distinguish red, green, and blue. The combination of these three colors forms the basis for all the colors we see. Other creatures use different color vision systems. By studying these distinctions, scientists might better understand how and when life forms separated during the evolutionary process.

FOR MORE INFORMATION ABOUT THIS PROJECT AND OTHER WORK AT THE BIODESIGN INSTITUTE, VISIT THE WEB SITE AT: HTTP://WWW.AZBIO.ORG
Teaching the Power of Biodiversity

David Pearson knows about the power of life. He also knows that the diversity of plants and animals and other creatures is key to our survival and quality of life on this planet. Pearson is a research professor in the School of Life Sciences at Arizona State University. He is on a mission to illuminate the importance of “biodiversity” in the minds of Latin American students and leaders.

Biodiversity refers to the variety of all life forms — the plants, animals, insects, microorganisms — and the ecosystems of which they are a part. Biodiversity is the sum of all the life around us. Pearson says that the most significant hindrance to the conservation and management of biodiversity is our lack of knowledge about it and the effects of human population and activities on it. He is trying to fill the knowledge gap.

Pearson conducts week-long workshops in Central and South American countries. Participants include government officials, business leaders, educators, students, and environmental activists.

“To understand biodiversity, you have to see it from the big picture – the people, the culture, the resources, and their local knowledge,” he says. “Recognizing this, you then seek out the best, most efficient ways of using available resources to augment your community’s current and future economic and environmental state.”

The ASU scientist’s educational efforts focus on four principles that define and denote the importance of biodiversity:

**Ecosystem processes:** Biodiversity underpins the processes that make life possible. Healthy ecosystems are necessary for maintaining and regulating atmospheric quality, climate, fresh water, marine productivity, soil formation, the cycling of nutrients, and waste disposal.

**Ethics:** No species, and no single generation, has the right to sequester Earth’s resources solely for its own benefit.

**Aesthetics and culture:** Biodiversity is essential to nature’s beauty and tranquility. Many countries place a high value on native plants and animals. These contribute to a sense of cultural identity, spiritual enrichment, and recreation. Biodiversity is essential to the development of cultures.

**Economics:** Plants and animals attract tourists and provide food, medicines, energy, and building materials. Biodiversity is a reservoir of resources that remains relatively untapped.

At home in Tempe, Pearson teaches the *Introduction to Biology* course to ASU undergraduates. He also works with students from participating countries and mediates debates and small group discussions during workshops. Topics focus on biology, sociology, and economics.

“The sessions allow the students to speak openly and offer an opportunity for them to learn from and teach each other,” he says.

Pearson has presented biodiversity workshops in Mexico, Peru, Venezuela, and at three universities in Brazil.

“‘Why’ is the most important question that people ask,” he explains. “Knowing why something happens is the key to meeting any challenge. We can go to the source of the problem instead of putting a band-aid on it by answering how to fix it. It’s a learning process for everyone involved, including myself.”

The exchange of ideas doesn’t stop once the five-day workshops end. Pearson developed a Web site to continue the communication and idea exchange. The site is hosted by el Instituto de Biología de UNAM Posgrado in Mexico City. Visit the site at:

http://www.ibiologia.unam.mx/~jcmr/ibunam2/posgrado/cursos.htm

The site is written mostly in Spanish and Portuguese. It provides a contact list for the more than 200 participants from Mexico, Brazil, Venezuela, and Peru.

One of the participants is Jon Paul Rodríguez, a researcher with the Ecology Center of the Venezuelan Institute for Scientific Investigation (Instituto Venezolano de Investigaciones Científicas, or IVIC).

Rodriguez coordinated a workshop Pearson taught at IVIC which included 24 participants. He says the ASU professor concentrates on teaching students how to think about biodiversity problem-solving, using the scientific method. “This is important,” Rodríguez says. “During their formal training, these students are taught how to complete exams, write essays, or fulfill the contents of lesson plans. Rarely are they taught how to really think.
Healthy hearts can be hard to find in the United States. By age 65, one in three Americans will develop coronary artery disease. It’s the country’s leading cause of death.

Many people opt for surgery to unclog their plaque-filled blood vessels. But almost half of them will be forced to schedule a return engagement when the once-repaired vessel clogs again. The phenomenon is called restenosis.

Alyssa Panitch is working to limit multiple visits to the surgeon’s table. Panitch is an assistant professor in the Harrington Department of Bioengineering at ASU’s Ira A. Fulton School of Engineering. Her work is supported by a 5-year grant from the National Institutes of Health.

“Restenosis typically happens when someone’s artery is partially blocked because of plaque,” Panitch explains. “Typically, surgeons go in with a balloon catheter to expand the artery. The catheter can damage the endothelium and smooth muscle cells that line the artery.”

Once a blood vessel is damaged, doctors now know that it can become blocked again in as little as six months to a year after the original surgery.

Panitch’s mentor on the project is Colleen Brophy, director of the Center for Protein and Peptide Therapeutics at the Biodesign Institute. Brophy originally identified a small protein called HSP20. When introduced inside smooth muscle cells, a small fragment of HSP20 causes those cells to relax. That fragment is called a peptide.

Panitch says that the relaxation effect might be used as an important new tool in coronary bypass surgery. During a bypass procedure, the surgeon removes a long piece of vein from another portion of the patient’s body, usually the leg. The surgeon uses the vein to “bypass” the blocked part of the coronary artery. The grafted vein takes over the job of moving fresh blood and oxygen to healthy heart muscle cells.

“The veins that surgeons use can go into spasm. That can cause the graft to fail in the long term,” Panitch says.

The ASU researchers are focusing on how best to optimize the bioactivity of the peptide. They also want to determine how best to deliver the HSP20 protein inside smooth muscle cells to prevent the vein from going into its harmful spasm. Joe Caspermeyer

For more information, contact Alyssa Panitch, Ph.D., Harrington Department of Bioengineering, 480.965.1430. Send e-mail to Alyssa.Panitch@asu.edu

“This is what distinguishes a successful, innovative scientist from the professionals who apply scientific principles without significantly advancing the frontiers of science. David is an ideal instructor for this kind of course.”

Rodriguez says that Venezuela’s conservation efforts are challenging. The biodiversity workshops have helped bring experts together to share beneficial information. “The main limiting resource is well-trained, updated personnel,” Rodriguez says. “These workshops help create a critical mass of professionals dedicated to biodiversity research and management. David’s workshop last year allowed me to meet the next generation of students and young professionals with interest in biodiversity conservation.”

IVIC is the only institution in Venezuela that offers graduate training in conservation biology. “Knowing who is out there is key,” Rodriguez adds. “Contacts made during the course have already resulted in the establishment of joint projects and/or information exchanges.”

Pearson says that even though biodiversity has an important effect on the way people live, many still remain unaware. The support for continuing education and workshop projects is minimal. “You have to help people prepare for their own future,” Pearson says. “There really isn’t a ready source of funding for this type of environmental education, because it’s not as obviously technical as other research projects. Even so, biodiversity affects everyone, everywhere.”

The ASU scientist continues to do his part. Pearson has 12 biodiversity workshops scheduled for the 2004-05 academic year in Paraguay, Peru, Panama, Ecuador and Brazil. Manny Romero

Biodiversity workshops are supported by Conservation International and the ASU Vice President for Research and Economic Affairs. Pearson’s newest books also incorporate the importance of biodiversity at home and in foreign countries. Field Guide to the Tiger Beetles of North America is published by Oxford University Press. Traveleurs Wildlife Guide for Ecuador and the Galapagos is published by Interlink Press. For more information, contact David Pearson, Ph.D., 480.965.5839. Send e-mail to David.Pearson@asu.edu

Helping the Heart

Many of the famous nurses in American history were social activists. Not only were these women caregivers, they were willing to speak out for the vulnerable. Their stories and others are told at the American Museum of Nursing.

Preserving Nursing’s History

Rojann Alpers is like most museum curators. Ask her to select a single item that is representative of the entire collection, and she would be hard pressed to make a decision.

However, Alpers might choose a grainy black and white photograph of a nurse grasping her diploma. Or perhaps the painting of a traditional nurses capping ceremony would work. Both images portray a young nurse reverently basking in a light shining down approvingly in what Alpers describes as “the light of legacy.”

Alpers is an associate professor and chair of Community/Public Health/Psych-Mental Health Nursing at ASU. She also serves as curator of a historical collection housed in a building once considered a place of hope and healing.

During the early 20th century, people afflicted with tuberculosis flocked to an oasis in the cactus desert near Phoenix. The Oasis in the Desert Tuberculosis Hospital sat atop a picturesque butte surrounded by cactus and mesquite trees. The neighbors included coyotes, roadrunners, and quail. Today, the building overlooks Tempe Town Lake where people gather for concerts, cast a line for trout, or take sailing lessons. It is less than a mile from the bustling shops and restaurants along Mill Avenue and the crowded pedestrian malls of the ASU main campus.

In 2004, the former hospital still attracts people. However, today’s visitors come to learn about the past, not to seek a cure. The building is home to the American...
On display are nursing uniforms worn by those who served in every American conflict dating back to the Civil War. Visitors can compare the black wool and starched white uniforms of the past to the camouflaged fatigues military nurses wear today.

Alpers says the ability to compare and benchmark nursing’s contributions to health care and society is valuable for current nursing students. “The museum gives nursing students, practicing nurses, and members of the public a valuable point of reference,” she says. “We can look at where we came from — and envision where we are going.”

One grim example on display of days not so long gone is a pediatric iron lung. The huge device weighs more than a ton. Physicians used iron lungs to treat young polio patients during the 1950s. Visitors can step back decades farther and explore a surgical suite equipped as a 1910 operating room.

Naturally, nursing caps have a prominent place at the museum. Nurses wore caps originally to keep hair away from their faces. But the hats also spoke volumes about the wearer. On display are caps with a velvet stripe, some with frills, and some that are almost wing-like. Another looks more like a chef’s hat than anything a nurse would ever wear. Each cap’s style actually denotes a particular nursing school.

“You used to be able to tell exactly where a nurse was educated by looking at the design of her hat,” Alpers says. “The nursing cap is still the most identifiable icon of nursing even though they went out of favor in the mid 1970s. Even now, decades later, think about what a nurse looks like and the cap immediately comes to mind.”

The museum also includes a considerable collection of nursing textbooks that date from the early 19th century. Alpers is very proud to have first editions of many books written by nursing icons, including Florence Nightingale’s Notes on Nursing, Clara Barton’s History of the American Red Cross, and Lillian Wald’s House on Henry Street.

In addition to an extensive library, the museum also boasts a detailed archive. Visitors can examine a variety of rare documents, journals, and texts dating back to the 1800s.

Nursing books hold a special place in Alpers’ heart. She vividly remembers receiving an anthology of nursing icons while in the seventh grade. “As I read about Clara Barton, Mary Breckenridge, and others, I realized these nurses were so beloved because they made a real difference in the world. They each made long-lasting and far-reaching contributions,” Alpers says. “I said to myself, that’s what I want. I haven’t veered from that path since.”

The ASU professor delights in taking her nursing students through the museum. “It’s important for my students to understand that nurses have historically been more than caretakers. They were social activists. They were willing to speak out for the vulnerable,” she says.

Alpers hopes that the wise words of nursing’s icons will inspire the next generation of nurses in the same way they encouraged her. “I like to talk with my students about historical figures. I ask, ‘What can we learn from them and apply to today’s nursing practices?’” she says. “It’s so important to learn from the past.”

Working as museum curator is a dream job for Alpers. “Being around these incredible artifacts every day reminds me of how lucky I am,” she says. “I start and end every day saying thank you for being a nurse.” Ina Zajac

**Notes on Nursing**

**House on Henry Street**

**History**

**Female War Nurses: The Wartime Recruiting of Military Nurses**

**American Red Cross**

**Lillian Wald’s**

**Clara Barton**

**Mary Breckenridge**

**Florence Nightingale**

HOURS VARY AT ASU’S AMERICAN MUSEUM OF NURSING. TOURS CAN BE SCHEDULED BY APPOINTMENT. FOR MORE INFORMATION, CONTACT ROJANN ALPERS, COLLEGE OF NURSING, 480.965.2195. SEND E-MAIL TO: ROJANN@ASU.EDU

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