have allowed visitors to get a sense of the breadth and depth of the collection.

When it became apparent that conservation concerns and architectural constraints justifiably precluded the open storage concept, Davison shared his accessibility challenge with Doug. "We'd worked together on a number of smaller projects, and I was familiar with his incredible digital reconstructions of the Presidio de Tucson and the Convento [Mission San Agustín]," Davison recalls. "It seemed like there still had to be a way to share these pots with people in an intellectually stimulating and visually engaging way."

"At the Center, I'd been successfully exploring the applications of 3D Solid Object Modeler, an accurate, low-cost three-dimensional profile modeling technology that was being developed for e-commerce applications," explains Doug. "It's primarily used in online retail so that shoppers can view an item accurately from any angle. The software companies—Creative Dimension Software Ltd. and Strata Inc.—have been very gracious in providing me with testable beta-versions of the program." According to Doug, this method quickly creates photorealistic digital models of objects and structures using photography rather than costly, time-consuming laser scans. The models also have the advantage of being relatively low bandwidth (300–500 kilobytes).

Both Doug and Davison knew that several museums—including ASM—were using Apple's Quicktime Virtual Reality (QTVR) to display mini-movies of pots rotating. "But the profile modeling technology goes beyond QTVR in its ability to share accurate three-dimensional information and allow examination from any perspective," continues Doug. "It provides an ideal solution for digitally representing the pots and sharing them in an interactive exhibition setting and over the Internet." At first, Davison and Doug conceived the Virtual Vault as just this kind of tool: a means of exploring the collection and examining the pots both on-site and online.

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Viewpoint

Virtual Balancing Act

Douglas Gann (Center Preservation Archaeologist and Digital Media Specialist) and Davison Koenig (Curator of Exhibits, Arizona State Museum) discuss their NEH award-winning proposed solution to a common museum dilemma: how to preserve objects and make them more accessible to the public and to researchers.

From thwarted plans comes a breakthrough interactive application that has the potential to transform museology and bolster the preservation of heritage objects. Known as the "Virtual Vault," this joint project of the Center and the Arizona State Museum (ASM) grew out of a brainstorming session between friends and colleagues Doug Gann and Davison Koenig.

The Virtual Vault Conceived

In 2000 ASM launched the “Pottery Project,” a multi-component initiative to preserve and interpret the ceramic legacy of the American Southwest and Northwest Mexico. Comprised of about 20,000 whole vessels, ASM’s collection represents the world’s largest and most comprehensively documented assemblage of ancient and ethnographic Southwest Indian pottery. With support from the Save America’s Treasures program, ASM was able to build a state-of-the-art storage and conservation facility to house the collection, which was in desperate need of relocation. As Curator of Exhibits, Davison was charged with the task of providing interpretive tools and visual access to the newly re-housed pottery. Initial plans called for a “Visible Vault”—an open storage design that would
Become Acquainted

Harold Elliott

Long-standing Center member Harold Elliott and his late wife Mignon made a significant contribution to archaeological preservation when they arranged for a special conservation easement to protect several undisturbed archaeological sites on their property in August of 2002. Harold lives near the town of Cascabel in the San Pedro River Valley of southern Arizona. Kate Sarther interviewed him in January.

I understand that you are not a “native” of the Cascabel area. When did you settle here? What drew you to the San Pedro River Valley?

We raised our family in California. Some years before I retired, I took a leave of absence and we traveled all over the Southwest. I’d attended the University of Arizona for two years before I went into the Marines at the start of World War II. I knew from that time that I liked the desert. While we were visiting in the area, we heard that there was some land for sale north of Benson. When we went out to the property, we saw right away that there was an archaeological site—Mignon was very interested in archaeology and had been taking classes at our local community college. We had a sense that we could protect the site, and we bought the land in 1973. We moved to Sahuarita in 1975. Over the years, we would come up and camp on the property, getting to know the residents of the area. In 1982, we moved to the property and lived in a travel trailer until I finished the house in 1986.

What do you best love about the valley, still?

The people, the rural setting, the scenery—the land. This place has “good vibes,” as they used to say. I saw a mountain lion crossing the road not long ago—a beautiful sight—only a mile away. And I’ve come to realize that having good friends is most important. I’ve got them here.

What do you feel are the biggest threats to your community today?

I’d say the most immediate threat is the [Interstate 10] bypass. Then there’s global warming, which I study. That’ll dry the whole area up and destroy the wildlife. Right now, Cascabel is on a dirt road and the area is growing slowly. If that road gets paved, development will follow. If that road gets paved, development will follow. If that road gets paved, development will follow. [Editor’s note: Harold’s subsequent attempt to upgrade the station proved unsuccessful. He plans to continue with it for a few more months while he arranges for another person to take over with a new weather station.]

How did you first become involved with the Center?

Well, as I said, Mignon was the one who was really interested in archaeology. My main interest was in keeping the sites protected. We met Bill [Doelle], Jeff Clark, and Patrick Lyons when they were beginning their work in the valley. In time, a small crew from the Center came out and excavated some in the middens across the ravine.

Some of our neighbors were setting up conservation easements through the Nature Conservancy. Our property wasn’t in the riparian area, so it didn’t qualify for that program. In talking with Bill, we thought that we could do another kind of conservation easement to protect the sites, and that’s what we did. I haven’t had any vandalism on the property. My neighbor Jacquie [Dale, Center Preservation Archaeologist] monitors the site. Another deterrent is the natural slope, which is steep and full of cholla cactus.

Jacquie keeps us up to date on all of your projects, and on your last visit to the Center, we got to hear about your weather station—could you tell our readers about your current research?

I’ve got two efforts. One is my weather station. I plot and record the data, and do some statistical analyses on data from my own station. It’s on its last legs, though—I have trouble getting reports. I’m thinking about upgrading, but I’m 85 years old, and I should see about getting someone else in the area to collect data. [Editor’s note: Harold’s subsequent attempt to upgrade the station proved unsuccessful. He plans to continue with it for a few more months while he arranges for another person to take over with a new weather station.]

The other study is not dependent on the weather station. We don’t have as much rain as we used to, and I wondered, was this because of a decrease in rain in the winter, or during the
summer? From my station, I saw a dramatic decrease in winter rains, but a more gradual or slighter decrease in the monsoons [June-September]. I contacted the Western Regional Climate Center in Reno, Nevada, and it turned out that they had never broken out summer versus winter rainfall. So I did—I analyzed data from ten cooperative weather stations around Arizona from 1983 until within a year or so of the present. Using a linear least squares computation, I found the same overall pattern: decreasing rains both summer and winter for all stations, and in most cases, winter rains are decreasing faster. Then I analyzed three temperature readings since 1970 for three stations. All show positive trend lines for average high and low temperatures. So, Arizona is drying up, and probably heating up. That’s kind of discouraging. It might be that we are in a periodic drought cycle, but it is very likely that a good part, or all of it, is due to global warming. I plan to run rainfall and temperature analyses on several more stations before winding up the project.

A retired aerospace engineer, Harold has also found time to work on a model ship, grow cactus, help collect local historical information, and draft a brief essay on time and our perception of it that he recently shared with his associates. We’re honored to call Harold our friend.

For more information on archaeological easements, contact Linda Pierce at (520) 882-6946.

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**Celebrate!**

**News We’re Proud to Share**

- In March, the National Trust for Historic Preservation awarded the Center a $111,500 Partners in the Field matching grant. This prestigious award will enable us to establish a new Preservation Outreach Coordinator position, which will in turn significantly expand the scope of our historic preservation and conservation easement programs across the Southwest. One of twenty-four award recipients, the Center was able to apply for this new program because we are one of more than 100 Statewide and Local Partners of the National Trust. These challenge grants are funded by a $5 million gift to the National Trust from the Robert W. Wilson Charitable Trust and matched by significant contributions from local donors and foundations. The Center will be working closely with the National Trust’s Western Office in San Francisco.

- We’re happy to welcome the Center’s newest Preservation Fellow, Rob Jones. A graduate student in Anthropology at the University of Arizona, Rob is interested in the ways in which technology and material culture reinforced social boundaries in prehistoric and protohistoric societies. Rob is also a key team member in the Center’s upcoming field research in the Upper Gila River region of New Mexico. The team plans to undertake survey and minimally intrusive excavation of sites that were occupied in the fourteenth and fifteenth centuries. The project will further the Center’s ongoing research on population dynamics and other patterns in late prehistory.

- Congratulations to Deb Huntley on the recent publication of *Ancestral Zuni Glaze-Decorated Pottery: Viewing Pueblo IV Regional Organization through Ceramic Production and Exchange* (University of Arizona Anthropological Papers No. 72). Deb will be speaking on this topic at the May 19th meeting of the Arizona Archaeological and Historical Society at the University Medical Center’s Duval Auditorium in Tucson, Arizona. This free lecture will take place from 7:30 p.m.–9:00 p.m.

- Likewise, Paul Reed is looking forward to the upcoming release of his edited volume, *Chaco’s Northern Prodigies: Salmon, Aztec, and the Ascendancy of the Middle San Juan Region after A.D. 1100* (University of Utah Press, June 2008). Contributors to this synthetic volume discuss the processes that contributed to the emergence of the Middle San Juan region after A.D. 1075, when Aztec and Salmon pueblos became population and political centers. The book also reassesses settlement and interaction patterns across northwest New Mexico and southwest Colorado, highlighting the local nature of this ancient Puebloan landscape during the thirteenth century.

- We were all pleased to learn from Jeff Clark that the Center’s project entitled *Precontact Population Decline and Coalescence in the Southern Southwest* has been chosen by the National Science Foundation for inclusion in its Highlights. This annual report features successful NSF grants that have “yielded valuable outputs and outcomes”—an honor that speaks to the excellence of the entire project team, which includes Brett Hill and Patrick Lyons.

- Center volunteers Georgiana Boyer and Peter Boyle recently completed their preparation of the Ross Bryce Collection for curation at the Arizona State Museum. Comprised of materials recovered on Mr. Bryce’s property by Jennifer Rinker in 1997 and 1998, the collection was subsequently studied by former Center Preservation Fellow Anna Neuzilla as part of her dissertation research on late thirteenth and fourteenth century population movements in the Safford Valley of southeastern Arizona. Mr. Bryce wished to donate the collections to an appropriate curation facility to ensure proper care and access, and Anna and the Center facilitated that outcome. After cleaning, analyzing, and organizing the materials, Georgie and Peter then painstakingly processed them according to established professional methods and standards set forth in ASM’s guidelines.

- Between January 23rd and February 1st, Doug Gann and a team of volunteers successfully moved the Casa Malpais
from its former location. Despite icy roads and bitter cold, the collections remained safe and sound thanks to the Town of Springerville Public Works Department and volunteers from the Little Colorado Chapter of the Arizona Archaeological Society. To find more about Casa Malpais, visit http://www.cdarc.org/visit/casa_malpais.php.

- Further congratulations go out to our esteemed colleagues T. J. Ferguson and Chip Colwell-Chanthaphonh (another former Center Preservation Fellow), whose edited volume History is in the Land: Multivocal Tribal Traditions in Arizona’s San Pedro Valley (University of Arizona Press, 2006) was recently awarded an honorable mention as an article prize for the Victor Turner Prize for Ethnographic Writing. The Society for Humanistic Anthropology reviewed fifty-one books and selected three for recognition. In Anthropology News 49(2), Regna Darnell writes, “Each SHA commit-

es into digitally rendered 3D reconstructions of archaeological sites and their surrounding cultural landscapes—sometimes even in situ, within rooms or other features and in relation to other objects. Moreover, he had the ability to create a virtual representation of ASM’s storage facility that tee member independently highlighted this collaborative ethnology . . . as a deeply humanistic ‘living history’ worthy of emulation.” The book presents the findings of the San Pedro Ethnohistory Project, a research partnership initiated by the Center with the goal of meaningfully integrating the ethnographic perspectives of the Tohono O’odham, Hopi, Zuni, and Western Apache with archaeological and historical information. A pdf of the Archaeology Southwest issue (18[1]) devoted to this project is also available for free at www.cdarc.org/pdf/arch-sw-v18-no1.pdf.

- Pat yourselves on the back! Our 2007 year-end fundraising appeal brought in just over $12,000—what a great way to mark our 25th anniversary! Your incredible generosity supports community-based preservation and outreach programs in Arizona and New Mexico, and it will also enable us to incorporate new technological means of including our more distant members and friends in our programming. We’ll keep you informed of these exciting developments here and on our website, www.cdarc.org.

Celebrate! continued from pg 3

Museum and Visitors’ Center to its new home at the Springerville Town Hall, 418 East Main Street, just around the corner

Volunteers Linda Shuster and Carol Farnsworth decorate the new Springerville museum space with a Fourmile Polychrome motif

Viewpoint continued from pg 1

The Virtual Vault Expanded

At the same time, neither was fully satisfied with the level of interpretation offered by many current Internet-based explorations of archaeological ceramics from the Southwest. Those modules tend to list a vessel’s type and ware designation, description, dating, and function—often referencing analytical techniques and classification systems that require a significant level of expertise to understand and interpret. Doug and Davison wanted the interactive experience to align with contemporary exhibition philosophy and preservation archaeology goals. As they considered how to embed dynamic layers of content and context, their awareness of the potential power of the Virtual Vault grew significantly.

Doug’s ongoing work at the Center showed that he could, in fact, situate archaeological pots with known provenience-

[The Vault represents] . . . a perfect example and application of preservation archaeology. Museums have an inherent conflict in which they must balance the need to preserve cultural heritage objects with the need to provide public access to them. The Virtual Vault mitigates that conflict by providing meaningful open access to collections while the actual storage vault ensures appropriate preservation conditions.

—Doug Gann
Center for Desert Archaeology
Preservation Archaeologist and Digital Media Specialist

such as Javascript, Flash, and PDF. This functionality means that researchers will be able to collect a range of baseline data without physically examining the actual vessels.

Davison saw an opportunity to capitalize upon ASM’s partnership with KUAT Public Television (now known as Arizona Public Media). As part of the Pottery Project, the two institutions are producing “Native Voice,” a high-definition video that gives voice to those who crafted the vessels by combining interviews with Native American potters and elders with documentation of pottery-making traditions. Curators, anthropologists, and conservators also share insights about knowledge gained through research on ASM’s collection and associated preservation concerns. This became another key element of the interactive.

The team now envisions an Internet-based Virtual Vault browser that enables on-site and online visitors to enter the storage area, or “pottery vault,” remove a pot from the shelf, rotate it, investigate the site where it was found, watch a potter
explain how it was made and the stories it embodies, hear a curator discuss its cultural significance, and peruse catalog data about it, among other activities. Interpretive components will situate the development of ceramics within the broader context of current archaeological and ethnographic research.

The Virtual Vault Funded: Phase One

Armed with this vision, Davison and Doug applied for a Level 1 Digital Humanities Start-Up Grant from the National Endowment for the Humanities last fall. In March, they were awarded $25,000 to develop an alpha-level prototype. Doug is quick to explain that this initial phase is “about demonstrating potential, not creating the finished resource. The explicit goals in this phase are to create a prototype and produce a white paper discussing procedures, best practices, and dead ends. We want to get museums to start talking about participating in this process of sharing three-dimensional information about cultural heritage objects.”

Ultimately, the team believes in the potential of the Virtual Vault and its offspring for changing how we view objects and our relationship with the past and present—but first they need to complete the prototype and raise funding for subsequent phases.

The Virtual Vault Technology Explained

Doug and his research assistant, Katie MacFarland, demonstrated the digitization process that produces the models at the Arizona Archaeology Expo in March. The pots remain at ASM; a vessel is set on a target mat and photographed using a specially calibrated digital camera. A host of images is taken from multiple angles. The images are downloaded at the Center’s digital imaging lab (also known as Doug’s office). The operator of the software—usually Katie or volunteer Frank Finkenberg—subsequently uses a mouse to trace the profile of the object onscreen for every image. The software compiles these profiles and develops an accurate representation of the three-dimensional geometry of the object. From the images, it understands other aspects such as color data and surface texture.

“The entire process takes two to three hours for each pot,” Katie estimates. “Frank and I have digitally rendered about 120 vessels out of the 275 that have been photographed so far. At this point, two-thirds of the photographed pots are from the ethnographic collection. We’re looking forward to starting on the archaeological vessels in earnest soon.”

The Virtual Vault Launched

Visitors to the May 10th grand opening of ASM’s Pottery Project will get to explore a pilot version of the Virtual Vault prototype. “They’ll be able to play with examples of some of the ceramics we’ve digitized so far,” Doug confirms. “It’s really more of a ribbon-cutting,” explains Davison. “We’ll have the new Interpretive Gallery open, where visitors can look into the storage vault, examine potsherds through microscopes, learn about the life of a pot, see the Native Voice presentation. The Pottery Project is definitely a work in progress.” Doug and Davison feel that a more complete version of the Virtual Vault as they envision it will be online by 2009.

To Davison, the primary benefit of the Virtual Vault is that “it allows us to share stories about the pot. It connects visitors with actual potters. It’s not just about ‘seeing’ it or looking at it or the basic facts—we’re providing something richer and deeper with this content. It’s a self-directed exhibit experience,” he continues. “You’re not being told ‘read this.’ We’re using so many other tools to convey information—interviews, landscapes, contexts. The visitors choose what pots they want to learn about and what they’d like to know about them. That’s huge.”

For Doug, the Vault represents “a perfect example and application of preservation archaeology. Museums have an inherent conflict in which they must balance the need to preserve cultural heritage objects with the need to provide public access to them. The Virtual Vault mitigates that conflict by providing meaningful open access to collections while the actual storage vault ensures appropriate preservation conditions.”

Initial progress on a prototype of this “Virtual Vault” can be viewed at the celebratory opening of the Arizona State Museum’s “Pottery Project” between 1:00 and 4:00 p.m. on Saturday, May 10, 2008, in Tucson, Arizona. Details are available at www.statemuseum.arizona.edu. To support the Virtual Vault project, contact Steve Harvath, ASM’s Director of Development, at 520-626-3466 or harvath@email.arizona.edu.
No Settlement, No Conquest

Center Research Associate Richard Flint offers a fresh look at attempted conquest and effective resistance.

Between 1539 and 1542, European seekers of wealth and status led two thousand indigenous Mexicans in an armed reconnaissance of the region now known as the American Southwest. The Europeans sought to impose their religion, economy, and way of life on the region’s inhabitants. Moreover, these communities were expected to recognize the expeditionaries as their new leaders. Disappointed expectations, hostile natives, and unfamiliar terrain doomed the expedition; surviving expeditionaries returned to Nueva España disillusioned and deeply indebted, leaving a trail of destruction that set the stage for future conflicts.

Recent archaeological and documentary discoveries support a new interpretation of how the Spaniards tried to conquer the New World. In No Settlement, No Conquest: A History of the Coronado Entrada, Richard Flint reviews these data and provides further insight into those who resisted conquest.

The Center will host a book signing with Richard from 5:30–7:30 p.m. on Saturday, May 31st, at the Porter Hall and Holsclaw Reception Garden at the Tucson Botanical Gardens. Richard will be joined by Pulitzer award-winning journalist and author Tony Horwitz, who will introduce A Voyage Long and Strange: Rediscovering the New World (Henry Holt and Company, April 2008). The book recounts Tony’s quest to understand European exploration of North America in the centuries between the arrivals of Columbus and the Pilgrims.