Humanists, Social and Physical Scientists United in New Center for Archaeometry

Thermoluminescence dating techniques proved that this Pre-Columbian Mexican funeral urn from the St. Louis Art Museum is authentic.

By Dorothy Brockhoff

The arts and sciences, closely allied during the Renaissance, but increasingly disparate in modern times, moved closer together in St. Louis this week with the establishment of a Center for Archaeometry at Washington University. The center is concerned with physical sciences in archaeology and in the conservation and history of art. It is composed of anthropologists, archaeologists, art conservators, art historians, museum curators and physical scientists. Some of them already have been active in significant collaborations.

About two years ago, for example, WU physicists joined with a number of art authorities to prove that the New York Metropolitan Museum of Art’s famous and controversial bronze horse was an ancient art work (in 1967 this classic Greek sculpture was declared a modern forgery). Thermoluminescence measurements at WU established that the horse was between 2000 and 4000 years old. Thermoluminescence is the emission of light produced when a ceramic sample is heated.

The center has been organized to further mutual education, stimulate research, and foster the application of existing or newly developed scientific techniques to specific problems. It takes its name from a journal, Archaeometry, published at Oxford University, England. Archaeometry derives from the Greek archios meaning primitive and metron meaning measure. The center also provides both graduate and undergraduate students with a unique learning experience and the opportunity to acquire an unusual combination of skills.

Scholars from four WU departments, (anthropology, art and archaeology, chemistry and physics) and from the St. Louis Art Museum comprise the center’s leadership. It will be directed by David W. Zimmerman, senior research associate, Department of Physics.

The center owes its origin to a number of developments which have been gaining momentum on the WU campus since the mid-1960’s when two independent studies were underway on campus. One of these involved a joint effort by conservator Phoebe Weil, chemistry professor Peter Gaspar, one of his graduate students, Robert Conlin, and Stanley Sun, formerly an earth sciences faculty member. They contributed significantly to the knowledge and understanding of the causes of deterioration and methods of treatment for conserving outdoor bronze sculpture.

The second study originated in the Department of Physics and involved methods of dating archaeological artifacts. In 1965 R. M. Walker, McDonnell Professor of Space Sciences, and L.S.B. Leakey of the National Museum Centre for Prehistory and Paleontology at

(Continued on page 2)
Shaffer Play Challenges PAA's Theatrical Talents and Edison's Technical Capabilities

By Anne Hallett

In its sheer technical demands alone, Peter Shaffer's play, The Royal Hunt of the Sun, will make full use of WU's theatrical talents and of Edison Theatre itself.

Shaffer's highly acclaimed drama utilizes dynamic pageantry, movement and color to portray the 16th century clash between the Incas and their Spanish conquerors. One of the most challenging productions ever presented by the WU Performing Arts Area, the play will be given Friday-Sunday, February 21-23. The Friday and Saturday performances will be at 8 p.m.; the Sunday matinee at 2:30 p.m.

The production staff has gone to extreme ends to oblige the commands of the script. Several tons of scaffolding must be assembled to provide the foundation for multi-level ramps and towering platforms, giving vertical as well as horizontal dimension to the production. In the great ascent scene, a rope bridge effecting the connecting point between symbolic mountains in the Andes is lowered to provide the juncture point for the Spanish-Inca confrontation.

"The immense proportions of the play using the whole theatre as an environment present technical challenges beyond those faced in any Edison Theatre production to date," said Richard Palmer, PAA chairman at WU and director of the play.

He pointed out that an open stage is required to accommodate the play's pageantry; the play also calls for a large cast skillful in the techniques of mime, music and stylized acting.

This is not to say that The Royal Hunt of the Sun is lacking in the force of essential drama. Its opening scene focuses on the brutality and fear of the Spanish invaders of Peru led by Francisco Pizarro (in the play a romanticized character when compared to the historical Pizarro). The brutalized are the Incas, held together by reverence for their living Sun God Atahuallpa (played by David Leibowitz).

Atahuallpa and his people believe with child-like simplicity that he is immortal. This simple and implicit faith in the Sun God is contrasted with the fear-ridden, greed-driven Spaniards who hypocritically invoke the "judgment" of a vengeful God against their pagan victims. The heart of the conflict arises, however, from a change that takes place in Pizarro (played by Trip Bates). He begins to believe in the Incan philosophy and in Atahuallpa.

Characters in the PAA production of Royal Hunt of the Sun include, from left to right: Trip Bates (Pizarro), Blade Hauth (Villac Umu), Michael Weiser (Challeuchima), Ron Kimmel (Manco), and Alan Birnkrant (Headman)

(Photo by Richard N. Levine)

The change in Pizarro is subtle. He is basically tough, commanding, cruel. Although he lacks the education and polish, for example, of his fellow conquerer DeSoto (played by Stuart Goodale), Pizarro is more complex than his fellow soldiers in one regard: he seems to catch a glimpse of what is beautiful in the Incan culture.

The captive Atahuallpa—who is being held for 9000 pounds of gold in ransom by the Spaniards—communicates with and trusts the curious Pizarro. The latter postpones putting Atahuallpa to death despite pressure from the soldiers who finally mutiny, try Atahuallpa in a sham court and garrote him.

Critic John Elsom wrote, "Pizarro is overwhelmed by the finality of Atahuallpa's death and the conquistadores are shocked into shame. Shaffer's most tragic plays still end with an assertion, sometimes oblique but always present, of human dignity and faith: and this optimism sets him apart from his contemporaries."

Shaffer himself wrote, "The greatest tragic figure in history is man's apparent need to mark the intensity of his reaction to life by joining a band; for a band, to give itself definition, must find a rival, or an enemy."

General admission to each performance of The Royal Hunt of the Sun is $3; WU community and student admission is $1.50. For further information call the theatre box office, 863-0100, ext. 4113 or 4114.

Archaeometry (Continued from page 1)

Nairobi, used the fission-track method to date Leakey's famous anthropological finds at Olduvai Gorge in Africa. In 1971, research began on thermoluminescence dating, and led to its application in dating the bronze horse. The thermoluminescence (TL) research is supported by the National Science Foundation. Last year Zimmerman and Philippa D. Shaplin, a former assistant curator of ancient and primitive art at the St. Louis Art Museum, used thermoluminescence dating techniques to determine if 120 Pre-Columbian Mexican funeral urns were authentic. All but seven proved to be genuine.

By the time the work on the urns was completed in December, 1973, a Working Group for the Physical Sciences in Art and Archaeology had been formed at the University. It met regularly for seminars and study and through these efforts important developments relating to three more projects were made. These included the expansion of the TL dating of the Oaxacan urns into a more comprehensive study of Pre-Columbian Mexican ceramics by TL dating and elemental analysis; the use of atomic absorption spectrometry for the elemental analysis of ceramic potsherds from Cyprus; and the modification of a sandblasting technique using non-abrasive glass spheres for cleaning the Milles Fountain in front of Union Station in St. Louis. The application of this glass-bead peening method to clean outdoor bronze sculpture has attracted worldwide attention. It was perfected by Weil, who is now doing additional restoration work, supported locally by the St. Louis Ambassadors Art and Fountains Foundation.

Funding is now being sought to undertake a variety of new projects. These range in scope from research on the conservation and inhibition of the deterioration of paper as evidenced in the Eads Bridge drawings recently acquired by the University to an elemental analysis of obsidians and cherts from the Near East and North America to determine provenances and trade routes.

In addition to Zimmerman, the staff of the new Center includes Weil and Stephen Sutton. Center associates are: Gaspar; Walker; Richard Cleveland, curator, St. Louis Art Museum; Lee Parsons, lecturer in the Art and Archaeology Department and curator of Primitive Art, St. Louis Art Museum; art and archaeology professors Sarantis Symeonoglou and Mark Weil; and anthropology professor Patty Jo Watson.
ANNOUNCEMENTS

NEW ACCESS ROUTES for Francis Gymnasium, Wilson Pool and the Field House have been established and marked for the convenience of the WU community. Entry for all facilities is now available through Francis Gymnasium, with access to the women's dressing rooms in Wilson Pool through the upper ramp between the gym and the pool, then via the east pool balcony. The Field House is now easily accessible to women using the stairs at the south balcony of Wilson Pool. Men may use the lower ramp door to Wilson Pool at all times. The schedule for athletic facilities is available from the Athletics Department office, Box 1067.

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Priorities Committee Named by Danforth

Chancellor William H. Danforth has appointed an all-University advisory committee to review the administration's priorities for the 1976-77 central fiscal unit and to make suggestions for balancing the budget.

Committee members are: Ira J. Hirsh, professor of psychology, chairman; Lucius J. Barker, Edna Fischel Gellhorn University Professor of Public Affairs; and chairman, Political Science Department; Francis J. Connelly, assistant professor of marketing; John B. Ervin, dean, School of Continuing Education; Bruce E. Goodman, junior, liberal arts; Edward Greenberg, professor of economics; Karl A. Hill, dean, School of Business and Public Administration; Gregory J. Kamer, junior, liberal arts; Merle Kling, dean, Faculty of Arts and Sciences; Nancy M. Koetting, senior, fine arts.

Lucian Krukowski, dean, School of Fine Arts; William G. Madsen, chairman, English Department; James M. McKelvey, dean, School of Engineering and Applied Science and director of the Sever Institute; Constantine Michaelides, dean, School of Architecture; Richard E. Norberg, professor and chairman, Physics Department; Donald C. Royse, associate professor of architecture; Sharon D. Scoby, sophomore, liberal arts; Joseph E. Varner, professor of biology; Linda S. Wilson, Associate Vice Chancellor for Research; and Patty Jo Watson, professor of anthropology.

The Board of Trustees' budget committee has agreed to recommend to the full board a budgeted deficit no larger than $1 million in the central budget for the 1975-76 academic year with the stipulation that the 1976-77 budget be in balance. Danforth said, "It is evident that, although the 1975-76 budget can be put together by squeezing and trimming, the 1976-77 budget will require much more careful planning and some difficult setting of priorities."

RECOGNITIONS

JANE LEE ANTON, assistant professor of counseling at WU, will be a co-leader of the National Conference on Behavioral Self-Control Feb. 24-27 in Salt Lake City, Utah. The conference is sponsored by the University of Utah. Anton received her Ph.D. degree in counseling psychology from Stanford University, and was on the staff of the Stanford Institute for Behavioral Counseling.
**Calendar**

**February 13-19**

**THURSDAY, FEBRUARY 13**
- 9 a.m. United States Eighth Circuit Court of Appeals Session. Courtroom, Mudd Law Bldg.
- 4 p.m. Department of Chemistry Seminar, "Solid State Methods and Transition Metal Complexes—New Life in an Old Subject," Professor Hans Julius Wolff, U. of Freiburg and Princeton Institute for Advanced Studies. Law School Courtroom, Mudd 305.
- 8 p.m. Poetry Reading by John Knoepfle, professor and poet-in-residence, Sangamon State University, Springfield, Ill. Hurst Lounge, Duncker Hall.

**FRIDAY, FEBRUARY 14**

**MONDAY, FEBRUARY 17**
- 4 p.m. Biology and Biomedical Sciences Molecular Biology Program Seminar, "Structural Organization and Processing of the Primary Genetic Transcript in the Cellular Slime Mold Dictyostelium Discoides," Professor Hans Julius Wolff, Department of Biology, U. of California-San Diego. Moore Aud.

**TUESDAY, FEBRUARY 18**
- 12 noon. Computing Facilities Seminar, "Intermediate Fortran," David G. Weible, WU computer education specialist. 509C Bryan, call 863-0100, ext. 3138 to register. (Also Wednesday-Friday.)
- 12 noon. Gallery Talk with Graham Beal, director, Steinberg Gallery of Art. Steinberg Gallery.
- 4 p.m. Department of Sociology & Department of Urban and Regional Studies Colloquium, "Residential Mobility of Irish Immigrants in Philadelphia: 1850-1880," by Alan N. Burstein, research associate, U. of Pennsylvania. 111 McMillan Hall.
- 7:30 p.m. Center for the Biology of Natural Systems Seminar, "Lead in Children in Different St. Louis Environments, as Indicated by Deciduous Teeth," Dr. William Lockeretz, professor of urban design, Department of Planning, U. of California-Berkeley. Steinberg Aud.

**THURSDAY, FEBRUARY 13**

**FRIDAY, FEBRUARY 14**
- 7:30 and 9:30 p.m. WU Filmboard Series, "Pink Flamingos"; and midnight, "Butch Cassidy and the Sundance Kid." Admission $1 for one feature; $1.50 for both. Wohl Center Line D.

**SATURDAY, FEBRUARY 15**
- 2 p.m. WU Filmboard Series, "Pink Flamingos"; and midnight, "Butch Cassidy and the Sundance Kid." Admission $1 for one feature; $1.50 for both. Brown Hall Theatre.
- 9 p.m. Classic Film Series, Classic Heroes, "Thief of Baghdad" with Douglas Fairbanks, and "Sahara" with Humphrey Bogart, J. Carroll Naish, Lloyd Bridges. Admission 50 cents. Wohl Center Line D.

**SUNDAY, FEBRUARY 16**
- 2 and 4 p.m. WU Filmboard Series, "Butch Cassidy and the Sundance Kid." Admission $1. Brown Hall Theatre.

**EXHIBITIONS**

Albert Schweitzer Exhibit, a collection of Schweitzer memorabilia including letters, books, manuscripts, and documents showing his influence, on display in Olin Library, level three. Monday-Thursday, 8 a.m.-midnight; Friday, 8 a.m.-10 p.m.; Saturday, 9 a.m.-10 p.m.; Sunday, 11 a.m.-midnight.

Gifts '74, a special exhibition of 27 works of art presented to Washington University last year, on display in Steinberg Hall, lower gallery. Included are paintings, a canvas wall hanging, prints, watercolors and sculpture. Monday-Friday, 9 a.m.-5 p.m.; Saturday, 10 a.m.-4 p.m.; Sunday, 1-5 p.m.

Gertrude Stein Exhibit, documenting the progress of her work with fine printing items from Banyan Press, a number of limited editions from the Department of Special Collections and private collections, and other assorted Steini ana. Olin Library, level three. Through Feb. 15.

**SUNDAY, FEBRUARY 16**
- 4 p.m. Senior Voice Recital, Susan Greenleaf, soprano. Sponsored by the WU Department of Music. Graham Chapel.
- 8 p.m. Concert by The Rose Hip String Band, from Chicago. Admission $1 at door. Graham Chapel.

**WEDNESDAY, FEBRUARY 19**
- 11:30 a.m. Noon Music with Bob Brozman, WU music student, singing and playing blues and ragtime. Mallinckrodt Gallery.

**MUSIC**

**SUNDAY, FEBRUARY 16**

**FRIDAY, FEBRUARY 14**
- 7:30 and 9:30 p.m. WU Filmboard Series, "Pink Flamingos"; and midnight, "Butch Cassidy and the Sundance Kid." Admission $1 for one feature; $1.50 for both. Wohl Center Line D.

**SUNDAY, FEBRUARY 16**
- 7:30 and 9:30 p.m. WU Filmboard Series, "Butch Cassidy and the Sundance Kid." Admission $1. Brown Hall Theatre.

**TUESDAY, FEBRUARY 18**
- 7:30 p.m. WU Filmboard Series, "All the King's Men"; and 9:30 p.m., "Mr. Smith Goes to Washington." Admission $1 for one feature; $1.50 for both. Brown Hall Theatre.

**WEDNESDAY, FEBRUARY 19**
- 7:30 and 9:30 p.m. WU Filmboard Series, "A Free Woman" (German with English subtitles). Admission $1. Brown Hall Theatre.

**SPORTS**

- **FRIDAY, FEBRUARY 14**
  - 7:30 p.m. Swimming, WU vs. Chicago State and Westminster College. Wilson Pool.

- **SATURDAY, FEBRUARY 15**
  - 1:30 p.m. Wrestling, Southwest Missouri State Tri-Dual at Springfield.
  - 2 p.m. Swimming, WU vs. Southwest Missouri State University. Wilson Pool.

- **WEDNESDAY, FEBRUARY 19**
  - 4 p.m. Swimming, St. Louis Area College Athletic Association Championships at UMSL.

**Hill**

(Continued from page 1)

Commenting on Hill's retirement, Chancellor William H. Danforth said, "Substantial progress toward the goal of excellence in its field has been made by the school under Dean Hill's guidance." Danforth said that Hill's accomplishments include curricula reform, establishment of a sound faculty research and development program, improved relations with the business community, and improved effectiveness and service to students.

A graduate of Dartmouth College and its Amos Tuck School of Business, Hill joined the Tuck School faculty in 1946 and served as its dean from 1951 to 1968. He holds an honorary Doctor of Law degree from Drury College. Hill is a member of the board of directors of several business corporations and of the St. Louis Interracial Council for Business Opportunity.