

in Africa was that of an alignment of basalt pillars at Namoratunga in Kenya. The stones were oriented toward certain stars and constellations and suggested the existence of a calendar at about 300 BC. Two sites with stone pillars set in circles were also excavated in The Gambia and dated to about 200 BC to AD 800. The remains of a number of furnaces (of about AD 1 to 500) were uncovered on the western shore of Lake Victoria, Tanzania, and there was evidence to suggest that high-carbon steel was being produced.

(ROBERT J. BRAIDWOOD)

Western Hemisphere. Through field studies, continuing research, and cultural resource management programs, a number of archaeological insights were gained during the 1977-78 field season in the Western Hemisphere.

UNITED STATES. In 1978 the U.S. Congress failed to take action on the Cultural Property Implementation Act. This law, in part defeated by lobbyists representing the primitive art market, would have ratified a UNESCO accord making it illegal to export artifacts and primitive art from third world countries. Failure to ratify meant that the U.S. had yet to take a strong stand in opposing the continuing and highly profitable international art market in cultural items. From an archaeological point of view this postponement suggested that massive (and in some cases, total) destruction of archaeological sites would continue unabated.

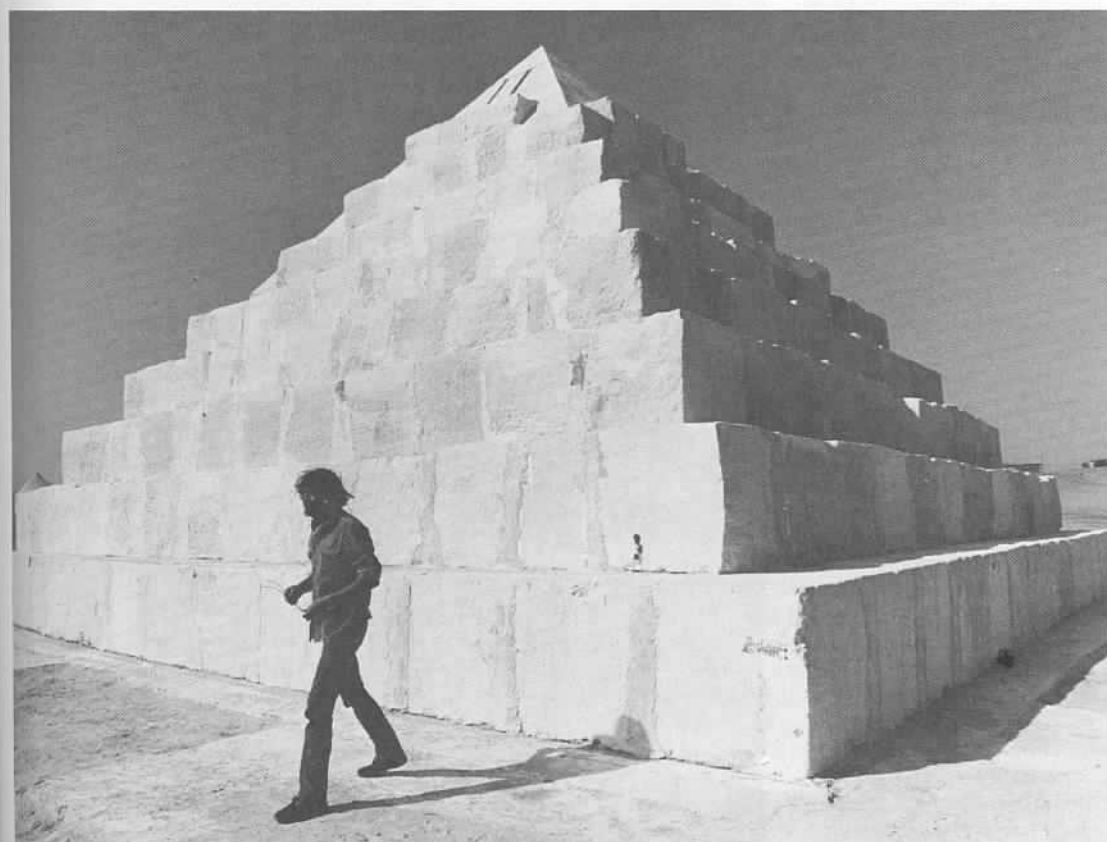
As a reflection of this continuing loss of non-renewable archaeological resources, the 1977-78 field season in the U.S. was dominated by a large number of intensive regional surveys in compliance with recently enacted state and federal envi-

ronmental protection legislation. These surveys yielded new estimates of densities of prehistoric cultural resources throughout the U.S., showing them to be greater than previously believed. In addition, the surveys raised questions regarding the adequacy and accuracy of earlier surveys.

In California, for example, a 1.5% sample of 800,000 ha (1 ha = 2.47 ac) revealed a projected density of more than 10,000 historic and prehistoric sites, all within only a small segment of the Mojave Desert. Similarly, a 20% sample of 65,000 ac of a reservoir revealed no less than 1,400 sites in a partial sampling of the area studied.

The ongoing threat to the archaeological resources remaining in the U.S., in combination with the need for cost effectiveness and accuracy of methods utilized for site detection, stimulated the development of new techniques to identify and define the location of buried remains. At Valley Forge, Pa., a team under the direction of John Cotter and Bruce Beven used both a cesium magnetometer and a ground-penetrating radar unit to identify and then verify subsurface Revolutionary War remains. Under the direction of Joel Grossman, the Rutgers Archaeological Survey Office applied the newest generation of ground-penetrating radar. In exploring the subsurface remains of the Raritan Landing (a Colonial and Revolutionary period port community in New Jersey) the radar was used to develop a polychrome (six-colour) map of remains that were buried beneath four feet of shale. Evaluation of this material through the use of traditional techniques would have been extremely difficult.

Japanese archaeologists directed the building of a mini-pyramid on the sands at Giza in an attempt to recreate the construction methods used for the Cheops pyramid 4,500 years ago.



EARLY MAN. Since the discovery of Folsom and Clovis projectile points (in the first quarter of the 20th century) in association with extinct large animals, archaeologists have debated the antiquity of early man in the Western Hemisphere. During the year several site reports added fuel to the controversy. They presented new examples of remains of extinct large animals found together with man-made tools. For example, work at the Shriver site in Daviess County, Missouri (by Michael J. Regan and others from the University of Missouri, the University of Kansas, and Texas A & M), revealed a deposit containing fluted points overlying a stratum containing only flake and core tools. In the absence of material that could be dated by using the radioactive carbon technique, thermoluminescent dates from the more recent, fluted-point stratum yielded age determinations of between 8690 (± 1000) and 12,855 (± 1500) bc. While no comparable dates were derived from the deeper flake and core tool-bearing stratum, the authors suggested that this distinctive assemblage was in excess of 15,000 years old. This was older than estimates for the Folsom and Clovis points.

Also during 1978, however, Don Keller and Eileen Camilli of the Museum of Northern Arizona reinvestigated stone-tool-bearing sites situated along the Little Colorado Valley. This material, referred to as the Tolchaco Complex, had been previously regarded as older than the Folsom and Clovis remains. But the investigation suggested that Tolchaco dates to a more recent, Paleo-Indian period (about 10,000–7000 bc) or even to later Pue-

blo occupations (extending into the Christian era).

Recent research in both North and South America provided evidence for the association of Paleo-Indian projectile points and other artifacts with an expanded inventory of extinct Pleistocene animals. In Texas continued excavations of the Paleo-Indian Lubbock site (by Eileen Johnson and Vance Holiday of the Museum of the University of Texas) produced Clovis period material that was radiocarbon-dated to 12,055 (± 95) bc. Also, the first definite direct association of Clovis tools with an extinct variety of short-faced bear (*Arctodus*) was unearthed. This is the first reported occurrence of this animal with early human tools.

MESOAMERICA. A major archaeological find occurred in Mexico City in February when construction workers accidentally discovered a carved Aztec monolith seven feet below a busy city street. Roughly circular and weighing almost ten tons, the andesite stone monolith bears a representation of the Aztec moon goddess Coyolxauhqui and was probably sculpted late in the 15th century.

After the discovery the site was cordoned off, and a full-scale archaeological dig was ordered. As they progressed, archaeologists uncovered the complete foundation of the Great Temple, the most important pyramid in the Aztec capital of Tenochtitlán, and also 19 small stone chambers containing offerings to the gods.

In other parts of Mesoamerica research focused on evidence of long-distance trade and its role in regional growth. In addition, the application of techniques for the gathering of information about

Students and other volunteers working at the site of the ancient Roman Verulamium at St. Albans, England, uncovered a seven-foot-square floor mosaic said to be among the finest ever found in Great Britain.



cies, supported a program of archaeological survey and excavation. Working under this program, Emile Peterson reported on the early site of Coto-callao prior to its imminent destruction by commercial development. His excavation revealed a number of square-cornered, multiroomed house remains, constructed with outer walls of vertical posts and interior rooms separated by partitions of woven matting. Food remains of corn, beans, deer, rabbit, and waterfowl were also recovered.

Several large-scale, long-term, multidisciplinary studies of the most prominent pre-Inca urban centres in Andean Peru were initiated during the 1977-78 season. At the coastal capital of Chan-Chan, Michael Moseley was working with James Kus, both under the auspices of Chicago's Field Museum of Natural History. With specialists in soils, pollen, and hydrology, they studied the Chimú social and economic organization as it was reflected by the construction and maintenance of regional irrigation systems. In the Andean Highlands of Peru, William Isabell of the State University of New York began a six-year investigation of the pre-Inca capital of Huari, which enjoyed dominance over much of the Peruvian highlands and coast nearly a thousand years before the Inca expansion in the 1400s. (JOEL W. GROSSMAN)

See also Anthropology.
[723.G.8.c; 10/41.B.2.a.ii]

Architecture

In 1978 the twin problems of design and economic pressure were once again the subjects to which much attention was devoted by architectural organizations and periodicals. Balancing the question of what a building should look like from an aesthetic viewpoint with how much it would cost to build and to maintain has always occupied the architectural profession. Because economic factors in 1978 looked generally more hopeful, continuing the trend of the previous year, there was a noticeable leaning during the year toward concern with quality of design.

The design-economic conflict is most easily discernible in commercial and industrial developments, particularly those of a speculative nature, where return to the developer per square foot looms large in the client's priorities. One relatively new factor in reconciling such conflicts was the growing field of architectural research, whereby studies are undertaken to determine the needs and wishes of the client or users of the building proposed and research is carried out in such areas as new technologies applicable to building and new techniques of construction and use of materials. Indeed, the importance of the research field was indicated by the fact that *Progressive Architecture* magazine began including research prizes in its annual series of design awards.

In its opening issue of 1978 the U.S. magazine *Architectural Record* again emphasized the need for architects to concern themselves with quality of design coupled with the appropriate research techniques and business acumen. The editors wrote "... by understanding how people feel about their

Archery:
see Target Sports



Two bird hunters seeking refuge in a cave in Greenland found several mummified corpses, including that of a seven-month-old child who died about 350 years ago.

food remains was being studied. Research continued into the nature and function of large urban ceremonial centres, with an increased emphasis on the centre and its relation to the hinterland.

Preliminary results were reported from three long-term projects within the Maya lowlands. In Guatemala, work at Quiriguá and surrounding smaller mound complexes (under the direction of Robert Sharer of the University of Pennsylvania) entered its final season. Four construction phases were defined for the period between AD 600 and 950. A number of secondary administrative centres and nonelite residences were identified surrounding the elaborate site core.

In the lowlands of Honduras a Harvard University team (led by Gordon Willey, with the assistance of Richard Leventhal and William Fash) completed the second year of a regional survey program around the Mayan centre of Copán. No fewer than 300 secondary mound centres were identified to the north and to the east of the main centre of Copán. These smaller sites, consisting of from 2 to 3 mounds to as many as 50, were each organized around a court area. The mounds varied in both size and complexity, and appeared to represent differences in the status and wealth of the resident populations.

SOUTH AMERICA. In South America sites were regularly being robbed for the antiquities market and also were being obliterated by urban development. One estimate placed archaeological attrition at no less than 2.4 sites per week in the Quito area of Ecuador.

In an effort to record the dwindling archaeological remains, the Museo del Banco Central of Ecuador, in conjunction with private and federal agen-