

Keck telescope sees its 'first light'

The giant Keck telescope peered skyward for the first time on Nov. 24, photographing the spiral galaxy NGC 1232. The event is a "milestone in the completion of the telescope," says project manager Gerald M. Smith at Mauna Kea, Hawaii. Scheduled to begin full operation late next year, the world's largest optical telescope will feature a mirror made of 36 segments, nine of which are now in place (SN: 12/1/90, p. 348).



Maker, NASA blamed for Hubble's defect

A NASA-appointed panel concluded last week that the space agency and the contractor it hired to build the Hubble Space Telescope's primary mirror deserve equal blame for not detecting — prior to Hubble's launch — the serious optical aberration that today flaws the telescope's vision. In its final report, the panel observed that at least one of the mirror's prelaunch tests precisely identified the mirror problem.

There were other portents of the mirror's flaw as well. But the mirror maker and NASA's one on-site inspector never heeded these warnings, the panel says.

Two years before building the mirror, the Danbury, Conn.-based contractor, then called Perkin-Elmer Corp., fabricated a scaled-down mock-up. Because the company so carefully crafted this 1.5-meter test mirror, "the feeling was, 'Okay, the guys [making the full-size mirror] know how to do it now, so let's let them,'" explains panel member Roger Angel, an astronomer and mirror designer at the University of Arizona in Tucson. However, the panel says, the contractor, now called Hughes Danbury Optical Systems, Inc., failed to employ that same precision in making the 2.4-meter mirror actually used on Hubble.

Several clues during the production of Hubble's mirror should have strongly hinted that factors other than size differentiated it from the test mirror. For example, the panel found that the mirror designers needed to increase the spacing between two elements of a testing device called a null corrector. That the designers had to alter this spacing "ought to have been a clue" that the mirror wasn't focusing as intended, says Lew Allen, head of the investigating board and director of NASA's Jet Propulsion Laboratory in Pasadena, Calif. His panel also found evidence of poor quality control in the production (SN: 10/6/90, p.220) and testing of Hubble's mirror by both the contractor and NASA's inspector.

The contractor did hold frequent project reviews, Angel notes. However, Angel says, "conflicts in the measurements they were getting were never discussed."

Why not? "That's the \$64,000 question," he says. "The mentality at the time was, 'Get out of my way; let me get on with the job.'"

The panel found, for example, that the actual Hubble mirror passed one null-corrector test but failed a less sensitive one that followed. And although that second test precisely identified the spherical aberration, its finding was ignored. "That's what makes your jaw drop," says Angel.

— J. Eberhart

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Cyprus dig pushes back colonization date

Excavations at a collapsed rock shelter on Cyprus suggest that people inhabited the site at least 10,000 years ago, about two millennia earlier than any other documented human occupation on the Mediterranean island.

The discovery of human-fashioned stone artifacts among the bones of extinct animals, including dwarf elephants and a species of pygmy hippopotamus, hints that hunting by early colonizers may have helped wipe these creatures out, says archaeologist and project director Alan H. Simmons of the University of Nevada-Reno. He presented the new evidence in New Orleans last week at the annual meeting of the American Anthropological Association.

"Given the variety of our evidence, it's too much to expect that the association between human artifacts and extinct animals is a coincidence," Simmons contends. "But the implications of the site for understanding extinctions and island colonization are not clear-cut."

Most researchers maintain that an unusual menagerie of now-extinct dwarf and giant animals roamed many Mediterranean islands between 1.6 million and 10,000 years ago, dying off before humans ever arrived. In previous excavations at Cyprus, for instance, scientists unearthed the remains of extinct pygmy hippos from 32 sites that showed no signs of human intrusion.

Over the past three summers, Simmons and his co-workers have excavated nearly the entire site of Akrotiri-Aetokremnos. Before that, another investigator's radiocarbon dating of burned seashells and bones at the site had placed human occupation at around 10,000 years

ago. But many archaeologists questioned the accuracy of the dating.

Simmons now reports that his team's 17 radiocarbon dates for sediments containing stone artifacts also cluster around 10,000 years of age.

The recent field work has yielded more than 250,000 pieces of bone, he says. One-fifth of those come from identifiable animals, including about 200 pygmy hippos of all ages, at least three dwarf elephants and nearly 70 bird species.

Several hundred of the bones, mainly from the pygmy hippos, emerged from a sediment layer containing chipped stone artifacts, Simmons says. The researchers found a total of 1,014 such artifacts, including chisels and thumbnail-sized scrapers. Numerous beads fashioned from stone and shells also turned up.

Several stone hearths within the rock shelter provide further evidence for human occupation, he asserts.

Although examination of the animal bones has not revealed any incisions clearly produced by butchery, Simmons says butchery marks often show up only under extreme magnification, and even then their identification can prove elusive.

He speculates that human hunting, combined with a decreasing supply of vegetation resulting from climate changes around 10,000 years ago, may have caused species die-offs on the island.

"I believe the earliest occupants of Cyprus enjoyed pygmy hippo steaks," Simmons says. "Whatever the case, Akrotiri changes our appreciation of early Mediterranean prehistory."

— B. Bower