

# ENR

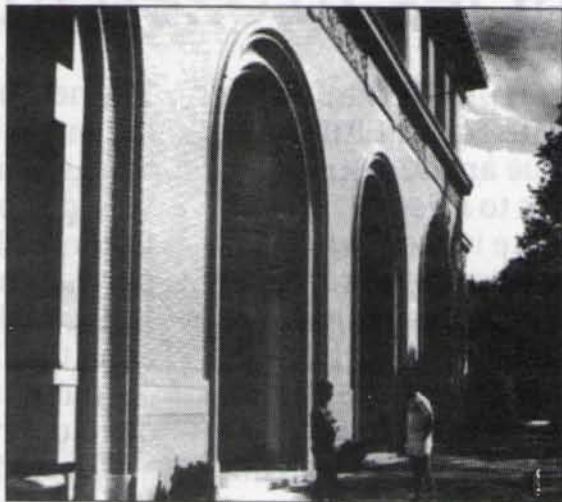
Engineering News-Record

COMPUTERS

## Finally filling a niche

**A**fter 80 years, Carnegie Mellon University is finally filling a niche—actually five niches. Stone carvers are chipping their way to complete the College of Fine Arts' giant limestone alcoves—each filled with examples of different architectural styles. Though some components will represent ancient architecture, they will be created using ultra-modern computer design methods.

The computer-aided design and manufac-



Stone carvings in old alcoves are designed on computer. Robotic saws will cut new stone pieces.



The architect and contractor have similar CAD equipment. Design files are sent via a modem that allows on-line adjustments in real time. Changes on either end are instantaneous.

CAD also helps because it allows the contractor to plot full-size drawings onto heavy mylar molds. Like patterns, the molds help carvers create the carvings.

Beginning this summer the contractor's robotic saws and routers—interfaced with its CAD system—will rough-cut new pieces of niche stone, such as columns, before they are shipped to Pittsburgh for detailed hand-carving. "It takes one day to rough-cut a column" by machine, says Lindsey, compared with one month by hand.

The neoclassical building, designed by Henry Hornbostel, was completed in 1911 with 30 x 14-ft niches, 7 ft deep. War and poor finances prevented their completion.

Carvers have just finished the Roman style entryway niche. They are nearly done with the Renaissance niche and will follow during the next 18 months with the Medieval, Greek and non-Western niches. ■

turing (CAD-CAM) approach made the project financially feasible, says Bruce Lindsey, of Pittsburgh-based Bruce Lindsey Paul Rosenblatt Associates, the project's architect-of-record. Lindsey and Rosenblatt are also assistant professors in the Pittsburgh school's department of architecture, housed in the fine arts building.

Traditional Italian carvers had estimated the cost of the \$2-million project at almost \$4 million. Although the actual scheme is a "simplification and therefore difficult to compare [exactly], there is definitely a difference in price" using CAD-CAM, says Lindsey.

The advantages of CAD-CAM are "time, money and accuracy," adds David M. Teitelbaum, president of the project contractor, Cathedral Stone-works, New York City, which is preparing shop drawings on CAD.