SCIENCE & TECHNOLOGY

onists who, more than 3,000 miles from home, remained deeply attached to their cultural heritage for 200 years, even after they quietly declared their independence circa 250 B.C. But the Greek settlers also acquired some habits from Eastern civilizations, as Bernard, leader of the French dig, explains.

Ai Khanum—perhaps founded by Alexander the Great (356–323 B.C.) —sits high above the juncture of two rivers, an ideal site for a military outpost. It is surrounded by a mud-brick wall 33 feet high and 20 to 27 feet thick. The city's grand palace, a complex of monumental administrative and residential buildings, covers more than 20 acres. There is nothing like it in Greece; the model for the plan was probably Persian, and the flat roofs are "characteristically Eastern." But columns in the classical styles—Doric, Ionic, Corinthian—abound. And the palace's occupants, true to Greek tradition, apparently read philosophy: A library yields fragments of a treatise of the Aristotelian school.

The city's 6,000-seat theater is essentially Greek. And carvings suggest that most plays were Greek. But in the middle of the audience section are three ostentatious seats of honor—virtually unheard of in the mother country.

In the arts, the colonists' tastes were "traditionally Greek, even to the point of perpetuating an outdated classical style," writes Bernard. Their sculptures are fine, but the "treatment is conventional." But, in religion, the settlers seem to have gone native. The official gods—those who appear on coins—are from the Greek pantheon; yet the city's three temples are Persian in design. And the relics they contain suggest rites more Oriental than Hellenic.

Less benign non-Hellenic forces also touched the city's inhabitants. About 145 B.C., northern nomads drove the Greeks out of Ai Khanum.

Machines that See

"Toward Machines that See" by Blanchard Hiatt, in *Mosaic* (Nov.-Dec. 1981), Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Can scientists create machines that duplicate human vision?

In a limited way, reports Hiatt, a University of Michigan science writer, they already have: Sensors can detect patterns of light and dark and relay the information to computers for interpretation. The auto industry employs such systems—"fleshed out" with steel arms and hands—as assembly-line workers to pick up parts on a conveyor and position them for later use. But these machines are easily overwhelmed: If parts arrive off-kilter, or if they are mixed up in a bin, the machines are stymied. A recent prototype, however, designed by researchers at the University of Rhode Island, tackles the "bin-of-parts" problem with remarkable 90 percent success.

But scientists are also working to move beyond such special-purpose visual processing to general-purpose computer vision—to machines

that really "see" (i.e., that can analyze and make complex decisions about unfamiliar objects).

One apparent requirement, regarded as a "key advance" toward computer vision, is "parallel" processing. Fifteen years ago, the goal was sequential data processing, "with each stage telling you what to look for next," as one computer scientist put it. By contrast, parallel processing starts with a network or grid containing a processor at each node. Writes Hiatt: "Elements in a grid trade off information, then pass a processed array of new information through further grids or layers of parallel processors . . . until a suitable level of representation or decision making is reached." Human vision probably works this way, but at speeds no machine can match. A rudimentary parallel processor is due to be completed at the University of Maryland later this year.

Meanwhile, at MIT, researchers are working on systems that will detect depth and make sense of motion. Their theory is that an object in motion is actually viewed by humans several times, quickly, which greatly enhances identification. (One possible application: traffic lights that adapt to the different time needs of a motorist or pedestrian when each appears in the line of sight.) "Human vision is the model we want to understand," as one scientist said, "because humans do it better than anything else."

Science in Court?

"Science, Technology, and the Limits of Judicial Competence" by Sheila Jasanoff and Dorothy Nelkin, in *Science* (Dec. 11, 1981), 1515 Massachusetts Ave. N.W., Washington, D.C. 20005.

Scientific and technological controversies—from "right-to-die" cases to disputes over air pollution or nuclear power—increasingly fill the federal court calendars. Proposals have been made to help the beleaguered judges either by providing them with special advisers or training or by shifting some of their burden to a "science court." Such notions are misguided, say Jasanoff and Nelkin, a senior research associate and a sociologist, respectively, in Cornell's Program on Science, Technology and Society.

The basic issues involved in scientific and technological litigation are often not scientific at all, Jasanoff and Nelkin note, but may be moral or religious. Scientific advances raise questions of whether to permit *in vitro* fertilization or whether to prolong the life of a dying person, but science holds no answers.

In other cases, the fundamental issues are political. Balancing a nuclear power plant's risk to human health against its benefits to the community or the nation is essentially a matter of public policy. It is true that technical questions in such cases—e.g., what is a "safe" standard for human exposure to low-level radiation?—may not have undisputed answers. But the reason usually is that the evidence is inconclusive. Bringing in more experts would not make it less so.