

are seeded with organic material from the interstellar clouds so that the origin of prebiotic matter, if not living creatures, lies in extraplanetary space. Methylamine can react with formic acid, also present in the interstellar

clouds, to form glycine, the simplest of the amino acids. Fourikis says the clues to the search for glycine in space are very clear. He expects the next two years of observation to be "very critical" in that regard. □

Alaskan archaeology: In the hole

In the Upik Eskimo language, says John Cook of the University of Alaska, the word for "archaeologist" translates as "grave-robber." In the history of outsiders' dealings with Alaskan natives, points out Dartmouth's Robert McKennan, "the philosophy by and large has been, 'Get rich and get out.'" But the suspicion of the natives is only a fragment of the tangled mass of difficulties facing researchers trying to probe the history of the northernmost state.

Last week, as most members of the Society for American Archaeology met in Washington to discuss topics ranging from Mayan pottery to getting a mummy X-rayed, the Alaska specialists spent their entire half-day session wrestling with the uniquely thorny problems of simply trying to work in their chosen region. All of the archaeologist's traditional hassles seem to loom larger in Alaska's 586,000 square miles. Near-Arctic weather permits a "digging season" of only two to three months; the accelerating tempo of development has caught the archaeologists flatfooted with no state professional society or other body to effectively further their research; and perhaps most critical of all, the yet-unresolved jurisdictions of the Alaska Native Claims Settlement Act pose often baffling bureaucratic questions of just who really owns the land.

"In a sense," says Cook, "it belongs to everybody—but in what sense?" The Bureau of Land Management's latest jurisdictional map of the state shows an incredible collage of ownership categories, made all the more frustrating by the fact that the largest areas are in domains whose boundaries have yet to be finalized. Only a tiny fraction, most of it concentrated around Cook Inlet in the south, is firmly established as "patented" state land. Perhaps 10 times as much is branded "state selections pending." The largest areas are vast expanses that have been withdrawn from public domain to be reclassified into a variety of Federal categories such as National Parks and public interest usage.

All of these uncertainties will be resolved sooner or later, but for archaeologists they represent a no-man's land full of tortuous convolutions that ham-

Ivory artifact from the Thule Eskimo culture. A baffling mass of physical and jurisdictional problems plague archaeologists in the northernmost state.



per the way to the required digging permits that make their work possible. Even in clearly assigned domains, getting a permit requires permission from the National Park Service, from the relevant one of the 12 regional native corporations into which the state was divided by the Claims Act in 1971, and from the local village whose land may include the site. Where matters of dominion are "tentative," "pending," "possible" and "awaiting classification," requests for permits may wait in abeyance for months or years while jurisdictions are resolved.

The formation of the regional native corporations has, in some ways, added to the archaeologists' problems, and not only by providing another bureaucratic

layer to deal with. The corporations cover 12 geographic regions, "with each region," according to the act, "composed as far as practicable of natives having a common heritage and sharing common interests." They were established to give a louder native voice in dealings with government, control of development and minimization of exploitation, but to archaeologists they have sometimes posed particular problems.

"The establishment of corporate structures," says Robert Ackerman of Washington State University, "has altered the world view of native groups to a considerable degree. They have adopted our territorial concepts and have become more adept at controlling the use of their resources by white entrepreneurs. The archaeologist, as a scientist and an exploiter in his own right, is now faced with the problem of explaining to an awakened native population why his research is any different than other forms of land use, and what possible advantage his investigations will bring to the local people." In some areas, says Ackerman, there is considerable native interest in restoring historic artifacts such as totem poles and clan houses, but virtually none in the less dramatic findings from prehistoric sites. Even when there is a plan in the works for a museum that could hold such finds, Ackerman says—and insistence on confining artifacts to local museums is another of the archaeologists' woes—"they don't want my 10,000 chips."

Several of the archaeologists at last week's meeting described their efforts to inform local populations about the importance of their work, through classroom lectures, reports to villages on their results and other methods. But some of the speakers pointed out that a state archaeological society and some sorely lacking publicity could add a great deal. "We as professionals," says Allan McCartney of the University of Arkansas, "have stayed down in our archaeological holes, perhaps, a little bit too long." □

Salvaging artifacts: A legislative boost

Fourteen years ago, a law was passed requiring Federal agencies building or licensing the construction of dams to first notify the Interior Department, which would then survey the area for possible archaeological finds, and salvage them if necessary. It was a first step, but a small one, and for the last six of those years, archaeologists have been urging that the bill be radically broadened. This week came the first real sign that their

efforts may pay off.

The idea has been to expand the bill to cover all Federal and federally assisted construction projects, rather than just dams. A key point has been to authorize any Federal agency involved in such a project to use its own funds for survey and salvage operations, rather than wait out the possibly critical delay of working through the Interior Department.

"In the past," says Carl Chapman

of the University of Missouri, who has been helping to spearhead the archaeologists' efforts, "much extremely valuable scientific information has been lost due to lack of funds and available personnel at the critical time. By authorizing the expenditure of necessary funds from the agency responsible for potential destruction of the data, it is possible to act promptly and to tie the level of support needed directly to the amount of destruction and the availability of personnel."

Two years ago, such a bill failed to reach either the House or the Senate floor. Last year it passed the Senate, but never got out of the House Interior Committee. This week, with 128 Congressmen cosponsoring it, the bill passed resoundingly in the House, 296 to 23, although with 114 members not voting. The archaeologists had not expected any opposition—their concern was that lack of interest might have prevented a quorum from gathering to vote. They were almost right, but optimism is now high. An aide to Sen. Frank Moss (D.—Utah), who is the main sponsor of the Senate bill, has described the House bill's amendments to the 1960 act as "reasonable and sound," and several scientists at last week's meeting of the Society for American Archaeology (where the need to drum up the vote was highly touted at every turn) agreed that if the House version passed, the Senate would probably go along without the need for conference. □

Mariner 10: More Mercury TV

For weeks before Mariner 10 flashed by Mercury it had been giving its flight controllers nightmares about whether it would run out of the control gas necessary to aim it close to the planet. When it survived the initial encounter, the key question became whether it would be able to come around again, 176 days later, for a second pass on Sept. 21. Late this week, the controllers were to find out.

There are two possibilities for the return engagement: a television mission past the sunlit side of the planet and a magnetic field survey of the dark half. After considerable debate, the TV program has emerged as the favorite. The critical maneuvers are engine firings intended to aim the probe so that it would pass within 29,500 miles of the surface.

The big question was whether an erratic gyro circuit could be kept from using up all the gas. The prize could be detailed photographs of the planet's southern hemisphere, but if the cameras fail, the magnetic survey could be chosen as late as July 2. □

Slavery: The good old days?



History is like a living tree. And as far as that tree is concerned, reason is an ax. You'll never make it grow by applying reason to it.

—Alexander Solzhenitsyn

One such ax is the computer, and it is being wielded by mathematically minded historians who call themselves Cliometricians. Their task is to turn Clio, the muse of history, into an equation that can be subjected to computer analysis. And with the readout, the Cliometricians are hacking away at the traditional historical interpretation of the institution of black slavery in the United States. Robert Fogel and Stanley Engerman have combined 18 years of data collection with thousands of computer hours and produced a two-volume study of slavery that will not be taken lightly. The book, *Time on the Cross*, was published last week by Little, Brown and Co.

Traditional historians, applying humanistic values, have made five major points about the slave economy. According to Fogel and Engerman, these are: "1. that slavery was generally an unprofitable investment, or depended on trade in slaves to be profitable, except on new, highly fertile land; 2. that slavery was economically moribund; 3. that slave labor and agricultural production based on slave labor were economically inefficient; 4. that slavery caused the economy of the South to stagnate, or at least retarded its growth, during the antebellum era, and 5. that slavery provided extremely harsh material conditions of life for the typical slave."

The computer tells a different story. The South was not dying. The value of land was increasing and the worldwide demand for cotton was growing. And with slavery, "southern agriculture as a whole was about 35 percent more efficient than northern agriculture in the 1860's." This could not have been accomplished with stereotypical lazy, in-

competent and stupid slave laborers.

Data from slave market sales, census records and probate and plantation records have been used to sum up the lives of 250,000 slaves. The resulting statistical averages indicate that things weren't as bad as history has taught. African slaves, Fogel and Engerman say, "had much longer life expectations than free urban industrial workers in both the United States and Europe." Their average daily diet "exceeded modern (1964) recommended daily levels of the chief nutrients."

Slave family life was not full of promiscuity, immorality and broken homes. Plantation owners recognized the husbands as heads of families, and the family was the main administrative and housing unit of a plantation. The average age of a woman at the birth of her first child was 22.5 years. "The great majority of slave children were borne by women who were not only quite mature, but who were already married." In a society that did not have modern methods of contraception, this indicates that "prevailing sexual mores of slaves were not promiscuous but prudish."

These and many other findings presented in *Time on the Cross* will be disputed for several reasons. The computer gives averages, but, more often than not, history is made by individuals. The horrible experiences of individual slaves might have been statistically rare but the immensity of their psychological and cultural impact cannot be described on a computer printout. By emphasizing the cruelty of slavery, traditional historians have made a strong case against slavery. Fogel and Engerman, who state their personal abhorrence of slavery in the last chapter of their book, thought their work would reinforce this idea. The computer, however, double-crossed them. But even with their mounds of data, the Cliometricians admit that "history cannot be reduced merely to a science." □