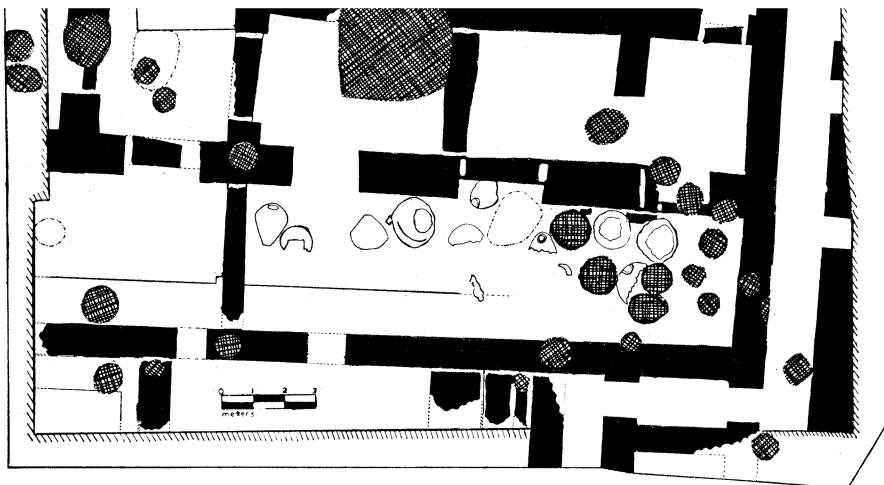




Workmen dig deep into Tal-I Malyun.



Illustrations: University of Pennsylvania
Proto-Elamite tablet from Anshan.



Anshan building is 5,000 years old, with hatched areas indicating newer finds.

The lost city of Anshan

In the mountains of southwestern Iran, on the corner of a large mound about 25 miles north of Shiraz, lies the little village of Malyun. Like much of Iran, part of the birthplace of the world's oldest known civilizations, the Malyun area has produced its share of archaeological relics. About a decade ago, Iranian archaeologists dug there, made a few finds and moved on.

But Malyun, it turns out, is no ordinary dig. Discoveries by an expedition from the University of Pennsylvania have revealed that the entire mound, 10 times the size of the village itself, is the site of the ancient lost city of Anshan, mighty capital of a mountain kingdom of the Elamites and dating back as much as 6,000 years.

Elam and its more famous neighbor, Sumer, were the earliest urban states to arise in the Mesopotamian area during the fourth millennium before Christ. Anshan was apparently occupied almost continuously from before 4,000 B.C. to about 1,000 B.C. and apparently had highly developed cultural and political ties with both the lower Elamite capital at Susa and the more distant centers of Mesopotamian civilization.

The excavation of the mound, Tal-I Malyun, resulted from a survey by William M. Sumner, now assistant professor of archaeology at Ohio State University but then working under Robert H. Dyson, director of Iranian projects for the University Museum of the University of Pennsylvania. Sumner inspected hundreds of sites and had hopes that Tal-I Malyun might indeed enclose the ancient capital, but there was no real evidence. Excavations began in June of 1971.

At about the same time, a photograph of inscriptions on an old construction brick from an unknown location in Iran appeared in a French archaeological publication. The language

was Elamite, a fairly well understood cuneiform writing system. It said in part that the Elamite kings had built a temple to the gods at Anshan.

Last fall, during the short October-November digging season permitted by Iran's weather, a cache of some 30 tablets, also in Elamite, was unearthed at Tal-I Malyun, and Erica Reiner of the Oriental Institute at the University of Chicago cracked the case. In translating the tablets, she found that although the fragments contained no mention of Anshan, they included a dedication to the gods which so closely matched that of the brick in the photograph that they had to be duplicates.

Anshan was found. The revelation was confirmed when the Pennsylvania researchers found tablets containing early administrative documents that actually referred to the city by name.

Three separate groups of tablets, in fact, have been among the most important discoveries from the site. The oldest is a collection of seven, made of unbaked clay and dating from early in the third millennium B.C. Found in a large mud-brick building that seems to have been a warehouse, they include various symbols that probably represent warehouse goods, along with some numerical notations. Unfortunately, they are written in Proto-Elamite, a language that has yet to be deciphered, although some researchers believe that it may be a script version of Elamite. (Elamite, too, has its mysteries, but they are not in making words out of the notation, but in translating some of the words, such as "shumash" stone.)

The same building yielded some broken lumps of clay with impressed seals—used to protect the contents and identify the owners—and 13 huge, painted pottery jars too heavy for a man to move, along with some cut pieces of mica and mother-of-pearl,

probably from an inlay decoration.

The second batch of tablets, from a shallower excavation, dates from the Old Elamite period of about 1,800 B.C. and are written in Sumerian, a sign of the strong influence of Mesopotamia. The researchers also found seals, friezes and figurines in the same deposits portraying animals, women clasping their hands or holding their breasts, and enthroned kings with attendants.

The third tablet find, from which Reiner discovered the city's identity, was in a room, detected during a cesium magnetometer survey, which had been destroyed in a fire. Its use is uncertain, since few other artifacts were found there.

The researchers' agreement with Iran required that the government get its choice of any 10 unique objects—they took several of the tablets—after which Sumner divided the rest in half and drew lots with the Iranian Government for the right to choose its half.

At present, the Pennsylvania team is carefully unpacking the artifacts returned from Iran, and in the future it will continue to investigate the parts of the site where the various tablets were found.

There is certainly no shortage of places to look. Remains of a wall completely enclose the city with its monumental architecture, and signs indicate several outlying settlements. "It would take several lifetimes," Dyson says, "to excavate all of Tal-I Malyun." □

Nature vs. nurture in African infants

If psychological development during the first year of life is important, then growing up in Africa has definite advantages. A number of studies have shown that sub-Saharan African infants are precocious. On motor- and mental-skills tests during the first year of life these infants outperform their age peers (both black and white) in the United States and Europe. Some researchers have attributed this precocity to genetic factors, others to social factors (SN: 11/4/72, p. 298).

But "these studies leave much to be desired methodologically," say researchers P. Herbert Leiderman, Beatrice Babu, James Kagia, Helena C. Kraemer and Gloria F. Leiderman of Stanford University School of Medicine and the University of Nairobi. So they designed a longitudinal (as opposed to cross-sectional) study to investigate whether or not there is developmental precocity and to assess the relationship of selected social and demographic variables to psychological development during the first year. The study was conducted in a Kikuyu agri-

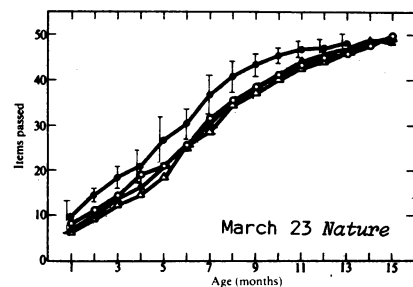
cultural community outside of Nairobi. Sixty-five infants (34 male and 31 female) were tested for mental and motor skills at 2-month intervals for up to 16 months. Information on such matters as family structure, educational achievement, economic status and density of household was collected for each child. The results of the study are reported in the March 23 NATURE.

Test results of the Kikuyu infants were compared with U.S. standards. The African infants surpassed U.S. performance on 38 items of the mental test and 20 items of the motor test. They lagged behind American children on 7 items of the mental test and 2 items of the motor test. The Kikuyu infants continued to score higher throughout the first year of life.

The Kikuyu infants from families with greater economic resources and with more modern amenities such as calendars, clocks and books performed better on the mental test. Infants born to fathers of higher income, more training and more education, scored higher on motor and mental tests than did those of fathers with less income, training and education. Infants from households with two or more persons past the age of 40 did better on the motor tests. This, say the researchers, suggests that additional caretaking of the infant by an older woman or grandmother contributed to motor development.

The researchers admit that a definite answer cannot be given yet for why the African infants have precocious mental and motor development during early life, or for why test performance is apparently influenced by economic and social factors. But assuming the Kikuyu infants to be non-precocious at birth, they say their findings lend support to theories emphasizing environmental influences during the first year of life.

The researchers agree with Arthur Jensen that genetic factors account for a large proportion of the variability of mental and motor test performance during the first year. They conclude, however, that the remaining variance (about 25 percent) is not random, but associated with identifiable social and demographic factors. □



Comparison of motor test performance (Bayley) for Kikuyu (●), UK white (○), US black (▲), and US white (△) infants during the first year.

Diving for knowledge of the ocean's life

Though ocean diving is an ancient art—Aristotle described the first diving apparatus and Alexander the Great is said to have made descents—the inner sea remains the great unexplored frontier of earth. Three recent developments reflect the increasing sophistication of diving techniques and the growing importance of the diving art to understanding the oceanic ecosystem.

William Hamner, a zoologist at the University of California at Davis, has adapted scuba-diving techniques to open ocean research for the first time. Scuba has long been used close to shore, where sight of the ocean bottom and plants gives fixed points of reference, but free divers attempting to explore the open sea often experience the same panicky sense of isolation observed in astronauts during spacewalks.

To meet this problem, Hamner erected a framework of floating pipes to give the divers a sense of orientation, and tethered them to a "safety man" in the middle, who kept the lines untangled and watched for sharks. The team has been conducting studies using the technique in the clear waters of the Florida current, off Bimini in the Bahamas, where the depth is about two miles and 150-foot visibilities are common.

On their first expedition, sponsored by the National Science Foundation, the Hamner team has concentrated on studying zooplankton—the floating or weakly swimming animals that make up a vital, and not fully understood, link in the sea's food chain.

Already the Hamner team has observed phenomena not discovered before. Previously, for example, only a few badly damaged specimens of a peculiar pteropod called the Gleba have been found, and no one could figure out quite how it functioned. Now, members of the team have observed several Gleba in their natural environment and watched as the animal fashioned a four-foot-wide net of mucus to ensnare smaller plankton. They also saw how another animal, the Larvacean, secretes a "filter house" that it uses to trap microplankton.

Hamner sees deep-sea scuba as an inexpensive alternative to elaborate bathyscaphes and research submarines and plans to take his team next to conduct research in the Gulf of California.

Meanwhile, after years of having the HYDROLAB underwater laboratory-residence used primarily for testing man's survival in a strange environment, scientists have begun to use the facility for extensive research at 50-foot