which the $60,000 became a fixed fee covering the tracking-network activities, while the other work would be financed by NASA itself.

The landing craft, meanwhile, is programed to operate through 1994, providing occasional photos and an ever-lengthening meteorological data base. "I'm confident that [contributions from the Fund] will continue to be an annual thing," says its founder, California aerospace engineer Stan Kent, who estimates that as much as an additional $40,000 has already been received. Contributions (to the Viking Fund, 357 Saratoga Ave., Santa Clara, Calif. 95050) have averaged about $10, he says, ranging from 25¢ to $100 or more, and are tax-deductible. "The space program is coming alive again," says Kent, bolstered by the grass roots support at a time when many scientists fear for the future of planetary research. "It's coming out of the doldrums." □

Three cloned mice? It depends...

The publication this month of a scientific paper reporting the first successful nucleus transplant in a mammal caused quite a stir in the press. Were the three mice born after micromanipulation truly mammalian "clones"? As first reported in SCIENCE NEWS from a meeting at Jackson Laboratories (SN: 7/28/79, p. 68), the genetic material for each mouse was moved in its nucleus from cells of young embryos and injected into a fertilized egg, taken from another mouse. The genetic material originally present in the egg was removed, and the egg was then implanted in an unrelated mouse foster mother. Karl Illmensee and Peter Hoppe, working at the University of Geneva, report that one of the resultant animals died after 7 weeks, but the other two reached adulthood and were bred. Their progeny showed the hereditary characteristics expected from the transplanted nuclei.

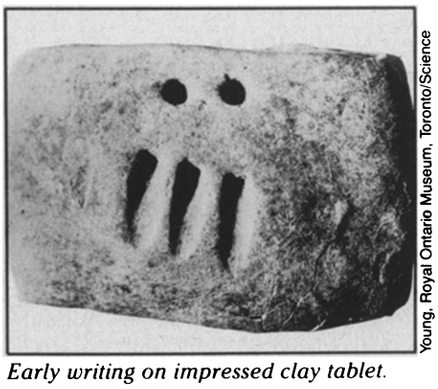
Whether this feat of experimental embryology ought to be called cloning is a matter of fine definition. There is no question that each mouse was created asexually from a single individual, but that individual, an embryo, was destroyed in the process. Another objection that has been raised is that true cloning must produce more than one genetically identical individual. The three mice described in this month's CELL each derived from a different embryo. In more recent work, more than one nucleus taken from a single embryo has been successfully transplanted — giving a "clone" of mice, according to the Jan. 8 New York Times, but the details have not been reported yet. If your idea of cloning, however, is to mass-produce copies of an adult animal, the mouse work is just one very significant step along the way. □

Token impressions mark early writing

Impressed markings made on clay tablets dug up around the Euphrates River in Mesopotamia are believed to be the earliest examples of writing. These crude signs, which date to about 3,000 B.C., appear to be a logical step in the evolution of a system of record keeping that began approximately 11,000 years ago. A new decipherment of these seminal writing samples supports and broadens this theory.

Denise Schmandt-Besserat of the University of Texas reports in the Jan. 16 SCIENCE that the signs stand for units of grain and land measurement, animal numeration and other economic and trade units. They were formerly thought to be numerical signs, devoid of content, but Schmandt-Besserat now suggests that the impressed tablets dealt with small amounts of food and commodities and were used as receipts for payments to individuals and to the government and religious temples.

This work grew out of previous explorations into the meaning of clay tokens reported by Schmandt-Besserat in the June 1978 SCIENTIFIC AMERICAN. She hypothesized that the first tokens appeared early in the Neolithic period around 8,500 B.C. because a newly developing agricultural economy required a recording system, especially for food storage. Fourteen tokens of different shapes, plus several others, were analyzed for their references to food, goods and numbers.



Young, Royal Ontario Museum, Toronto/Science

Early writing on impressed clay tablet.

Significant changes in the recording system occurred early in the Bronze Age, between 3,500 and 3,100 B.C., as the development of an urban economy, rooted in trade, brought about a more complex business accountancy. Parallel lines and perforations, explains the researcher, began to appear on tokens, and some tokens were strung together as records of transactions.

Images of tokens impressed on clay tablets soon replaced tokens themselves. Schmandt-Besserat says she studied about 200 impressed tablets from excavations in Iran, Iraq and Syria, and suggests that the markings are precise measurements rather than numerical notations. She has begun to make an inventory of the clay impressions, grouping them in content categories. But she told SCIENCE NEWS that much work needs to be done in this area, including the continued examination of tokens and tablets stored in museums throughout the world. □

New cancer detection test announced

Though early detection of cancer is a crucial factor in the ultimate outcome of therapy, there are currently no general screening tests for early, unsuspected cancer. Pennsylvania State University researchers, however, have just announced the development of a blood assay that identifies the presence of cancer in patients with known malignancies, and they are optimistic the test will prove capable of detecting cancers before any malignant growth becomes apparent.

The assay tests for the presence of a glycoprotein given off only by cancer cells. The researchers looked at blood from 330 cancer patients, 170 cancer-free persons, 28 patients with a recurrence of cancer and 80 patients in remission. The test proved 96 percent accurate in identifying active cancers, with a false positive rate of two percent, the researchers said in Washington this week at a press conference sponsored by Warner-Lambert. The company plans to develop the test for marketing either as a cancer screen, an indicator of treatment success or a diagnostic tool.

There are already 16 cancer detection tests available, but each is specific for a particular kind of cancer. Like the current tests, the new assay identifies a substance given off by cancer cells, but the glycoprotein the Penn State researchers isolated appears to be given off by most types of cancer. The test works for four major categories of cancer — cancinomas, melanomas, sarcomas and Hodgkin's disease — the researchers say.

Because the amount of glycoprotein in the blood correlates with the amount of cancerous tissue, the researchers expect the test will prove accurate in detecting cancer in its earliest stages. "Early detection is still the most effective means for dealing with malignancies," says Eugene A. Davidson, who developed the test with Sally D. Bolmer. Measurements of the accuracy and potential of the test are "extremely encouraging," he says.

The test will have to be refined and proved before it hits the market, which could be in three to three and a half years, if the testing goes well, a Warner-Lambert official reports. The Penn State researchers are currently working on a monoclonal antibody against the glycoprotein for use in the assay. □