

"heat death." The other end of the world, however, commonly called the beginning, is just as important scientifically, but is a great deal more difficult to construct. As we go back in "minus time" toward the "beginning," things become less and less random until, theoretically, they have become completely organized. The problem then arises of how they got that way.

One explanation depends upon the nature of the "second law" of thermodynamics which, like all so-called natural laws, is statistical. That is, it states what will happen in terms of innumerable observations of what has happened. It does not pretend to be absolute, but merely a statement on the basis of experience of an overwhelming probability, a probability of ten, raised to the twentieth power, to one. In the words of Sir Arthur: "If all my statements had as good a chance of being right, I would be afraid I was either a genius or a fool stating the obvious."

In these terms time may be imagined as extending indefinitely in both directions but having the character, not of a level plain, but of a series of mountains, the peaks of which represent states of complete organization and the valleys of which represent complete randomness. Logically, according to science, we progress over these peaks one after the other in turn, each journey up and down being an exact repetition of the one before so that "history" constantly repeats itself exactly.

Going "up the peak" from randomness to organization represents actually travelling reverse in time and going down the peak represents going in the direction which is ordinarily thought of as time. While science does not distinguish between the significance of the two directions, consciousness refuses to accept any but the downward direction from past to future, from the peak of organization to the valley of randomness or "heat death" where all is reduced to radiant energy.

Whereas for science it is perfectly reasonable thus to consider the direction of time's arrow in terms of plus and minus, for consciousness any reversal at all, any concept of minus time, is simply ridiculous. Thus matters stand at the moment. The dynamic quality of time which we instinctively sense and which the philosophers call "becoming" as opposed to "being" and the significance which we attach to it mentally is not explainable or describable by modern science. Once more the mind eludes analysis.

*Science News Letter, April 21, 1934*

#### ARCHAEOLOGY

# Explorations at Ur Finished; Cemetery Found in Pit Bottom

## Abraham's Town Had Great History and a "Personality" Scientists Declare Summarizing Discoveries of 12 Seasons

See Front Cover

**E**XPLORATION at Ur of the Chal-dees, one of the most remarkable archaeological projects ever undertaken, is finished, according to announcement made at the University of Pennsylvania Museum.

A report just received from C. Leonard Woolley, British archaeologist, who has directed the long campaign of digging, tells of the last discovery at Ur. This discovery is a cemetery of 200 graves found in the depths of a huge pit 50 feet deep, which is pictured on the front cover of this week's SCIENCE NEWS LETTER.

### Skeletons and Vases

Crumbling remains of skeletons, with tightly flexed knees and thighbones bent to right angles with the spine, were surrounded by vases and bowls. At the necks and waists of the bodies were found innumerable beads of crystals, lapis lazuli, carnelian, marble, shell, chalcedony, and one of gold. The age of these people of Ur is set at the fourth millenium before Christ, in a period which the archaeologists have named the Jemdet Nasr period.

In the latter days of this period, fashions of Ur evidently called for stone vases and bowls instead of the native clay, and the stone had to be imported from northern Mesopotamia, or from the Persian Gulf far away to the south. In the 200 graves, the archaeologists found 770 stone vessels of alabaster, gypsum, limestone, and diorite.

The British Museum and the University of Pennsylvania Museum have worked jointly at Ur for twelve seasons, finding the home town of Abraham to be a place with a great history and a "personality."

### Important Discoveries

Reviewing discoveries of paramount interest at Ur, Horace H. F. Jayne, director of the University Museum, included these:

1. Pre-Dynastic royal tombs of about 3500 B.C. were opened, revealing mute evidence of human sacrifice on a lav-

ish scale. Bodies of kings, queens, and their servitors, buried with an unbelievable array of jewelry and household goods, attest to the artistry, culture and luxury of Ur's royal court 5,000 years ago.

2. Royal tombs of the great Third Dynasty were found, and, while these burials at Ur had been plundered, the massive and elaborate construction of the tombs is of great historic interest.

3. Residential districts of Ur, particularly about 2000 B.C., which was Abraham's time, revealed a surprising elaborateness in middle class dwellings. Many middle class homes had private chapels, and below the houses were family burial vaults.

4. The great public buildings of Ur were found grouped mainly in the Sacred Area. The Ziggurat, largest existing example of the great staged towers of Mesopotamian cities, dominated this center. Near it were the Treasure House and the Temple to the Moon-God. Several palaces were also found.

5. A bed of water-laid clay eight feet thick was discovered and pronounced evidence of a flood which marked a break in the history of Ur. The layers of remains above and below the barren clay level were of very different civilizations.

*Science News Letter, April 21, 1934*

#### ORNITHOLOGY

## Ravens Know Trick Of Military Aviators

**S**TUNTING in the air is not a new thing under the sun. One of the favorite tricks of the military aviator—a quick side roll to an upside down position, followed by a half-loop downward restoring the right side up position and reversing the direction of flight—is known to ravens.

Several observations of this turn have been observed by a German naturalist, J. O. Fulz, and have been reported by him to the weekly journal, *Die Umschau*.

*Science News Letter, April 21, 1934*