be converted, they adopted the idea of having statues in their own holy places, in addition to the simpler natural objects they had revered before that time.

Many of the images are used by the shamans, or medicine men, in exorcising disease. One type of idol, called a "heart twister", is used when the trouble is supposed to be located in the heart. Most of the heart twisters are made of stone or wood, deeply carved in a spiral pattern, but there is at least one in use among the Hopi that is made of a fossil sea shell.

FEELING THE PULSE OF A STAR

By Dr. Edwin E. Slosson

By the new method of analyzing the spectrum of a star, it is now possible to trace regular pulsations through its atmosphere. What caused the fluctuations in the intensity and quality of the light from variable stars has long been a puzzle to astronomers.

By comparing the swinging of a candelabrum with his own pulse beats, Galileo discovered that the period of a pendulum is constant, that is, it does not depend upon the distance through which it swings. Quite similarly the gases in the atmosphere of a variable star are swinging back and forth, in and out, all in the same length of time, but not all through the same distance, as the outermost layer in some of the stars moves very little. Moreover, one layer of the atmosphere receives the motion and passes it on to the next from interior to exterior and back again like a perpetual motion machine. The pulsation of the outer layer takes place last, just as the tipping of the last domino of a falling row; but to make the analogy complete someone would have to stand the dominoes on end again and start the motion backward.

The pulse of the giant star, Eta Aquilae, beats once a week and during this period the star changes from the third to the fourth magnitude, which is easily observed with the naked eye. The change of light accompanies the pulsation through the atmosphere, which carries the energy from the storehouse in the interior to the surface boundary for exportation. Paring the same time the star changes from a bright orange to a golden color with the increase of radiation.

The cause of these changes has been investigated at the Observatory of the University of Michigan by Prof. W. Carl Rufus. By employing a new method of analyzing the rays from this star he has found that the changes of its light are due to alternate compression and expansion of the atmospheric gases.

Compression is a heating process, and the increase of temperature of the radiating surface makes the star shine more brightly. Expansion produces the opposite effect. So with every beat of the pulse of the star these alternating physical processes are revealed in the rate of flow of its energy as seen by the eye and interpreted by the mind of man.

The source of this inexhaustible supply of energy, however, is a problem that has completely baffled the astronomers in spite of their giant telescopes, their ingenious spectroscopes and sensitive photometers. Energy seems to be a final product in the quest for scientific truth or the most primitive star-stuff from which the universe evolved.
