

are the ones being employed in the Milky Way studies.

"The Cepheid variable stars, and to a lesser extent the long period variables, afford valuable means of measuring great distances," explains Dr. Shapley. "With the perfection of photometric methods, it becomes possible to analyze any part of the stellar system in which variables occur, outlining its extent in various dimensions and the frequencies of certain types of stars. The problem of the structure of the galactic system has been of special interest to me for several years, and we have now perfected plans to place on a systematic basis one part of the analysis of the Milky Way.

"Three belts in the galaxy are being photographed continually at Cambridge and at our branch station at Arequipa, Peru, with exposures of sufficient length to show stars to the seventeenth magnitude. Each one of the two hundred fields, which completely cover the Milky Way, will be photographed over a period of four or five years from five to forty times annually. The accumulated material will be sufficient, in general, to determine the light variations of all variable stars to the sixteenth magnitude, or fainter. More than a hundred new variable stars have already been found during the early stages of this work. We are particularly able to do this for we have suitable telescopes and an extensive collection of early photographs, and our staff has had long experience in measuring stellar brightnesses."

The first photographs ever made of stars in the United States were made at the Harvard Observatory in 1850, and ever since the work has been continued, so that now the observatory has a file of thousands of plates which are not duplicated at any other institution.

Some of these are direct photographs, others are spectra, which reveal the composition of the stars and which were used in the compilation of the great Henry Draper Catalog. This monumental work lists over 225,000 stars, and gives their brightness, position, and spectral type. Most of the work on it was done between 1911 and 1924, largely by Miss Annie Jump Cannon, the first and only woman to receive an honorary degree from Oxford University, in England, which was conferred in honor of her scientific achievements.

YOUTH OF NATION ASKED TO FIND HEALTHY CHESTNUT TREES.

Chestnut trees of the future, if there are any, may owe their existence to the energies of some boy or girl of today.

The Department of Agriculture is receiving the aid of the youth of the land, particularly boy and girl scouts, in scouting out chestnut trees that are resistant to the blight that has wiped out most of the chestnuts of eastern American in the region north of Virginia.

G. F. Gravatt, of the Office of Forest Pathology, said that there is no means of saving the present growth of chestnuts. All hope is concentrated on the starting of a new growth of blight resistant trees. Some species have been introduced from China and Japan, but occasionally there is found a resistant native tree which is still sound in spite of the epidemic that has killed its companions.

Scouts have been asked to send in the location, size and condition of the healthiest trees which they find. This information will allow experts to examine the trees and as a first step toward possible reforestation nuts and grafted trees from the most promising will be planted in the experimental orchard at Bell, Md. for further testing. It is expected that arrangements will be made in cooperation with state authorities to give out seedlings from the most resistant trees to scouts to plant on their own camp grounds, so that chestnutting will not become a lost art to the youth of America.

PHOTO REVEALS PINCH OF HUNGER

Hunger is pain, according to Dr. F. T. Rogers of Baylor University, who has succeeded in taking an X-ray snapshot of his own stomach at the instant when he was experiencing sharp pangs of hunger.

Investigation under Dr. A. J. Carlson of the University of Chicago had proved that the stomach undergoes a violent contraction, lasting nearly a minute, when the gnawing sensation is felt following fasting. This was shown by the insertion into the stomach of a rubber balloon, joined by a tube leading up the gullet to a pressure gauge. At the instant the sinking feeling came on a hungry subject, the pressure rose, indicating the balloon was squeezed as the walls of the stomach flapped together.

Now Dr. Rogers has analyzed the process, using a new X-ray technic which enables him to photograph the air in the stomach and in the balloon lowered into it.

"The hunger contractions differ from the movements of the stomach during digestion," Dr. Rogers explained. "When food is in the stomach, a constriction starts about halfway, and passes downwards, thereby moving the contents along."

"But in the case of a hunger spasm, there is a circular contraction of the lower two-fifths of the stomach, which shrinks like a deflated balloon."

"The photographs reveal that the hungry stomach is drawn upwards, frequently right under the ribs."

The hunger convulsions cease whenever solid or liquid, even water, enters the stomach. This fact complicated the taking of the X-ray pictures, since barium sulphate or bismuth subnitrate, commonly put in the stomach to make it opaque to the X-ray, would also stop the sought-for contractions.

"The hunger contractions are more pronounced in infants than in adults," said Prof. Rogers. "Children cry when they are hungry because they are indeed in pain."

Losses in the Florida watermelon crop are being reduced by disinfecting the seed with bichloride of mercury.
