ASTRONOMY

Star Eclipse Reveals Iron, Nickel and Aluminum

Heavenly Twins, the Binary Zeta Aurigae, Provide Opportunity Thrice Each Eight Years for Observation

CELESTIAL twins, a pair of giant suns revolving round and round each other millions upon millions of miles out in space, are revealing to astronomers secrets of star composition never before known for any other stellar object in the whole universe outside of our own sun.

How scientists found that these distant stars contain such common elements as aluminum, iron, nickel and hydrogen was disclosed to the astronomical section of the American Association for the Advancement of Science.

The celestial twins are the two stars which make up the binary star known as Zeta Aurigae to the astronomers.

One of the two stars in Zeta Aurigae is some 25,000 times as large as the other. As the smaller one passes behind the larger and its light is cut off in the stellar eclipse, astronomers have conditions of observation rivalling the almost ideal one which they might set up in a laboratory if they could.

The perfection of eclipse conditions on Zeta Aurigae makes possible the observations demonstrating what kind of atoms create the light in the outer gaseous layers of the dual star which extend out into space for thousands of miles.

As in the case of a total solar eclipse, the occasion of a stellar eclipse is the only time it is possible to analyze this outer shell starlight.

In three papers by Drs. W. H. Christie and O. C. Wilson of Mt. Wilson Observatory; Dr. P. T. Oosterhoff, also of Mt. Wilson; and Dr. Frank C. Jordan of Allegheny Observatory, the new discoveries about Zeta Aurigae were disclosed.

An analysis of the outer vaporous chromosphere starlight shows that atoms of iron, nickel, titanium and aluminum are present. Light hydrogen gas was also found, plus atoms of calcium and titanium in an ionized state, wherein a charge of electricity—an electron—had been stripped from them.

The year 1934 has been an especially fortunate one for observing the eclipses of Zeta Aurigae, for only three times in eight years do eclipses occur.

"At these times," explained Drs. Christie and Wilson, "the small hot star is passing behind the extended, tenuous atmosphere of the large one. As a result the spectrum of the smaller star shows the absorption lines due to the atoms composing these portions of the atmosphere of the larger one lying in the line of sight." By analyzing these spectral lines astronomers are able not only to tell what kind of atoms are to be found in the outer layers of the big star but have indications about the heights at which the various kinds of atoms may be found.

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GENETICS-ASTRONOMY

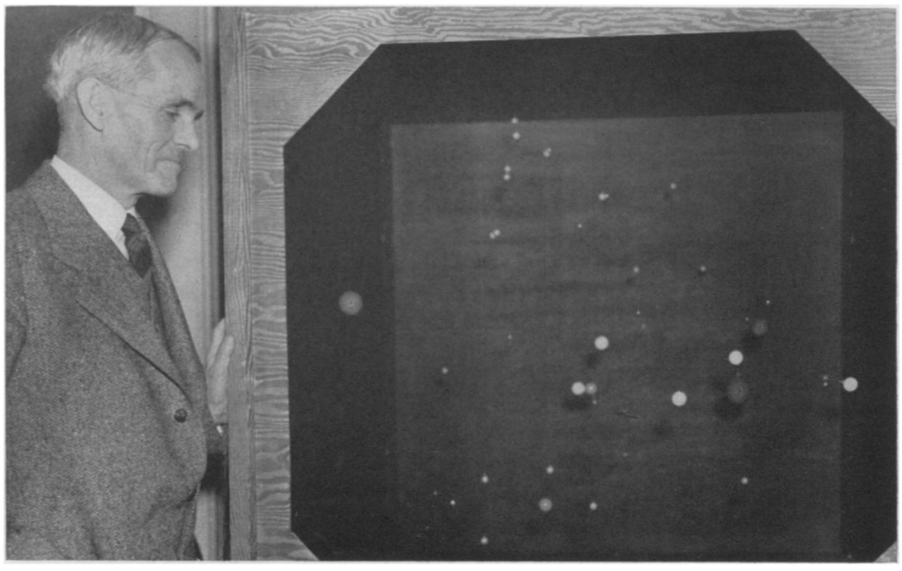
Genes' Exact Locations Demonstrated to Public

FOR the first time, the public were given an opportunity to see the exact locations of genes, the submicroscopic units that determine the course of heredity, when the annual exhibit of the Carnegie Institution of Washington opened.

Powerful microscopes carried slides mounting specially prepared cells showing recently discovered detailed structures in their chromosomes. The positions of the genes are correlated with these band-like markings. Enlarged diagrammatic charts show the positions of certain known genes, and tell the particular influence of each. Finally, a collection of "yeast flies," the tiny insects used in the experiments, show the particular heredity effects that follow the loss or displacement of some particular gene.

The exhibit was under the supervision of Dr. Thomas Hunt Morgan, research associate of the Carnegie Institution, who recently was awarded a Nobel Prize for his widely known pioneer work in the study of heredity. With him, and directly in charge of the exhibit, were two Carnegie Institution staff members, Drs. C. B. Bridges and M. Demerec, who have done much research on the newer developments demonstrated.

The sun's forty nearest neighbor stars, all within a comfortably close radius of sixteen light years, were also on display in model form. The model consists of vari-colored little globes suspended in their relative positions in space. Their distances apart are determined to scale, their relative brightnesses are indicated by their respective sizes, and the colors of the stars, blue,



OUR NEIGHBOR STARS

Dr. W. S. Adams, director of Mt. Wilson Observatory, inspecting the model of the sun's nearest neighbors at the Carnegie Institution's exhibit.