

ASTRONOMY

Circle At Terrific Speeds

Find two giant suns that whiz around each other at very high rates, one having a linear velocity of 190 miles per second, the other, 122 miles per second.

► TWO GIANT suns, one 5,000,000 and the other 3,000,000 miles across, swing around each other out in space with terrific speeds, yet stay very close together, Dr. Joseph A. Pearce, director emeritus of the Dominion Astrophysical Observatory at Victoria, B. C., reported to members of the American Astronomical Society meeting at Amherst College, Amherst, Mass.

The smaller star moves so fast it could skim around the earth's equator in a little over two minutes. Its linear velocity is 190 miles per second, Dr. Pearce estimates. The more massive star has a linear velocity of 122 miles per second. These enormous bluish stars whiz around each other every 27.2 days.

The two stars circle around each other in a volume of space about equal to that enclosed by the orbit of the planet Mercury, the closest planet to our sun. For two days the stars are only 12,000,000 miles apart,

Dr. Pearce reported, then 13.6 days later they are 79,000,000 miles from each other.

These enormous stars, one 13 times as massive as our sun and the other eight times as bulky, are in the constellation of Orion. Both are very brilliant and very hot, having a temperature of about 22,900 degrees Centigrade. So close together they appear as a single fifth magnitude star, they are so far from us that light which reaches the earth today started on its way from the star about 1,250 years ago.

The difference between the magnitude and intrinsic brightness of the stars, known to astronomers as H.D. 37756, was deduced from a spectrophotometric analysis of their light, Dr. Pearce explained. These data, combined with orbital elements of the binary, permitted the absolute dimensions of the double-star system to be evaluated by Dr. Pearce.

Science News Letter, January 10, 1953

BIOPHYSICS

Radioactivity Damage

► NO AMOUNT of exposure to radiation from radioactive products is small enough not to cause some biological damage to living cells, Dr. Karl Z. Morgan of the Oak Ridge National Laboratory told an American Association for the Advancement of Science symposium on radiation hazards in St. Louis.

Even the small amount of radiation man is constantly subjected to from naturally occurring irradiation sources like cosmic rays, causes some damage to cells, although the rate of repair is faster than the rate of damage, Dr. Morgan said.

The maximum amount of external radiation exposure workers with radiation can safely be subjected to is 70 times the natural background radiation per week, he said.

Even this maximum safety rate—0.3 rems, roentgen equivalent man—cannot be allowed as an average exposure for a worker over his entire occupational life, Dr. Morgan said. A worker exposed to 0.3 rems a week over 40 years, would probably have his life span shortened by four years, and would be more likely to have tumors, blood disease and eye cataracts than non-radiation workers.

This maximum permissible exposure of ionizing radiation, however, is not intended for year in, year out radiation work, Dr. Morgan said, but represents the toleration point for fairly short periods of time.

Workers in the Oak Ridge National Lab-

oratory, where many irradiation experiments are going on, average exposure to only 0.012 rems per week, which is four percent of the permissible rate or only three times natural background exposure rate, Dr. Morgan said.

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Do You Know?

There are about 79,400,000 telephones in the world today.

In a year's time in the U. S., the per capita consumption of assorted beverages is nearly 20 gallons, with a net alcohol content of about six quarts.

Prairie chickens perform a spectacular mating dance on ancestral "booming grounds" each spring; their calls echo far across the grasslands.

A bar made of a *gold-cadmium* alloy can be bent easily when cold, but when heated to about 150 degrees Fahrenheit, it quickly returns to its original shape.

The *archery bow* is a classic example of a mathematically perfect form, yet its shape probably was created only from the intuition and esthetic sense of the designers.

Questions

ASTRONOMY—How much more bulky than the earth is Saturn? p. 21.

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GENERAL SCIENCE—What is the "Red Tape Curtain?" p. 22.

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PHYSIOLOGY—Why should people learn to put a brake on their muscles? p. 23.

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PSYCHOLOGY—How can a study of eating patterns help prevent mental illnesses? p. 21. Does training in logic aid in sound thinking? p. 25.

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PUBLIC HEALTH—How are X-rays helping to give us cleaner bread? p. 27.

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VOLCANOLOGY—How was it shown that the new Pacific volcano was of continental type? p. 20.

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