signaled to the people that the new year had begun.

When Babylonian calendar records showed that the sign in the sky was late, and instead of being seen on the first evening of the expected month, the moon did not shine near the stars until the third evening, then the astronomers had an extra announcement. The calendar was slipping, and an extra month must be added.

Babylonian astronomy gained in exactness as time went on, making it possible now, thousands of years after, for persevering scholars to use the ancient lore in clearing up dates of interest to millions.

Science News Letter, April 12, 1941

SAFETY

Life-Saving "Oxygen Shirt" New Aid to Life Guards

A LIFE-SAVING "oxygen shirt" to aid life guards in rescuing drowning persons is announced by Dr. Christian J. Lambertsen, of the University of Pennsylvania Medical School. (*Journal, American Medical Association,* March 28.)

With this new kind of apparatus strapped like a harness to his bronzed back and chest, the life guard will be able to stay under water for from 18 to 25 minutes in depths to 60 feet while searching for drowning accident victims, instead of the usual one minute at depths to 30 feet.

The oxygen harness which thus increases the life guard's life-saving ability weighs just over 12 pounds in air. Under water it is practically weightless. A small cylinder for oxygen or an oxygen-nitrogen mixture fits into a pocket. A nose and mouth mask, rebreathing bags, lead plate and a soda lime container are the other chief features. The breathing bags, breathing tubes and inhaler are all buoyant under water and their lift almost exactly balances the under water weight of the oxygen cylinder, regulator, soda lime container and lead plate.

The whole life-saving apparatus can be strapped on and be in use within 15 seconds or less. It is designed to fit persons of varied size and shape without time-consuming adjustments. Unlike the deep-sea diver's outfit, this apparatus does not require an assistant at the surface but it does not give the life guard protection against cold while under the water.

Besides helping life guards and others rescue drowning persons, the new apparatus could be used for inspection and minor under-water repairs of hulls of boats; for pearl and sponge fishing; sport, as in goggle fishing; and, with slight modifications, in mines, sewers, chemical plants and gas companies where the atmosphere is deficient in oxygen or contains noxious gases.

Science News Letter, April 12, 1941

ASTRONOMY

Gigantic Pinwheel Star Shines With Many Colors

Red, Yellow and Green Gases, Spiralling Out From Double Star Center Would Be Beautiful Sight

IF IT could be seen from the proper angle, through some super-telescope many times more powerful than any now contemplated, the star Sheliak would be revealed as a gigantic pinwheel of red, yellow and green gases, spiralling outwards from a double star at the center to a distance of 50,000,000 miles.

This star, called beta Lyrae by astronomers, is in the constellation of Lyra, the lyre, near the bright star Vega, now seen in the northeast about midnight.

The pinwheel conception is given by Dr. Otto Struve, director of the Yerkes Observatory. (*American Journal of Physics*, April). His ideas are based on the researches of his colleague, Dr. Gerald P. Kuiper.

Beta Lyrae is normally fairly bright, of the third magnitude, but in 1784 a 20-year-old deaf mute in England, John Goodricke, noticed that it varies in a period of a little less than a week. Later it was found that the star's cycle is really 12 days 22 hours. From its full brightness, after 6.5 days, it decreases about a third, then it returns to the original, and drops again, this time to about two-fifths of its former brilliance. Then it brightens again, and the cycle starts over.

Though it was long ago realized that this is a double star, with two parts, revolving around their center, and that sometimes both stars are visible, sometimes one, and sometimes the other, depending on which is in front, many peculiarities were discovered, requiring an elaboration of the theory. Many of these were found in analyzing the star's light through the spectroscope.

Now, however, astronomers have evolved what appears to be a satisfactory theory to explain its mystery. The two stars, one large, the other small, are actually in contact, and material flows from the big one into the smaller. As the system revolves, some of this is sprayed off and spirals outward. Dr. Struve summarized the conceptions as follows:

"The star is actually a binary, just as the older theory had predicted. However, the cool and relatively small star which turns around the hot supergiant is so much fainter in light that we cannot even photograph it; in the time required to record it, the image of the hot supergiant would be so completely overexposed that the photographic emulsion would be burned out. Of course, the distance of beta Lyrae is so great that we cannot actually see the pinwheel structure of the expanding gases, or the motion of the faint companion around the primary star. Even the greatest telescope now in existence is much too small to bring this marvel to our eyes. We must be content with information secured by theory and indirect observation.

"Imagine then a giant sun so hot that its color is essentially blue, so large that a good portion of the entire solar system could be hidden within its confines, and so brilliant that our sun would completely disappear in its glare. At a short distance, probably less than the radius of the large star, is another sun, yellow in color, and relatively cool, though hotter and considerably larger than our sun. This yellow star revolves around the blue supergiant once in 13 days. Its gravitational attraction upon the supergiant is tremendous."

The pinwheel would be a gorgeous affair, for, says Dr. Struve, "this spiral is hot—almost as hot as the blue supergiant; and the gases shine in all the colors characteristic of electric discharges in gases—luminous hydrogen with its red tinge, helium with yellow and green, neon with its red; the matter spirals out with a speed close to 100 miles per second."

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