

DISTANCE BEYOND COMPREHENSION

By Garrett P. Serviss.

ASTRONOMERS do not like to deal with miles any more than millionaires like to count their wealth in cents. The unit of measurement must bear some convenient proportion to the magnitude of the thing measured. So the astronomer, when talking of writing the distances of the stars, employs a standard of suitable length, which he calls a "parsec." Formerly he used a "light-year."

A parsec is 206,265 times the mean distance of the earth from the sun, and turned into miles it amounts in round numbers, to 19,000,000,000,000. It takes light, which travels 186,300 miles per second, about three and one quarter years to cover a parsec. In other words, a parsec is equal to about three and one quarter light years, and a star situated at that distance would require three and one quarter years to flash a signal to use.

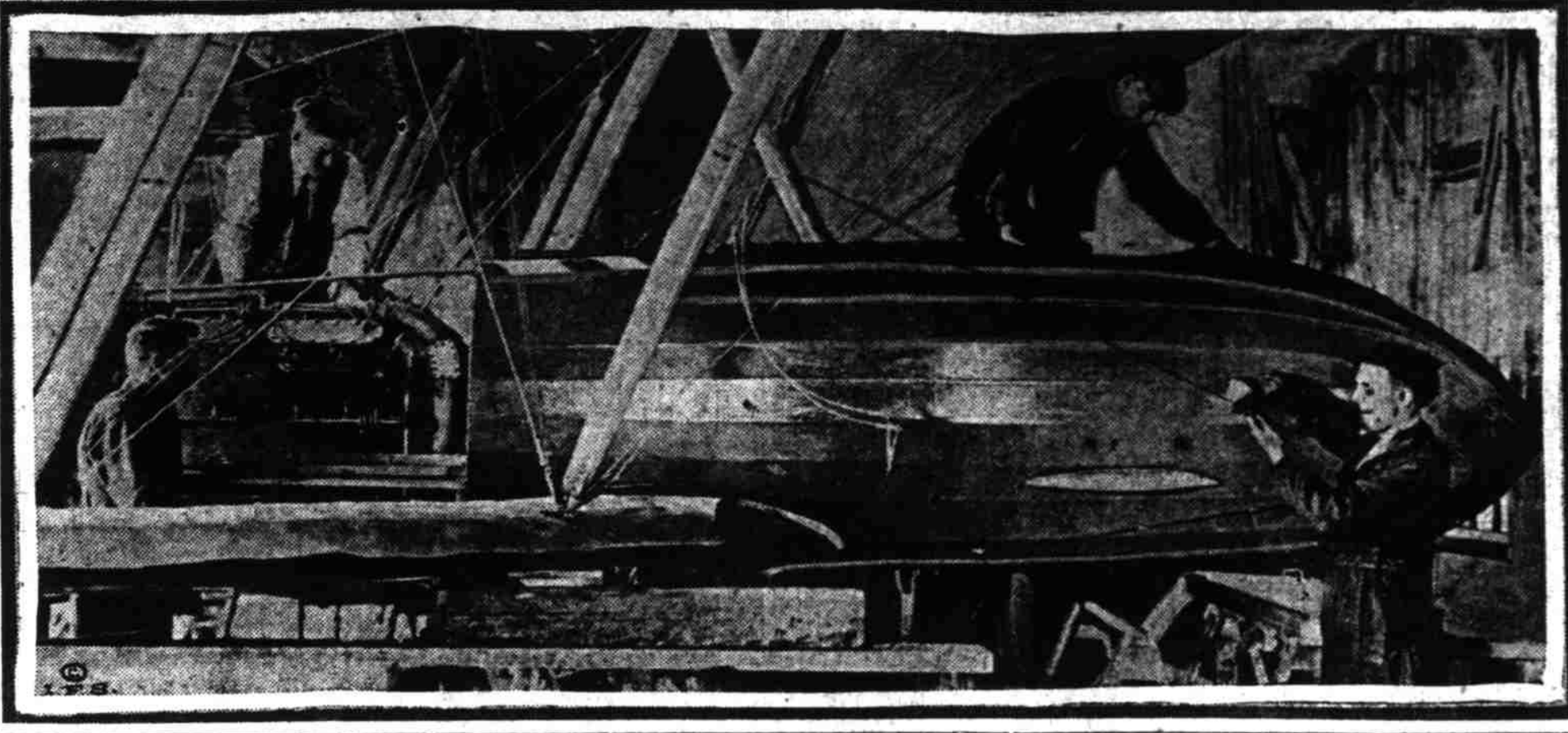
But there is no known star so near as a single parsec. The nearest star is Alpha Centauri, a double sun, each of whose components is about equal to our sun. The distance of the great double sun Alpha Centauri is about one and a third parsecs. The distance of the still greater star Sirius is about two and a half parsecs. But these are smaller neighbors when compared with millions of stars in the Milky Way, which are probably a thousand or more parsecs away.

We can make a still greater jump into space with some fair degree of probability that we have not overestimated the distance. For instance, the reason for believing that the globular cluster of stars in the constellation Hercules, which glows in a large telescope like a ball of frosted silver in a starry heaven, is a distance from the earth of as much as 10,000 parsecs; or, to put it into miles just to tickle the imagination, 190 quadrillions of miles. It would take 6,000,000 years to count 190 quadrillions. If you counted one every second and never stopped to eat and sleep!

On the lines of light you could ride to the Hercules sun-cluster in about 30,000 years, but if you went on a swift cannot ball, it would take 11,000 years, while a rocket, with its ultra express train would be 330,000,000 years making that trip! It would take a string of 23,750 billion earths to reach from here to the great sun-cluster.

Counts of stars in a photograph of the Hercules cluster made recently with the 60-inch reflecting telescope at Mount Wilson, show a distance estimate that that "ball of suns" contains

HEREWITH IS A VIEW OF THE LATEST THING IN HYDROPLANES, which the Burgess-Curtiss Co. of Marblehead, Mass., launched January 4 for John Hayes Hammond Jr., to be known as the Hammond wireless sea plane. She will be equipped with a wireless and will be given a series of tests by the United States government.



UPON NILES' return from Mexico, the writer was approached by the Carranzista agent in New York and tendered the position of chief of the Mexican aviation corps, but being already under contract the offer was declined.

THE STORY LADY The Race With the Wolves

By Georgene Faulkner.

ON a bitter cold night in winter a Russian baron started in a sleigh to go on a journey from the little frontier town of Robrin to his home in Petrograd. The baron had with him his wife and his child and his faithful servant, Eric.

The baron's wife covered her head and hid in the bottom of the sleigh. For a moment the blaze of the pistol as it flamed into their eyes startled the savage beast and two more of their number dropped dead.

Each armed himself with a pistol or long gun. They all dashed back into the woods on horseback. But they could find no trace of the faithful servant.

Finally they found Eric's pistol, empty, in the center of a trampled circle of snow. Then they knew that the faithful servant had given his life for his master.

COAL TAR! What does that word suggest to you? The chances are that the first thing you picture to yourself is the smoky, smelly tank of melted tar used in street repairing.

The destructive distillation of coal, as the process is called, was originally carried out for the single purpose of manufacturing illuminating gas.

As they drew near the baron and his men saw that nothing more could be done to stop the wolves, for they could not spare another horse. The two tired beasts could not outrun the snarling pack.

Then Eric said, quietly, "I will get down, baron, and will soon be safe. I can fire at them for a while and hold them at bay until you and your wife and child get safely into town."

The wolves were coming closer and closer. They surrounded the sleigh and one of the number was about to spring upon the horses' legs when Eric cried, "Now, God be with you all! Bang! here the sleigh!" and the baron, who had the pistol as the baron fired, and the faithful servant sprang

STAR'S MESSAGE FOR FEBRUARY

By Frank Theodore Allen

JANUARY ends and February opens under planetary conditions that very strongly suggest chaotic conditions on a general state of confusion, change and uncertainty affecting the people and the government.

The solar eclipse on January 23 will not only generate cosmic vibrations, whose effects will be especially pronounced during the succeeding four weeks, but will be productive of long lasting influences which will crop up belatedly throughout the remainder of the year.

In the extreme east of this country a cold spell or blustery storm of unusual severity will follow this eclipse, while in the Mississippi valley some very unusual weather conditions will be experienced, as well as a record breaking number of mishaps affecting mines, factories and buildings.

Unusually strong seismic vibrations will be recorded as one result of this eclipse, also wind storms of unusual vigor. The same stellar influences which produce atmospheric disturbances also cause brain storms in mortals, and one of the certain results of this eclipse will be manifested in the mental activity of the appointed preachers, teachers and prophets, who will undertake to instruct the people in the ways of religious, moral and political reformation.

In and near the Rocky mountain region a cold spell of unusual severity will follow in the wake of this eclipse. The working classes in this region will be disappointed and manifest a somewhat surly and threatened attitude for a month at least following the eclipse conditions will be extremely adverse for building and mining operations, and the sensational fall or destruction of large buildings will likely be reported from one or more places in that section of the country.

At San Francisco a generally along and near the Pacific coast the most severe of the disturbing vibrations of this eclipse will adversely affect high society and places of amusement and public entertainment. The lawmaking bodies of this region will also become involved in confusion and misunderstandings connected with legislation of a more or less socialistic nature, which will arouse great hostility on the part of the constructionists, standpatners and reactionaries.

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War's Effect On Elements

DOES the war make it rain? "Rain-makers" from time to time have experimented with doubtful success. Firing explosives into the air to "shake" the rain down. After all, were they on an entirely wrong track?

A French engineer, writing for the first time in a scientific manner, has produced the rain, but it can be proved that it very probably adds to the quantity and provokes it. Says he: "First, is it possible to collect above the battlefield or elsewhere an abnormal amount of clouds?"

"Second, once clouds are collected, will the firing cause rain to fall?" "The reply to the first question does not seem to me to be doubtful. Heavy gunfire acts upon the air by heating it and shaking it. The detonation temperature of explosives used for firing shells and the heat of the exploding shell itself is 1800 degrees Centigrade and above.

Those who have seen the battlefields of the Somme, Les Eparges and Verdun know that all vegetation disappears around spots where cannon have been firing for a month or more. It is beyond dispute that the explosions draw a certain amount of humidity from the ground, and the increased temperature of the air in the regions about lakes and rivers tend to hasten vaporization. Also the explosions, by setting up vast vibrations in the air, further add to the temperature by means of molecular friction.

"Therefore, cannonading has two effects on the elements: It increases vaporization on the ground and heats the air, and shaking it. The detonation temperature of explosives used for firing shells and the heat of the exploding shell itself is 1800 degrees Centigrade and above.

"TIZ" FOR SORE, TIRED FEET—AH! "Tiz" is grand for aching, swollen, tender, calloused feet or corns.

Advertisement for Tiz foot powder, featuring an illustration of a woman's feet and text describing its benefits for various foot ailments.

Coal Tar Products

By John F. Queeny.

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On one side of a new electric porch light are grooves into which figures are slotted. This makes it light a number either by day or night.

Encouraged by Worden's success, in 1912 the Mexican government sent three army officers to the aviation field at Mineola, L. I., to learn to fly. When Niles went to Mexico he met Salinas, and Ignacio Ruiz, who were developed into brilliant aviators. The Salinas boys, nephews of General Carranza, at present hold responsible positions under the Carranzista government.

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