ASTRONOMY

Holiday Comet

Look For It in West Just After Sunset Early in Month; Two Brilliant Planets Also Brighten Evening Skies

By JAMES STOKLEY

TO THE usual brilliant display that the stars provide in the evening skies of January, we have this month added attractions in the form of two bright planets and, early in the month, a comet.

Cunningham's comet, discovered in September, and which became easily visible to the naked eye about Christmas, is still with us. In the first week of January it is moving through the constellation of Aquila, the eagle. This group does not show on our maps, since it sets before the time for which they are prepared. However, it is easily found.

Around 6:30 or 7:00 p.m., look directly west, and you will see a bright star with a fainter one nearby on either side. The bright one is Altair, and all three are in Aquila. The comet is rapidly moving through this group. Night after night it gets brighter.

At the same time it is nearing the sun, setting sooner and sooner after the sun. By mid-January, when most brilliant, it will be lost in the sun's glare, to reappear a few weeks later in the morning sky to people in the southern hemisphere. Also, the moon, at first quarter on January 5, is getting brighter and brighter, and it will help drown out the comet by its light.

The planet Jupiter, brightest object save the moon to be seen in the evening sky just now, is high in the southwest, in Aries, the ram. Saturn, fainter, is alongside it, to the left. The moon, in a gibbous phase, passes just south of the pair on the seventh.

Stars of the evening sky are shown on the accompanying maps, as they appear at 10:00 p.m., Jan. 1, 9:00 p.m., Jan. 15, and 8:00 p.m., Jan. 31. If you look first for the three stars that form Orion's belt, with Betelgeuse above and Rigel below, both in the same group, you can quickly find the other bright orbs in this part of the heavens.

Below Orion, and a little to the left, is Sirius, the dog star, in Canis Maior, the big dog. Above this is Procyon, in Canis Minor, the lesser dog, and still higher is Pollux, in Gemini, the twins. Above Orion and to the right is Aldebaran, in Taurus, the bull. Almost directly overhead is Capella, in Auriga, the charioteer. Two other first magnitude stars are Deneb, in Cygnus, the swan, low in the northwest, and Regulus, in Leo, the lion, to the east.

About 5:00 a.m., Mars, still far away and faint, rises to the southeast, and Venus, more brilliant even than Jupiter, follows about an hour later.

When you look over to the southeast these evenings, and see the brilliant Sirius, you are looking at a star that has attracted attention of men for ages. To the Egyptians it was an object of worship, called Sothis and other names.

Since it is the brightest star seen in the night-time sky, either from the northern or southern hemisphere, its fame is not surprising. However, it really is not so bright, nor as big, as it may seem. Astronomers' calculations indicate that its diameter is 1,560,000 miles, about 80% bigger than that of the sun.

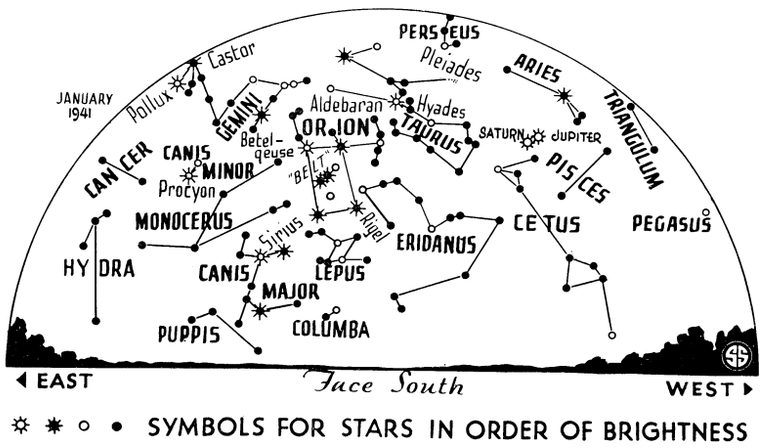
Its actual brightness, or candlepower, is about 30 times that of the sun. This may seem very brilliant, but the star Rigel, in Orion, is about 21,000 times the sun's luminosity. Rigel is 63 times as far as Sirius, and so it looks fainter.

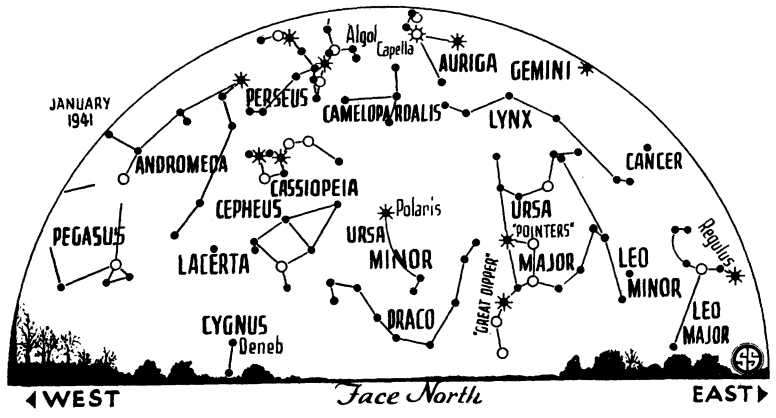
One of the most interesting things about Sirius is its curious companion. Visible only through big telescopes, this star is caller Sirius B. With Sirius A, brighter member of the pair, it performs a kind of "ring around the rosy" dance. Every 50 years the two stars make a complete circuit around a point between them.

Strangest thing about Sirius B is that it contains half as much stuff as Sirius A, and about as much as the sun, concentrated into a sphere only a thirtieth the diameter of the sun, about as big as the planet Uranus. To crowd so much matter into so small a space means that it must be extremely condensed. It proves to be about 27,000 times as dense as the sun, or about 40,000 times as dense as water. That is, a pint of this star's material would weigh 20 tons! Yet this stuff is a gas, which sounds even more incredible.

The explanation given for this remarkable stuff was clearly elucidated a number of years ago by Sir Arthur Eddington, famous British astronomer who is perhaps the leading authority on the interior of the stars. On a trip to America, he said that he found his hats, shoes, and other impedimenta in the luggage took up a lot of room. If he could have chopped them up into small bits, a much smaller suitcase would have carried them all. In a similar way, he suggested, the atoms of which all matter is made take up a lot of room, but in them is a lot of empty space. In a star such as Sirius B, the enormous temperatures of a stellar interior "ionizes" these atoms—that is, they are broken into bits, and so can be compressed into a far smaller space. More recent studies seem fully to confirm Sir Arthur's suggestion.

Because they are so small, yet white in color, stars of this kind are known as white dwarfs, and during the past year many new ones have been found. Some are as much as a thousand times as dense as Sirius B, in strange contrast to a star such as Betelgeuse, in Orion. If





we had a piece of this star on earth, we should call it a pretty good vacuum.

Celestial Time Table for January

Friday, Jan. 3, 1:00 p.m., Earth nearest sun — distance, 91,300,000 miles. **Sunday, Jan. 5,** 8:40 a.m., Moon in first quarter; 12:00 p.m., Moon farthest, distance 251,260 miles. **Tuesday, Jan. 7,** 2:11 a.m., Moon passes Jupiter; 7:17 a.m., Moon passes Saturn. **Friday, Jan. 10,** 5:00 a.m., Saturn changes from westward to eastward movement through sky. **Monday, Jan. 13,** 6:04 a.m., Full moon. **Thursday, Jan. 16,** 1:04 a.m., Cunningham's comet nearest sun. **Sunday, Jan. 19,** 3:00 a.m., Moon nearest, distance 229,970 miles. **Monday, Jan. 20,** 5:01 a.m., Moon at last quarter. **Thursday, Jan. 23,** 4:48 a.m., Moon passes Mars. **Saturday, Jan. 25,** 3:10 p.m., Moon passes Venus. **Monday, Jan. 27,** 6:03 a.m., New moon.

PHYSIOLOGY

1840 Americans Could Drink Quart of Whisky a Day

Harm From Alcohol Comes From Increasing Calories In Proportion to Vitamin B_1 Intake; Diet Worse Now

THE AMERICAN of 1840 could drink nearly a quart of whiskey (29 ounces) every day and still keep his health and live to a good old age, but the average American of today cannot, Dr. Norman Jolliffe, of New York University, told the American Association for the Advancement of Science.

The immunity of our great grandfathers to the diseases of alcohol was due to their superior intake of vitamin B, Dr. Jolliffe explained. The vitamin deficiency that scientific study has recently demonstrated to be the real basis of the so-called alcoholic diseases, is due not so much to an absolute lack of vitamin B_1 as it is to a vitamin intake which is too low in proportion to the calories. Increasing the calories consumed by experimental animals that are getting too little vitamin B_1, only increases their liability to deficiency disease. Those that eat too few calories are safest.

The average American of drinking age today consumes more than 200 calories every day just from his alcohol in addition to the non-alcoholic calories in his drink and the calories in his food. This extra 200 calories cuts the important ratio between vitamin B_1 and calories from the alcohol-free 3.32 to 3.13. This means an 18.2 per cent reduction in the already slim margin of safety for this vitamin.

The average American of 1840 had a ratio of 7.2 and a margin of safety of 230 per cent.

It is a mistake, Dr. Jolliffe emphasized, to assume from the recent demonstration of the part of vitamin B deficiency in alcoholic diseases that alcohol itself is harmless—a mistake made by those opposed to drinking as well as those who like it. Although these diseases do unquestionably develop as a direct result of nutritional deficiency, he said, it is the consumption of too much alcohol and too little food that is responsible for the nutritional lack.

The alcohol acts in still another way to cut down the individual's ration of vitamin B_1—by irritating the intestinal tract so that food is lost or avoided.

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internal forces is likely to reach the utmost limit . . . Again observe that security is a primary objective. In a world where predatory nations, powerfully armed, are ready to attack, the ideal of security is not adequately respected. Internal forces are not trained for action. Protective instruments of warfare are lacking. At a time of crisis industry is obliged to begin to construct buildings and design tools and machines to manufacture the instruments which the crisis demands. Compare this unpreparedness with the preparedness of our bodies which through many generations of little use still retain the elaborate reactions of defense."

The physiological balance of the body would further suggest that stability is more important than economy. Excess of water or salt or sugar is thrown away when derangement of a steady state is approached. In personal and governmental practices, also, the principle of preferring security to economy has to some degree been recognized, in fields all the way from peaceful fire insurance and police departments to warlike armies and navies. These are not economical, in the narrow sense, but they are considered worthwhile because they contribute to the safety of the body politic.

The principal of the protection of the most vital organs, even at the expense of others, is observed to some extent in the body politic when national emergencies arise: we keep key men at home and exempt skilled workers and technicians from military duty, and even at the front we shelter the General Staff and the Service of Supply as much as possible.

However, lest this point be stretched in an attempt to justify dictatorships, Dr. Cannon cautioned his hearers against jumping to the conclusion that the brain is the all-dominant, and therefore the all-precious organ of the body. True, the brain can, by implementing an act of will, destroy the body by suicide and the other parts cannot save themselves. But in normal functioning, the whole body cooperates in self-direction, through the hormones or gland secretions that act with, and react upon, the brain and nervous system.

Likewise, in a democratic society, "the diffused functional groups have possibilities of continuing the life of the social organization and of controlling their own circumstances," Dr. Cannon said in conclusion. "When an arbitrary dictator seizes power these possibilities vanish . . . Experience has shown that the social body, like the human body, is integrated