The Approach of Halley's Comet

Historic Celestial Marvel, With a Head as Large as the Moon, Recently Sighted at Heidelberg, Germany, Will Soon Be Visible to the Naked Eye the World Over.

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AFTER an absence of seventy-five years that monster of the sky, Halley's comet, is close to its return. Already it is sighted and photographed after being waited for for years and looked for for months. On Sept. 11 Professor Wolf of Heidelberg observatory, Germany, got his great telescope on the wandering son of the solar family and wired all the principal observatories to prepare to welcome the prodigal home.

They are few who have access to the great telescopes, but those who do may now sight this celestial marvel in advance of the rest of mankind, who will have to wait till December to gaze upon the wondrous spectacle. Even without a telescope it is of interest to know just where the comet now is. Most people who understand anything about the heavens are familiar with the curiously shade and brilliantly studded winter constellation known as Orion. This now rises soon after midnight and by 2 o'clock in the morning is well above those mists that hang about the horizon. The bright whitish star at the west of the rectangular figure is Rigel. The bright reddish one at the east is Betelgeux. Looking off to the east of Betelgeux another bright star is seen. This is Procyon, in the constellation Canis Minor. A brighter star than either is seen southward — that is, Sirius — brightest of all the fixed stars. Draw imaginary lines connecting Betelgeux, Procyon and Sirius and you have a great equilateral triangle. One-third the distance along the line from Betelgeux to Procyon stands the comet. It will not remain there, for it is moving with ever increasing speed as it nears the sun, but there is where it is now.

Traveled Many Millions of Miles.

Now the question is raised, Where has this comet been for seventy-five years, and where does it come from now? We answer that it has been away beyond the orbit of Neptune, the most distant world of our solar family of which we have any knowledge. We are staggered by the earth's distance of 93,000,000 miles from the sun, but Halley's comet has been thirty-five times as far as that and from that distance is returning to a point only 65,000,000 miles from the sun, nearer than the planet Venus. At its greatest distance, known as "aphelion," the sun would appear only as a bright star and the cold would be so intense that possibly air itself would freeze into liquid form. At its nearest approach to the sun that luminary would appear immensely greater than seen from the earth, and the heat would dry up all water courses and destroy all life, both vegetable and animal.

Now, although the comet can be actually seen over only a very small part of its course of thousands of millions of miles, such is the nature of its curve that the wonderful science of mathematics enables us to track it perfectly. Let us therefore follow it in imagination, just as we do a railway train by studying the time table. About last January the comet crossed the orbit of Jupiter and was 450,000,000 miles from us. Next February it will cross the orbit of Mars and will have taken 400,000,000 miles from its distance. About the last of March it is expected to cross the orbit of the earth. About ten days later it will cross the orbit of Venus. It will then swing about the sun, reaching its perihelion, or point of nearest approach to the sun, May 10, according to one calculation, though according to another it may be there some time in April. It then begins to push back into space again, and in so doing it again crosses the orbits of the planets about as follows: Venus, May 28; earth, June 19; Mars, July 28; Jupiter, nearly a year later.

If the comet twice crosses the orbit of the earth it becomes a question of the utmost interest whether our globe is liable to be run into. It is reassuring to be told that the earth will be at the two crossing points about Nov. 1 and May 1. It will thus be seen that we make a good escape, though a little narrow in the latter case, inasmuch as there is a margin of only about a month and a half at that point. But even if the earth were at the crossing points at the same time with the comet nothing could happen for the reason that the two bodies do not travel in the same plane or on the same level. At the first crossing the comet goes over and at the second it goes under the earth, so that there is no danger of collision at either point any more than there is of collision between a surface car and an elevated train on the one hand or between a surface car and a subway train on the other. It has been calculated that the nearest possible approach of the comet to the earth would be 6,000,000 miles, but we shall be millions of miles farther separated than that even when nearest.

Source of Comets Unknown.

It used to be believed that comets were entirely irresponsible bodies, not under the control of the same forces that control the planets. It was not perceived that the law of gravitation has them in its grip, as well as earth, Jupiter and Saturn, and that they follow definite and well known curves. A comet originally comes from we know not where. Something has shot it through infinite space, and it happens to pass within the range of our sun's gravitating power. At once it is attracted toward the sun and compelled to sweep down out of space and around the sun before it is released. Indeed, whether it shall be released is altogether a question. If the curve on which the comet approaches is what is known as a parabola or a hyperbola it stands wide open at the farther end, and the comet, having paid us a single visit, sweeps back into space and never again appears in our sky. But if it be an ellipse it is closed at both ends, and, after a certain period of absence, back it comes as certainly as tomorrow's sunrise.

The truth is that all the planets, including the earth, are traveling about the sun, not on circles, but on ellipses, but their paths are only slightly eccentric, while that of the periodical comet is extremely so. A boy's round hoop when pressed out of shape becomes an ellipse, and the harder the pressure the more elliptical it becomes. Such is the path of the periodical comet. When the comet is as near the sun as the earth is, if its speed be more than twenty-six miles a second it will describe a parabola or a hyperbola and will never come back. If it be less than the same it will describe an ellipse and will return at regular intervals.

How Comets Are Captured.

The periodical comets are believed to have been captured by some of the planets. A comet comes journeying through space under the influence of the sun, intending to pay us but a single visit. It passes so near great Jupiter, for example, that its speed is slowed down below the critical point. It is thereby compelled to change its orbit to an ellipse and stays with us for the rest of its life. Neptune is credited with capturing six comets, including Halley's; Uranus three, Saturn two, Jupiter about thirty. One reason for believing that there is yet another undiscovered planet beyond Neptune is that a certain comet shows a curve which reaches out to a distant point where a planet ought to be in order to account for its introduction into our system.

Naming of the Comet.

It has been ascertained that the period of Halley's comet is in general about seventy-five years, though it is sometimes a little less and sometimes several years more, the differences being due to the influence of the planets which it passes in going and coming. This is therefore a historic comet and by no means an upstart, for it has recently been traced back to more than 200 years before Christ.

Considering how young the science of astronomy is, think of being able to identify appearances of this same comet in all the following years: B. C. 240, A. D. 451, 760, 1066, 1145, 1222, 1301, 1378, 1456, 1531, 1607, 1682, 1759, 1835, 1910. In 1066 William the Conqueror was terrifying England, and the comet was looked upon as an omen of terrible disaster. In 1456 all Europe was moved to terror by this enormous sword of light held aloft nightly in the sky, and the pope directed that to the Ave Maria should be added the prayer, "Lord, save us from the Turk, the comet and the devil." It was at this time that the noonday call to prayer by the ringing of church bells was introduced, which has never been abandoned. In 1759 the comet first came back according to prediction of the great Sir Edmund Halley, the friend of Newton, and it henceforth took upon itself his name.

There always has been and still is much of mystery as to the nature of comets. Where they came from no one knows, but they are in the universe journeying through space. When first sighted a comet looks only like a faint nebula changing its position among the fixed stars. As it draws nearer the sun it becomes brighter and begins to shoot out a tail. Yet nearer, the head can be recognized as quite distant from the tail and a bright core at the center of the head called the nucleus. Great comets like Halley's are described as presenting a head as large as the moon, shining with the brightness of Venus and stretching out the tail over one-third of the sky. Halley's comet has shown a tail forty-five degrees long, which is equal to a procession of ninety full moons. As it does not always appear the same, it is likely on the present occasion to have a length either greater or less.

Peril In Its Head.

The head of a comet is the dangerous part, consisting probably of a mass of particles like stones, held together by their mutual gravitation. The increasing heat of the sun as it approaches that body develops vapors, which envelop the nucleus and are driven back into space in the form of the tail. It is noteworthy that the tail always streams away from the sun, going before the head when the sun retires into space. This, so long a mystery, is now believed to be due to the pressure of light from the sun, so great a force that not less than 70,000 tons of it ever rest upon the earth's surface. The tail is extremely thin, so that the faintest stars can be seen through a million miles of its thickness. The earth has once or twice passed through a comet's tail and suffered no harm. If, however, there should occur a head-on collision with the nucleus it would not only be the end of the comet, but might seriously damage if not ruin the earth. If nothing more, it would be likely to introduce noxious gases into our atmosphere, which would as swiftly produce death as the descending fumes of Mont Pelee. We have already shown that no collision is possible with Halley's comet, nor as long as we believe that human history is yet to be consummated and that a divine plan lies back of the universe can we indulge in now antiquated fears. Nothing is less probable, even astronomically, than a cometary collision. However, there is some ground for believing that in that strange curiosity of the plains, Coon Butte, Ariz., we have the evidence that just once a comet struck the earth, but if so, whether before or after the advent of man, we have no means of knowing.

Halley's comet will not be an apparition of a moment, like a meteor, nor of a week or two, like the moon. On its last appearance it was visible the larger part of a year, and certainly for months we shall have our sky, partly at night and partly in the morning, transformed by the presence of this not unwelcome stranger. It will be seen the world over. Peary at the north pole and Shackleton at the south pole would each be cheered by its radiance, and seventy-five years hence a very few very old men will tremblingly point to the heavens and say that in their youth they saw yonder spectacle once before.
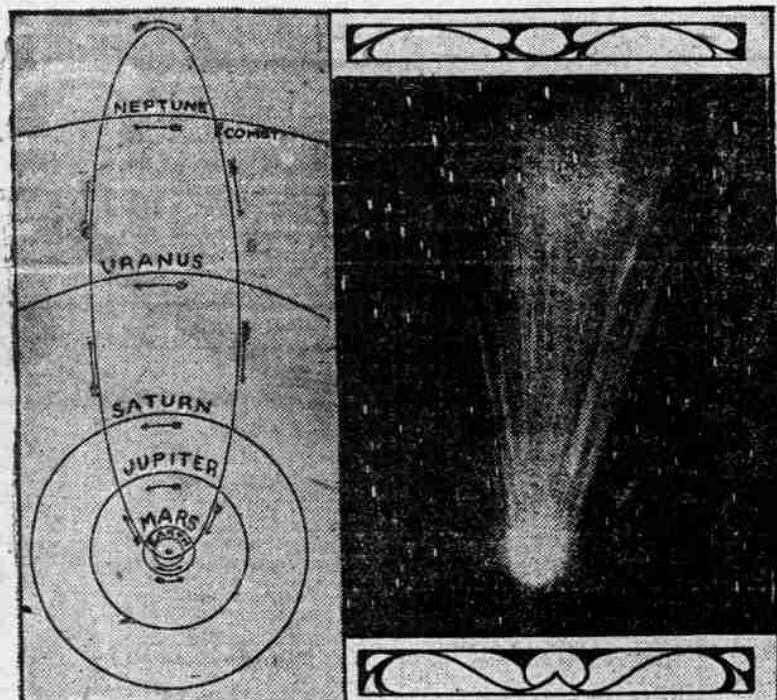
COOK'S POLAR BEAR FIGHT.

North Pole Finder's Adventure in the Arctic Regions.

On one occasion when he was proceeding south after the discovery of the north pole Dr. Frederick A. Cook had an exciting adventure with a polar bear. He had drawn the canvas boat upon the ice, and the Eskimos had gone in search of game, leaving the doctor alone and without weapons or ammunition. The only food he had left was the shoulder of a seal which he was keeping for an emergency. Dr. Cook, who was asleep in the boat, was suddenly awakened and saw a few yards away a bear sniffing about. Finally it pushed its nose in inquisitive fashion into the boat where Dr. Cook was lying. The explorer was scared, but he seized a runner of a sled and hit the bear. This frightened the animal, but it returned and was about to attack when Dr. Cook shouted loudly and advanced upon it, flourishing the sled runner as he went. This demonstration so impressed the animal that it turned tail and fled. Later it was killed by the Eskimos. After this Dr. Cook never remained alone.

Canary Colored Railroad Cars.

Canary yellow has been adopted as the standard color for the coaches, refrigerator cars and all other box cars used in the passenger service on the Panama railroad. Tests to ascertain the color best suited to withstand the local climatic conditions, which are unusually hard on exterior paints, were made with the result that yellow was demonstrated a superior lasting quality over the other colors tried.

ORBIT OF HALLEY'S COMET.