

DANIEL'S COMET.

Comets are not exceedingly rare visitors, but it is seldom that they are prominent enough to be visible to the naked eye. Not in twenty-five years have we had the opportunity to observe as large a comet as has been conspicuous in the eastern skies each morning for the past two months. It is owing to the fact that the object could be seen only in the early hours before sunrise that it has awakened so little public attention. Since our issue of August 31, in which appeared a description of Daniel's comet, it has arrived at perihelion (its closest approach to the sun) on schedule time, the 4th of September, and is now speeding away at a pace that will soon carry it beyond the reach of the naked eye. As its course is a parabola, we will probably never see it again.

One would suppose that after rounding the sun the comet would pass from the east side to the west of the sun, and be visible in the evening skies. However, this is not the case, because the earth has followed the comet far enough around to see it strike away still on the right hand or eastward side of the sun. At present writing the comet is visible to the naked

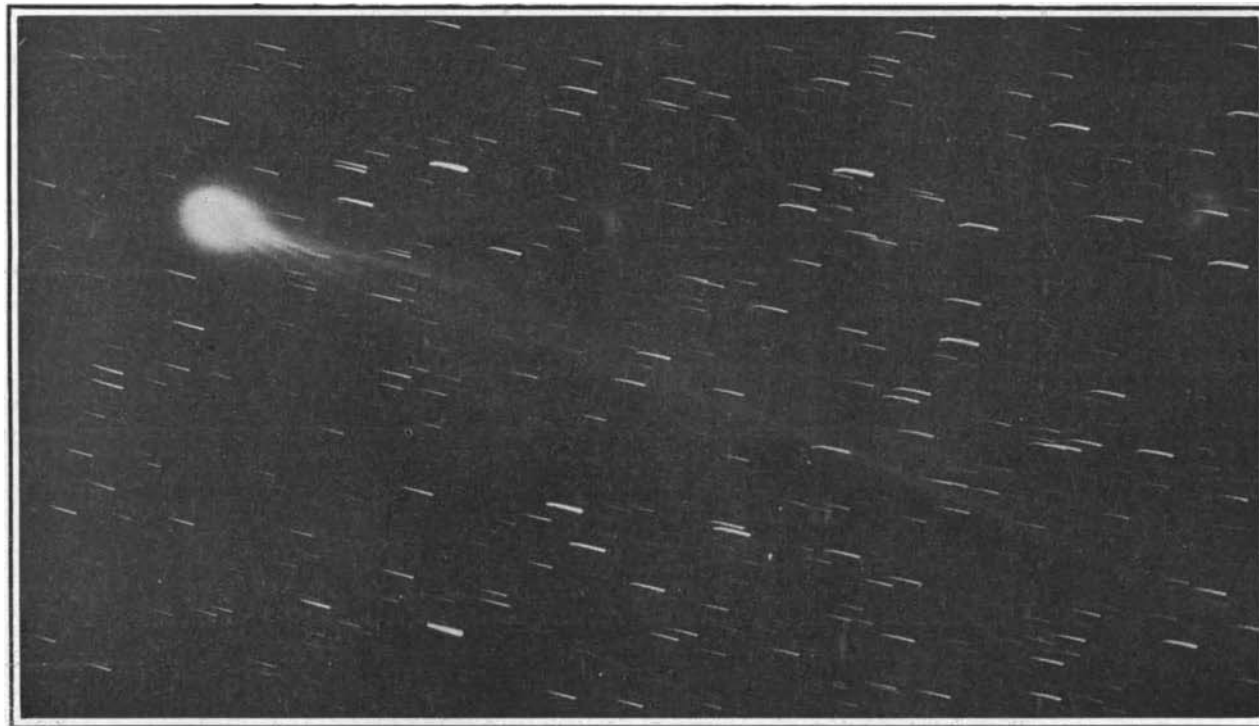
eye, although it is so nearly in line with the sun as not to be very conspicuous. It rises at about 4 o'clock in the morning, but before it ascends above the dense and murky atmosphere of the horizon sufficiently to be clearly observed, it is overtaken by the first rays of dawn, and the faint nebulous tail can scarcely be distinguished against the bright background of the sky. However, the head or nucleus of the comet is clearly visible, and appears like a second-magnitude star, or as bright as the stars which make up the Great Dipper. Shorn of its tail the object bears little resemblance to the popular notion of a comet, and it is difficult for a layman to identify it unless he knows just where it is to be found.

The comet when first sighted by Daniel at the Princeton Observatory, on June 9, was of the ninth magnitude. By the 7th of July it had grown to the sixth magnitude, so that a practised eye could just make it out without the aid of the telescope. Its nearest approach to the earth occurred on the 1st of August, when it passed within 70 million miles of us. It was then 85 million miles from the sun. At perihelion, on September 4, it was 48 million miles from the sun, and 80 million miles from us. When at its most favorable position for observation, it grew nearly as bright as a first-magnitude star, and had a tail which appeared as long as the handle of the Great Dipper. In some photographs it

can be traced to a much greater length. The head, including the nebulous aureole, was of about one-third the apparent diameter of the moon. The real diameter of the head was about 236,000 miles, or almost thirty times the diameter of the earth. The tail appeared to have a length of 20 million miles, but as it was not perpendicular but oblique to the line of sight, its length was evidently much greater than this.

At a number of the principal observatories photographs of the object were taken nightly whenever the

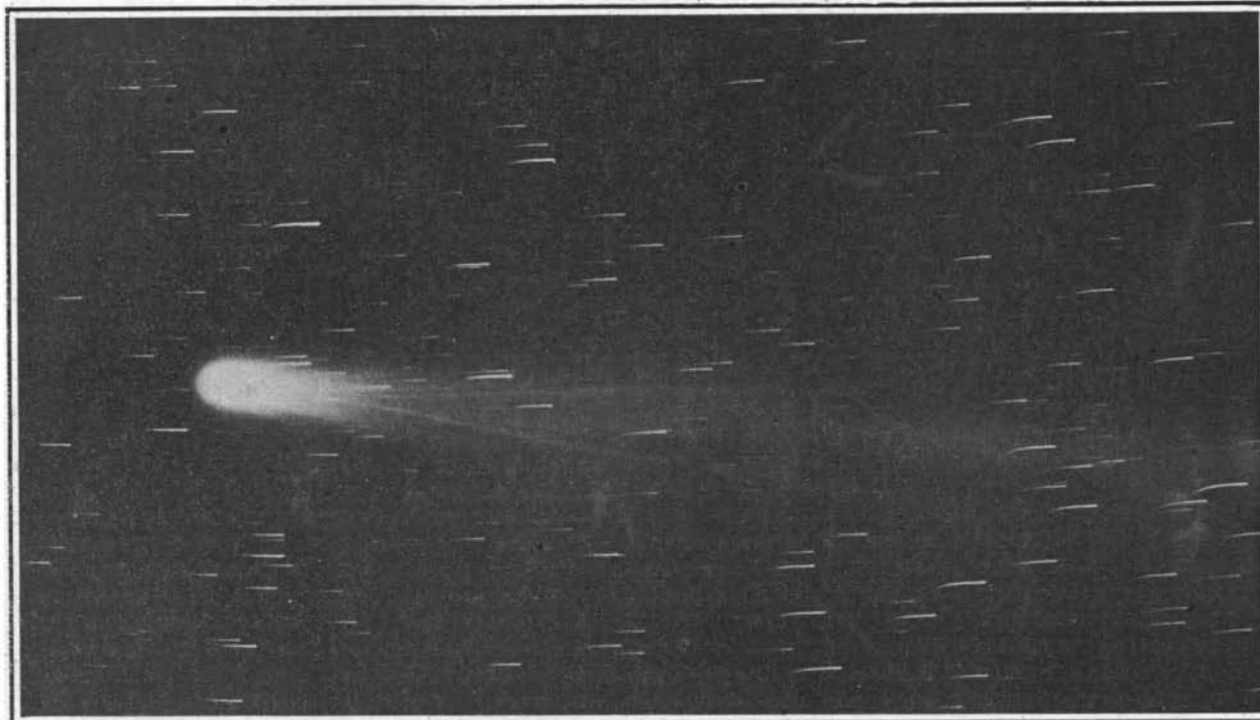
weather was favorable, and as long as the position of the comet with respect to the sun permitted. These photographs, put together, form a pictorial diary of the comet. Camille Flammarion, comparing the photographs taken at the Juvisy Observatory, has noted that the luminous streamers of the tail varied their position on successive nights, which leads him to believe that the tail was rotating on its axis. This, however, is doubted by other observers. The photographs shown herewith were taken at the Yerkes Observatory at Chicago, and show two characteristic phases of



PHOTOGRAPH OF DANIEL'S COMET TAKEN AT YERKES OBSERVATORY. NOTE THE GREAT LENGTH OF THE TAIL STREAMERS.

the comet's tail. As the photographs were made with the telescope trained upon the comet, the stars appear as lines of length proportional to the duration of the exposure, that is, they show the relative eastward motion of the comet. The eastward side of the photographs is shown at the left instead of the right, because to see the comet in the position illustrated, the observer would have had to face toward the south.

As is usual when a conspicuous comet makes its appearance, the daily press has published sensational and alarming predictions of the possible consequences of a collision between this earth and the comet. Some one has stated, and very truly, that the chances of our earth ever being hit by a comet are about the same as the chances of one's killing a



ANOTHER VIEW OF DANIEL'S COMET. THE STAR STREAKS OF THE BACKGROUND SHOW THE MOTION OF THE COMET WITH RESPECT TO THE STARS DURING TIME OF EXPOSURE.

bird on the wing by firing a gun blindfolded at the open sky.

The nucleus of a comet is probably made up of a swarm of meteorites, and the tail is made up of a very fine dust, and not a gas as is commonly supposed, which is driven off from the nucleus by the repulsive action of the sun's rays. As comets' tails often stretch out for many millions of miles, the chances of our passing through one of them are far greater. But should we ever encounter a comet's tail, it is doubtful if any laymen would be the wiser, and the fact could

be determined only by mathematical calculations. The earth would not be enveloped in noxious gases, or in white-hot matter, because the indications are that comets' tails are comparatively cold, and shine with a certain glow due to the action of the sun's rays on the minute particles. The only visual evidence we could possibly have of passing through the tail of a comet might be a shower of shooting stars; and since the particles which make up the tail of a comet are exceedingly minute, they would be entirely consumed by friction with the earth's atmosphere long before they came within reach of the ground.

Cariboo District.

The central part of British Columbia, during the years 1860 to 1870, or thereabouts, produced some \$40,000,000 of gold from very rich shallow placers, mined by very primitive methods. The movement of prospectors to this region was known as the Cariboo "excitement" or "stampede," and probably, area for area, there was then a greater amount of gold collected from the above region than any other equal area ever discovered, not even excepting the rich creeks of the Dawson region in Yukon Territory. Williams Creek, in the Cariboo District,

is said to have produced upward of \$25,000,000 from a length of 2½ miles of its creek bed, according to government records. The attention of capitalists is again being largely directed to this district.

There is a false impression extant that mining can be carried on in this region for only a few months in the year. While the eastern part of British Columbia receives a large fall of snow varying from 30 to 40 feet per year, in the western part the snowfall amounts to only 4 or 5 feet. The climate of central British Columbia is very mild, due to the warm and persistent Chinook winds coming from the Japanese current.—Mines and Minerals.

In a recent six-hour test at the refuse-burning plant which generates light for the Williamsburg Bridge, New York, 40,497 pounds of refuse was burnt, or at the rate of 6,749 pounds per hour. The total bulk of the refuse burnt was 293 cubic yards, weighing 138 pounds per yard. It was burnt under two 200-horse-power Stirling water-tube boilers; the total grate area was 192½ square feet, and the consumption of refuse per hour on each unit of surface was 39.2 pounds. The heating surface of the two boilers was 3,780 square feet, and the steam pressure during the test was 143 pounds per square inch; 2.29 pounds of water were evaporated for each pound of refuse burnt from and at 212 deg., this result

being due in part to the economizers on the boilers. The consumption was 46 pounds per kilowatt hour, due to the fact that only part of the power produced was used to generate current, though the boilers were run at their full capacity.

During 1896 the United States imported 77,194 short tons of asphalt from Trinidad. This material is obtained from a pitch lake, and as it is removed the supply is replenished from subterranean sources.