

Halley's Comet, and What It Could Mean

ON May 18th, so astronomers tell us, the earth will pass through the tail of the much talked of Halley's Comet. Astronomical science has arrived at such a degree of perfection that the astronomer to-day through intricate calculation is enabled to ascertain the position of this particular member of this planetary world to a nicety.

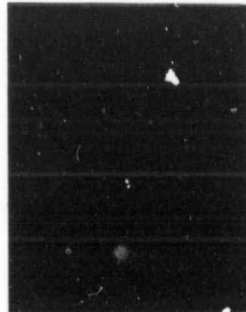
As to just what a comet is scientists are not agreed, but in so far as Halley's Comet is concerned they have come to the conclusion, backed up by its past history, that it appears every seventy-five years, as will be seen from the following table:

Year.	in years.	Year	Interval in years.
B.C. 118		A.D. 989.7	77.5
A.D. 66.0	77.8	1066.2	76.5
141.1	75.1	1145.3	79.1
218.2	77.1	1222.9	77.6
296.2	77.0	1301.8	78.9
373.8	78.6	1378.8	77.0
451.5	77.7	1456.4	77.6
530.8	79.2	1531.6	76.2
607.3	76.5	1607.8	76.2
684.8	77.5	1682.7	74.9
760.4	75.6	1759.2	76.5
837.2	76.8	1835.8	76.7
912.2	75.0	1910.3	74.5

In the April number of the Review of Reviews there appears a very interesting description of this comet and for want of better information we give it here.

Those who remember the great comet of 1882 will recall that many said that it was the cause of the war that England was then carrying on in Egypt; and our own great Civil War was ushered in by Donati's splendid comet of 1858, and by the comets of 1860 and 1861. Such coincidences can be numbered many fold; and it is but natural that there should have grown up in the popular mind down through the centuries the conviction that a comet brought in its train disasters of all kinds—war, murder and sudden death. Undoubtedly this old superstition has been the cause of our present interest in comets, and the year 1910, with its return of Halley's comet, is by some looked upon with fear and dread, for does not this comet of Halley's come so close to the earth that we are to sweep right through its tail? What will happen if the astronomers have made a slight mistake in their calculations and the comet should come into collision with the earth? With the earth traveling in space at the great speed of 18½ miles per second, and the comet in the opposite direction with a velocity even greater, such a head-on collision would be appalling; the earth might possibly be blown to pieces. Altogether we have records of about 1,000 comets, half of which were discovered before the invention of the tele-

scope three hundred years ago. At the present time five or six comets are discovered yearly; but most of these are faint and can be seen only with the aid of a telescope and are consequently known only to the astronomer. If each comet brought a war along with it, it would, indeed, require the continued sitting of The Hague Conference! The absurdity of this notion was recognized 150 years ago. One author of that period says: "If war is caused by the bile of a sovereign becoming heated by the approach of a comet, a court doctor should be employed, who should counteract the action of the comet by the application of sundry doses of rhubarb." There have, indeed, been remarkable comets seen in years when a great war was being waged, or a comet may have



Halley's Comet as seen in February 1910.

appeared a year or two previous. There have also been splendid comets in the sky when there was no attendant war, and likewise there have been great wars without their attendant comet. We do not recall any serious outbreak of hostilities following the train of Coggia's fine comet of the year 1874, and certainly no one can point to a remarkable comet of the time of the recent Russian-Japanese war; and that surely was a great war. It would, indeed, be remarkable if wars and comets did not at times appear together, but to imagine that a heavenly body of such weight as a comet could be able to disturb the affairs of men is perfectly absurd. This has even less foundation than the superstition that the moon has an influence on weather, for all the statistics of modern science show that the weather is absolutely independent of the moon.

At the last appearance of the comet in 1835-36, its position in the sky was measured by many astronomers. From its motions as exhibited in these measures it was

possible to calculate the comet's journey off to hundreds of million of miles from the sun. As the comet travelled through space it went close to some of the bodies of the solar system. These planets pull the comet exactly in the same way as does the sun, but with less force, since they weigh much less than the sun. The planets might accelerate or retard the motion of the comet depending on their relative positions. These "perturbations" of the comet's motion is necessary for the astronomer to calculate, and if the comet happened to pass close to a great planet the perturbations might be very great. By referring to the table, it will be seen that the time occupied by the comet in returning changes considerably, the difference between the least and greatest is as much as five years. At the 1835 appearance the calculations were very simple but for the 1910 appearance was exceedingly difficult, due to the close approach of Jupiter. In spite of these difficulties two Englishmen, Cowell and Crommelin, calculated the time of perihelion passage within three days of the actual time and this, too, when the comet took nearly seventy-five years to make its return. By pointing the telescopic camera to the position in the sky calculated by them, Wolf discovered the comet seven months before it would be close to the sun, when still at a distance of three hundred millions of miles from the earth. In these seven months the comet has been gradually brightening, but very slowly; but before many days from this writing it will be a wonderful spectacle in the skies.

What will happen when we pass through the tail on May 18? Will the cyanogen be enough to poison us? Or if we escape will vegetation be blighted or disease brought? We shall be directly in line at 9 p.m., Eastern standard time. The Japanese people will be directed towards the sun and comet and will form the central part of the bombardment of the particles of cyanogen gas. However, the modern theory of the tail of comets tells us that though their size is enormous their weight is excessively small, and as a result the number of particles per cubic mile in the comets tail is almost vanishingly small. The comet of 1882 was so situated that we could see through ten million miles of its tail, yet stars shone through it with undimmed lustre. Hence, though there may be cyanogen gas in the tail it is there in such small quan-

ties that could we have a cubic mile of the tail concentrated into a glass breaker in the laboratory, it would probably take the greatest refinement of chemical research to detect the cyanogen. In addition the earth is covered over with a shell of atmosphere thousands of times denser than the comet's tail, and the particles could not possibly penetrate to the earth's surface.

The tail of the comet always points away from the sun and is more or less curved, depending on the relative speed of the particles that are shot off to form the tail, and of the comet in its orbit. A splendid theory explaining the apparent negation of gravitation in comet's tails pointing away from the sun has lately been developed by the Swedish scientist Arrhenius. According to him the particles of the tail are exceedingly small, and they are driven from the sun by the pressure of sunlight. In addition a new tail is continually being formed, the old material is left behind in space and the comet is slowly wasting away. The rarity of the tail may be imagined when we realize that Halley's comet has lasted as we know for two thousand years and still it is not consumed.

Although the comet will pass directly across the face of the sun on May 18, it is questionable if even an astronomer will be able to see the transit, and although we shall be enveloped in the tail for some hours and shall be bombarded by cometary material, we probably shall be totally unaware of it, for the cometary particles are so small that probably not even a meteor shower will take place. Indeed, so little of an unusual nature will occur that nothing would be known of it were it not for the calculations of the astronomer. The earth has more than once passed through the tail of a comet; it happened last in 1861, but no one was sure that anything unusual was observed. However, May 18 will be a memorable day to the astronomer and all the refinements of modern science will be employed. Meanwhile the comet, as it gets closer and closer to the sun, is getting brighter and the tail is increasing in length. On February 3 Professor Barnard estimated the length of tail at 5,000,000 miles, while on February 27 this had increased to 14,000,000 and this almost two months before the comet is closest to the sun and most active. The modern camera with the sensitive plate, in the skillful hands of a great man like Professor Barnard will bring to us photo-

graphs of matchless beauty showing the many and varied changes taking place in the tail, while the

