

that appeared in 371 A. C., occupied a third of the hemisphere, or  $60^{\circ}$ ; that of 1580 is said to have covered an extent of more than  $70^{\circ}$ ; and that of 1618,  $104^{\circ}$ . But a tail is not a necessary appendage to a comet, for some have been quite destitute, as were those of 1585 and 1763; but there are also some that have several tails; that of 1744 had no less than six, which, spreading out in the form of a fan, extended over a space of nearly  $30^{\circ}$ . A very small condensed spot has been observed in the heads of some comets, but the fixed stars may be seen through the densest parts of many; and from the circumstance that none of them have exhibited phases, though they undoubtedly shine by reflected light, we may gather that they have no claim to be considered as solid bodies, but have in all probability the condition of the lightest vapour.

The appearances of several hundred comets have been recorded, but in estimating their probable number it should be remembered that only the largest among them could have been observed previous to the discovery of the telescope; and that many are not seen on account of their traversing that part of the heavens which is above the horizon in the daytime, although it has sometimes happened that they have been sufficiently bright to be seen in spite of the solar beams, as were those which preceded the death of Cesar, and those which were observed in 1402 and in 1532. Yet scarcely a year passes without an appearance of one or two comets, and it occasionally happens that two or three are visible at the same time. According to a calculation on the theory of probabilities, by Mrs. Somerville, there may be no less than fourteen hundred comets that range within the earth's orbit; and Herschel being twenty times more distant, there may be no less than eleven millions two hundred thousand comets that come within the known extent of our system. This calculation was founded upon the circumstance that a hundred and forty comets appeared within the earth's orbit last century.

The calculations that have been made to determine the dimensions of comets prove that they are by far the largest bodies in our system. The greatest length of that which appeared in 1759 was sixteen million leagues; that of 1811, thirty-six million; while that of 1680 was not less than forty-one million leagues.

The path of a comet is frequently deranged, and sometimes