

the stars shining through it. Arcturus was noway dimmed when it shone through the very middle of the brightest part of the tail of that comet. But I have already stated that that part measured 90,000 miles, and as this part of the tail was no doubt *round*, as thick as broad, the star's light must have shone through 90,000 miles of this mist. Now, every one must have noticed that the steam puff of a railway carriage completely obscures the sun, much more a star. You cannot see the sun through it. Well, then: there must have been less substance in the line of 90,000 miles of tail between the eye and star than in the line of a few yards of steam smoke penetrated by the eye in the other case.

(50.) If you look at a filmy cloud at sunset, though not thick enough to hide a star, you see it bright with vivid golden light by reflection from the sun. How much more then if it were much nearer to the sun, and much more strongly illuminated. Such a cloud is penetrated with light through its whole thickness and reflects it equally from its interior and exterior. Just so in the almost infinitely more thin texture of a comet—even in the densest part of the head it cannot be compared to the lightest cloud so far as substance goes. In Biela's comet very minute stars have been seen by myself through a part of the head at least 50,000 miles in thickness, which a fog a few yards thick would have extinguished. A solid body of a round shape would exhibit phases like the moon, and would appear sometimes as a half moon, sometimes as a crescent, and sometimes as a full moon—but the heads of comets show no such appear-