if all the ponderable matter but a single pound were collected in one of them, and that pound circulated about it as the earth does about the sun. Here, then, we have the case stated over again, with only the difference of times and distances, which, in our Lecture on "The Sun," already referred to, § 16, 17, served us to show how we might arrive at a knowledge of the sun's mass, and to calculate that mass. Substitute in the reasoning there explained for one year 78 or 514 years, and for the sun's distance respectively fifteen and thirty times that distance; and the result, in place of the mass of the sun, will furnish us with the total or joint masses of the two stars in the one or the other of these two sidereal combinations or "binary systems" respectively. We shall not trouble our readers with the calculation: suffice it to state the result, viz., that the joint mass in question in the former pair (that in the Centaur), is about $\frac{11}{20}$,—a little more than half that of the sun, or equal to 198,000 earths; and in the latter (in the Swan), about $\frac{1}{10}$ of the sun, equivalent to 36,000 earths.

(34.) Beyond the distances of these two remarkable sidereal combinations, our grasp becomes less and less assured as we push forward into space. Remarkably enough, Sirius and Arcturus, the two brightest stars visible in our hemisphere, stand barely within the limits of any estimation approaching to certainty,—the former being between six and seven, the latter about eight, times the distance of our nearest neighbour in the Centaur. At the distance thus assigned to Sirius, our sun (if any faith can be placed in photometry) would appear as