(1836 and 1839), by Preuss and Otto Struve in Pulkowa (since the catalogue of 1837), by Mädler in Dorpat, and by Mitchell in Cincinnati (Ohio), with a seventeen-feet Munich refractor. How many of these 6000 stars, which appear to the naked eye as if close together, may stand in an *immediate relation of attraction* to each other, forming systems of their own, and revolving in closed orbits—or, in other words, how many are so-called *physical* (*revolving*) double stars—is an important problem, and difficult of solution. More revolving companions are gradually but constantly being discovered. Extreme slowness of motion, or the direction of the plane of the orbit as presented to the eye, being such as to render the position of the revolving star unfavorable for observation, may long cause us to class *physically* double stars among those which are only *optically* so; that is, stars of which the proximity is merely apparent. But a distinctly-ascertained appreciable motion is not the only criterion. The perfectly uniform motion in the realms of space (*i. e.*, a common progressive movement, like that of our solar system, including the earth and moon, Jupiter, Saturn, Uranus, and Neptune, with their satellites), which in the case of a considerable number of multiple stars has been proved by Argelander and Bessel, bears evidence that the principal stars and their companions stand in undoubted relation to each other in separate partial systems. Mädler has made the interesting remark, that whereas, previous to 1836, among 2640 double stars that had been catalogued, there were only 58 in which a difference of position had been observed *with certainty*, and 105 in which it might be regarded as more or less *probable;* at present, the proportion of *physically* double stars to *optically* double stars has changed so greatly in favor of the former, that among the 6000 double stars, according to a table published in 1849, 650 are known in which a change of relative position can be incontestably proved.* The earliest comparison gave one sixteenth, the

number of multiple stars in the northern hemisphere, discovered at Pulkowa since 1837, at not less than 600.

* The number of fixed stars in which *proper motion* has been undoubtedly discovered (though it may be conjectured in the case of all) is slightly greater than the number of double stars in which *change of position* has been observed. (Mädler, *Astr.*, s. 394, 490, and 520–540.) Results obtained by the application of the Calculus of Probabilities, according as the several reciprocal distances of the double stars are between 0″ and 1″, 2″ and 8″, or 16″ and 32″, are given by Struve, in his *Mens. Microm.*, p. xciv. Distances less than 0″·8 have been taken, and