

appeared stars in Cygnus and Ophiuchus (the former of which continued luminous for twenty-one years), with the brightness of other stars, called attention to photometric determinations. The so-called *dark* stars of Ptolemy, which were below the sixth magnitude, received numerical designations according to the relative intensity of their light. "Magnitudes, from the eighth down to the sixteenth," says Sir John Herschel, "are familiar to those who are in the practice of using powerful instruments.* But at this faint degree of brightness, the denominations for the different gradations in the scale of magnitudes are very undetermined, for Struve occasionally classes among the twelfth or thirteenth stars which Sir John Herschel designates as belonging to the eighteenth or twentieth magnitudes.

The present is not a fitting place to discuss the merits of the very different methods which have been adopted for the measurement of light within the last hundred and fifty years, from Auzout and Huygens to Bouguer and Lambert; and from Sir William Herschel, Rumford, and Wollaston, to Steinhil and Sir John Herschel. It will be sufficient for the object of this work briefly to indicate the different methods. These were a comparison of the shadows of artificial lights, differing in numbers and distance; diaphragms; plane-glasses of different thickness and color; artificial stars formed by reflection on glass spheres; the juxtaposition of two seven-foot telescopes, separated by a distance which the observer could pass in about a second; reflecting instruments in which two stars can be simultaneously seen and compared, when the telescope has been so adjusted that the star directly observed gives two images of like intensity;† an apparatus hav-

* Sir John Herschel, *Outlines of Astr.*, p. 520-27.

† This is the application of reflecting sextants to the determination of the intensity of stellar light; of this instrument I made greater use when in the tropics than of the diaphragms recommended to me by Borda. I began my investigation under the clear skies of Cumana, and continued them subsequently till 1803, but under less favorable conditions, on the elevated plateaux of the Andes, and on the coasts of the Pacific, near Guayaquil. I had formed an arbitrary scale, in which I marked Sirius, as the brightest of all the fixed stars, equal to 100; the stars of the first magnitude between 100 and 80, those of the second magnitude between 80 and 60, of the third between 60 and 45, of the fourth between 45 and 30, and those of the fifth between 30 and 20. I especially measured the constellations of Argo and Grus, in which I thought I had observed alterations since the time of Lacaille. It seemed to me, after a careful combination of magnitudes, using other stars as intermediate gradations, that Sirius was as much brighter than Canopus, as *α Centauri* than Achernar. My numbers can not, on account of the