

Compared with the slow progress we have hitherto depicted, the knowledge of nebulous spots received a rich accession of facts by the persevering industry of Messier. His catalogue of 1771 contains, after deducting the older nebulæ discovered by Lacaille and Méchain, 66 which had not been previously observed. He had the merit of doubling the number of the nebulous spots hitherto enumerated in both hemispheres, although his labors were carried on in the ill-supplied Observatoire de la Marine (Hôtel de Clugny).*

To these feeble beginnings succeeded the brilliant epochs of the discoveries of William Herschel and his son. The former began, as early as 1779, a regular exploration of the numerous nebulous masses with which the heavens are studded. These observations were made with a seven-foot reflector. His colossal forty-foot telescope was completed in 1787; and in the three catalogues† which he published in 1786, 1789, and 1802, he indicated the positions of 2500 nebulæ and clusters of stars. Until 1785, or almost as late as 1791, this great observer appears to have been more disposed, like Michell, Cassini, and the present Lord Rosse, to regard the nebulous spots which he was unable to resolve as very remote clusters of stars; but a prolonged consideration of the subject between 1799 and 1802 led him to adopt the nebular theory, as Halley and Lacaille had done, and even, with Tycho Brahe and Kepler, the theory of a star-formation through the gradual condensation of cosmical vapor. The two hypotheses, however, are not necessarily connected.‡ The nebulous and stellar clusters observed by Sir William Herschel were subjected by his son to a renewed investigation from 1825 to 1833; he also enriched the older catalogues with 500 new objects, and published in the *Philosophical Transactions for 1833* (p. 365–481) a complete catalogue of 2307 nebulæ and clusters of stars. This great work contains all that had been discovered in the heavens of Central Europe; and in the five succeeding years (from 1834–1838) we find Sir John Her-

lvii., for 1767, p. 251), “in which we can discover either none, or only a few stars, even with the assistance of the best telescopes, are probably systems that are still more distant than the rest.”

* Messier, in the *Mém. de l'Académie des Sciences*, 1771, p. 435, and in the *Connaissance des Temps pour 1783 et 1784*. The whole catalogue contains 103 objects.

† *Philos. Transact.*, vols. lxxvi., lxxix., and xcii.

‡ “The nebular hypothesis, as it has been termed, and the theory of sidereal aggregation, stand, in fact, quite independent of each other.”—Sir John Herschel, *Outlines of Astronomy*, § 872, p. 599.