

XIII. "Report of Proceedings of the Astronomical Expedition to Teneriffe, in 1857." By Prof. C. PIAZZI SMYTH. Presented by G. B. AIRY, Esq., F.R.S., Astronomer Royal. Received June 2, 1857.

(Abstract.)

The Report, presented originally to the Admiralty, at whose expense and whose orders the Expedition was sent out, consists of ten parts, with their contents as follows:—

Part 1. Astronomical and Physical observations.

Part 2. Mountain Meteorological Journal.

Part 3. Reductions of above.

Part 4. Sea-level Meteorological Journal.

Part 5. Reductions of above.

Part 6. Plans, Sections, and Astronomical illustrations.

Parts 7, 8, 9. Condensed statement of results and conclusions in Astronomy, Physics, Meteorology, Geology, Botany, and Navigation.

Part 10. Photographs illustrating the botany and geology of three different levels in the Island.

The original instructions of Prof. Piazzì Smyth had been purely astronomical, and were to ascertain how much telescopic vision could be improved by eliminating the lower third of the atmosphere. In furtherance of this view, he erected the Sheepshanks equatorial of the Edinburgh Observatory on Mount Guajara in Teneriffe at a height of 8903 feet, and found the space-penetrating power extended from mag. 10 to mag. 14, and so great an improvement in definition, that a magnifying power of 240 could be used with more satisfaction on the mountain, than one of 60 in Edinburgh. After a month's experience of this station, he ascended to a higher one—the Alta Vista—at a height of 10,702 feet on the eastern slope of the Peak, and there erected the large equatorial of Cooke, lent for the occasion by Mr. Pattinson of Newcastle. The definition was here admirable, and the telescope equal, if not superior, to all the test objects it was turned upon. A comparative hypsometric estimate was not possible; for although the observer had spent an equal number of days to what he employed on the Peak, in trying to ascertain the capabilities of the instrument at the house of its hospi-

table owner, on several visits, the cloudy atmosphere of Newcastle had always prevented any good observations being made.

An argument in favour, however, of the increase of height was ascertained through means of radiation instruments, which indicated almost as much improvement between 10,700 and 8900 feet, as between the latter height and the sea-level. This unexpected degree is attributed by the author to the circumstance of the highest station being almost clear of certain dry, hazy, or dusty strata of atmosphere, which include and overtop the intermediate station, and are, next to the clouds themselves, the greatest obstacle to good telescopic vision of the heavenly bodies. The results with regard to the clouds were equally satisfactory, for  $\frac{7}{10}$ ths of the whole were found to be under the level of 5000 feet.

The author expresses the most cordial thanks to Sir Charles Wood, the First Lord of the Admiralty, for his intelligent liberality, to which the Expedition owed its existence ; also to Lord Clarendon, the Secretary of State for Foreign Affairs, for his letters to the Spanish Government and to the English Customs ; and he acknowledges with pleasure the amount of assistance which he received from many private gentlemen, friends of science, through whose contributions he was enabled to execute, with a limited grant, and in a circumscribed portion of time, a much greater amount of work than he could otherwise have hoped for ; those gentlemen were, Robert Stephenson, Esq., M.P., G. B. Airy, Esq., H. L. Pattinson, Esq., Dr. J. Lee, Prof. Stokes, the late Admiral Beechey, Admirals FitzRoy, Manners and Smyth, Prof. Baden Powell, J. Gassiot, Esq., Capt. Washington, and Messrs. Cooke and Adie.

In the island of Teneriffe, Prof. Piazzi Smyth also received valuable aid in many ways from C. Smith, Esq., of Orotava, formerly of Trinity College, Cambridge, L. Hamilton, Esq., of Santa Cruz, Don Francisco Aquilan, Spanish engineer, and more particularly from the acting Vice-Consul of Orotava, Andrew Goodall, Esq., and his nephew Mr. Carpenter, who were aiding and abetting, and in fact forming an important part of the Expedition during its whole stay in Teneriffe.