TESTS OF THE 19″ MERZ REFRACTOR OF THE MANILA OBSERVATORY

(A) HISTORICAL INTRODUCTION

Originally it was intended to mount a large equatorial on top of the central tower of the Meteorological Observatory proper, and the foundation was in fact constructed. But later, serious difficulties arose against this idea, and hence a separate building was planned to house an equatorial. The project received additional impetus when Father Faura, of our Observatory, was informed by the astronomer G. Ferrari that there was a chance of obtaining from the German optician Merz a good objective of 19″ diameter. The lens was finally contracted for in 1890, and in 1894 the cupola was started, with "El Arsenal Civil," of Barcelona, Spain, as constructors. Saegmuller of Washington was given the contract for the construction of the mounting for the telescope. Due to many delays, it was not until the early part of 1898 that the telescope was finally mounted in its completed cupola, and functioning properly.

The Manila objective is one of three made by Merz, with almost exactly the same dimensions. One is now at the Strassburg Observatory, has a free aperture of 489 mm., focal length 6.92 m., and hence ratio 1:14.1. The second is that made for Schiaparelli, at the Observatory of Brera, Milan, with free aperture 487 mm., focal length 6.98 m., ratio 1:14.33. The third is at the Manila Observatory, free aperture 485 mm., focal length 6.95 m., ratio 1:14.33.

A search through the observatory archives brought to light an interesting letter from Jakob Merz, dated Munich, May 7, 1892, which gives Merz' candid statement as to his own handiwork. The letter reads in part as follows:

> This objective is as perfect as that which Sr. Schiaparelli received, i. e., it gives the same sharp image, and is distinguished from that of Sr. Schiaparelli only in this, that the one for Sr. Schiaparelli has no "defects of beauty" (Schönheitsfehler), while the former has such defects in the flint glass, to wit: The glass is not wholly white, but verging somewhat on the yellow green; it has a few more little air bubbles, and then three small fibres (streaks), that go vertically through the glass; also so-called comet tails that radiate from the air bubbles; also several extremely fine striæ; and upon the surface a very light brown sheen, which can only be seen in reflected light, but not in transmitted light. Such a sheen can originate of itself if the flint glass is not washed from time to time in the period immediately following the making of the objective . . . And this would happen naturally during use in the observatory, if the flint glass is not cleaned from time to time with a cloth.
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> It is well known also to astronomers, that such "defects of beauty" as exist in this objective, have no influence upon the distinct perception of the image, and one sees just as clearly as if they were not present. If in an objective these defects do not exist, of course the objective has a better appearance; and I repeat to you as already indicated, that the objective is just as perfect, i. e., it gives as sharp an image, as that of Sr. Schiaparelli.

Merz has accurately described the defects visible to the eye. As to his contention that the objective is fully as good in image formation as that of Schiaparelli, the tests hereafter described may offer some criteria for judgment.

16—29—O. W.