

adorned in every case with figures of dragons," etc. He then proceeds to describe them:

"(1). Armillary Zodiacal Sphere of 6 feet diameter. This sphere reposes on the heads of four dragons, the bodies of which after various convolutions come to rest upon the extremities of two brazen beams forming a cross, and thus bear the entire weight of the instrument. These dragons . . . are represented according to the notion the Chinese form of them, enveloped in clouds, covered above the horns with long hair, with a tufted beard on the lower jaw, flaming eyes, long sharp teeth, the gaping throat ever vomiting a torrent of fire. Four lion-cubs of the same material bear the ends of the cross beams, and the heads of these are raised or depressed by means of attached screws, according to what is required. The circles are divided on both exterior and interior surface into 360 degrees; each degree into 60 minutes by transverse lines, and the minutes into sections of 10 seconds each by the sight-edge\* applied to them."

Of Verbiest's other instruments we need give only the names: (2) Equinoxial Sphere, 6 feet diameter. (3) Azimuthal Horizon, same diam. (4) Great Quadrant, of 6 feet radius. (5) Sextant of about 8 feet radius. (6) Celestial Globe of 6 feet diameter.

As Lecomte gives no details of the old instruments which he saw through a grating, and as the description of this zodiacal sphere (No. 1) corresponds in some of its main features with that represented in the photograph, I could not but recognize the possibility that this instrument of Verbiest's had for some reason or other been removed from the Terrace, and that the photograph might therefore possibly *not* be a representation of one of the ancient instruments displaced by him.†

The question having been raised it was very desirable to settle it, and I applied to Mr. Wylie for information, as I had received the photographs from him, and knew that he had been Mr. Thomson's companion and helper in the matter.

"Let me assure you," he writes (21st August, 1874), "the Jesuits had nothing to do with the manufacture of the so-called Mongol instruments; and whoever made them, they were certainly on the Peking Observatory before Loyola was born. They are not made for the astronomical system introduced by the Jesuits, but are altogether conformable to the system introduced by Kúblái's astronomer Ko Show-king. . . . I will mention one thing which is quite decisive as to the Jesuits. *The circle is divided into 365½ degrees, each degree into 100 minutes, and each minute into 100 seconds. The Jesuits always used the sexagesimal division. Lecomte speaks of the imperfection of the division on the Jesuit-made instruments; but those on the Mongol instruments are immeasurably coarser.*

"I understand it is not the ornamentation your friend objects to?‡ If it is, I would observe that there is no evidence of progress in the decorative and ornamental arts during the Ming Dynasty; and even in the Jesuit instruments that part of the work is purely Chinese, excepting in one instrument, which I am persuaded must have been made in Europe.

"I have a Chinese work called *Luh-King-t'oo-Kaou*, 'Illustrations and Investigations of the Six Classics.' This was written in A.D. 1131-1162, and revised and

\* *Pinnula*. The French *pinnule* is properly a sight-vane at the end of a traversing bar. The *transverse lines* imply that minutes were read by the system of our *diagonal scales*; and these I understand to have been subdivided still further by aid of a divided edge attached to the sight-vane; qu. a Vernier?

† Verbiest himself speaks of the displaced instruments thus . . . . "ut nova instrumenta astronomica facienda mihi imponeret, quæ scilicet more Europæo affabre facta, et in specula Astropica Pekinensi collocata, æternam Imperii Tartarici memoriam apud posteritatem servarent, prioribus instrumentis Sinicis rudioris Minervæ, quæ jam a trecentis proxime annis speculam occupabant, inde amotis. Imperator statim annuit illorum postulatis, et totius rei curam, publico diplomate mihi imposuit. Ego itaque intra quadriennis spatium sex diversi generis instrumenta confeci." This is from an account of the Observatory written by Verbiest himself, and printed at Peking in 1668 (*Liber Organicus Astronomiæ Europææ apud Sinas Restituta*, etc.). My friend Mr. D. Hanbury made the extract from a copy of this rare book in the London Institution Library. An enlarged edition was published in Europe. (Dillingen, 1687.)

‡ On the contrary, he considered the photographs interesting, as showing to how late a period the art of fine casting had endured.