



*William F. Rigge, S. J., F. R. A. S., F. A. A. S.

ASTRONOMICAL PANORAMIC VIEWS.

Readers of "The Chronicle" may remember that mention was made in two previous numbers (February and March, 1914), of a series of eight astronomical panoramic views taken from the dome of the Observatory towards the principal points of the compass, which had the circles of the celestial sphere drawn upon them at intervals of five degrees, so that the motions of the stars could be studied with respect to fixed terrestrial objects. These views had been mounted on the sides of a regular octagon, so that by placing one's eye at its center, and on the level with the horizon line, one could get an exact idea of the various motions of the stars. As this octagon was rather small, being only two feet across, the pictures were too near the eye to be comfortably seen, nor could they be viewed by more than one person at a time. All this has now been greatly improved. Several students or visitors can now stand together in the middle of a large octagon, which may almost be called a room since it measures eight feet across, and they may all look together upon the eight pictures which are each forty inches wide and thirty high.

The sight presented astonishes all that have had the privilege to see it. There is first a continuous and unbroken view all around the horizon. With the exception of the college building, terrestrial objects rise only two or three degrees above the astronomical horizon, and the distant bluffs all the way from east to north, that is, for one-fourth of the entire circle, rise scarcely a quarter of a degree. It is really astonishing that an Observatory situated in the very heart of a city of over 120,000 inhabitants, should command such an extensive view of the sky. The

*Professor of Physics and Astronomy, The Creighton University, College of Arts and Sciences; Director of the Observatory.

next feature to catch the beholder, which was the original cause of the construction of these panoramic views, are the lines drawn on the pictures. There are four kinds of these lines, representing two systems. The first are vertical straight lines, evenly spaced. There are seventy-two of them, five degrees apart. They indicate the bearing of objects or their azimuth, as it is called, the points of the compass, north, south, east, west and all five degree distances from them. The second are the lines parallel to the horizon line, and show the angular elevation of objects and of the stars. From these it is seen that the north wing of the college, which is the nearest large building, rises to a height of about 15 degrees and stretches about 40 degrees along the horizon, the highest part of the tower over the main entrance being 19 degrees high. These altitudes and azimuth lines are full or unbroken lines and easily distinguishable from the dotted or broken lines of the second system. This system refers directly to the apparent motions of the stars. Beginning with the north view, we see that some seem to be concentric circles with the north star as their centre. These circles do not touch or intersect the horizon line, showing that the stars in this part of the sky never set, but go around continuously day and night and would, therefore, be perpetually visible to us if daylight, clouds or other causes did not interfere. Following these lines on the adjoining northeast view, we see that, while they all still have the pole star as their centre, they cut the horizon, and their inclination to it is steeper the farther we go east. On the east view these star paths are almost straight lines. In the southeast their curvature is reversed, and in this as well as in the south view, a continually smaller portion of their circular orbits lies above the horizon, while their common centre now is far below it, and just as in the north view. There are many of these circular orbits which are completely above the horizon, so in the southern one there are many completely below it.

That is, while towards our north there is a certain circular region, which has the north celestial pole for its centre and a radius equal to the height of this pole above the horizon, and

which is called the circle of perpetual apparition, so towards the south there is an equally large circle of perpetual occultation, the stars in which are never visible to us in Omaha. Thus for example, we never get to see the Southern Cross, while the Big Dipper is always above our horizon. Along with the curved paths of the stars, called declination circles, we see on the panoramic views, a number of straight lines, all converging towards the north or south pole and numbered from one to twelve. They are hour lines and denote the time it takes the stars to run from them to the south meridian. As one hour in circular measure is 15 degrees, 5 degrees on the views mean 20 minutes, so that we can find the hour angle of any star by measurement or estimation almost to the minute. By a study of these panoramic views a student can locate the point of rising of the sun, or moon, or any planet or star, and trace its diurnal path across the sky to its point of setting. He can also find the time of its rising, meridian passage, and setting, as well as its position in the sky at any time, and compare this position with the terrestrial objects shown in the views. And lastly by comparison with these terrestrial objects, he can learn what a degree means, that is, learn what is called the value of circular measure.