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THE latest volume of the *Annals of the Zo-se Observatory* in Zi-ka-wei, near Shanghai in China, was received recently and is more than usually interesting. It is for the year 1911, and consists of four parts. In the first are given the customary solar observations of the year; the second contains some visual and photographic observations of double stars, and the third a number of fine photographs of Comet Brooks. The fourth part is the most interesting. It consists of a catalogue of 3083 stars observed during the eighteenth century under the direction of the Jesuit Father Kogler, during the reign of the Emperor K'ien-long. The positions of the stars have been reduced to the epoch 1875 by Father Tsutshashi and compared with European catalogues, especially with Bradley's so that almost all the stars have been identified.

The preface of this catalogue is from the pen of the Emperor himself, and is dated the 11th moon of the 21st year of his reign, January 1757. He recalls what his ancestor K'ang-hi did for astronomy, and what he himself had ordered done to follow the example of his illustrious predecessor.

The first part of this catalogue refers to the construction of an armillary sphere, larger and more perfect than that of Nan-Hoi-jen (Father Verbiest) which was carried off by the European Powers during the Boxer troubles in China a few years ago. The second part deals with the present catalogue of stars.

It begins with the personnel of the observatory. After the names of three presidents Yun Lou, Prince Tchoang, and of two vice-presidents, there follow those of three astronomers, T'ai Tsin-hien, former president of the astronomical tribunal, raised to the dignity of sub-president of the tribunal of rites, Lieou Song-lin,

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president of the astronomical tribunal, and Pao Yeou-Koan, sub-president of the astronomical tribunal. These three were the Jesuit Fathers, Ignatius Koegler, a German, who was born in 1680, arrived in China in 1716, and died March 30, 1746; Augustin von Hallerstein, and Austrian, born in 1703, arrived in China in 1738, and died October 27, 1774; and Anthony Gogeisl, born in Bavaria in 1701, arrived in China in 1738, and died October 12, 1771. These three are followed by nine computers, five students, one draughtsman, and three other students. To these was added later the name of a fourth Jesuit Fou Tso-lin, Felix de Rocha, a Portuguese, who was born in 1728, and arrived in China in 1747, and died May 22, 1781.

The complete work contains in reality five catalogues. But that which is reproduced in the Annals of the Zo-se Observatory is the second of these, and gives the stars in the order of their right ascension. It contains the positions of 3083 stars, as said, distributed into 300 constellations. As 23 of these with their 150 stars are near the South Pole and invisible in China, their positions have been taken from European catalogues in order to complete the celestial sphere.

The data of the catalogues are presented in ten columns. The first shows the number proper to the catalogue. In the second we find the Chinese name of the star in Chinese and European characters. The third column gives the magnitude to the nearest whole number; the fourth and sixth, the right ascension and declination in 1744 in degrees, minutes and seconds; the fifth and seventh, their respective precession in seconds and thirds, i. e., sixtieths of a second. The eighth column shows the right ascension in 1875, in hours, minutes and tenths of a minute; the ninth the declination in degrees, minutes and tenths, and in the tenth and last column is found the European name of the star. This catalogue is accompanied by many pages of explanatory text in Chinese and French.

While this list of stars and their positions is of great value to a professional astronomer, the non-professional will take more interest in the charts. Two circular charts give the northern and

southern hemispheres on a polar projection. These are exclusively Chinese, not only in the Chinese characters denoting the names of the stars and of the constellations, but also in the rather peculiar representation of the stars by dots, all of the same size, with an utter disregard of magnitude. Hence it is not an easy task to trace our familiar groupings in their strange configurations, rendered still more embarrassing by the unusual lines connecting the stars. The Big Dipper is the first to be made out after a little study, because the connecting lines are according to our ideas; but it has five instead of three stars in the handle. The pointers then direct us to the Pole Star, which, but for this clue, would be totally unrecognizable, on account of its companions and its greater distance from the Pole. Orion is the only other familiar constellation. For the other stars, even the brightest, and their constellations, there is absolutely nothing but their position to serve as an identification mark, and even this is very difficult because of the magnitude of the precession that has shifted our reference lines during the 170 years which have elapsed since the construction of this Chinese chart.

All these difficulties, however, are done away with by Father Tsutshashi's maps, which have been drawn for the epoch 1875, and presented in modern dress. The stars are represented by dots proportionate to their magnitudes, and are aligned according to our modern ideas. The bounding lines of our familiar constellations are drawn, and their names printed in common type. The stars are also lettered according to present usage. In addition and without undue crowding, the Chinese names of the constellations and of the principal stars are given in both Chinese and European characters. Four charts of this kind are supplied. Two are on a polar projection, and show the stars within 45 degrees of either pole. The other two are rectangular, each extending over 12 hours or 180 degrees in right ascension, and to 50 degrees on either side of the equator.

Besides the invaluable help that this catalogue gives to Chinese astronomical students, it is an interesting monument to

the scientific activity of the Jesuits in the Chinese Empire two centuries ago, as well as to that of their modern successors.

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The Physical Science Section of the Nebraska State Teachers' Association held its session in the physics lecture room of the Arts and Science building of the Creighton University on Thursday morning, November 5th, from 9 o'clock until noon. This was the first time that such a distinguished assembly of teachers of science had ever met in that place. Five interesting papers were read and discussed. One of these was on the "Ray System" and the "Wave System" in Optics by Ernest Simmons, Superintendent of Schools in Springfield, Nebraska, a former Creighton student who had studied physics in the very room in which he was lecturing. After a clear exposition of the subject in hand, he illustrated his ideas with stereopticon drawings. Professor E. J. Hartsook of Nebraska City, read a paper on "The Possibilities of Wireless in the High School." Professor Rigge, by appointment, opened the discussion, but owing to the lateness of the hour, confined his remarks within two minutes. In regard to the formation of wireless clubs in the High School and their signalling to one another, he suggested that they be careful to obey the law by securing a license and having their instruments properly tuned, as otherwise they would cause much annoyance to professional operators and to those desirous of getting the Arlington time.

The senior students acquitted themselves very well as ushers, in directing the visitors to the proper place, and in explaining the use of some of the instruments in the cabinet. General surprise and delight were expressed at the completeness of the outfit, especially at the astronomical panoramic views. It was most likely in appreciation of their reception that they unanimously elected Professor Rigge, President of the section for the ensuing year. An evening party was organized for the observatory, but as the banquet they attended was late in being served, only one of the number managed to tear himself away and enjoy a look at Jupiter and the moon.

On the morning of November 7th, an event of unusual astronomical importance occurred. It was a transit of the planet Mercury across the face of the sun. The last time that this happened was on November 14th, 1907, when clouds made observation impossible in Omaha. The time before that was in 1894, when Professor Borgmeyer observed it. The next time will be May 7th, 1924, ten years from now.

The image of the sun was projected on a card supported by rods beyond the eye-piece of the telescope. The driving clock kept this image stationary on the paper. It was about five inches in diameter. The planet seemed no larger than the prick of a fine needle. It was about half as large as each of two spots directly across the sun's centre from it. Owing to this small size of the planet and the low altitude of the sun, which made its image very tremulous, the exact moment of its egress could not be observed with accuracy.