WASHINGTON POST May 22, 1906

The sundial to be dedicated next Thursday is the work of Prof. Frank H. Bigelow of this city, astronomer and meteorologist. Bigelow is an ardent churchman, and is one of the assistant clergymen at St. John's Church, and it is only owing to a throat affection, it is said, that he does not devote his entire time to the ministry. Prof. Bigelow brought t his work in connection with the sundial a praiseworthy zeal. He holds degrees from a number of the leading universities of this country, including Harvard, Cornell and George Washington, and occupies the chair of solar physics at the latter institution. Prof. Bigelow is the author of numerous scientific papers and reports, and was one of the commission sent by the United States government to view and report on the eclipse in the Mediterranean.

Speaking of the sundial and shadow calendar, Dr. Bigelow said: "It was suggested by Bishop Satterlee that the top of the monument should be so arranged as to serve at the same time three useful purposes. The first is to register the time of the day by a sun dial, the second to record the main festivals of the Christian year by the shadow from an upright cross, and the third to servie generally for out-of-door celebrations ofthe Holy Communion, as is befitting reverent services under the canopy of heaven. The dial and the calendar scheme were united by a prostrate cross covering the entire tablet. In the center of the long arm of this dross rises a small cross, the top of whose short arm is exactly fifteen inches high above the surface of the plate. The point where the two arms of the prostrate cross meet is also the senter of a large sundial, the gnomon beginning at this center and rising at an angle of 38° 55'. The hours are marked on a large circular ring, and the innter part is filled with conventional rays to represent the radiance streaming from the cross from day to day. The unoccupied portion of thd hour circle covering the interval time when the sun is not shining is filled with the table of corrections needed to turn the apparent time of the sun into the mean time indicated by a good clock set to local time. As the Washington clocks are usually set to the 75th meridian time, it is also necessafy to add eight minutes to the sun dial mean time to produce the watch time to common used. Hence, noting the hour and minute by the shadow on the dial, one must add the correction

found in the little table on the dial, for a plus sign adding and for a minus sign subtracting the amount, and finally eight minutes must be added to give the 75th meridian watch time. To find the time of the sun crossing the meridian at apparent noon, subtract eight minutes from your watch and apply the dial correction with the opposite sign, and at that minute the cial ought to be casting no shadow.

"In order to secure the exact position of the central line of the dial and cross on the side of the Cathedral hill it was necessary to transfer the astronomical meridian of the United States naval observatory by suitable transit measurements. This was done by Mr. Yowell of the observatory, by permission of Admiral Walker, United States navy, the superintendent of the naval observatory and myself. A long sight line was taken from the observatory to the Peace Cross, and by suitable angles the new north and south line was transferred to a Cathedral meridain line and to the monument site. The meridian line is secured by stone posts set in cement, and it will be valuable for years to come in all the building operations of the Cathedral, and indeed, for all the surveys of the region. Testing the stone before setting on the masonry or the foundation of the monument the shadow of a long plumb line fell along the edge, showing that the orientation was satisfactory.

"Besides casting the shadow of the sun at the different hours of the day to denote the local apparent time we can utilize the position of the sun at noon, when it is just crossing the meridian, to cast the shadow of the arms of the upright cross upon the surface of the plate. Since the sun rises and falls in altitude with the season of the year as it passes north and south of the equator in declination, it casts a longer or shorter shadow, according to the time of the year. Thus, in summer, when the sun is high in the sky, it casts a short shadow, or in the winter, when it is lower down toward the south, at noon it casts a longer shadow. By calculating the altitude, or the corresponding zenith distance, the length of the shadow may be found for any date in the year.

"The easter arm of the cross registers the calendar for the summer-autumn half of the year, and the western arm for the winter-spring half of the year. There is, of course, some trouble with the movable feasts and season depending upon the date of Easter, that is for Lent, Easter, Ascention and Whitsunday. Easter is on the first Sunday following

the full moon which occurs on March 22 or later, and it may range from March 24 to April 20. It was only possible to indicate one Easter date, namely, March 25, which is assumed to be the date of the first scriptural Easterday, and leaving a broad space to the line of April 20. The other dates of Lent, Ascension, Whitsunday must be placed according to the Easter of the given year.

"In a similar manner we can calculate the number of degrees north or south of the east and west line- that is, the line perpendicular to the fixed meridian, where the sun rises at a given day.

"If it were desired to place the axis of the new Cathedral of Saint Peter and Saint Paul so that the rising sun shall shine through the rose window exactly down the Nave of the building, it must be placed 30°31' north of the east line."