

walks of the city, except where no streets had been opened, as along the middle branch of the Patapsco river, where the stones were set along the high-water line. These stones were connected with the triangulation and their location accurately described in the records.

As a base for the needful triangulation, Assistant Tittmann adopted the same line, Bayview monument, that had been used in 1876, and as the progress of the measurements between the reference stones in the streets disclosed a want of accord between the distances determined by these measurements and those deduced from the triangulation, it was deemed advisable to strengthen and check the triangulation by connecting it with some of the primary stations. Finally, however, on account of the difficulties of recovering the stations proposed and the expense attending their occupation, it was decided to obtain the desired check by the measurement of a base line and its introduction into the triangulation. A site about a mile in length having been selected on Fort Avenue, the measurements were made with the four-metre contact slide case apparatus and a correction found and applied to the previously accepted distance, Bayview monument. One hundred and seven geographical positions were determined, of which all but eleven were new.

In the scheme of triangulation carried out by Assistant Tittmann, many points of the work of 1876 were included. Of the one hundred and eleven geographical positions determined, nearly all can be identified and made available for future surveys. The prominent new positions added to the previous lists are: "Grace Methodist Church Spire," "St. James' Church Spire," "Johns Hopkins Hospital," "City Hall," "Holy Cross Church Spire," and the "Canton Elevator."

At the end of March, 1887, Major Hutton applied for the assignment of an officer of the survey to execute certain work supplementary to that accomplished by Assistant Tittmann, and Sub-Assistant W. I. Vinal was assigned for that purpose. In connection with the soundings made, some miscellaneous measurements of streets and wharves along the water front were included in his work.