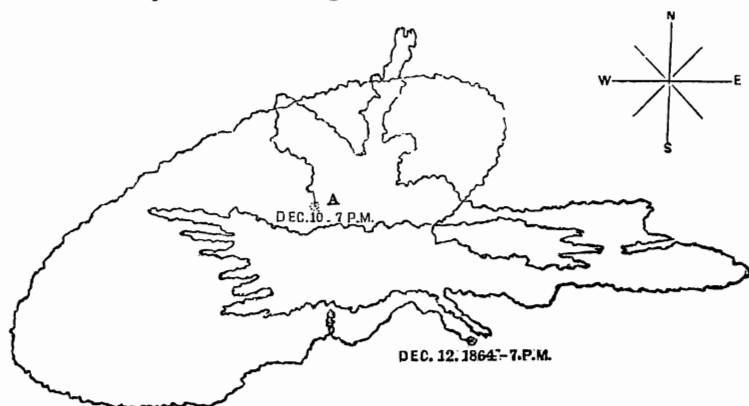


ART. XLVI. — *Movement of the Dome of the Capitol at Washington, during the gale of December 10-12, 1869.* From a letter to the editors.

WE all know, by having seen the thing itself, or representations of it, the form of the dome of the capitol at Washington. It is of cast and wrought iron throughout. Its architectural beauty is only equaled by the truly wonderful combinations of its multitudinous parts. Had it been erected at any other time than during the late war, when men's views were absorbed in watching the vicissitudes of the contest, it would have attracted the eager attention of hundreds of scientific observers, who would have noticed, with the deepest interest, the ingenuity and skill with which all the exigencies of the structure were provided for, until a rail road, built, as it were, in the skies, was used to place the statue on the summit.

The exterior diameter of the dome, where the iron work rests, as it were, on the roof of the building, is somewhere about one hundred and thirty-seven feet; and the height, from the roof to the feet of the statue about two hundred—the statue is between nineteen and twenty feet high.

The distinguished architect, Mr. Thomas M. Walter, supposed naturally enough, that this enormous amount of iron would be more or less affected by the action of the sun's rays—causing an expansion, to meet which he had been making, throughout his protracted labors, all possible provision. To ascertain what this effect would be, he suspended a wire from the center of the ceiling of the Tholus, or crowning cupola, under the feet of the statue. At the extremity of this wire nearest the ground, or pavement of the rotunda, he arranged a delicate mechanism, that carried a pencil, whose point rested on a sheet of paper, on which it was expected that expansion and contraction would record their effects. It was Mr. Walter's expectation, probably, that, as the sun moved from the east to the west, something of a uniform curve would be traced by the pencil's point upon the paper, furnishing, in that way, data that might be as useful as they would be original.



It happened, however, that the wind, and not the sun made use of Mr. Walter's preparations, and recorded its vagaries, through the agency of the vast mass of the dome. One would have thought, looking to the breadth of the base, and the form of the architecture above it, that the dome would remain unmovable against any action of the wind. This was not so, however; and the diagram above shows what a gusty day was capable of effecting, in giving motion to the mass. Beginning at A, and following the lines, it can be seen when the wind blew fitfully but moderately, and then, when a blast of unusual violence occurred; and when, too, the direction was changed, as the wind veered round the points of the compass. That chimneys and shot towers wave in the wind is well known; but the movements that take place in rough weather in the dome of the capitol could hardly have been reasonably expected.

The diagram above is a tracing carefully made from the work done by the pencil on the occasion now referred to. L.

AM. JOUR. SCI.—SECOND SERIES, VOL. XLIX, No. 147.—MAY, 1870.