Note on change of the Piers of the 6-inch Steel Transit Circle at the U. S. Naval Observatory, Washington, D. C.

The article entitled »Determination of the Cause for Variation of Level and Azimuth in Fixed Meridian Instruments« in A. N. 3902, by Professor G. W. Hough of the Dearborn Observatory, Evanston, Ills. is of service in calling attention to a subject of importance and of interest to the limited number of astronomers who are engaged in meridian work of a fundamental character. Prof. Hough states that his attention was directed to the matter by the experiments which were made two or three years ago to remove the instability in azimuth of the 6-inch Transit Circle at the Naval Observatory.

An account of this work is given in Vol. III, Part IV of the Publications of the Naval Observatory (New Series) published in April 1903, but it had apparently not been read by Prof. Hough, who bases his remarks concerning this work on certain brief statements in the Annual Reports of the Superintendent of the Observatory for 1901 and 1902. The brick piers were considered preferable to the marble piers because a reasonably thorough investigation showed that the general experience of astronomers, a priori considerations, and the weight of authority, all agree in pointing to the conclusion that piers of an amorphous, and in a general way, homogeneous material like brick masonry or concrete, give usually, greater stability in supporting meridian instruments than piers which consist of single blocks of stone cut from strata formed in the geological evolution of the earth. The substitution of brick for stone piers in the case of the 6-inch Transit Circle at Washington was entirely successful, changing it from one of the most unstable instru-

ments to one of the most stable instruments in the world. A year's subsequent use of the instrument showed the weekly, monthly and yearly changes in azimuth and level to be very small. Slight though annoying, changes in these constants during a night's work remained but were usually counteracted by change in the opposite direction, taking place within a few hours after work was stopped, and are to be attributed to small changes in the metal parts of the instrument, supporting the pivots and were probably not, in the main, due to any change in the piers.

But it is shown clearly in the description above referred to, of these experiments, that the great instability, which was removed by substitution of the brick piers, was probably not, to any large extent at least, caused by defects in the marble piers themselves. The trouble was found to be due to two causes, 1) defective mounting of the marble piers on their foundations, and 2) to some obscure fault (probably defective annealing) in the steel foundation plates on which the pivot bearers rested.

While, as Prof. Hough suggests, it would be interesting to know whether the marble piers, properly mounted on their foundations, would in this case have given better results than well built brick or concrete piers, yet the experiments were not conducted with a view to settle that question, but for the purpose of removing the principal defect in the instrument. It was considered necessary under the circumstances to get the instrument into serviceable condition as quickly as possible, and the course of action adopted seems to be justified in that it led to the desired result.

U. S. Naval Academy, Annapolis Md., 1903 Dec. 15.

Milton Updegraff.

Ortsbestimmungen des Planeten (324) Bamberga

am großen Refraktor (48.9 cm Öffnung, 6.92 m Brennweite) der Kais. Universitätssternwarte
zu Straßburg von C. W. Wirtz.

1903	M.Z.Straßb.	$\Delta\alpha$	$\Delta\delta$	Vgl.	Vgr.	α app.	Parall.	δ app.	Parall.	Red. ad l. app.	*
Aug. 7	10 ^h 34 ^m 52 ^s	-1 ^m 23 ^s 20	-2' 7".6	20.4	407	22 ^h 27 ^m 8 ^s 06	-0 ^s 29	-12° 3' 48".4	+7".9	+3 ^s 26 +23".4	1
24	10 38 52	+0 46.60	+9 22.3	20.4	»	22 11 11.95	-0.16	-10 25 48.6	+8.6	+3.49 +24.1	3
26	9 36 27	-1 23.49	-8 34.7	10.2	»	22 9 6.45	-0.26	-10 14 12.8	+8.5	+3.49 +24.1	4
27	11 1 10	+1 14.04	+5 10.6	20.4	»	22 7 58.65	-0.09	-10 7 50.1	+8.7	+3.50 +24.1	5
31	9 25 53	+1 36.11	-4 57.9	20.4	»	22 3 48.62	-0.24	-9 43 52.9	+8.6	+3.52 +24.2	6
Sept. 1	8 48 45	+0 35.22	+1 4.8	12.4	»	22 2 47.73	-0.29	-9 37 50.2	+8.5	+3.52 +24.2	6
2	8 35 19	-0 26.26	+7 13.2	12.4	207	22 1 46.25	-0.30	-9 31 41.8	+8.5	+3.52 +24.2	6
6	9 2 19	-0 10.69	-8 40.6	19.4	154	21 57 45.52	-0.29	-9 6 22.1	+8.5	+3.52 +24.3	7
8	9 7 26	+0 21.70	+5 31.8	8x, 8y	207	21 55 51.73	-0.20	-8 53 31.2	+8.5	+3.52 +24.3	8
19	9 9 11	+0 15.66	+7 13.3	8x, 8y	»	21 47 20.71	-0.09	-7 40 29.9	+8.3	+3.46 +24.3	9
21	8 24 12	-0 5.66	-1 0.9	8x, 8y	407	21 46 14.39	-0.16	-7 26 57.7	+8.1	+3.44 +24.4	10
22	8 31 7	-0 36.12	+5 56.1	6.2	»	21 45 43.92	-0.14	-7 20 0.7	+8.1	+3.43 +24.4	10
24	9 37 14	+1 32.03	+2 50.1	10.1	»	21 44 48.91	0.00	-7 5 44.6	+8.1	+3.41 +24.4	12
27	8 7 22	+0 16.82	-3 24.4	4x, 4y	207	21 43 48.48	-0.14	-6 44 57.1	+7.9	+3.38 +24.4	13
28	8 30 46	-0 0.31	+3 53.0	4x, 4y	»	21 43 31.34	-0.09	-6 37 39.7	+8.0	+3.37 +24.4	13
30	8 58 4	+0 31.23	-1 32.4	4x, 4y	»	21 43 6.45	-0.02	-6 23 6.8	+7.7	+3.35 +24.4	14