# THE ADJUSTMENT OF A QUADRILATERAL WHEN ONE TRIANGLE HAS ALREADY BEEN ADJUSTED.

by

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On page 220 et seq. of the *Hydrographic Review*, Vol. VIII, N° 2 for November 1931 is described a method of closing and balancing a quadrilateral, one triangle of which has already been adjusted (Publication H. D. 295 of the Hydrographic Department, British Admiralty, February, 1931). This problem faced the writer when carrying out a survey in India and before the November, 1931, Review was received, and the method by which it was overcome will now be described.
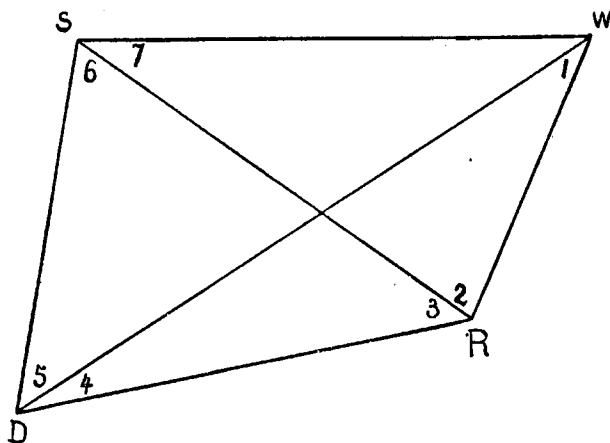
DSWR is a quadrilateral of which the triangle DRS is already adjusted. The other triangles DRW, DSW and RSW were first corrected according to their weighting values to make each corrected sum equal 180° and the sum of the two angles SDW and RDW equal to the whole angle SDR which is already adjusted. The figure was then closed and balanced in a similar manner to that described on page 217 of above quoted Review except that as no corrections could be applied to the already adjusted angles 3 and 6, they were divided amongst the other 6 angles. In obtaining the balancing correction e the "Diff. for 1" for the angles 1 and 8 was multiplied by two and a correction 2e applied to each of these angles and e to the remaining four.

The opposite page shows the actual working out of the problem by this method, with a comparison of the result with that obtained by the method described in the above mentioned Publication H. D. 295.

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TRIANGLES Observed. Observés	Preliminarily corrected. Correction préliminaire		Corrected Angles corrigés	1st Corr.	Angles (1st adjust.) (1ère compensat.)	2nd Corr.	Angles (2nd adjust.) (2ème compensat.)	Log. Sin.	Diff. for 1"	3rd Corr.	Angles (Final).	Log. Sin.
D 64.41.39.6		Previously adjusted. Déjà compensés										
R 46.16.28.8			1 46.00.31.3	—0.7	46.00.30.6	—0.9	46.00.29.7	9.856 9945	40.6 (×2)	25.4 +	46.00.55.1	9.857 0380
S 69.01.51.6			3 46.16.28.8*	—0.7	46.16.28.8		46.16.28.8	9.858 9350	—	—	46.16.28.8	9.858 9350
			5 35.48.30.2	—0.7	35.48.29.5	+1.9	35.48.31.4	9.767 2161	29.2	12.7 +	35.48.44.1	9.767 2531
			7 42.46.35.5	—0.7	42.46.34.8	+0.3	42.46.35.1	9.831 9588	22.8	12.7 +	42.46.47.8	9.831 9877
								—5 1044				2138
	180.00.00.0		2 58.49.55.1	—0.7	58.49.54.4	—1.0	58.49.53.4	9.932 2956	12.7	12.7 —	58.49.40.7	9.932 2794
			4 28.53.09.4	—0.7	28.53.08.7	—0.5	28.53.08.2	9.684 0034	38.2	12.7 —	28.52.55.5	9.683 9549
			6 69.01.51.6*		69.01.51.6		69.01.51.6	9.970 2419			69.01.51.6	9.970 2419
			8 32.23.02.3	—0.7	32.23.01.6	+0.2	32.23.01.8	9.728 8312	66.4 (×2)	25.4 —	32.22.36.4	9.728 7469
			360.00.04.2					5 3721 / 5 1044	209.9		2677 / 209.9	2231
D 28.53.10.4	D 28.53.09.4							Diff. 2677				
R 105.06.28.3	R 105.06.19.3											
W 46.00.34.2	W 46.00.31.3											
	180.00.00.0											
180.00.12.9	180.00.00.0											
D 35.48.23.2	D 35.48.30.2											
S 111.48.07.5	S 111.48.27.5											
W 32.22.55.2	W 32.23.02.3											
	180.00.00.0											
179.59.25.9	180.00.00.0											
R 58.49.58.3	R 58.49.55.1											
S 42.46.47.5	S 42.46.35.5											
W 78.23.29.4	W 78.23.29.4											
	180.00.00.0											
180.00.15.2	180.00.00.0											

2677 / 209.9 = 12.7 = e

Verification:

1 46.00.30.6 —0.9   3 46.16.28.8*
2 58.49.54.4 —1.0   4 28.53.08.7   —0.5
   104.50.25.0   75.09.37.5
        25.0
   104.50.21.1   75.09.37.5
                                   37.5
5 35.48.29.5 +1.9   75.09.36.4
                          7 42.46.34.8   +0.3
6 69.01.51.6*
8 32.23.01.6 +0.2

Diff. = 3.9   Diff. = 1.1
½ Diff. = 1.9   ½ Diff. = 0.5

(*) Already adjusted. Déjà compensé.

Comparison of above results with those obtained by method described in H.D. 295.

Comparaison des résultats ci-dessus avec ceux obtenus par le procédé décrit dans la Publication H.D. 295.

	As above D'après le procédé ci-dessus	By H.D. 295 Par H.D. 295	Diff.
1	46°00'55".1	00'59".7	4".6 +
3	46 16 28 .8	16 28 .8	—
5	35 48 44 .1	48 45 .6	1 .5 +
7	42 46 47 .8	46 58 .2	10 .4 +
2	58 49 40 .7	49 37 .4	3 .3 —
4	28 52 55 .5	52 54 .1	1 .4 —
6	69 01 51 .6	01 51 .6	—
8	32 22 36 .4	22 24 .6	11 .8 —