Note on the Transit Velocities of the Guatemala Earthquake of April 19, 1902.

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In the *Proceedings of the Royal Society of London*, Vol. A 76, 1905, Mr. R. D. Oldham* gives an important discussion of the transit velocities of the Guatemala earthquake of April 19, 1902. As, however, Mr. Oldham confines himself to the velocity calculation by the "direct method," I shall here try the calculation by the "difference method" of the velocity of propagation of the 1st preliminary tremor.

The following table, which gives for the different stations the epicentral distance and the time of occurrence and the duration of the 1st preliminary tremor, is taken from Mr. Oldham's paper.

GUATEMALA EARTHQUAKE OF APRIL 19, 1902.

Station.	Epicentral Distance.	Time of occurrence. (G. M. T.)	Duration of 1st Prel. Tremor.
		h min.	min.
Baltimore	27°.8	2 30.1	5.5
Toronto	30.8	30.5	5.0
Victoria, B.C.....	43.0	31.3	5.9
Cordova, Arg.....	52.7	32.1	7.0
Mean	**38.6**	**31.0**	**5.9**
Edinburgh	77.0	36.0	9.5
Bidston (Liverpool).....	77.4	35.0	—
San Fernando	77.6	34.8	8.5

* R. D. Oldham: "The Rate of Transmission of the Guatemala Earthquake, April 19, 1902."

GUATEMALA EARTHQUAKE.—*Continued.*

Station.	Epicentral Distance.	Time of occurrence. (G. M. T.)	Duration of 1st Prel. Tremor.
	°	h min.	min.
Shide (I. of Wight)	78.8	2 35.5	11.4
Kew	79.3	36.2	9.6
Mean	**78.0**	**35.5**	**9.8**
Uccle	82.3	36.0	10.4
Hamburg	84.9	36.3	10.3
Strassburg	85.0	36.2	—
Padua	88.6	36.6	10.6
Florence	88.7	36.6	10.3
Triest	90.2	36.8	12.1
Rome	90.2	37.6	12.7
Quarto Castello	90.4	36.8	10.5
Rocca di papa	90.4	37.0	10.3
Jurjew	91.4	36.8	9.9
Ischia	91.7	37.0	10.6
Catania	93.6	36.7	—
Mean	**89.0**	**36.7**	**10.8**
Nicolajew	100.3	37.0	—
Wellington	102.5	38.0	9.0
Christchurch	104.5	37.2	10.8
Mean	**102.4**	**37.4**	**9.9**
Tokyo	110.4	38.8	15.7
Tiflis	110.7	38.2	18.3
Irkutsk	111.9	42.9	16.2
Cape Town	113.9	38.4	13.2
Mean	**111.7**	**39.6**	**15.9**
Taschkent	121.3	40.2	9.5
Calcutta	142.9	44.0	—
Bombay	144.1	43.5	22.1
Perth, W. A.	149.8	43.8	18.2
Kodaikanal	152.9	—	20.4
Batavia	160.4	43.7	24.3
Mean	**149.3*** / **151.8**	**43.8**	**21.3**

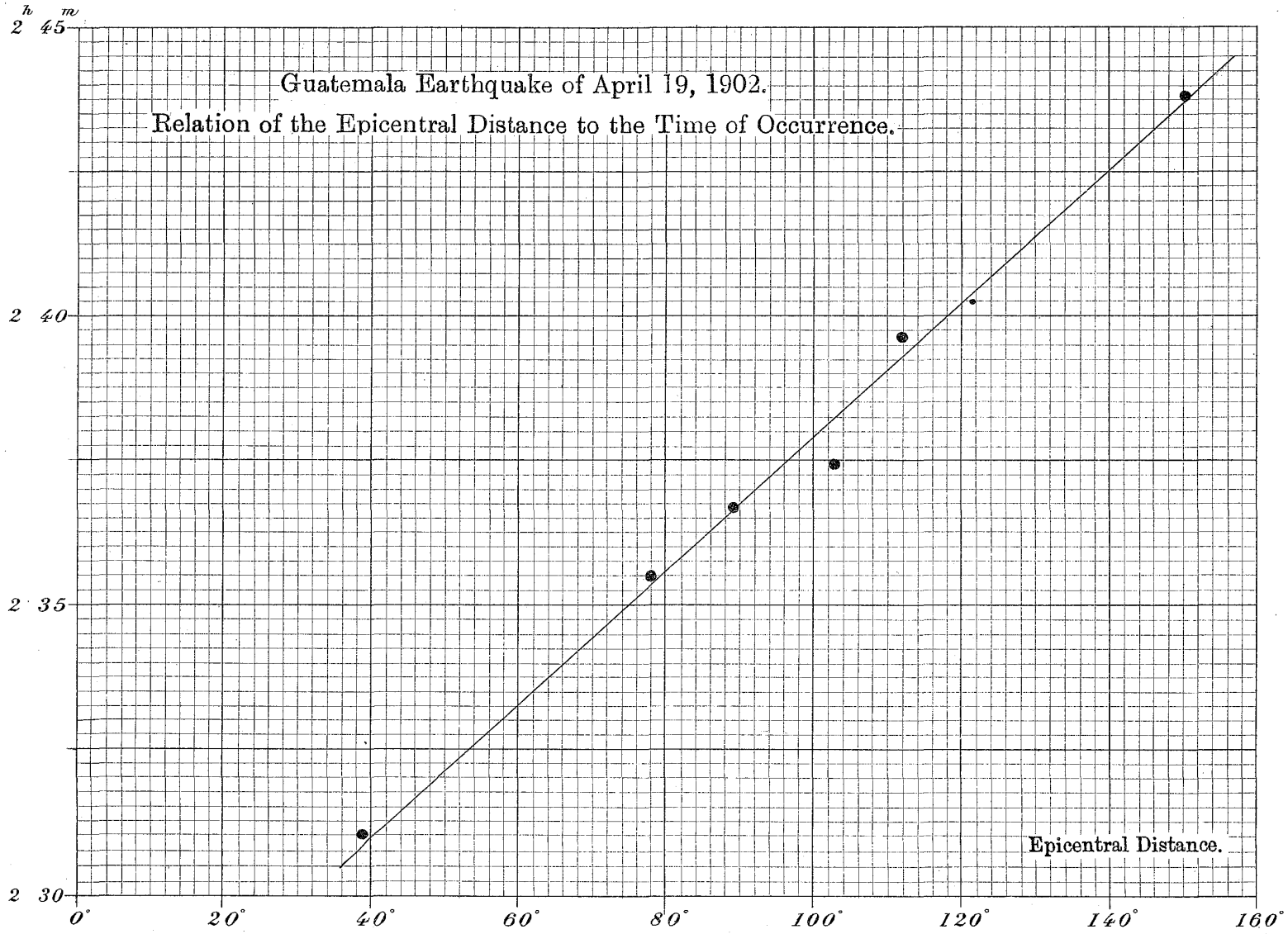
* 149.3 is the mean distance obtained by omitting Kodaikanal, and 151.8 that obtained by omitting Calcutta. These two values are to be used respectively for the time of occurrence and the duration of the 1st preliminary tremor.

I have divided the 34 stations contained in the preceding table into 7 groups, the relation between the mean values of the epicentral distance and the time of occurrence being illustrated in the accompanying figure (Pl. XIV). From the latter it will be seen that, within the limits of the distance under consideration, the time of earthquake occurrence increased linearly with the distance. Assuming, therefore, an equation of the 1st degree between the time and the distance, and calculating by the method of Least Squares, we obtain

$$v_1 = 16.02 \text{ } km. \text{ per sec.}^*$$

This value of v_1 is 2 *km.* greater than that found for the San Francisco earthquake, as given in the preceding article.

* The value of v_1 previously obtained for this earthquake by Dr. A. Imamura was 15.6 *km.* per sec.



The small dot refers to Taschkent; all the large dots refer to group means.