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Microbarograph Records of Indian observatories in association with the large Nuclear Explosion of 30 October 1961 in the U.S.S.R.

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According to newspaper reports the USSR exploded a fifty megaton hydrogen bomb on 30 October 1961 in the latest series of Russian atomic weapon tests. A number of communications have appeared (Carpenter, Harwood and Whiteside 1961, Rose, Oksman and Kataja 1961, Tandon 1961, Saha 1962) reporting the effects of this explosion on seismographs and microbarographs at various places.

2. An examination of the microbarograph records at the Indian observatories was made to see the effect of the explosion on the barograph traces. It was found that the pressure wave associated with the explosion had been registered by the microbarographs of all stations from Srinagar in the north to Minicoy in the south. Microbarograph traces of selected stations are shown in Fig. 1. Table 1 gives the times of arrival of the pressure wave and the amplitude of the first impulse as estimated from the traces. Fig. 2 gives isochrones showing the passage of the pressure wave across the Indian region.

3. The explosion took place at Novaya Zemlya at 0833 GMT on 30 October 1961. The pressure wave reached Srinagar Observatory at 1223 GMT, that is $3^h\ 50^m$ after the explosion. The great circle distance between Srinagar and the site of the explosion is about 40 degrees of arc. This gives a value of 322 metres/sec for the velocity of propagation of the pressure wave. Similar calculations between places over the Indian territory give values progressively decreasing from about 319 metres/sec in the north to 304 metres/sec in the south.

4. The microbarographs at the various Indian observatories are of more than one make and hence their sensitivities vary correspondingly. Also, very high accuracy cannot be claimed for the times given in Table 1 since no special care had been taken to synchronise with precision the clocks at the various observatories. Nevertheless it is of interest to note that the value for the velocity of propagation based on approximate calculations is found to be nearly the same as the figure of 311 metres/sec given by Rose, Oksman and Kataja (1961).

REFERENCES

Carpenter, E. W., Harwood, G. and Whiteside, T.	1961	*Nature*, **192**, p. 857.
Rose, G., Oksman, J. and Kataja, E.	1961	*Ibid.*, **192**, pp. 1173-1174.
Saha, B. P.	1962	*Indian J. Met. Geophys.*, **13**, 2, p. 232.
Tandon, A. N.	1961	*Ibid.*, **12**, 4, p. 604.

TABLE 1

Time of arrival and amplitude of pressure wave due to Nuclear Explosion on 30 October 1961

Station	Latitude (° 'N)	Longitude (° 'E)	Time of arrival of pressure wave (GMT)	Approximate amplitude of first impulse (mb)
New Delhi	28 35	77 12	1303	0·3
Jodhpur	26 18	73 01	1311	0·3
Srinagar	34 05	74 50	1223	0·3
Lucknow	26 45	80 53	1318	0·3
Jaipur	26 49	75 48	1316	0·3
Allahabad	25 27	81 44	1333	0·4
Barmer	25 45	71 23	1309	0·4
Pathankot	32 14	75 38	1239	0·3
Calcutta (Alipore)	22 32	88 20	1352	0·3
Calcutta (Dum Dum)	22 39	88 27	1354	0·5
Bhubaneswar	20 15	85 50	1401	..
Gopalpur	19 16	84 53	1406	0·3
Saugor Island	21 39	88 03	1359	0·5
Jamshedpur	22 49	86 11	1349	..
Port Blair	11 40	92 43	1458	0·2
Sriniketan	23 39	87 42	1343	0·3
Asansol	23 41	86 59	1337	0·3
Shillong	25 34	91 53	1339	0·4
Mohanbari	27 29	95 01	1331	0·5
Gauha'i	26 05	91 43	1333	0·5
Gaya	24 45	84 57	1337	..
Nagpur	21 06	79 03	1343	0·4
Bombay (Colaba)	18 54	72 49	1355	0·3
Bombay (Santacruz)	19 07	72 51	1355	0·3
Veraval	20 54	70 22	1341	0·3
Ahmedabad	23 04	72 38	1331	0·3
Baroda	22 18	73 15	1334	0·3
Bhavnagar	21 45	72 11	1339	0·3
Chikalthana	19 51	75 24	1349	0·2
Poona	18 32	73 51	1357	0·3
Kutch Mandvi	22 49	69 16	1333	0·5
Ratnagiri	16 59	73 20	1408	0·1
Madras (Meenambakkam)	13 00	80 11	1428	0·3
Bangalore (Central Obsy.)	12 58	77 35	1431	0·4
Visakhapatnam	17 43	83 14	1410	0·4
Gannavaram	16 32	80 48	1420	0·2
Begumpet	17 27	78 28	1408	0·4
Tiruchirapalli	10 46	78 43	1444	0·2
Trivandrum	08 29	76 57	1500	..
Kodaikanal	10 14	77 28	1450	..
Minicoy	08 18	73 00	1458	0·3

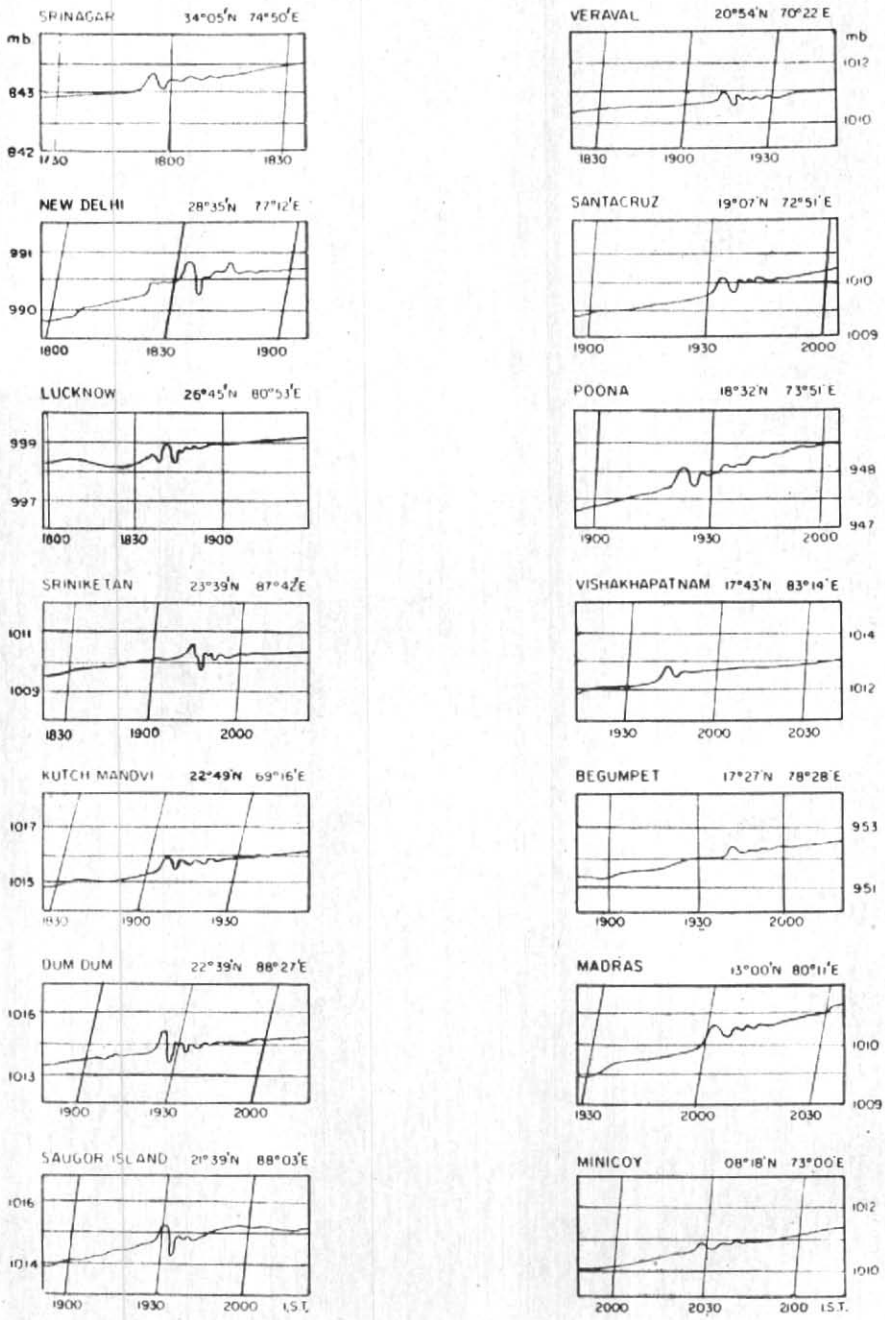

Fig. 1. Microbarograms of Indian observatories associated with the large Nuclear Explosion on 30 October 1961

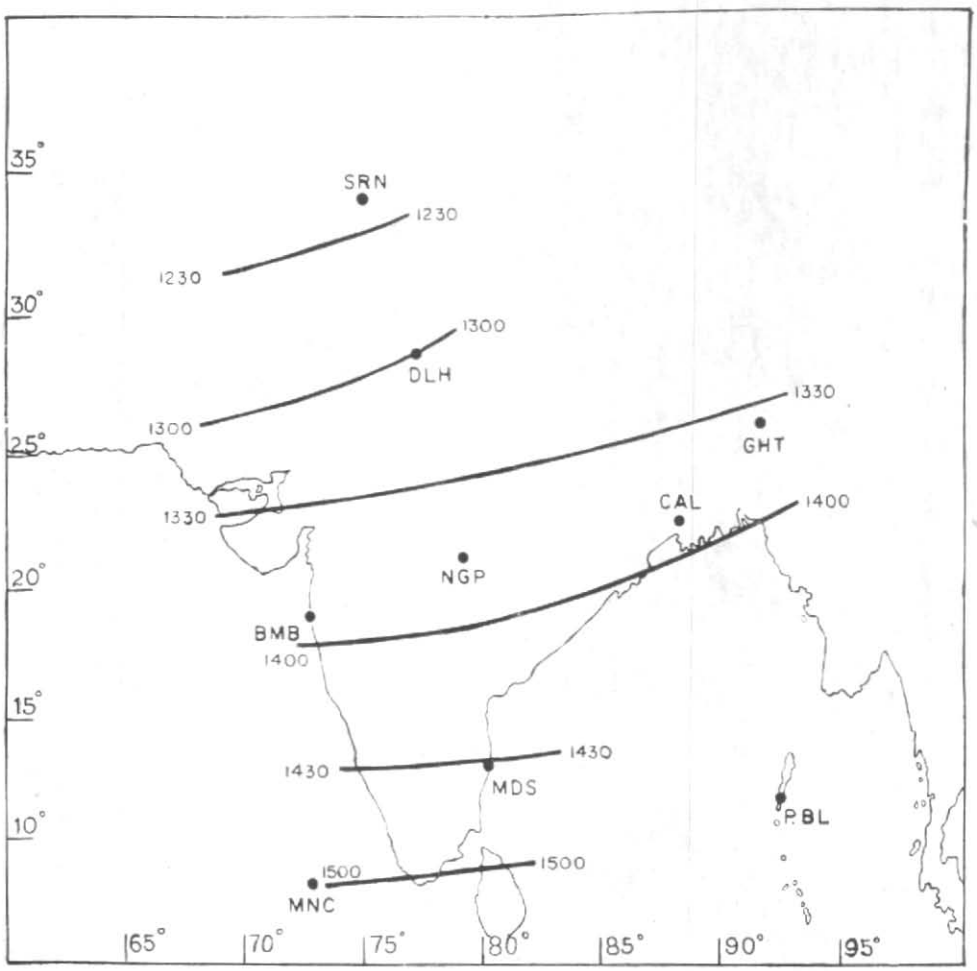

Fig. 2. Isochrones showing the passage of pressure wave due to the large Nuclear Explosion on 30 October 1961

(Time in GMT)