

PROLONGED COLD SPELL AT POONA IN DECEMBER 1970

1. An unusual weather event that took place in December 1970 was a prolonged cold spell around Poona which caused considerable inconvenience to the people of Poona City and Madhya Maharashtra in general and affected the crops in the area.

According to the standard procedure followed in describing departures from normal of minimum temperatures during the winter season, they are stated to be appreciably below normal if they are 3°C or more below normal. If the departures of minimum temperature are 6°C or 7°C below normal the situation is described as a “Moderate Cold Wave” condition and if the departures are 8°C or more below normal “Severe Cold Wave” conditions are stated to exist. In November-December 1970 the minimum temperatures at Poona were appreciably below normal for a continuous spell of 26 days as shown in Table 1, for a good part of which it was in the category of a moderate cold wave. In an effort to examine how frequently such cold spells have been occurring at Poona at this time of the

TABLE 1

Departure from normal (°C) of minimum temperature at Poona

Date 1970	Dep. (°C)	Date 1970	Dep. (°C)	Date 1970	Dep. (°C)
		Nov		Dec	
25	3	3	6	12	5
26	3	4	6	13	6
27	3	5	6	14	5
28	4	6	6	15	5
29	4	7	5	16	4
30	6	8	6	17	3
		Dec		18	4
1	6	10	7	19	4
2	6	11	6	20	4

year and the duration of such spells in the past, the minimum temperature data of Poona for the period 15 November to 31 December for the years 1880 to 1970 were collected and analysed.

2. The frequencies of the lowest minimum temperature recorded at Poona during December

TABLE 2
Frequencies of the lowest minimum temperature ($^{\circ}\text{C}$) recorded at Poona during December (1880-1970)

Lowest Min. temp. ($^{\circ}\text{C}$)	Years of occurrence	Total No. of years
3	1968	1
4	1940, 1970	2
5	1936, 1945	1
6	1883, 1897, 1905, 1908, 1922, 1926, 1928, 1930, 1934, 1937, 1938, 1942, 1964, 1966	14
7	1881, 1885, 1887, 1889, 1895, 1902, 1903, 1907, 1910, 1915, 1916, 1920, 1932, 1939, 1941, 1943, 1948, 1969	18
8	1884, 1886, 1888, 1891, 1893, 1901, 1904, 1906, 1914, 1917, 1919, 1929, 1931, 1933, 1935, 1947, 1949, 1950, 1951, 1953, 1954, 1959, 1960, 1965	24
9	1890, 1892, 1898, 1899, 1909, 1912, 1921, 1924, 1925, 1944, 1956, 1963	12
10	1882, 1894, 1896, 1913, 1923, 1927, 1952, 1955, 1961, 1962	10
11	1880, 1900, 1911, 1918, 1958, 1967	6
12	1946, 1957	2

for the period 1880 to 1970 are shown in Table 2. It may be seen that only in three out of the 91 years concerned, have temperatures of 4°C or below been recorded at Poona during this month. The lowest temperature of 3.6°C recorded on the 11th of December 1970 was exceeded only once in the entire period which was on the 27th of December 1968. It is also significant that the lowest temperature in 1970 was recorded earlier in the month as compared to that in 1968.

The cold spells that have been occurring over Poona during this part of the year have been of varying durations. For two categories (one in which the minimum temperatures were 3°C or more below normal and the other in which they were 6°C or more below normal) the frequencies of occurrence of cold spell of varying durations

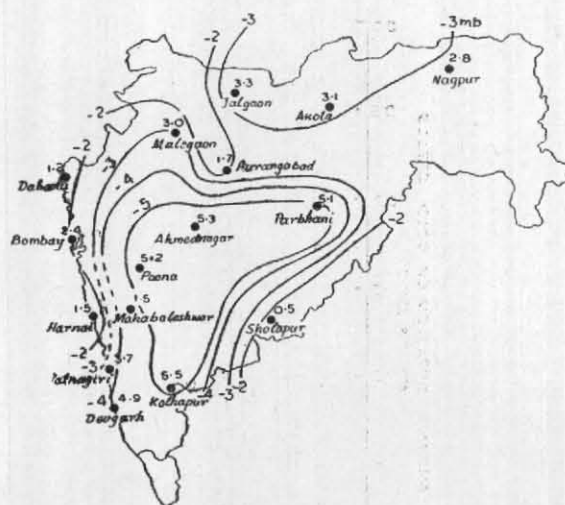


Fig. 1

Mean vapour pressure deficits (mb) over Maharashtra (1-20 Dec 1970)

(from 1 to 26 days) have been shown in Table 3. It is noteworthy that the longest spells in both categories, *i.e.*, 26 days for minimum temperature departures -3°C and above and 7 days for minimum temperature departure -6°C and above were both in 1970 in the month of December, primarily. This persistent cold spell was a record as seen from the data of the past 90 years. It is interesting to note in this connection that in a study on the persistence of abnormally cold days at Poona based on data from 1901 to 1950 Srinivasan (1956) has concluded that the persistence is higher in December than in January.

The duration of spells each year when the minimum temperatures were continuously 3°C or more below normal are shown in the Figure 2. As against 26 days in 1970, the longest spells in previous years of any significance were only 16 days in 1939 and 15 days in 1910.

The cold wave conditions were mainly felt in the central parts of the country. In the absence of a definite indication of regular incursion of cold air from northern latitudes the persistence of cold conditions in these parts could be attri

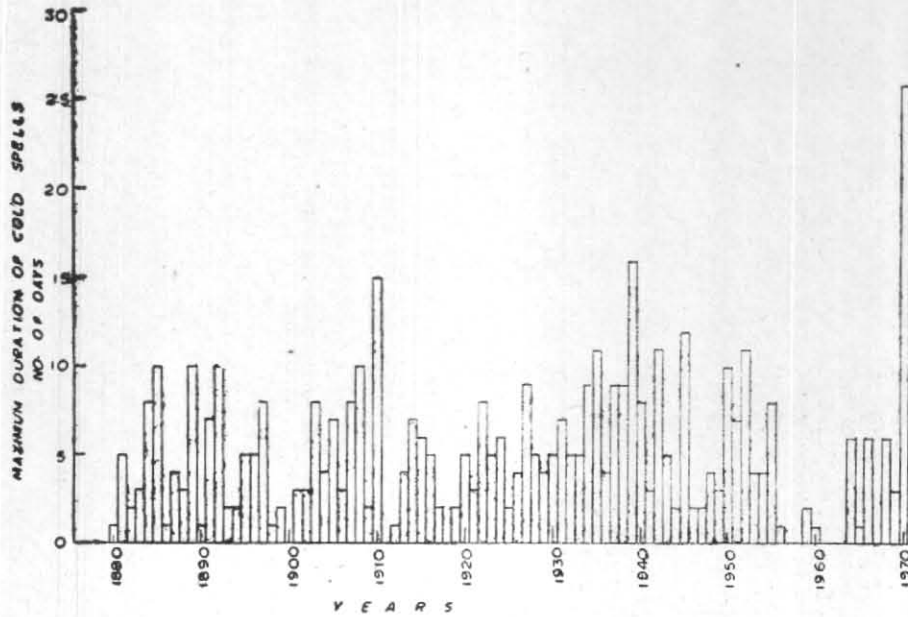


Fig. 2

TABLE 3
Duration of spells

Temp. (°C)	No. of spells		No. of days															
	Occasions		1	2	3	4	5	6	7	8	9	10	11	12	15	16	19	26
3	228		79	46	26	23	13	5	7	9	5	5	4	2	1	1	1	1
6	17		17	10	3	1	3	—	—	1	—	—	—	—	—	—	—	—

buted to the trapping of comparatively dry air in the area and radiation cooling effects. That a pool of dry air was existing over Madhya Maha-

rastra from 1st to 20th December 1970 may be seen from the mean vapour pressure deficit shown in Figure 1.

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REFERENCE

T. R. Srinivasan 1956 *Indian J. Met. Geophys.*, 7, p. 48.