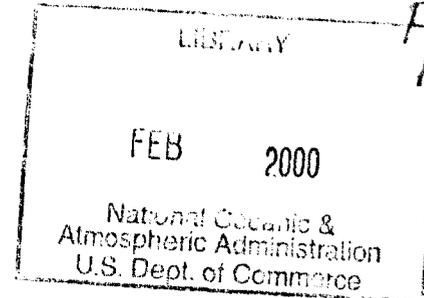


INDIA WEATHER REVIEW, 1935.

ANNUAL SUMMARY.

PART B.

SNOWFALL.



This part contains a summary of the reports of snowfall in the mountain regions to the north and northwest of India. These reports are collected by local officers from the local residents, headmen of villages, or from travellers who have passed through the region, and are then transmitted to this office.

The amount of snowfall is usually measured by finding the depth of undisturbed snow lying on the ground and such measurements are given in feet and inches. At places provided with raingauges the amount of snow collected in the gauge is melted and measured as rain and the amounts are given in inches and decimals of an inch.

Cold weather period, January and February.

I.—AFGHANISTAN.

Kabul.—Snow fell in Kabul and its neighbourhood almost every week during January and February and remained on the ground till the end of February. Snowfall in Afghanistan is reported to have been very heavy this year.

II.—BALUCHISTAN.

Quetta.—At Quetta light snow or sleet fell on several days in each of the months January and February. The precipitation is reported to have been slightly below normal in January and considerably above it in February.

III.—NORTH-WEST FRONTIER PROVINCE.

(a) *Hazara.*—Snow is reported to have fallen on about fourteen days in January and twelve days in February. The amounts both in January and February were above normal; the snowline is said to have descended to 2,800 ft. in January and risen to 4,000 ft. in February. The accumulations were above normal at the end of January and about normal at the end of February.

The following table gives the approximate total depths of falls in each month and the depths of accumulation at the end of each month :—

Locality.	JANUARY.		FEBRUARY.	
	Falls.	Accumulations.	Falls.	Accumulations.
	Ft.	Ft.	Ft.	Ft.
Narang	11	7	8	7½
Pludran	10	6	5	6
Kagan	8½	5	3	3
Jared	3	¼	¼	..
Malakandi	¾	¼	¼	..
Sundigali	12½	3	2	1½
Jachha	10½	3	2	1
Thandiani	10	6½	5½	4
Dungagali	9½	9	4	4
Birangali	2½	2½	¼	..

(b) *Dir, Swat and Chitral.*—No information was received.

(c) *Khyber Agency.*—Snowfall in January and February was heavier than usual on all hills over 5,000 ft. above sea-level. Snow fell and lay to a depth of 3 in. at Landikotal (3,600 ft.) on January 29th.

(d) *Kohat.*—Fort Lockhart had about 3 ft. of snow in January and 1 ft. in February.

(e) *Waziristan.*—In North Waziristan, snowfall on the hills, specially on Masdak and Shoidar, was heavier than usual. No information was received from South Waziristan.

(f) *Dera Ismail Khan.*—The snowfall on the Suleiman range was above normal, and the accumulations were consequently deeper than usual.

IV.—KASHMIR.

(a) *Skardu.*—Snow fell at the station and on the neighbouring peaks on about eleven days in January and eight days in February. The falls were heavy and the accumulations at the end of each month are also reported to have been deeper than usual, being estimated at 7 ft. at the end of January and 10 ft. at the end of February.

(b) *Dras.*—Two heavy snow storms were reported in January and three in February. The snowfall for the season was above normal. The accumulations at the Zojila and Mushkoo passes are estimated at 15 ft. at the end of either month, which is much above the average.

(c) *Srinagar.*—Frequent light to moderate, and a few heavy falls of snow were received both in the mountains and in the main valley during January and February. The amounts were above normal in January and nearly normal in February. The accumulations on the surrounding mountain ranges were said to be normal at the end of both January and February.

(d) *Kargil.*—Snow fell on nine days in each of the months January and February. Snow lay in the passes to an estimated depth of 15 ft. at the end of January and 20 ft. at

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the end of February. The snowfall for the season, as well as the accumulations, were above normal.

V.—PUNJAB.

(a) *Rawalpindi*.—Snow fell on eleven occasions in January and on four occasions in February at Murree and on the neighbouring peaks. The snowfall was very heavy in January, amounting to about 9 ft. at Murree.

(b) *Kulu (Kangra District)*.—On the high ranges of the Himalayas in the Kangra and Palampur tahsils there were heavy falls beginning with the second fortnight of January. In the Kulu subdivision there was also heavy snowfall in places above 3,000 ft. The accumulations appear to have been deeper than usual.

(c) *Kilba (Simla District)*.—There were four heavy falls in January and two in February. Snowfall was much above normal. The snowline descended to about 5,500 ft. in January and rose to 7,500 ft. in February. The accumulations were stated to be above normal at the neighbouring passes.

Hot Weather Period, March to May.

I.—AFGHANISTAN.

Kabul.—Snow fell on the 13th and 14th March; it was light in Kabul, but was heavy on the hills. The high mountains were covered with thick snow until May.

II.—BALUCHISTAN.

Quetta.—The hills surrounding Quetta had the usual amount of snow for the season. On a number of days in April, though Quetta had rainfall only, the hills had a fairly good amount of snowfall. Some snow was lying on the high peaks up to the first week of May.

III.—NORTH-WEST FRONTIER PROVINCE.

(a) *Hazara*.—Snowfall was observed on the surrounding hills on eleven days in March, the total fall being above the average. The accumulation at the end of the season was about the average.

(b) *Dir, Swat and Chitral*.—Snow fell on the high ranges and passes during May. Accumulations at the end of the period were reported to be far above normal in all the parts of this region.

(c) *Khyber Agency*.—Occasional falls of snow occurred during March, the final fall being on the 13th-14th. There were considerable accumulations on the high mountains till later than usual, but the passes were open in May.

(d) *Kurram*.—No reports were received for March and April. In May falls of snow occurred on the hills in the first and third weeks. The accumulations on the peaks of the Safed Koh at the end of the period were above the average.

(e) *Kohat*.—A light snowfall of about $\frac{1}{2}$ in. is reported from Fort Lockhart in April.

(f) *North Waziristan*.—Snowfall on the hills is reported to have been heavy. The last fall was about the middle

VI.—UNITED PROVINCES.

(a) *Almorah*.—Snowfall is reported to have been heavy in January in the various localities of the district and the accumulations at the end of the month were above normal. In February the falls did not exceed the normal.

(b) *Garhwal*.—Snowfall in the higher valleys of the district amounted to a total depth of $2\frac{1}{2}$ ft. in January and 2 ft. in February.

VII.—ASSAM.

(a) *Kamrup*.—Except for a little snowfall on the Poonakha route there was no snowfall in the district. Snowfall was reported as below the average for the season.

(b) *Sadiya Frontier Tract*.—Snowfall was lighter than usual.

(c) *Baliapara Frontier Tract*.—Falls of snow not exceeding 2 ft. are reported to have occurred on the Pankim La and Piri La passes.

of April. The gorges continued covered with snow till the end of May.

(g) *South Waziristan*.—No reports were received for March and April. There was no snowfall in May. The accumulated snow drifts above 9,000 ft. remained longer than usual.

(h) *Dera Ismail Khan*.—Snowfall on the Suleiman range was reported to be heavy; owing to this and to cooler weather than usual, accumulations of snow are reported to have lasted about a month longer than usual.

IV.—KASHMIR.

(a) *Skardu*.—Snow fell on three days in March, one day in April and four days in May. The snowfall is reported to have been above the average in March and May, less than the average in April, and above average for the season as a whole. The depths of snow on well-known peaks were estimated at 13 ft. at the end of March, 8 ft. at the end of April and 5 ft. at the end of May.

(b) *Dras*.—Snowstorms occurred on the neighbouring passes and mountains on four days in March, one day in April and two days in May. The amounts were above normal in March and below normal in April and May. On the Mushkoo and Zojila passes deep accumulations of about 12 ft. are reported at the end of March and April; and of 7 ft., which is slightly above normal, at the end of May.

(c) *Srinagar*.—A few moderate to heavy falls occurred on the surrounding mountains in the second half of March and the first half of April, and several light falls during the same period and also during May. According to the reports, snowfall amounts were above normal in March, normal in April and below normal in May. The snow accumulations at the end of the period were estimated to be above the average.

(d) *Kargil*.—Moderate to heavy falls of snow occurred on seven days in March and light falls on two days in April.

In May there was no snowfall. For the season as a whole the snowfall was heavier than usual. Accumulations on the Zojila pass are reported as about 12 ft. at the end of March and above normal at the end of May.

(e) *Sonamarg*.—No reports were received for March and April. In May there were a few light falls of snow on the mountains only. Accumulations at the end of May on the passes amounted to about 8 ft. which is much greater than the normal depth.

(f) *Leh*.—No information was received for March and April. There was no snow in May. The passes were open a month earlier than usual and the snowline was reported to have retreated to a level of 15,000 to 16,000 ft. at the end of the period.

V.—PUNJAB.

(a) *Rawalpindi*.—There were two light snow-storms in March-April on the Murree peaks. Snow melted away before the end of the latter month.

(b) *Chamba*.—There were occasional light falls of snow during the period on elevations above 11,000 ft. Accumulations of snow on well-known passes and peaks at the end of the period were much above the average.

(c) *Kulu (Kangra District)*.—Falls of snow occurred at elevations above 6,000 ft. in March, and above 7,000 ft. in April. The accumulations at the end of the season at the Rohtang and Hampta passes were about 8 ft. and were above normal.

South-West Monsoon Period, June to September.

JUNE AND JULY.

I.—AFGHANISTAN.

Kabul.—The Paghman range had one heavy fall of snow on the 25th June; there were two heavy falls during this month, on the 15th and the 16th, on the northern slopes of the Shibar pass and on the mountain ranges to the north of the Hindu Kush. The snowfall was heavier than usual in June. The accumulations at the end of the season were, however, about normal.

II.—NORTH-WEST FRONTIER PROVINCE.

(a) *Hazara*.—The amount of snowfall during the two months was estimated as equivalent to a total depth of 8 in. at elevations of 17,500 ft.; localities at lower altitudes reported lesser amounts, down to light falls only at 10,000 ft. The accumulations at the end of July ranged from 9 in. at 10,000 ft. to 5 ft. 6 in. at 17,500 ft.

(b) *Dir, Swat and Chitral*.—Chitral and Malakand reported snowfalls in June at heights over 10,000 and 18,000 ft. respectively. There was no snow in Drosh. The accumulations at the end of the season were reported as deeper than usual owing to cooler weather.

(c) *Khyber Agency*.—There was no snowfall in the neighbourhood of Tirah. As usual, snow existed at the end of the season on the tops of the Gurdama, Adina and Malaka peaks.

(d) *Kilba (Simla District)*.—Snow fell on five days in March and on thirteen days in April. Except for one light fall at Kilba, snowfall was confined to elevations of 8,000 ft. and above. In May snow fell on two days and was confined to elevations above 11,000 ft. The snowfall of the period was heavier than usual; and the accumulations at the end of each month were reported to be much above the normal. The passes continued to be blocked till the end of May.

VI.—UNITED PROVINCES.

(a) *Almorah*.—The snowfall was heavier than the normal. The estimated depth of accumulations on the Nuwe pass and other passes of the district were much above the average throughout the season.

(b) *Garwhal*.—No information was received about the snowfall of March and April; there was no fall in May. The snow accumulations at the end of May were reported to be above the average.

VII.—ASSAM.

(a) *Kamrup*.—No snowfall appears to have occurred during March and April. The Tasigong and the Poonakha routes were both free from snow.

(b) *Sadiya Frontier Tract*.—The only information which can be gathered from the report received is that the snowfall if any, and the accumulations, were much less than usual.

(c) *Baliapara Frontier Tract*.—No snowfall occurred during the period and there were no accumulations by the end of April.

(d) *Kurram*.—There were no snowfalls in the valley and the adjacent region. The accumulations on the peaks of the Safed Koh were above normal.

(e) *Waziristan*.—No report was received from North Waziristan. There was no snowfall in South Waziristan.

III.—KASHMIR.

(a) *Skardu*.—There were three falls of snow in June and two in July. The snowline was reported to have descended down to 11,000 ft. during the season; at the end of the season there was some snow lying on the ground only at elevations above 12,000 ft.

(b) *Dras*.—There were two snowfalls in June on the Zojila and Mushkoo passes, but no fall in July. The accumulations at the end of the season were about normal.

(c) *Srinagar*.—No snow fell either in June or in July. The accumulations at the end of the season, in particular on the Pir Panjal range, were greater than usual.

(d) *Gulmarg*.—Several light to moderate falls of snow were observed on the Afarwat mountains in June and one light fall in July. Accumulations in the gorges and on the sides of the Handibal and the Afarwat mountains were about normal.

(e) *Kargil*.—Light falls occurred in the mountains. The depth of accumulations at the passes is reported as about 2 ft. at the end of June and a few inches only at the end of July.

(f) *Sonamarg*.—No snow fell in either month. The depth of snow on the Zojila and the Dachinur passes was reported as about 3 ft.

(g) *Leh*.—One snowfall was reported in July. Accumulations melted earlier than usual; all the passes were free of snow before the end of July.

IV.—PUNJAB.

(a) *Chamba*.—There were two falls of snow in June and one in July. Accumulations existed at altitudes down to 10,000 ft. and their average depth was estimated to be above normal.

(b) *Kulu (Kangra District)*.—There was no snowfall in the populated areas. Some snowfall was observed in June only at altitudes above 10,000 ft.

(c) *Kilba (Simla District)*.—Light snowfall was observed at altitudes above 15,000 ft. once only, in June. There was no snowfall in July. The accumulations, however, were reported as deeper than usual.

V.—UNITED PROVINCES.

(a) *Almorah*.—The snowfall at the principal localities, namely, Byans, Chaudans, Malla Danpur, Malla Johar and Malla Dharma appears to have been fairly heavy in either month, according to the reports of the patwaris. The accumulations at the passes were reported to be deeper than usual at the end of July.

(b) *Garhwal*.—Snowfall was observed in June only at altitudes above 11,500 ft. The amount was estimated as equivalent to a total depth of not more than 6 inches.

AUGUST AND SEPTEMBER.

I.—AFGHANISTAN.

No reports were received.

II.—NORTH-WEST FRONTIER PROVINCE.

No reports were received, except from the Kurram Valley, where no snowfall occurred in either month.

The Retreating Monsoon period, October to December.

I.—AFGHANISTAN.

Kabul.—No snow fell in Kabul. Snow is reported to have fallen thrice in November and December on the Paghman hills and on the Hindu Kush ranges. Only one of these was moderately heavy. Snowfall for the season was below normal.

III.—KASHMIR.

(a) *Skardu*.—Two light falls of snow were reported in August and three in September, at elevations above 10,000 ft. The amount was about the average. The snowline is said to have descended lower than is usual in this season.

(b) *Dras*.—There was no snowfall in August; in September there were three falls, the amounts on each occasion being about 3 in. on the passes and 6 in. on the higher elevations. The amount for the season was about normal. There was no snow at the Zojila and the Mushkoo passes at the end of either month.

(c) *Srinagar*.—There was no snowfall in August; in September there were two falls. The amount for the period was about the average. Some accumulations of snow existed on the surrounding mountains at the end of August, but only a very thin layer remained at the end of September.

(d) *Gulmarg*.—One light fall of snow was observed on the mountains in August and one light and three moderate falls in September, the moderate falls descending down to the Khelanmarg. The total amount was about the average. The accumulations on the Afarwat and the Handibal ranges at the end of the period were thin as usual.

(e) *Kargil*.—There was no snowfall in August; in September snow fell only at the higher levels. The accumulations at the passes were estimated as about $\frac{1}{2}$ ft. which is less than the average.

IV.—PUNJAB.

Kilba (Simla District).—No snowfall occurred in August; several falls occurred at high elevations towards the end of September, the snow descending down to the level of 11,000 ft. The amount for the season was above the average. There was very little snow left on the passes at the end of August, but most of the well-known passes had a cover of snow at the end of September, and the Charang pass was blocked.

V.—UNITED PROVINCES.

Almorah.—Snowfall occurred in both the months. The total snowfall for the season was more than the average. The accumulations at the passes were also deeper than usual at the end of either month.

II.—BALUCHISTAN.

Quetta.—Light snowfall was observed on the surrounding mountains once in November and once in December.

III.—NORTH-WEST FRONTIER PROVINCE.

(a) *Hazara*.—No report was received for October and November; presumably the winter snowfall began, as usual,

only in December. The following table gives the total depth of falls during December and the accumulations at the end of the month, as estimated by the villagers :—

Locality.	Falls.	Accumulations.
	Ft.	Ft.
Narang	4½	2½
Pludran	3	2
Kagan	3½	1
Jared	1½	Nil
Malakandi	1	Nil
Sundigali	3½	½
Jachha	3	½
Thandiani	2½	1
Dungagali	2	1½
Birangali	½	Nil

Snowfall was above the average in the inner hills and below normal in the outer hills.

(b) *Dir, Swat and Chitral*.—A report was received only from Drosh, which reported a fall of about 8 in. depth on the surrounding hills in October and a fall giving about 1 in. depth at Drosh in December. The higher peaks were covered with snow, but the lower hills were free from snow at the end of December.

(c) *Khyber Agency*.—No snow fell in November. Falls estimated as equivalent to a total depth of 1 ft. were observed on the peaks of Adina, Gurdama and Malaka in December.

(d) *Kurram*.—Snowfall occurred between the 23rd-25th in October, 12th-14th in November and between the 4th-5th and 9th-12th in December. The amount for the season appears to have been below normal. The accumulations at the end of the season were reported as below the average.

(e) *Kohat*.—Fort Lockhart reported 9 in. of snowfall in December.

(f) *Waziristan*.—No report was received from North Waziristan. South Waziristan reported light falls at elevations between 6,000 to 11,000 ft. during December.

IV.—KASHMIR.

(a) *Skardu*.—Snowfall was observed on the surrounding mountains on three days in October, five days in November and eight days in December. Six of the falls in December extended down to the station itself. The amount of the snowfall for the season appears to have been normal, or slightly above it. The accumulations at the higher levels at the end of the period were estimated as 3 to 5 ft. deep.

(b) *Dras*.—There were two snowfalls in October, four in November and seven in December. The falls were light to moderate except on the 25th November, when it was heavy and snow lay to a depth of 2½ ft. The total fall of the season

was said to be above normal. On the Zojila and Mushkoo passes the accumulations at the end of the season were estimated as about 9 ft. which is above normal.

(c) *Srinagar*.—The first falls of the season were observed in the mountains in the second week of October. November and December had several moderate to heavy falls in the mountains. Srinagar itself had two falls on the 7th and 8th November, an early date for snowfall in the valley. The amounts were about normal in October and December and above normal in November.

(d) *Kargil*.—There was one light fall of snow over the passes in October. Three falls occurred in each of the months November and December in Kargil itself. The depth of the accumulations at the end of the period was estimated at 6 ft. on the higher peaks and passes.

(e) *Sonamarg*.—Frequent light falls of snow occurred in October and November.

(f) *Gurez*.—Light falls were reported in November and December.

(g) *Leh*.—Several light falls occurred in Leh during the period. The passes were open.

V.—PUNJAB.

(a) *Kulu (Kangra District)*.—In the Kulu tahsil there were two falls, one in November and one in December, the snowfall extending down to places at 4,500 ft. level. In Saraj one heavy fall occurred in places down to the level of 5,500 ft. Accumulations existed towards the end of December at altitudes above 6,000 and 7,500 ft. respectively in Kulu proper and in Saraj.

(b) *Kilba (Simla District)*.—Snow-storms were observed on the Kilba Kailas range, at elevations of 10,000 ft. and above, for the first time on the 2nd of October, an early date for snowfall in the region; snow fell on three more occasions in this month. November had three light to moderate falls, between the 6th and the 9th, at places down to 8,500 ft. level. In December there was light snowfall from the 5th to 10th, and the snowline descended to 8,000 ft. The fall was somewhat heavier than usual in November, but the amount for the season as a whole was below the average. The accumulations at the passes were estimated at 2 to 3 ft. The passes, except the Charang pass, which was closed, were open until towards the end of December.

VI.—UNITED PROVINCES.

(a) *Almorah*.—Light to moderate falls were reported from Malla Darma, Chaudans and Malla Johar and heavy falls from Malla Danpur. The accumulations at the passes appear to have been about normal.

(b) *Garhwal*.—There was one moderately heavy snowfall in each of the three months, October to December. The falls were confined to the mountains and the higher valleys in the north of the district.

VII.—ASSAM.

(a) *Kamrup*.—There was no snowfall at the station or on the Tasigong and Poonakha routes. The depth of the snowfall on the nearer hills is reported to have been about $1\frac{1}{2}$ ft. The snowfall of the season was below the average.

(b) *Sadiya Frontier Tract*.—There was some snowfall in the Mishmi and Abor hills at elevations above 8,000 ft. The accumulations are estimated at about 2 ft. at this height. Both the snowfall and the accumulations are about the average.

Summary.

Cold Weather Period, January and February.—Falls and accumulations were generally above average in the north-western Himalayas and neighbouring regions and below it in Assam.

Hot Weather Period, March to May.—Snowfall for the period as a whole was generally about the average, or slightly above, except in Assam where it was less than the normal. Accumulations were above normal throughout the Western Himalayas, being heavy in the Punjab ranges.

South-west Monsoon Period, June and July.—Snowfall was mostly confined to elevations above 10,000 ft. and its amount was generally below the average. The accumulations, however, were in general not far from the average.

South-West Monsoon Period, August and September.—Snowfall was about normal in Kashmir and the Punjab, and above normal in the United Provinces. Elsewhere there was hardly any snow. The accumulations at the end of the period were generally below normal, except in the United Provinces, where they were above the average.

Retreating Monsoon Period, October to December.—Snowfall for the period was not far from the normal in Kashmir, and the United Provinces. Elsewhere it was below normal. The accumulations at the end of the period were generally about the normal.

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