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INDIA WEATHER REVIEW, 1943

ANNUAL SUMMARY

PART B

SNOWFALL

CONTENTS

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ANNUAL SUMMARY.

PART B.

SNOWFALL.

This part contains a summary of the reports of snowfall in the mountain regions to the north and north-west 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 amountof snowfall is usually measured by finding the depth of undisturbed snow lying on the ground. The measurements are given in feet and inches. At places provided with raingauges, the snow collected in the gauge is melted and measured as rain; this is indicated in the text and the amounts are given in inches and cents.

Cold Weather Period, January and February.

I.—Afghanistan.

Kabul.—Snow fell on ten days in January to a total depth of about 3 ft. at Kabul. Two of the falls were heavy. Two light falls occurred in the first fortnight of February amounting to a depth of 5 inches. Falls were reported to be below normal and accumulations about normal.

II.—Baluchistan.

Quetta.—Very heavy snow fell almost continuously for 24 hours from 9 p.m. of the 10th January, giving a total of 2 ft. of snow on the ground. This fall is said to be the heaviest recorded in 24 hours in the last 10 to 12 years. Four other falls occurred during the month to a total depth of 8 inches. The months fall was above normal. During February there was only one light fall confined to the hills, and the total of the month was below normal.

III.—North-West Frontier Province.

(*a*) *Hazara.*—Falls occurred on several days during the period above an elevation of 4,000 ft. Approximate total depths of falls and accumulations at the end of each month are given in the following table. Falls and accumulations were above normal in January and slightly below normal in February.

Locality.	Elevation.	January.		February.	
		Falls.	Accumulations.	Falls.	Accumulations.
	Ft.	Ft.	Ft.	Ft.	Ft.
Unaridge	10,500	15½	11	..	..
Phalkot	9,000	11¾	8	6¼	4
Thandiawi	8,800	11½	7	5	3½
Dungagali	8,000	28	8¾	5½	4
Narang	8,000	24¾	8	8½	3
Kalabagh	7,900	26½	8¾	4½	3
Paludran	7,500	18¾	7	6¾	1½
Sundigoli	7,000	8½	7	..	..
Kagan	7,000	14¾	4	4¾	¼
Birangali	6,600	7	3	3¾	2
Jared	5,000	6	2	2¾	..
Malkandi	4,450	4¼	1	2¼	..

(*b*) *Dir, Swat and Chitral.—Drosh.*—Snow fell at the station on five days in each of the months amounting to 20 in. and 9 in. respectively. On the Lowarai pass and Madaglasht hills snowfall amounted to 8 to 10 ft. in January and was fairly heavy in February also, the falls being more frequent than at the station. About 6 to 8 ft. of snow was still present on the hills at the end of the period. Both falls and accumulations were normal during the period.

Malakand.—Snow is reported to have fallen on six days in January to an aggregate depth of about 3¼ ft. Two of the falls were very heavy giving about 10-12 ft. of snow on each occasion. Falls and accumulations were about the average. Approximate depths of snow at the end of January at some localities are given below. No report has been received for the month of February.

Locality.	January.
	Accumulations.
	Ft.
Lowarai	38
Bashkar	40
Mankyal	41
Ilam and Dwa Sarai	34
Hindu Raj	33

(*c*) *Khyber Agency.*—In Tirah, snowfalls occurred on two occasions in January to a total depth of 2½ ft. in the plains and of 5 ft. in the hilly tracts. One snow storm which occurred in the first week of February gave 1½ ft. of snow in the plains and 2½ ft. in the hills. No snow fell at Landi Kotal.

(*d*) *Kohat.*—Snow fell on seven days in January at Fort Lockhart to a total depth of about 18 inches. The falls were below normal, and the snowline was above 9,000 ft.

(*e*) *North Waziristan.*—Snowfall was normal during the period.

(*f*) *D.I.Khan.*—No exact information is available except that the snowfall in the Takht-i-Suleman was above the average.

IV.—Kashmir.

(*a*) *Skardu.*—Snow fell at the station on many days in January and on four days in February, the snow converted into water amounting to 1·36″ and 0·18″ respectively in the two months. On the surrounding passes and mountains the falls were much heavier in both the months. About one foot of snow accumulation remained on the ground at the end of January and by the end of February this had almost melted away except for a thin layer here and there in shady places. Snowfall was normal in both the months and the accumulations at the end of the period were below normal.

(*b*) *Dras.*—Snow fell on 13 days in January and on 9 days in February aggregating to depths of 6 ft. 9 in. and 3 ft. 6 in. respectively. Snowline descended to 8,000 ft. in each month on the surrounding hills of Lamchan,

Marpachoo, and Kawa Baal. Accumulations of snow at the end of the months are given in the table below :—

Locality.	January.	February.
	Ft.	Ft.
Dras Station	9	5
Surrounding hills (Lamchan, Marpachoo and Kawa Baal)	12	8

Falls were much above normal in January and slightly below it in February. The accumulations at the end of the period were about normal.

(c) *Srinagar.*—Several light to moderate falls were observed on the surrounding mountains and were also recorded in the valley during each of the months. The falls were reported to be above normal in January and below normal in February. The accumulations at the end of the period were reported to be above normal.

(d) *Kargil.*—Snow fell on 13 days in January and on 8 days in February. Falls were much above normal in January and above normal in February. The accumulations on the surrounding high peaks were estimated at 12 ft. at the end of January and at 8 ft. at the end of February ; these were also much above normal.

(e) *Sonamarg.*—There were fifteen snowfalls in January and fourteen falls in February at the station. Snow converted into water amounted to 18·00″ and 5·98″ respectively in the two months. On the higher mountains, snowfalls were reported to be still heavier. The falls were above normal in January and below it in February. The accumulations at the station amounted to 9 ft. at the end of January and to 7 ft. at the end of February and were slightly below normal. The depth of accumulations on the Zojilla pass could not be estimated as it was totally blocked.

(f) *Gurez.*—Snow fell on 11 days to an aggregate depth of nearly 8 ft. in January and on 9 days to a depth of 3¼ ft. in February. Accumulations at the end of the months were as follows, and were above normal.

Locality.	January.	February.
	Ft.	Ft.
Gurez station	8	3¼
Tragbal Pass	11	6
Burzil Pass	14	7

(g) *Leh.*—There were several heavy snowstorms in January, the depth of snowfall during each storm being 1 to 2 ft. and the snowline descending to 11,500 ft. In February, some light falls occurred in the beginning of the month, the snowline descending to 10,500 ft. The accumulations on the higher passes were estimated to be about 5 ft. or more at the end of January and 4 to 5 ft. at the end of February. Falls and accumulations were above normal.

V.—Punjab.

(a) *Chamba.—Chamba range.*—There were 13 snowfalls during January and two falls in February. The total depth of snow as measured at Bassu at a height of 6,000 ft. amounted to 7 ft. and 0 ft. 6 in. respectively in the two months. Snowline descended to a height of 3,500 ft. in January. It is reported that while the falls during the period on higher peaks and passes were above normal they were below normal at lower altitudes especially in February.

Bharmaur range.—Snow fell on 13 days in January and on 2 days in February amounting to 8 ft. and only 8 inches respectively at Bharmaur. The character of the falls and accumulations were similar to those at Chamba range, described above.

Pangi range.—There were four snowstorms in each month giving snowfall on 13 days in January and on five days in February. At Kilar (8,000 ft. a.s.l.) the total depth of snowfall was 9 ft. 10 in. in January and 1 ft. 7 in. in February. The falls were above normal in January and below it in February. No information is available about the accumulations of snow on the higher passes and peaks.

Bhandal range.—Snow fell on 11 days in January to a total depth of 3½ ft. and on 2 days in February to a total depth of 3 in. only. Snowline descended to 7,000 ft. in January but receded to 8,500 ft. in February. The falls were about normal in January and below normal in February. Snow accumulations at Padri pass (12,000 ft.) were estimated to be more than 16 ft. at the end of the period. The accumulations were above normal.

The character of the snowfall of the season up-to-date was reported to have been unusually heavy above an elevation of 9,000 ft. but at lower levels, the snowfall was below normal.

Pissa range.—Snow fell on 14 days in January, the total depth of snowfall varying from about 7 ft. to 13 ft. at different places ; snow fell on 10 days in February to depths varying from 1 ft. to 3½ ft. Falls were above normal in January and below normal in February. The accumulations of snow on the passes viz. Sach, Chachni and Darate were 24 ft., 27 ft. and 30 ft. respectively at the end of January. No information is available about accumulations at the end of February.

(b) *Kulu (Kangra District).*—In January about 6 ft. of snow fell at Banjar in Saraj tahsil and at Naggar in Kulu tahsil, while on the mountains in the Kangra and Palampur tahsils and in the Kulu Subdivision the falls amounted to about 13 ft. The snowline descended to 6,000 ft. a.s.l. In February about three feet of snow fell on the high mountain ranges, and the snowline descended to 8,000 ft. a.s.l. Falls were above normal in January and below normal in February.

Accumulations were as given below and were about normal in January and below normal in February.

Locality.	Accumulations at the end of	
	January.	February.
	Ft.	Ft.
Awaru	10	6
Sawai	9	8
Sangaru	8	7
Hampta	12	10
Rohtang	13	11
Bhabu	9	7
Bishleu	8	6
Jalori	9	7

(c) *Kilba hills (Simla District).*—There were seventeen snowfalls in January and four falls in February in the Kilba Kailas range. One fall in each month was heavy and descended down to 6,000 ft.

The amounts measured at some stations are given in the following table. The falls were slightly above normal in January and below normal in February.

Station.	Snowfall.	
	January.	February.
	Ft.	Ft.
Nichar	4½	½
Kilba	3	½
Sangla	8½	1
Purbani	5½	½
Phancha	9	1½
Chini	6	1½

Passes were not passable during the period, the average accumulations being about 10 ft. at the end of January and about 25 ft. at the end of February on the Rupan, Buran, Charang and Shathal passes.

VI.—United Provinces.

(a) *Garhwal.*—There were four snowfalls in January and two in February on the higher altitudes, the depth of the falls ranging from 2″ to 5 ft. in January and 2″ to 4 ft. in February. The snowline descended to 5,000 ft. in each month. The accumulations were estimated at about 1 to 2 ft. at the end of January and about 4 ft. on the tops of hills and 7 ft. in the valleys at the end of February. Falls and accumulations were generally below normal.

(b) *Almora.*—Falls and accumulations during the period were as shown below :—

Locality.	January.	February.
	Ft.	Ft.
Falls.		
Malla Danpur	8	8
Byans	10	7½
Chaudans	5¼	3
Malla Darma	18½	12½
Malla Johar	3	3
Accumulations.		
Pindar Valley	38	38
Nundakhat	40	40
Sundar Dhunga	40	40
Bankatiya	50	50
Masarleg	15	15
Lipu	24	26
Lampia	36	39
Nuwo	22	20

The falls were slightly above normal in January and below normal in February and the accumulations were generally about the average.

(c) *Naini Tal.*—Snow fell on two days in January at Muktesar and on the surrounding peaks. The depth of snow on each occasion at Muktesar amounted to one inch only. Snowfall of the month was below normal. No report was received for the month of February.

VII.—Assam.

(a) *Baliapara Frontier Tract.*—On the lower hills, snowfall began late this year, in the middle of January; but there were heavy falls from the end of January, the heaviest fall occurring in the middle of February. The general character of the snowfall of the season was reported as above the average.

(b) *Sadiya Frontier Tract.*—Snowstorms of moderate intensity occurred from 31st January to 2nd February on both sides of the Tidding saddle on the Mishmi hills, the depth of snowfall varying from ½" to 18 inches according to elevation. The snowline descended to about 4,000 ft. The falls were above average.

There were comparatively heavy falls of snow on the Dirap peaks on the Abor hills which lasted longer than usual. Falls on the upper hills were normal.

Hot Weather Period, March to May.

I.—Afghanistan.

Kabul.—There was no snowfall in Afghanistan after the 6th April. Snowfall of the season as a whole was reported to be much below the average. Snow accumulations on the Paghman and Hindu Kush ranges at the end of May were less than normal and were mostly confined to crevices of the mountains. Shibbar pass (10,000 ft.) in northern Afghanistan was clear of snow at the end of May.

II.—Baluchistan.

Quetta.—One light snowfall occurred on all the important peaks in each of the months March and April. Snow completely disappeared from the highest peaks in the third week of April. Falls were about normal.

III.—North-West Frontier Province.

(a) *Hazara.*—Snow fell in the district only on two days in March above an elevation of 5,000 ft. Falls and accumulations for March at hights below 10,000 ft. are given below :—

Locality.	Elevation.	Falls.	Accumulations.
	Ft.	Ins.	Ft.
Phalkot	9,000	9	..
Thandiani	8,800	6	..
Dungagali	8,000	7	..
Narang	8,000	4	3
Kalabagh	7,900	6	..
Paludran	7,500	3	1
Sundigali	7,000	..	..
Kagan	7,000	2	½
Birangali	6,600	3	..
Jared	5,000	1	..
Malkandi	4,450	*nil*	..

Falls were much below normal and accumulations at the end of March were below normal. Accumulations at the end of April at levels above 10,000 ft. and below 17,500 ft. ranged from 3½ ft. to 12 ft.; these were above normal.

(b) *Dir, Swat and Chitral.—Drosh.*—No snowfall occurred at the station during the period. On the surrounding mountains however falls were observed on two days in March and on three days in April. Snowfall was reported on Lowarai pass and Mandaghalasht hills in March and April, the falls amounting to 2 ft. on Lowarai in March. Snow accumulations were present on the passes and peaks in March and April, but at the end of May the passes were clear of snow, although there was some snow on the surrounding peaks. The falls and accumulations of the season were reported to be below average.

Chitral.—Accumulations of snow were reported to be above average at the end of May.

Malakand.—No detailed report was received. Snowfall of the season was however reported to be below normal and the accumulations at the end of May were below normal.

(c) *Kurram.*—No reports are available for March and April. No snow fell in May. The accumulations at the end of May on the passes and peaks were as shown below; these were above normal.

Locality.	Accumulations at the end of May.
	Ins.
Sikaram Peak	4
Fadin Peak	2
Zeran Pass	1½
Sikaram proximity peak	1½

(d) *Khyber Agency.*—There was no snowfall in the agency during the period. Accumulations of snow on the peaks of the Morga Hill were reported to vary from 1½ ft. to 4½ ft. at the end of May.

(e) *Kohat.*—No snow fell in Kohat district during the period.

(f) *North Waziristan.*—Snowfalls were normal during the months March and April. There was no accumulation of snow on the well known peaks in the agency at the end of May.

(g) *South Waziristan.*—No reports were received for March and April. No snow fell in May. A small quantity of snow remained only on the Preghal peak.

(h) *D.I.Khan.*—It is reported that the snowfall on Takht-i-Suleman was above average during the season.

IV.—Kashmir.

(a) *Skardu.*—No snowfall occurred at the station during the period. The surrounding mountain peaks and passes received fairly good snowfalls in March, occasional light falls in April and a few falls during the last week of May. The snowline descended to about 9,000 ft. in each month. The accumulations on the surrounding mountains and passes were reported to be 10 ft. at the end of March, 6 to 7 ft. at the end of April and 3 to 4 ft. at the end of May. Falls and accumulations were normal during the period.

(b) *Dras.*—There were snowfalls on 11 days in March, on 6 days in April and 2 days in May. The depth of snow amounted to 11½ ft. in March, 2½ ft. in April and about 2 ft. in May. The falls were much above normal in March, normal in April and above normal in May.

Accumulations of snow were as shown below :—

Locality.	March.	April.	May.
	Ft.	Ft.	Ft.
Dras	5	1	*nil*
Surrounding hills of Lamchan, Kawa Baal, Marpachoo.	7 to 8	2 to 3	2

The accumulations were slightly above normal in March but normal at the end of the period.

(c) *Srinagar.*—Several light to moderate falls of snow were observed on the surrounding mountains during each of the months. Falls and accumulations were reported to be above normal throughout the period.

(d) *Kargil.*—Snow fell on seven days in March and the amount of snowfall on the well known peaks was estimated to be about 4 ft. This is reported to be above normal. No snowfall occurred in the other two months. The accumulations on the well known peaks were estimated at 4 ft. at the end of March, and 3 ft. at the end of April; they were generally above normal.

(e) *Sonamarg.*—Snow fell at the station on 11 days in March, on 12 days in April and on three days in May; snow converted into water amounted to 18·39 inches, 6·13 inches and 1·71 inches respectively in the three months. The snowfall on 29th May was very heavy, the amount of snow being equivalent to 3·88 inches of water. The accumulations of snow were as shown below :—

Locality.	March.	April.	May.
	Ft.	Ft.	Ft.
Sonamarg	6	1	Traces.
Zojilla pass	7	3	2

Snowfall was above normal for the whole period, while the accumulations were generally below normal.

(f) *Gurez.*—Snow fell on eight days in March and on six days in April, and the falls were normal. Towards the end of May an unusually late snowstorm occurred giving 6½ inches of snow at the station, and 2 to 3 ft. of snow

on the neighbouring Tragbal and Burzil passes. Local inhabitants state that such a late storm was unknown for fifty years. The accumulations at the end of March amounted to 3 ft. at Gurez and about 13 ft. on the top of Burzil pass; at the end of May the accumulations on the surrounding mountains were estimated at six feet.

(*g*) *Leh.*—There were three snowfalls in each of the months March and April and the accumulations on the surrounding high passes, which were closed to traffic, were estimated at 4 to 5 ft. in both the months. These were about normal for the period. A few light falls of snow occurred in the first fortnight of May which was colder than usual. The melting of snow was consequently slow and the accumulations at the end of May were above normal on the surrounding passes, which remained closed to traffic.

V.—Punjab.

(*a*) *Rawalpindi.*—There was no snowfall during the period.

(*b*) *Chamba.*—The reports were received only for the month of March and were as follows.

Chamba range.—Four snowstorms occurred at high altitudes. At Kundi (6,000 ft. a.s.l.) the depth of snowfall was 6 inches. The depth of accumulations at Baliani pass (12,000 ft.) at the end of March was 9 feet. Snowfall and accumulations on the higher altitudes were above normal.

Tissa range.—There was only one snowstorm when the snow came down to 4,000 ft. a.s.l. The depths of falls were as given below :—

Locality.	Falls in March.
	Ins.
Chatri	7
Sloh	6
Ail	4
Bhangor	12
Chanju	6
Khangu	4
Alwas	14

The passes were unapproachable at the end of the month. It was reported that the snowfall in this month did not come so low during the last 10 years. Falls were above the average.

Bhandal range.—Five snowfalls occurred of which two gave 2 inches of snow at the station, while the others gave snow at higher elevations only. Falls were normal. At Padri pass 4 ft. of snow accumulations remained at the end of March and this was below normal.

Pangi range.—Snowfall was recorded at Kilar on six days during March to a total depth of about 5 ft. Snow came down to 7,000 ft. a.s.l. The passes were all closed. Falls were reported to be above normal.

A report received by the end of May for the whole of Chamba State shows that several falls occurred above 8,500 ft. a.s.l., and that the accumulations of snow on well known passes and peaks were estimated at 10—15 feet, slightly above average.

(*c*) *Kangra and Kulu.*—Snow fell up to average depths of 2′, 1½′ and 1½′ respectively on the high ranges of mountains in the Kangra and Palampur tahsils and Kulu subdivision during the three months. Snowline descended to 7,000 ft. a.s.l. The falls were apparently about normal. The accumulations of snow were as shown below :—

Locality.	Accumulations at the end of		
	March.	April.	May.
	Ft.	Ft.	Ft.
Higher ranges of mountains	11	5	2
Sawai	3	1	..
Sangaru	2	1	..
Awaru	2	1	..
Hampta	4	2	..
Rohtang	5	2	..
Bhabu	2	1	..
Bishleu	1	1	½
Jalori	2	1	1

The accumulations were generally much below normal; in the Kulu subdivision however according to a report received from the Assistant Commissioner, Kulu, the weather this year was much more severe than for many years past, and the accumulations of snow at the end of May on the higher passes were much heavier than usual.

(*d*) *Kilba* (*Simla District*).—There were two snowfalls in March, eight light falls in April and occasional very light falls in May. The snowline descended to 6,500 ft., 9,500 ft and 11,000 ft. respectively in the three months. The falls were reported to be above normal in the first two months and below normal in May. All the peaks and passes were under snow and unfit for traffic up to the end of April, but were open for foot traffic by the end of May.

VI.—United Provinces.

(*a*) *Garhwal.*—Two snowfalls occurred in March to a depth of ½″ to 2″ and there was no snowfalls in April and May in the district except for a few falls on high peaks in the first fortnight of May. The falls were generally much below the average. The accumulations on well known passes and peaks amounted to three to four inches; they were reported to be below normal.

(*b*) *Almora.*—Falls and accumulations were as shown below :—

Locality.	March.	April.	May.
	Ft.	Ft.	Ft.
Falls.			
Malla Danpur	5	3	3
Malla Darma	9	7½	½
Chaudans	4½	2½	½
Byans	4	No report.	8½
Malla Johar	No report		No report
Accumulations.			
Pindar Valley	35	35	35
Nandakhat	40	35	40
Sundar Dhunga	40	35	35
Bankatiya	50	50	50
Nuwe	17	15	15
Masurleg	12	9	10
Lipu	12	No report	28
Lampia	18		31

The falls were normal in March and above normal in April and May. The accumulations were normal in the first two months and above normal at the end of the period.

VII.—Assam.

The reports received up to the end of April indicate that there was no snowfall in the Assam hills in March and April.

Southwest Monsoon Period, June to September.

JUNE AND JULY.

I.—Afghanistan.

Kabul.—There was no snowfall in Afghanistan during June and July. As usual at the end of the season snow had cleared from the mountains except in a few crevices.

II.—North-West Frontier Province.

(*a*) *Hazara.*—Approximate depths of falls during and accumulations at the end of the period are given in the following table :—

Name of Peak.	Falls during the period.	Accumulations at the end of the period.
	Ins.	Ft.
Kachh	8	8½
Mahli Burawai	6	6½
Khopra	6	6
Kuropass	6	6
Raji Bhogi	6	6
Mahli Battal	5	4¾
Sarool	5	4½
Bajtar	6	5¾
Shah Kharan	5	5
Jam Garh	5	5
Musala Moosa	3	2½
Mulki	1	2¾
Mokra	1	2½

The accumulations at the end of the period were above normal.

(*b*) *Dir, Swat and Chitral.—Drosh.*—No snowfall occurred during the period. At the end of the period, snow was present only on the Lowarai and Madaglasht peaks and the peaks of the surrounding hills.

Malakand.—No snow fell during the period. Accumulations at the end of the period were normal and less than those of last year.

(*c*) *Khyber Agency.*—There was no snowfall in the Khyber area.

(*d*) *Kurram.*—Snow fell on two days in June on the Sikaram Peak and on two days in July on the Badin Peak. The falls amounted to 10 inches of snow each month and were normal. The accumulations of snow on well known peaks and passes at the end of July were as shown below and were above normal.

Locality.	Accumulations at the end of July.
	Ins.
Sikaram Peak	5
Badin Peak	3
Zeran and Sikaram Passes	1½

South Waziristan.—There was no snowfall during the period.

III.—Kashmir.

(*a*) *Skardu.*—No snow fell during the period. Traces of snow accumulations were present only on some high peaks at the end of the period. These conditions were reported as normal for the period.

(*b*) *Dras.*—No snow fell during the period and there was no snow accumulation on ground at the station. About six inches of snow accumulation remained at the end of the period on the peaks of Lamchan, Marpachoo and Kawa Baal hills. This was normal.

(*c*) *Srinagar.*—Several light to moderate falls of snow were observed on the surrounding mountains in June. At the end of July, snow accumulations on the surrounding mountains were reported to be normal.

(*d*) *Gulmarg.*—Several light to moderate falls occurred on the Afarwat range in the second fortnight of June. At the end of July very thin layers of snow accumulations were present only on some peaks. The accumulations were reported to be much below normal.

(*e*) *Kargil.*—No snowfall occurred during the period. About a foot of accumulated snow lay on the highest peaks at the end of June of which only traces were visible at the end of July. The accumulations were below normal.

(*f*) *Sonamarg.*—No snow fell during the period. At the end of the period some isolated traces of snow remained on the surrounding mountains. On the Zojilla pass some remaining accumulations were fast melting away. The accumulations at the end of the period were slightly below normal.

(*g*) *Leh.*—There was no snowfall at the station during the period, but occasional light falls were observed on the mountain tops in July. At the end of the period the accumulations of snow on the high passes were considerable and slightly above normal; although open for foot traffic before sunrise the passes were still not negotiable for mule traffic.

(*h*) *Gurez.*—No snowfall occurred during the period.

IV.—Punjab.

(*a*) *Chamba.*—No snow fell during the period. The accumulations of snow on well known peaks and passes extended down to 10,000 ft., an unusually low level as compared with previous years.

(*b*) *Kangra.*—In the Kulu subdivision snowfall was observed above 13,000 ft. in June and July, and the accumulations at the end of the period were reported to be much heavier than usual.

(*c*) *Kilba Hills.*—A few light falls occurred above 13,000 ft. in each of the months. All the passes were open to traffic at the end of the period.

V.—United Provinces.

(*a*) *Garhwal.*—No snowfall occurred during the period. Three to five feet of accumulations existed on the highest peaks at the end of the period; the passes were clear of snow.

(*b*) *Almora.*—The following table gives the aggregate falls during June and July and the accumulations at the end of each month on the well known peaks and passes.

Locality.	June.	July.
	Ft.	Ft.
Falls.		
Malla Danpur	1	1
Malla Darma	9½	5
Byans	7	4
Chaudans	1¼	1¼
Accumulations.		
Pindar Valley	32	30
Nandakhat	38	35
Sundar Dhunga	32	30
Bankatiya	50	50
Masurleg	8	9
Lipu	15	9
Lampia	22	13½
Nuwe	17	7

Falls and accumulations were above normal in both the months.

AUGUST AND SEPTEMBER.

I.—Afghanistan.

Kabul.—No information was received.

II.—North-West Frontier Province.

(*a*) *Dir, Swat and Chitral.—Drosh.*—No snow fell either at the station or on the surrounding hills in August. Two snowfalls giving an aggregate total of 4 to 6 inches of snow were observed on the surrounding hills and on the Lowarai pass in September. About three inches of snow accumulations were present at the end of the period on Drosh Gole (12,000 ft. a.s.l.), but the passes were free of snow. The accumulations were slightly above average.

(*b*) No report was received from other parts of the province.

III.—Kshmir.

(*a*) *Skardu.*—No snowfall occurred either at the station or on the surrounding hills during August; in September a light snowfall occurred on the surrounding higher mountain passes, the snowline descending to 10,000 ft. a.s.l. At the end of the period a few inches of snow were reported to be lying on the higher passes. The falls and accumulations were reported as normal.

(*b*) *Dras.*—No snowfall occurred. Only a trace of snow accumulation was visible on the surrounding peaks of Lamchan, Kawa Baal and Marpachoo hills at the end of August.

(*c*) *Srinagar.*—No snowfall was observed in August while several light to moderate falls were observed on the surrounding mountains in September. The falls during September and accumulations of snow at the end of the period were reported to be normal.

(*d*) *Gulmarg.*—There was no snowfall in the valley or on the surrounding mountains in August. Several light to moderate falls were observed on the surrounding mountain ranges of Afarwat and Handibal during the second fortnight of September; the heaviest fall descended much below Khilanmarg. The falls were reported to be normal. Snow accumulations on the surrounding mountains were also reported to be normal at the end of the period.

(*e*) *Kargil.*—No snowfall was observed during the two months.

(*f*) *Sonamarg.*—No snow fell during August. In September rainfall at the station was accompanied by light snowfall on the higher ranges and peaks 2,000 ft. above Sonamarg. The snow generally melted away soon. About four inches of snow accumulations were reoprted to exist on Zojilla pass at the end of the period; this was normal.

(*g*) *Leh.*—A few falls were observed on the high summits during August while there was no fall in September. There were no appreciable accumulations of snow on the high passes at the end of the period. The falls during the period were reported to be normal.

IV.—Punjab.

Kilba.—No snowfall occurred in August and the snow accumulations at higher elevations disappeared. The snowline ascended above 16,000 ft. a.s.l. During the first week of September snow fell on the higher peaks and they were again covered by snow, the snowline descending to 11,000 ft. a.s.l. The snowfall of the season as a whole was reported to be below normal. All the passes were passable at the end of the period.

V.—United Provinces.

(*a*) *Garhwal.*—There was no snowfall in the district during the period.

(*b*) *Almora.*—Estimated falls during August and September and the accumulations at the end of each month on the well known peaks and passes are given in the following table:—

Locality.	August.	September.
	Ft.	Ft.
Falls.		
Malla Danpur	1	1½
Malla Darma	1¾	1¾
Malla Johar	Report not received.	
Chaudans	4¾	4¼
Byans	Report not received.	
Accumulations.		
Pindar Valley	30	30
Nandakhat	35	35
Sundar Dhunga	30	30
Bankatiya	50	50
Masurleg	6	..
Nuwe	12	15

The falls were normal or slightly below it, while the accumulations were above normal during the period.

The Retreating Monsoon Period—October to December.

I.—Afghanistan.

Kabul.—There was no snowfall in the Kabul valley itself during the period. Light falls of snow were observed on two days in October and on one day in November on the peaks of the Paghman and Hindukush hills (14,000 ft. a.s.l.). The falls melted away. Snow fell again on the hills on the 7th and 8th December and the peaks were still covered with snow at the end of the month. Travellers from north reported that the passes were open to traffic at the end of the period. Falls and accumulations were below normal.

II.—Baluchistan.

Quetta.—According to a report up to the 15th December there was no snowfall up to that date, although usually some snow falls in the first fortnight of December.

III.—North-West Frontier Province.

(*a*) *Hazara.*—Snow fell on four days in December; the aggregate depth of snowfall for the month together with accumulations at the end of the month are given below:—

Locality.	Falls.		Accumulations.	
	Ft.	Ins.	Ft.	Ins.
Phalkot	0	8	0	8
Thandiani	0	4	0	4
Dungagali	0	1	0	½
Narang	3	0	2	0
Kalabagh	0	1	0	½
Paludran	2	3	1	6
Kagan	1	4	1	0
Birangali	0	2	0	2
Jared	0	1	0	1
Malkandi	*Nil.*		*Nil.*	

Falls and accumulations were much below normal.

(*b*) *Dir, Swat and Chitral.—Drosh.*—No snowfall occurred at the station during the period; rather an early fall of snow occurred on the Lowarai pass and the surrounding hills in the third week of October; snow fell in November and December also in the same localities. The depth of accumulations on Drosh Gole was 5″ at the end of October and about 1 ft. at the end of November and December.

(*c*) *Kurram.*—No reports were received for October and November. Snow fell on the Sikaram and Badina peaks and all other peaks of Safed Koh on four days during the first half of December. Although there was some melting the peaks were well clad with snow.

(*d*) *South Waziristan.*—No snow fell up to the 20th of December.

IV.—Kashmir.

(*a*) *Skardu.*—There was no snowfall at the station in October and November; snow fell to a total depth of 5 inches on 27th and 28th December. On the surrounding passes and mountain ranges, snow fell occasionally in October, the snowline descending to 9,000 ft., and frequently in December. The accumulations of snow on the passes and peaks at the end of October were about one and a half feet. This was practically steady till the end of November, but increased to 3 to 4 ft. by the end of December. Falls and accumulations were normal for the season.

(*b*) *Dras.*—There was a light fall of snow at Dras proper in October. Three to four inches of accumulations lay on the Dras peaks at the end of the month. Six falls of snow are reported in November to a total depth of about six inches. In December snow fell on nine days at the station. At the end of the month about 12 inches of accumulations lay at Dras proper and about three feet on the Mushkoo hill. Zojilla pass was closed to traffic at the end of the period. Falls and accumulations were below normal.

(*c*) *Srinagar.*—One light fall of snow in October, several light falls in November and several light to moderate falls in December were observed on the surrounding mountains. In the valley only three falls occurred in December. Falls and accumulations were reported to be generally normal during the period.

(*d*) *Kargil.*—No snow fell in October and in November light snow fell on one day. In December snow fell on four days to a total depth of about 6 inches. At the end of the period about one foot of snow accumulations lay on the high peaks and about half an inch of accumulation at the station. Falls and accumulations were below normal for the period.

(*e*) *Sonamarg.*—Light falls of snow occurred on the surrounding mountains, but no snow fell at the station during October. The snowline descended to about 1,000 ft. above Sonamarg. At the end of the month the depth of snow accumulations on the Zojilla pass was about two inches. Snow fell on seven days in November at Sonamarg the total snow converted into water amounting to 2·59″. At the end of the month three inches of snow were present at the station and about six inches of accumulation on the Zojilla pass.

In December there was snowfall on ten days aggregating to 3·40″ of melted water. The falls were widespread and at the end of the month the accumulation of snowfall was 4 ft. at Sonamarg and about 6 ft. on Zojilla. Both the Zojilla and Banikal passes were totally blocked.

Both falls and accumulations were below normal in October and November, and about normal in December.

(*f*) *Leh.*—There was no snowfall in October and very light accumulations of snow were present on the high passes at the end of the month. Early in November a few falls occurred on the high passes with no appreciable increase in the snow accumulations. A few falls of moderate intensity occurred in December but the snow at the station melted away soon. On the surrounding mountains about 3 ft. of accumulations remained at the end of the period. Conditions were reported as normal throughout the period.

V.—Punjab.

(*a*) *Rawalpindi.*—Snowfall occurred once in December to a total depth of two inches.

(*b*) *Chamba.*—No reports were received for October and November. In December, there were two falls giving about 5 inches of snow at Bhandal on the Bhandal range, two falls giving 2′ 2″ of snow at Tissa (8,000 ft.) on the Tissa range and four falls giving 2′ 7″ of snow at Kilar on Pangi range. The falls were below normal on all ranges. At the end of the period the accumulations at Sach pass (14,000 ft.) were estimated at more than 4 ft., and at Kilar 2½ ft. No information was available about the accumulations on the higher passes of the Bhandal range.

(*c*) *Kulu.*—There was no snowfall during the months of October and November 1943. At the end of the third week of December snow fell up to an altitude of 7,000 ft. in Seraj Tahsil and 6,000 ft. in Kulu. By the end of the month snowline had receded to 7,000 ft. in Kulu. The accumulations of snow on passes at the end of December were as shown below :—

	Ft.
Sirikhand Pass	5
Hampta Pass	4
Bashleo Pass	2½
Jalori Pass	1½

Only Jalori pass was open to traffic at the end of the period. The accumulations were about normal.

(*d*) *Kilba.*—There was no snowfall during October and November and the snowline was at 15,000 ft. Two falls of snow on the 21st and 22nd December brought the snowline down to about 7,000 ft. At the end of December all passes were closed. The season on the whole was reported to have been unusually dry and the snowfall was below normal.

VI.—United Provinces.

(*a*) *Garhwal.*—No snow fell in October and November. Only one fall occurred in December and as a consequence the snowline descended to 9,000 ft. The accumulations on higher passes were about 1½ ft. Falls were below normal.

(*b*) *Almora.*—Falls reported during the period and the accumulations at the end of each month are shown in the table below :—

Locality.	October.	November.	December.
	Ft.	Ft.	Ft.
Falls.			
Malla Danpur	2	3	5
Malla Darma	No report.	*Nil.*	No report.
Chaudans	½	½	6
Byans	2½	No report.	No report.
Accumulations.			
Pindar Valley	32	35	38
Nandakhat	35	35	38
Sundar Dhunga	30	30	32
Bankatiya	50	50	52
Nuwe	..	15	..
Masurleg	11	1½	2
Lipu	8	..	..
Lampia	12	..	..

Falls were normal in October and slightly below normal in November and above normal in December. The accumulations were generally above normal at higher elevations.

VII.—Assam.

(*a*) *Baliapara Frontier Tract.*—No reports are available for October, and no snowfall occurred in November. In the last week of December 6 to 12 inches of snow fell in four days in the lower hills. In the upper hills, however, snowfalls were reported to have been heavier than usual.

(*b*) *Sadiya Frontier Tract.*—No snow fell during November and December in the Mishmi hills and the snowfall on the upper Minjong Abor hills was reported to be normal.

(*c*) *Kamrup.*—Falls were reported as normal for the season as a whole.

Summary.

Cold Weather Period—January and February.—Snowfall was above normal in Assam, slightly above normal in Kashmir, normal in Baluchistan, the North-West Frontier Province, and the Punjab, and below normal in Afghanistan and the United Provinces. The accumulations were slightly above normal in Kashmir, and generally normal elsewhere.

Hot Weather Period—March to May.—The falls were generally above normal in Kashmir, normal in Baluchistan, the North-West Frontier Province and the Punjab, slightly below it in the United Provinces and much below normal in Afghanistan. The accumulations were somewhat above normal in Kashmir, normal in the North-West Frontier Province, the Punjab and the United Provinces, and below normal in Afghanistan.

South-West Monsoon Period—June and July.—Snowfalls were above normal in the Almora district of the United Provinces and generally normal elsewhere. The accumulations were above normal in the North-West Frontier Province, the Punjab and parts of the United Provinces and generally normal in Kashmir.

South-West Monsoon Period—August and September.—Both the falls and accumulations were generally normal.

The Retreating Monsoon Period—October to December.—The falls were about normal in the United Provinces and Assam, and below it in Afghanistan and the Punjab, and locally below normal in the North-West Frontier Province and Kashmir. The accumulations were above normal in the United Provinces, normal in the Punjab and below normal in Afghanistan, the North-West Frontier Province and Kashmir.

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