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METEOROLOGICAL DEPARTMENT

INDIA WEATHER REVIEW, 1941

ANNUAL SUMMARY

PART B
SNOWFALL

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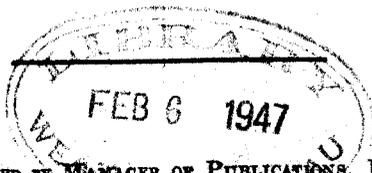
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INDIA WEATHER REVIEW, 1941.

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. 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 seven days during the second half of January and on four days in the first half of February aggregating to depths of 8½" and 1" respectively. The falls were slightly below normal in January and below normal in February. Snow accumulations on the ground were 4" at the end of January and *nil* at the end of February. The Paghman and Hindukush ranges were thinly covered with snow at the end of February. The accumulations at the end of February were below normal.

II.—BALUCHISTAN.

Quetta.—Fairly heavy snow fell on the 16th and 17th January on all peaks and on the ground to depths of about 4" and 3" respectively. Snow accumulations disappeared from the ground on the 19th January and from the peaks in the last week of February.

III.—NORTH-WEST FRONTIER PROVINCE.

(a) *Hazara.*—Snowfalls were reported on five days in January and six days in February, the falls being much below normal in both the months. The snowline descended to a height of about 4,500 ft. in January and 5,000 ft. in February. Accumulations were about normal at the end of January and below normal at the end of February.

Approximate depths of falls and accumulations at the end of each month are given in the table below:—

Locality.	January.		February.	
	Falls.	Accumulations.	Falls.	Accumulations.
	Ft.	Ft.	Ft.	Ft.
Phalkot	4½	3½	6½	2½
Thandiani	3¾	3	4¾	2
Dungagali	7¼	2	8½	2½
Kalabagh	7	1¾	8½	2½
Birangali	2¾	¾	2¾	0
Narang	10¾	6	9	6
Pludran	10	4	8	4½
Kagan	8¾	3	7	3
Jared	2½	½	¾	0
Jachha	5½	4¾	3½	4½
Sundigali	8¾	4	1¾	1
Malkandi	½	0	0	0

(b) *Dir, Swat and Chitral.*—*Drosh.*—Five snowfalls occurred on the peaks of the surrounding mountains during January and on three occasions at Drosh aggregating to a depth of

3 inches. During February there were three falls on the surrounding hills only. The falls were reported to be below normal in both the months. At the end of the period a little snow existed on the peaks of the surrounding hills.

Malakand.—Seven snowstorms giving falls ranging in depth from 10 inches to 4 feet and eight storms giving falls ranging from 1½' to 3½' occurred during January and February respectively on the surrounding ranges. The falls were normal in both the months. The estimated accumulations at the end of each month on the various ranges were as follows:—

Locality.	January.	February.
	Ft.	Ft.
Lowarai	19	20
Bashkar	22	26
Hindu Raj	13	12
Mankyal	23	25
Ilam	10	10
Dwa Sarai	10	10

(c) *Khyber Agency.*—In the Landi Kotal and Khyber areas there was a snowfall of 2" to 3" during January. Snowfall for the period was below normal.

(d) *Kohat.*—Snow fell on the high mountains and peaks of the Sawana range to a depth of about 12" in January and to about 4" in February. Fort Lockhart had falls of 12" and 4" in January and February respectively. Falls were below normal in both the months.

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

(f) *Dera Ismail Khan.*—Snow fell only once in January on the Sulaiman range when the snow line descended to about 8,000 ft. Snow lying on higher peaks of the Takht was estimated to be about 2 to 3 ft. deep. Snowfall was below normal in January. There was no snowfall in February.

IV.—KASHMIR.

(a) *Skardu.*—Slight snowfalls occurred at the station on seven days in January and on three days in February amounting to 0.66" and 0.65" respectively. There were, however, fairly good snowfalls on the surrounding mountain ranges in both the months. The snow line descended to a height of about 8,500 ft. during the period. The surrounding higher mountains and peaks were covered with snow to a depth of 3 ft. at the end of January and 4 ft. at the end of February. Falls and accumulations were below normal.

(b) *Dras.*—Snow fell on nine days in January and on seven days in February to approximate depths of 16 inches and 4.3" respectively. Accumulations of snow at the end of January and February were about 1½' and 5½' respectively at Dras, and about 2' and 6' respectively on the surrounding hills. About 8' of snow existed on the Zojilla pass at the end of February. The accumulations at the end of the period were below normal.

(c) *Srinagar.*—Several light to moderate falls of snow were observed on the surrounding mountains as well as in the valley in both the months. Falls and accumulations were normal in January and slightly below it in February.

(d) *Kargil.*—Snow fell on 6 days in January to a total depth of 3 ft. and on 4 days in February giving a total of 1.38 inches of snow converted into water.

(e) *Sonamarg.*—There were thirteen snowfalls in each of the months January and February. The snow converted into water and measured amounted to a total of 13.97 inches in January and to 6.95 inches in February. Falls were below normal in both the months. Accumulations at the end of February were below normal.

(f) *Leh.*—Three snowstorms with about a foot of snow on each occasion occurred during January. Snowline descended to 11,000 ft. in January. Only one slight fall occurred in February. The falls were below normal. Accumulations of about 4 ft. remained at the end of February and these were above normal.

(g) *Muzaffarabad.*—No snow fell during the period. There was moderate amount of snow in the high passes at the end of each of the two months.

V.—THE PUNJAB.

(a) *Rawalpindi.*—Snow fell on seven days in January and on two days in February aggregating to depths of 2½ ft. and ¾ ft. respectively. The falls were confined to the neighbourhood of Murree Peaks, Patriata, Upper and Lower Topa and Kuldana, the snow line descending to about 5,500 ft. The falls were below normal.

(b) *Chamba.*—*Tissa Range.*—Snow fell on eleven days in January to a maximum total depth of 3 to 5 ft. Falls were below normal. No information is available for February.

Bhandal Range.—There were three snowstorms in January and two in February which gave 2¼ ft. and ¼ ft. of snow respectively. The accumulation of snow on the Padni pass was 5 ft. at the end of February. Falls and accumulations were below normal.

Bharmour Range.—There were four snowfalls which gave 3¼ ft. of snow in January. The snowline in this month descended to a height of 4,500 ft. above sea level. The falls were recorded at 7,000 ft. above sea level and were below normal. The depth of accumulations at the end of January was about ¾ ft.

Snow fell in February to a depth of about 3 ft. and it was below the average.

Pangi Range.—At Kilar, snow fell on eleven days to a total depth of 3½ ft. in January and on seven days in February to a total depth of 3¼ ft. The falls were reported to be much below normal in both the months.

(c) *Kulu (Kangra District).*—Snowfall occurred on the high ranges of the Himalayan mountains, in the Kangra and Palampur tahsils and Kulu sub-division upto the average depths of 5 ft. and 4 ft. in January and February respectively. The snow lines on the neighbouring ranges

descended to 7,000 ft. and 8,000 ft. respectively in the two months. The falls were below normal during the period.

The estimated depths of accumulations at the end of each month are given in the following table :—

Locality.	January.	February.
	Ft.	Ft.
Awaru	9	7
Sawai	8	6
Sangaru	7	5
Hamptha	10	9
Rohtang	9	8
Bhabu	2	4
Bishleu	5	4
Jalori	4	3

The accumulations were about normal at the end of January but much below the average at the end of February. In the Nagar area, snowfall was experienced above a height of 5,000 ft.

(d) *Kilba Hills (Simla District)*.—Snow fell on five days in each of the months. The snowline in January and February is reported to have descended to 6,000 ft. and 5,500 ft. respectively. All the well-known higher peaks and passes were closed to traffic. The falls were reported to be below average.

Hot Weather Period.—March to May.

I.—AFGHANISTAN.

Kabul.—There was no snowfall during the period. The snow accumulations on the Paghman and the Hindukush ranges were much less than in the previous years and were mostly in the crevices of the mountains. Shibar pass (10,000 ft.) was clear of snow.

II.—BALUCHISTAN.

Quetta.—Snow fell on all the important peaks on 7th March to a depth of about 3 inches which melted away by the 12th March 1941. Another light fall occurred in the highest peak (Tikater peak) on 28th March to a depth of about an inch. The falls were below the average.

VI.—UNITED PROVINCES.

(a) *Almora*.—The estimated falls and accumulations of snow for the two months are given below :—

Locality.	January.	February.
	Ft.	Ft.
<i>Falls.</i>		
Malla Danpur	5	5
Malla Johar	6½	5½
Malla-Darma	12½	7½
Chaudans	5	4
Byans	8	..
<i>Accumulations.</i>		
Nandakhat	35	35
Pindar Valley	30	25
Sunder Dhunga	40	40
Bankatia	30	30
Lipu	18	..
Lampia	27	..
Masurleg	15	15
Nuwe	27	20

Falls were normal in January and below it in February. Accumulations were below normal at the end of February.

(b) *Garhwal*.—There were fifteen snowfalls in January and eight in February giving snow to depths of 1/5" to 5' in January and 2" to 4' in February. Falls and accumulations were below normal.

(c) *Muktesar*.—There were five falls in January totalling to a depth of 21" and one fall of 6" at the station in February.

VII.—ASSAM.

(a) *Kamrup*.—There was no snowfall during the period. The snow on the peaks, Chamba, Oangthala, Latangla, Thanachela, Saktung and Ningchengla melted away during the two months. Falls were reported to be slightly below normal.

(b) *Baliapara Frontier Tract*.—No information is available.

(c) *Sadiya Frontier Tract*.—Snowfalls were less than usual during the period. The snowline during the period was as low as 5,500 ft.

III.—NORTH-WEST FRONTIER PROVINCE.

(a) *Hazara*.—There were eleven falls of snow in the inner hills and two on the outer hills during March. The falls and accumulations are given below :—

LOCALITY.	Falls.	Accumulations.
	Ft.	Ft.
Phalkot	3½	1
Thandiani	2½	Nil
Birangali	1½	Nil
Dungagali	½	Nil
Kalabhag	½	Nil
Narang	8½	3
Pludran	17½	3
Kagan	11½	1
Jared	½	Nil
Sundigali	1	Nil
Jachha	2½	Nil
Malkandi	Nil	Nil

Accumulations at the end of May at levels above 10,000 ft. and below 17,500 ft., ranged from 2 ft. to 8 ft., these were above normal.

(b) *Dir, Swat and Chitral—Drosh*—Light snow fell on two days in March on the surrounding hills and once in April the snow line descending to 8,000 ft. Falls were below normal. There was no accumulation of snow on the surrounding hills at the end of the period. Snow was however present only on the peaks of Madaglasht and Lowarai and the accumulations were below normal. There was no accumulation of snow on the passes.

Chitral.—No snow fell in May and the accumulations of snow were below the average at the end of the period.

Malakand.—Snowstorms occurred on seven days in March and on three days in April, the depth of the falls varying from 3 inches to 3 feet in March and 2 inches to 5 feet in April on the ranges according to height. No snow fell in May. The falls were below the average for the season.

Accumulations of snow at the end of each month are given below. These were below normal at the end of the period.

Locality	March	April	May
	Ft.	Ft.	Ft.
Lowarai	14	7	1
Bashkar.	21	10	9
Hinduraj	8	6	—
Mankyal	20	13	10
Ilam } Dwa Sarai }	7	4	—

(c) *Kurram*.—Accumulations of snow at the end of the period on the well known passes and peaks were as follows. They were generally below normal.

Sikaran Peak	2½ inches
Badin Peak	1½ ..
Zeran Pass	¼ inch
Sibaran proximity pass	1 ..

(d) *South Waziristan*.—No reports were received for March and April. There was half an inch of snow accumulation on Marai and Narai ranges at the end of May, and they were reported to be somewhat less than normal.

IV.—KASHMIR.

(a) *Skardu*.—Snow fell on seven days on the surrounding high mountains in March, when the snowline descended to 9,000 ft. Report for April was not received and no snow fell in May. Snowfall of the season was normal. Snow accumulations on the surrounding passes and mountains were about 3½ ft. and one foot at the end of March and May respectively. The accumulations were below normal.

(b) *Dras*.—Snow fell on nine days in March aggregating to a depth of about 10 ft. 4 in. and on 5 days in April to a depth of about 3 ft. There was one snowfall in May giving four inches of snow. Snowfall in March was heavy and much above normal, while the falls in April and May were normal.

The accumulations at the end of each of the three months are given below :—

Locality	March	April	May
	Ft.	Ft.	Ft.
Dras	5	nil	nil
Surrounding hills . . .	6	1	1

The accumulations were below normal.

(c) *Srinagar*.—Several light to moderate falls in March and April and some light falls in May were observed on the surrounding mountains. At the station only one moderate fall of snow occurred in March. The falls of the period were about normal.

Snow accumulations on the surrounding mountains were about normal at the end of the period.

(d) *Kargil*.—Snow fell on six days in March to a total depth of about 7 ft. There was only one fall in each of the months April and May.

(e) *Sonamarg*.—There were thirteen snowfalls at the station, aggregating to 21·13 inches of water when melted; the falls were heavy and they were heavier on the surrounding mountains. There were six snowfalls in April; and none in May. The snowfall of the season was below normal. The accumulations on the Zojilla pass at the end of each of the three months were 8 ft., 4 ft. and nil respectively. These were below normal.

(f) *Leh*.—There were three snowfalls in March; Snowline descended to 11,000 ft.; only slight falls on the distant hills in April; some violent snowstorms in May the snowline descending to 12,000 ft. The falls were on the whole normal. The accumulations of snow on higher passes at the end of each of the three months were 5, 5 and 4 ft. respectively and these were normal.

(g) *Muzaffarabad*.—No snowfall occurred in March and April. Report for May was not received.

V.—PUNJAB.

(a) *Rawalpindi*.—There was no snowfall during the period and the accumulations melted away by the middle of April.

(b) *Chamba*.—(i) *Bhandal Range*.—In March two snowstorms occurred in the Bhandal Range down to 5,000 ft. and 7,000 ft. above sea-level respectively and the snowfall was below normal. Accumulations of snow on the Padni Pass was about 2½ ft. deep.

(ii) *Bharmaur Range*.—In April a few falls of snow occurred on the Bharmaur range descending to a height of 9,000 ft. The falls were above the average.

(iii) *Pangi Range*.—Kilar range experienced four snowfalls in March, aggregating to a depth of 2½ ft. The falls were below normal. All the well-known passes were covered with heavy snow at the end of the month. No snow fell at Kilar in April though a few falls occurred on the Pangi range descending down to 11,000 ft. above sea-level.

The falls of the season in the Chamba State as a whole were below normal. Accumulations of snow on well-known

passes and peaks were estimated to be about 2 ft. and were below normal.

(c) *Kangra*.—Snow fell on the high ranges in the Kangra and Palampur tahsils and Kulu sub-division upto average depths of 2 ft., 1 ft., and $\frac{1}{2}$ ft. respectively during each of the three months. The average depth of accumulations on the high ranges were 5 ft., 2 ft. and $\frac{1}{2}$ ft. for the three months. The accumulations at the end of March are given below :—

Locality.	Ft.
Sawai	1 $\frac{1}{2}$
Sangaru	2
Awaru	1 $\frac{1}{2}$
Hampta	3
Rohtang	3
Bhabu	1 $\frac{1}{2}$
Bishleu	2
Jalori	1 $\frac{1}{2}$

The falls and accumulations were generally below normal.

(d) *Kilba*.—There were four snowfalls during March, three light falls during April and occasional light falls during May. The snowline descended to 7,500 and 12,000 ft. respectively in March and April. All passes were closed during March and April. At the end of May except for Kailas peak and Charang pass all the others were passable. The falls of the season were below normal but the accumulations at the end of May were about normal.

VI.—UNITED PROVINCES.

(a) *Almora*—Snowfall and accumulations are entered in the table below :—

Locality.	March.	April.	May.
<i>Snowfalls.</i>			
	Ft.	Ft.	Ft.
Malla Danpur	2	1 $\frac{1}{2}$	1 $\frac{1}{2}$
Malla Johar	4	2 $\frac{1}{2}$	1 $\frac{1}{2}$
Chaudans	1	2	2 $\frac{1}{4}$
Malla Darma	2 $\frac{1}{2}$	3 $\frac{1}{2}$	1
Byans	No information.	3 $\frac{1}{2}$	1 $\frac{1}{2}$
<i>Accumulations.</i>			
Pindar Valley	25 to 30	25 to 30	25 to 30
Nanda Khat	30 to 35	30 to 35	30 to 35
Sundar Dunga	40 to 45	35 to 40	25 to 30
Bankatia	30 to 35	30 to 35	30 to 35
Masurleg	14	No information.	No information.
Nuwe	17	18	15
Lampia	No information.	18	15
Lipu	No information.	12	10

The falls were below normal in all the three months while the accumulations were about normal during the period.

(b) *Garhwal*.—There were four falls in March and five each in April and May, the depth varying from 2" to 1' in March, 2" to 6" in April and 1" to 1 $\frac{1}{2}$ " in May. The snowline descended to 9,000 ft. in March, to 12,000 ft. in April and to 14,000 ft. in May. Falls were below normal in all the months. Accumulations were about normal on the well-known higher passes.

South-West Monsoon Period—June-September.

JUNE AND JULY.

I.—AFGHANISTAN.

Kabul.—No snow fell on any of the mountain ranges of Afghanistan during the period. Snow had cleared from the Paghman and Hindu Kush ranges at the end of the season.

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 :—

Peaks.	Falls during the period.	Accumulations at the end of the period.
	Ft.	Ft.
Kaelh	$\frac{1}{2}$	8
Mahli Burawai	$\frac{1}{2}$	7
Khopra	$\frac{1}{2}$	7 $\frac{1}{2}$
Kuropass	$\frac{1}{2}$	7
Mahli Battal	$\frac{1}{2}$	6
Sarool	$\frac{1}{2}$	8 $\frac{1}{2}$
Bajitar	$\frac{1}{2}$	8 $\frac{1}{2}$
Raji Bhogi	$\frac{1}{2}$	6
Shah Khara	$\frac{1}{2}$	4 $\frac{1}{2}$
Jam Gath	$\frac{1}{2}$	3 $\frac{1}{2}$
Mussala Musa	$\frac{1}{2}$	3 $\frac{1}{2}$
Mulki	$\frac{1}{2}$	2 $\frac{1}{2}$
Makra	$\frac{1}{2}$	2 $\frac{1}{2}$

Accumulations at the end of July were above normal.

(b) *Dir, Swat and Chitral—Drosh*.—No snowfall occurred during the period at Drosh. There were no accumulations on the ranges and passes at the end of the period.

Chitral.—No snow fell during the period on the surrounding mountains. Accumulations of snow were about normal.

Malakand.—No snowfall occurred during the period. Accumulations at the ends of June and July were as below :—

Locality.	June.	July.
	Ft.	Ft.
Mankyal	7	5
Bashkar	4	2

(c) *Khyber Agency*.—There was no snowfall during the period. There were no accumulations of snow on the well-known passes and peaks at the end of July.

(d) *Kurrum*.—No snowfall occurred during the period in the Agency or the adjoining hills. Approximate depths of

accumulations at the end of the period on well-known passes and peaks are given below :—

Sikaram Peak	. . . . .	2"
Badina Peak	. . . . .	1½"
Zeran Pass	}	Traces.
Sikaram Pass		

The accumulations were above normal.

III.—KASHMIR.

(a) *Skardu*.—No snow fell during the period. No snow accumulations existed on the surrounding mountain peaks, ranges or passes.

(b) *Dras*.—No snowfall occurred during the period.

(c) *Srinagar*.—A few slight falls of snow were observed on the surrounding high mountains in the month of July. At the end of the period no snow existed on the surrounding mountains except in gorges and on very high peaks. The falls were below the average.

(d) *Gulmarg*.—Three light to moderate falls of snow were observed on the Affarwat range in June while only one was observed in July. Falls were below normal. Accumulations on the surrounding mountains at the end of the period were also sub-normal.

(e) *Kargil*.—There was no snowfall during the period.

(f) *Sonamarg*.—No snow fell during the period. But traces of snowfall were observed on two days in July on the high peaks. They melted away soon. Accumulations of snow did not exist on the surrounding mountains at the end of the period.

(g) *Leh*.—Two severe snowstorms occurred in June and a few of short duration were observed on the summits of the mountain in July. The total snowfall of the period was normal. All the passes were clear of snow. A foot or two of snow existed on the high peaks at the end of July.

(h) *Gurez*.—There was no snow at the station or on the surrounding hills.

(i) *Muzaffarabad*.—No snowfall was recorded during the period. There were no accumulations on the peaks of the surrounding mountains at the end of July.

IV.—THE PUNJAB.

(a) *Chamba*.—A few falls of snow occurred in June and July above 13,000 ft. There was not much accumulation of snow on peaks and high passes at the end of the season.

(b) *Kangra*.—There was no snowfall in the district during the period. Kulu reported slight snowfall in July above 14,000 ft. Accumulations at the end of the period were below normal.

(c) *Kilba Hills*.—In June occasional light falls of snow occurred on the high peaks, but the snow did not last long. In July no snow fell except a little above 16,000 ft. The falls were below the average. All the passes were open to traffic during the period.

V.—UNITED PROVINCES.

(a) *Almora*.—The following table gives the aggregate falls and accumulations of snow on the well-known peaks and passes near Almora at the end of June and July respectively :—

Locality.	June	July
<i>Falls.</i>		
Malla Danpur	1½	—
Malla Darma	3½	½
Byans	5	½
Chaudans	1½	½
<i>Accumulations.</i>		
Pindar valley	25 to 30	20
Nanda Khat	30 to 35	25
Sundar Dhunga	35 to 40	20
Bankatiya	30 to 35	25
Nuwe	10	7
Lipu	8	6
Lampia	12	6
Musurleg	7	—

Falls of the period were below the normal.

(b) *Garhwal*.—No snow fell during the period. Accumulations of snow on the mountain ranges and passes were normal.

AUGUST AND SEPTEMBER.

I.—AFGHANISTAN.

Kabul.—No information was received.

II.—NORTH-WEST FRONTIER PROVINCE.

(a) *Dir, Swat and Chitral—Drosh*.—No snowfall occurred at the station or on the surrounding hills and peaks of Lowarai and Madaglasht during the period. No accumulations existed on the well-known peaks and passes at the end of September.

(b) *Malakand*.—A fall of one inch deep which melted away soon was recorded in September. Snowfall was below the average during the period. The depths of accumulations on the well-known peaks and passes are given below :—

Locality.	August.	September.
	Ft.	Ft.
Bashkar	4	2
Mankyal	1½	1½

III.—KASHMIR.

(a) *Skardu*.—Light snow fell on the surrounding mountain peaks above 11,000 ft. in both the months. Depth of snow on the peaks of the surrounding mountains was estimated to be about 1 ft. at the end of September.

(b) *Dras*.—No snowfall was observed during the period.

(c) *Srinagar*.—Two light to moderate falls of snow were observed on the surrounding mountains during the month of September. Snowfall during the period was below the average.

(d) *Gulmarg*.—A light fall of snow occurred on the peaks of Handibal and Affarwat ranges in August while several light to moderate falls were observed on the peaks during the first half of September. Falls and accumulations of snow on the surrounding mountains were below the average at the end of the period.

(e) *Kargil*.—No snowfall was recorded during the period.

(f) *Sonmarg*.—No snowfall occurred during the period.

(g) *Lch*.—Frequent heavy snowstorms occurred during first half of September. Falls of the period were below the average. Depth of accumulation on the peaks of the surrounding mountains was estimated to be about 2 ft.

IV.—THE PUNJAB.

Kilba.—Snowline descended to 12,000 ft. in August. In September light snow fell down to a height of 10,000 ft. Falls were below the average. All the passes were open to traffic.

The Retreating Monsoon Period—October to December.

I.—AFGHANISTAN.

Kabul.—Snow fell on three days each in November and December. The falls in November were confined to Paghman and Hindu Kush ranges while those of December came down to Kabul proper. There was about 12 inches of snow on the Siibar Pass at the end of the period.

II.—BALUCHISTAN.

Quetta.—Reports for the period ending 15th December indicate that there was a heavy fall of snow on the high mountains on the 9th December. Snow line descended to about 1,000 ft. Depth of snow on all important peaks was about $\frac{1}{2}$ ft. Falls were normal.

III.—NORTH-WEST FRONTIER PROVINCE.

(a) *Hazara*.—Reports for October and November are not available. Falls and accumulations for December are given below :—

Locality.	Falls.	Accumulations.
	Ft.	Ft.
Jared	$\frac{1}{2}$	—
Kagan	$2\frac{1}{2}$	$\frac{1}{2}$
Paludran	$3\frac{1}{2}$	$\frac{1}{2}$
Narang	$4\frac{1}{2}$	1
Birangali	$\frac{1}{2}$	0
Thandiani	$\frac{1}{2}$	$\frac{1}{2}$
Phalkot	$1\frac{1}{2}$	$\frac{1}{2}$
Kalabagh	3	$\frac{1}{2}$
Dungagali	$2\frac{1}{2}$	1

V.—UNITED PROVINCES.

(a) *Almora*.—Estimated depths of falls and accumulations of snow on the well-known peaks and passes at the ends of August and September are given in the following table :—

Locality.	August.	September.
	Ft.	Ft.
<i>Falls.</i>		
Malla Danpur	1	$1\frac{1}{2}$
Chaudans	$1\frac{1}{2}$	$2\frac{1}{2}$
Byans	$5\frac{1}{2}$	$6\frac{1}{2}$
Malla Darma	$6\frac{1}{2}$	$6\frac{1}{2}$
Malla Johar	—	2
<i>Accumulations.</i>		
Pindar Valley	20	20
Nanda Khat	20	20
Sunder Dhunga	25	25
Bankatiya	25	25
Masurleg	8	9
Nuwe	7	11
Lampia	9	12
Lipu	6	8

On the whole the accumulations were above normal at the end of the period

(b) *Garhwal*.—No snowfall was recorded during August while two falls were observed in September. The depth of snow on the highest peaks ranged from 1" to 2" only. Falls were below the average. Accumulations at the end of the period were normal.

Both the falls and accumulations were below normal.

(b) *Dir, Swat and Chitral—Drosh*.—Snow fell on the Lowarai and Madaglasht peaks and on the peaks of the surrounding hills on two days in November. No snow fell in December. Accumulations of snow at the end of the season were estimated to be $3\frac{1}{2}$ ft. on the Lowarai Pass and $3\frac{1}{2}$ ft. and 2 ft. on the Madaglasht and Drosh Gol hill respectively.

Malakand.—Snow fell on the surrounding mountains on three days in November and eight days in December. The falls were above normal in November and December but below it in October. The accumulations at the end of each of the months are given below :—

Locality.	October.	November.	December.
	Ft.	Ft.	Ft.
Bashkar	$3\frac{1}{2}$	4	10
Mankyal	$1\frac{1}{2}$	$2\frac{1}{2}$	$11\frac{1}{2}$
Lowarai . . . . .	..	$2\frac{1}{2}$	7
Ham Dwasarai . . . . .	..	2	$3\frac{1}{2}$
Hindu Raj . . . . .	..	$3\frac{1}{2}$	6

(c) *Kurrum*.—Snow is reported to have fallen on one day at Parachinar to a depth of about 5" and on five days on all the peaks of Safed Koh including Sikaram and Bahua Peaks.

(d) *South Waziristan*.—Two to three inches of snow fell on Shakki Sar, Marmatti Sar and Razmak in the first week of December.

IV.—KASHMIR.

(a) *Skardu*.—Three light falls of snow occurred on the peaks of the surrounding high mountains in November. In December snow fell to a total depth of 2" at the station and to about 4 ft. on the surrounding mountain ranges. Snow line descended to 8,000 ft. Falls were normal. Accumulations about 5 to 6 ft. deep lay on the peaks of the surrounding mountains and were above normal.

(b) *Dras*.—Snow fell on one day in October, on two days in November and on four days in December to a total depth of 1", 3" and 5 ft. respectively. Snow line descended to a height of about 7,000 ft. during the period. Falls were below normal in October and November but above it in December. Accumulations of snow on the surrounding peaks of Lamchan, Marpachhoo and Kawa Baal were about four feet deep at the end of the period.

(c) *Srinagar*.—Several light to moderate falls of snow were observed on the surrounding mountains in each of the months. Falls and accumulations were normal at the end of the season.

(d) *Kargil*.—Traces of snow were observed on the highest peaks of the surrounding mountain in October. No snow fell in November. There were four falls of snow in December. The depth of snow on the well-known peaks was less than four feet.

(e) *Sonamarg*.—Snow fell on four days in November amounting to 5" of water when converted and measured and on seven days in December giving 5½" of snow water. The falls were much below normal. Accumulations of snow at the end of the period on the Zojilla Pass were more than 3 ft. deep.

(f) *Lch*.—Three light falls of snow occurred during the period, one in November and two in December. Snow line descended to 13,000 ft. Accumulations of snow at the end of the season were about 2 to 3 ft. deep. Falls and accumulations were about normal.

(g) *Muzaffarabad*.—Snow fell twice in November and December on the high hills and tops of the mountains with the result that passes were closed to traffic on both these occasions. A moderate amount of snow was present on the top of the hills on the Karnah side, at the end of the period.

V.—PUNJAB.

(a) *Rawalpindi*.—Murree had a fairly good fall on the 30th December. It covered the station to a depth of a few inches but did not last long.

(b) *Chamba*.—Snow fell on four days on the range proper. Bharmaur range witnessed one fall in November. During December one fall on each of the two ranges Bhandal and Panggi and two falls on each Bharmaur and Tissa ranges were

reported. Snow line came down to 6,000 ft. during the season. The falls of the period were below normal. On account of heavy accumulations of snow on the higher hills, passes were closed for traffic.

(c) *Kilba (Simla District)*.—One fall each was reported in the months of October and November. Snow line during the months descended to 14,000 ft. and 8,500 ft. respectively. Of the three falls during December one which was the heaviest descended down to 8,500 ft. Falls during the period were below the average. All the passes were closed for traffic during the season.

VI.—UNITED PROVINCES.

(a) *Almora*.—Snowfall of the period was below the average. The total amounts of the falls and the accumulations as estimated by the Patwaris are given below:—

Locality.	October.	November.	December.
<i>Falls.</i>	Ft.	Ft.	Ft.
Chaudans	2	1	½
Malla Darma	1	1	2
Malla Danpur	2	2	3
Malla Johar	—	—	2
Byans	1	1½	2
<i>Accumulations.</i>			
Pindar Valley	20	25	28
Nanda Khat	20	25	28
Masurleg	9	9	10
Nuwe	13	11	17
Sundar Dhunga	25	30	33
Bankatia	25	30	33
Lampia	13	15	18
Lipu	9	12	12

(b) *Garhwal*.—There was one fall in October, two in November and six in December. The snow melted away soon and there were no accumulations on the peaks at the end of the period. The falls in each month were below the average.

VII.—ASSAM.

(a) *Kamrup*.—Snow fell locally in the district and was above normal.

(b) *Sadiya Frontier Tract*.—Towards the end of December heavy falls of snow were observed on the Abor and Mishini Hills. Falls and accumulations were above normal.

(c) *Baliapara Frontier Tract*.—Nothing is known except that the snowfall was below normal.

Summary.

Cold Weather Period—January and February.—The falls and accumulations were generally below normal.

Hot Weather Period—March to May.—The falls were normal in Kashmir and below normal in Baluchistan, the North-West Frontier Province, the Punjab and the United Provinces. Accumulations at the end of May were generally below normal except in the United Provinces where they were normal.

South-West Monsoon Period—June and July.—Snowfalls were below normal in the Punjab and the United Provinces and slightly below it in Kashmir. Accumulations were above normal in the North-West Frontier Province, normal

in the United Provinces and below normal in Kashmir and the Punjab.

South-West Monsoon Period—August and September.—The falls were below normal in the North-West Frontier Province, Kashmir, the Punjab and the United Provinces. Accumulations were slightly above normal in the United Provinces and below normal in Kashmir.

The Retreating Monsoon Period—October to December.—The falls were normal in Baluchistan, slightly below normal in the North-West Frontier Province and Kashmir, below normal in the Punjab and the United Provinces and slightly above normal in Assam. Accumulations were above normal in the Punjab and Assam, normal in Kashmir and below normal in the North-West Frontier Province.