# Notes and News

## WORLD METEOROLOGICAL ORGANISATION. COMMISSION FOR AGRICULTURAL METEOROLOGY

The First Session of the Commission for Agricultural Meteorology was held at Paris from 3 to 20 November 1953. L.A. Ramdas, Deputy Director General of Observatories (Climatology and Geophysics), was deputed by Government to represent India at these meetings.

The Session was inaugurated on 3 November 1953, at 11 A.M. by M. Olmi, Secretary of State for Agriculture, representing the Government of the French Republic. His opening speech was followed by another from M. Andre Viaut, permanent representative for France at the WMO. Prof. J. J. Burgos, President of the Commission for Agricultural Meteorology then delivered his address.

At the Plenary Session in the afternoon of the 3rd, M. Sanson, the Principal Member of France, the host country, was elected as Vice-Chairman for the duration of the Session and the Committee for Nomination and the Drafting Committee were formed. Dr. Ramdas from India was elected as a member of the Committee for Nomination. After adopting the agenda, the Commission split into two working committees, a small one, namely Committee A, to deal with some of the items of an organisational or administrative nature, and a Committee B consisting of the majority of members to deal with the main items of the agenda which covered the technical and research problems. Mr. Johnson was elected President of Committee A and Dr. Ramdas as President of Committee B.

From 4 November onwards, the work of the Session was mainly in the hands of these two committees which held their Sessions daily for the next two weeks. Amongst the technical and research items which were discussed were those relating to :

(*a*) Application of meteorology and climatology to scientific and practical agricultural problems;

(*b*) Biological observations for agro-meteorological purposes;

(*c*) Determination of the meteorological and climatic requirements of plants ;

(*d*) Acclimatisation of cultivated plants, including increase of resistance to drought and low temperatures;

(*e*) Application of meteorology and climatology to animal life problems, and

(*f*) The draft provisional technical regulations relating to Agricultural Meteorology.

The terms of reference of the Commission for Agricultural Meteorology were revised and about a dozen resolutions and twenty recommendations covering the various major aspects of meteorology in relation to agriculture and cognate subjects were discussed and passed at the Plenary meetings towards the end of the Session. A number of working groups were also constituted : in four of these India finds representation. Dr. Burgos continues to be the President of the Commission.

The meetings afforded an excellent opportunity for presenting the valuable experience which our workers in India have gained on the subject of Agricultural Meteorology and also to exchange the experiences of other countries represented. The Session came to a very successful close on 20 November 1953.

## COMMISSIONS FOR INSTRUMENTS AND METHODS OF OBSERVATION AND FOR AEROLOGY

The First Sessions of the Commission for Instruments and Methods of Observation and of the Commission for Aerology of the World Meteorological Organisation were held simultaneously at Toronto (Canada) from 10 August to 5 September 1953. L. S.Mathur of the India Meteorological Department attended the Sessions as India's delegate. Items discussed at the CIMO Session included (*a*) Observational practice with regard to various meteorological elements, (*b*) Criteria of the

sensitiveness of meteorological instruments and (*c*) Preparation of Technical Regulations relating to the field of CIMO.

Principal subjects discussed at the Session of the CAe were (*a*) Preparation and publication of aerological tables and diagrams (*b*) Aerological network, (*c*) Radio electrical meteorology and (*d*) Preparation of the Technical Regulations concerning the field of this Commission.

## COMMISSION FOR BIBLIOGRAPHY AND PUBLICATIONS

The First Session of the Commission for Bibliography and Publications of the World Meteorological Organisation was held at Paris from 24 November to 14 December 1953. Agenda on the items of this Session included (*a*) Classification, form, preservation, reproduction of meteorological documents, (*b*) Glossary for different branches of meteorology, (*c*) Exchange of meteorological publications and (*d*) Preparation of Technical Regulations relating to the field of this Commission.

## THIRD INTERNATIONAL GEOPHYSICAL YEAR

To organise the work of the Third International Geophysical year for 1957-58 in India, the Government of India have constituted a National Committee with the following members :

(1) K. S. Krishnan (Chairman), (2) S. K. Mitra, (3) K. R. Ramanathan, (4) Vikram Sarabhai, (5) S. Basu, (6) Representative of the Central Board of Geophysics, (7) President, Geodetic and Research Branch, Dehra Dun, (8) Director, Kodaikanal Observatory, (9) Director, Colaba and Alibag Observatories.

## METEOR

(1) *Vessel* : S. S. Jalamayur
Captain : T. Mather
*Voyage* : Suez to Aden
*Observer* : P. S. Barve, 3rd Officer

Red Sea. 28 August 1953, 1945 GMT Position D/R 36° 34′N, 41° 05′E.

Observed meteor falling bearing 180° at an altitude of about 20°. It travelled in a downward direction along the meridian and was seen for about 2 seconds. It looked bluish in colour and left no trail behind. The phenomenon was observed through a thin layer of *St* covering all the sky near horizon upto 15—20°. The moon had risen an hour before. The brightness of the meteor was equal to that of Venus. Tufts of *Ci* were visible overhead. Wind airs, Dry Bulb 91°F, Wet Bulb 85°F. Bar. 1005.7 mb.

(2) *Vessel* : S. S. Jalamayur
Captain : T. Mather
*Voyage* : Aden to Bombay
*Observer* : P. S. Barve, 3rd Officer

30 August 1953, 1930 GMT, 2230 LMT. Position 12° 43′N, 46° 00′E.

Observed meteor falling bearing 045° at altitude 15° above the horizon. It was white in colour and appeared southeast of Cassiopeia and travelled downward. It was bright enough to light up the whole area for about one second.

Dry Bulb 87°F, Wet Bulb 83°F. Barometer 1008.2 mb Vis. 98, Sky—clear, No moon. Pos. 12° 43′N, 45° 56′E.

## SEA FOG

*Vessel* : S. S. Jalamayur
Captain : T. Mather
*Voyage* : Aden to Bombay (Gulf of Aden)
*Observer* : B. D. Kataria, Chief Officer

31 August 1953. At about 1930 ATS (1318 GMT) a patch was visible extending from about bearing 070° to North, S. Head 080°. It was first thought to be land as it appeared very marked and clear but on verifying from the chart this possibility was dismissed, the ship being about 80 miles from the nearest shore. The whole was believed to be a cloud.

At about 1655 ATS the cloud was observed to " Fray and Loose " its clear outline. It was now a darker patch of black and there being no clouds in the sky appeared to be a patch of fog.

At about 1720 ATS the bank of fog was round the ship travelling from NE in SW'ly direction. Wind NE 0-1, visibility was reduced to about 100—200 yards until 1750 hrs when it was all clear again.

Bar corrected 1008·5 mb, Sea Temp. 84°F, Air Temp. Dry Bulb 84°F, Wet Bulb 83°F. Position at observation 13° 10'N, 49° 20'E. Course 080°, speed 10·5 kts.

Note : The frequency of fog—visibility less than ½ mile—during the months of August and September given in Monthly Meteorological Charts of the Indian Ocean is 0—2.

LUMINOUS SEA

*Vessel* : S. S. Jalamayur
Captain : T. Mather
*Voyage* : Aden to Bombay (Arabian Sea)
*Observers* : B. D. Kataria, Chief Officer
V. Pareira, 2nd Officer
P. S. Barve, 3rd Officer

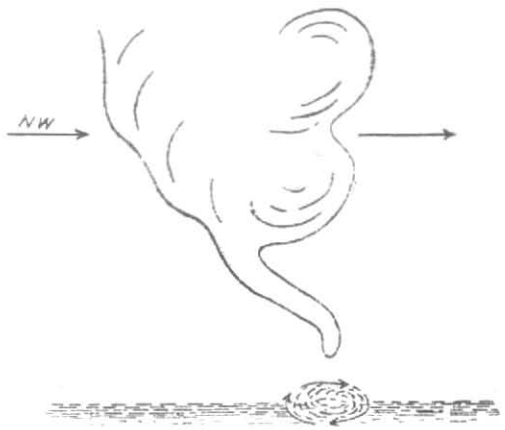
2-3 September 1953. Time 2040 ATS. Position 15° 15'N, 59° 08'E. Course 075°, speed 11 kts.

The whole sea from horizon to horizon looked luminous and bright. The phenomenon lasted through the night and was no more to be seen at the break of dawn.

At about 2030 ATS, 1640 GMT, easterly horizon appeared to be illuminated as it may with shore lights beyond. In about 5 minutes the whole sea appeared to be luminous and white. It was very bright for the first hour but later on the brightness faded. It was last seen at 0445 ATS on 3 September.

It was noted that during this time the sea had calmed considerably and remained so till later part of the day with glossy surface. SW'ly swell moderate to heavy was running through the phenomenon.

There was no moon. The sky remained mainly clear. Sea Temp. rose from 74°F to 76°F and remained constant at 76°F. Air Temp. Dry Bulb 78°F and Wet Bulb 74°F.




WATERSPOUT

*Vessel* : S. S. Jalaganga
Captain : H. O. Lewis
*Voyage* : Cochin to Calcutta via Ceylon
*Observer* : J. C. Joseph, Chief Officer

7 September 1953, 0200 GMT. Pos. of ship —Lat. 14° 00'N, Long. 81° 50'E, course 041°(T).

Observed waterspout of a mild nature overtaking ship a mile off. Cloud formation, heavy nimbus and a cylindrical form directly above the spout reaching halfway from the skies. The revolving agitation in the water was clockwise and from the time it took to pass the ship the speed was estimated to be ranging from 25 to 30 knots. When first observed, wind from south Force 4 and after 10 minutes shifted to west and northwest, Force 5 with heavy rain following. No appreciable change or fall in the barometer was noticed. Temp. Air Dry 84°F Wet 80°F. Barometer 1006·9 mb.

Note : On 7 September 1953 the unsettled conditions in west central and north Bay of Bengal concentrated into a shallow depression centred at 0300 GMT within half a degree of Lat. 20°N, Long. 88°E.

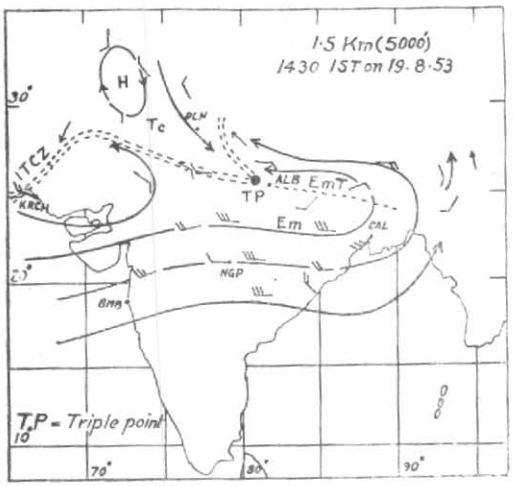



Fig. 1

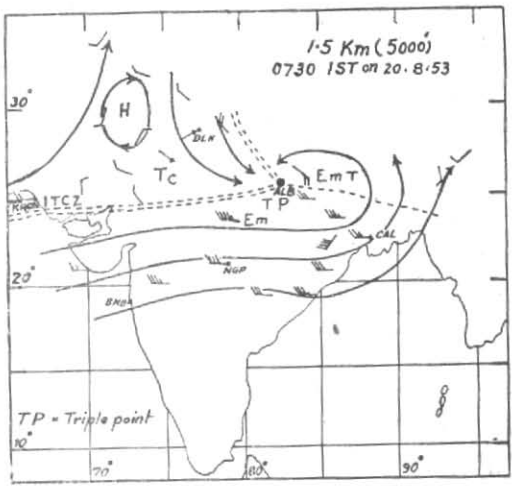



Fig. 2

## RECORD RAINFALL AT ALLAHABAD ON 20 AUGUST 1953

Allahabad (Bamrauli) recorded the exceptionally heavy rainfall of 13·20 inches and Allahabad City 12·0 inches for the 24 hours ending at 0830 IST of 20 August 1953. This is an all-time record (since 1881) for the station, the previous highest rainfall being 10·48 inches on 4 September 1930. Of the 13·20 inches recorded on the 20th morning, about 10·0 inches fell between 1730 IST of 19th and 0830 IST of 20th. During the succeeding three days rainfall of 4″, 1/4″ and 8″ respectively, were recorded making the total for the four days 26 inches. On the last of these days, a severe squall of 65 miles per hour accompanied the rains.

The damage caused by this unprecedented rain was, according to newspaper reports very heavy. As a result of the downpour, 200 houses were reported to have collapsed in Allahabad and its suburbs rendering 1500 persons homeless, and nearly 300 villages on the banks of the Ganga with a population of 30,000 were water-logged and about 50 per cent of the houses in this area had collapsed. The severe squall on the morning of the 23rd coming in the wake of heavy rains caused several more houses to fall down, uprooted many trees, disrupted the city power supply system and also telegraph and telephone communications. At least seven persons were reported to have been killed.

*Synoptic situation*—Early in the 3rd week of August, the Arabian Sea branch of the monsoon was very active. A low was extending from Madhya Bharat to northeast Madhya Pradesh on the morning of the 16th and persisted with little change in position and intensity till the 18th. The monsoon trough in the upper air (upto 7000′) was very narrow and active and the easterly deflected stream and the Arabian Sea monsoon current were separated hardly by 60 miles. An upper air cyclonic circulation appeared over Saurashtra and Kutch on the 18th morning and under its influence the monsoon became vigorous over that area causing some very heavy falls. About the same time the low over Madhya Bharat and northeast Madhya Pradesh shifted towards southeast Uttar Pradesh and the axis of the monsoon trough also shifted northwards. By the morning of the 19th a very small low was lying over south Uttar Pradesh with the associated cyclonic circulation extending upto 5000 ft. The wind circulation at 5000′, the position of the ITCZ and the axis of the trough at 1430 IST of 19th and at 0830 IST of 20th are shown in Figs. 1 and 2 above. It

will be seen in Fig. 1 that a stream of $T_c$ air was flowing southeastwards parallel to the foot of the hill from the Punjab towards Uttar Pradesh. The advent of this $T_c$ air was marked with widespread thunderstorm activity in west Uttar Pradesh in the afternoon of 19th. The rains started at Allahabad about midday and by evening 3″ was recorded. Apparently by the evening of the 19th the $T_c$ stream had reached Allahabad and that station was at the triple point where $E_m$ from the Arabian Sea, $E_mT$ round the trough and $T_c$ converged. As the Arabian Sea branch of the monsoon was vigorous, the $E_m$ air converging towards the triple point was fresh and with the excessive convergence at the triple point gave the exceptionally heavy fall at Allahabad. The neighbouring observatories recorded only 2 to 4 inches, showing that the very heavy rain was probably confined to a small area round about the triple point.

During the later stages, as this low over southeast Uttar Pradesh shifted westwards, very heavy falls confined to narrow regions were still associated with it showing that the triple point continued to be present till the low became unimportant.

## WEATHER, MONSOON SEASON (JUNE-SEPTEMBER 1953)

*Chief features*—The southwest monsoon season of the year was characterised by abundant rainfall in most parts of the country. While the advance of monsoon into the south peninsula was delayed by about a week, its subsequent progress northwards was quite rapid, and it extended into northwest India before the usual date. Breaks in monsoon were generally short and the season's rainfall over the country was, on the whole, well-distributed both in respect of time and space—which was a very welcome feature from the point of view of the country's food crops.

*June*—The Arabian Sea branch of the monsoon advanced into the southeast Arabian Sea and Travancore-Cochin on the 7th, about a week after the usual date. Its further advance into Malabar-south Kanara and the south Konkan took place by the 10th and 11th June respectively. The Bay of Bengal branch of the monsoon advanced into the head Bay by the 2nd week of the month. A depression formed in the west central Bay of Bengal on the 15th morning. Moving northwestwards initially and then in some northerly direction it lay as a deep depression centred about 50 miles east of Puri on the 18th morning. It intensified further and became a cyclonic storm of small core by the 19th morning. The storm crossed the Orissa coast on the same afternoon, and weakened into a deep depression centred about 40 miles northnorthwest of Gopalpur at 1730 IST on the 19th. Thereafter, moving in a westerly direction and weakening gradually, it lay as a depression near Nagpur on the 21st morning and became unimportant on the next day. In association with this, the monsoon extended over the remaining parts of the peninsula, northeast India and east Uttar Pradesh between the 14th and 16th. Vigorous monsoon prevailed in the Konkan between the 18th and 21st ; Dahanu (north Konkan) had 24″ of rain during the 48 hours ending at 0830 IST on the 19th, while Santacruz (Bombay) recorded 19″ during the same period. Heavy rain during the period caused floods in parts of the north Konkan, and rail communication between Gujarat and Bombay suffered temporary dislocation. Fairly widespread rain also occurred in north coastal Andhradesa between the 18th and 21st and in Madhya Pradesh between the 20th and 22nd, with locally heavy to very heavy falls in Berar on the 21st. The monsoon advanced into Rajasthan, west Uttar Pradesh and the Punjab (I) by 24th, causing locally heavy falls of rain in Uttar Pradesh. Thereafter, the monsoon generally weakened for a time over the country, outside northeast India and the Konkan. Heavy to very heavy rainfall occurred locally in sub-Himalayan West Bengal and at a few stations in Assam and north Bihar on the 26th, Cherrapunji recording about 30″ of rain during the 48 hours ending at 0830 IST of that date. According to newspaper reports, the river Kosi was in spate and inundated about 20 villages in Darbhanga district in Bihar.

A second depression formed in the northwest Bay of Bengal on the 29th afternoon, with its centre near Sandheads. Moving northwestwards, it crossed the coast on the 30th evening and weakened into a trough over Chota Nagpur and the adjoining areas by the next day. Under its influence widespread and locally heavy to very heavy rain fell in Chota Nagpur on the 29th and 30th. The monsoon was also vigorous in the south Konkan on the 30th, when Ratnagiri recorded 12″ of rain.

Averaged over the plains of India, the rainfall during June was 12 per cent in defect.

*July*—An important feature of July this year was an excess of rainfall over the country as a whole although no depression formed in the Bay of Bengal and travelled across the country during this month. In association with a low pressure area over north Madhya Bharat, the monsoon strengthened in Chota Nagpur and east Madhya Pradesh between the 2nd and 7th. Widespread rain also occurred in Gangetic West Bengal on the 5th and 6th, in east Uttar Pradesh on the 4th and 5th, in northwest Madhya Pradesh and south Madhya Bharat between the 4th and 8th, in Gujarat on the 7th and 8th and in Rajasthan on the 8th. Surat recorded 9″ of rain on the 7th. The monsoon revived over Uttar Pradesh by the 8th and remained active over the whole of north India, outside Rajasthan, between the 10th and 15th. Locally heavy to very heavy rain fell in northwest Uttar Pradesh during this period, and in the Punjab(I) between 10th and 12th. Floods were reported from the Manipur valley in Assam following rapid rise in the level of the Imphal river which, according to newspaper reports, inundated about 30,000 acres of paddy fields. Floods were also reported from Muzaffarpur district of Bihar by the 11th. The monsoon was markedly active in Malabar-south Kanara and Travancore-Cochin till the 8th, after which it showed a slight weakening. Very heavy falls were reported locally from south Deccan (Desh) on the first two days of the month leading to floods and considerable damage to crops and property in Kohlapur district. Monsoon was vigorous in the south Konkan between the 9th and 15th and in the north Konkan between the 13th and 15th. A few heavy to very heavy falls were also reported from north Madhya Pradesh on the 14th. Thereafter, the monsoon generally weakened throughout the country, with the exception of Assam. By the 22nd, monsoon again strengthened over north India ; widespread heavy to very heavy rain occurred in Uttar Pradesh and the Punjab (I) between the 22nd and 23rd. Under the influence of a low pressure wave which moved westwards across the south peninsula between the 24th and 27th, the monsoon revived over the interior of the peninsula and the central parts of the country. There was fairly widespread rain in northeast India between the 25th and 28th. The rivers Kosi, Kamala, Balan and Jiwach in Bihar were reported to be in high floods inundating about 200 villages in the Darbhanga district. Vigorous monsoon prevailed in the Konkan between the 28th and 31st, and in Malabar-south Kanara on the 30th and 31st. Bombay (Santacruz) recorded 12″ of rain on the 28th. Widespread and locally heavy to very heavy rain also occurred in north Uttar Pradesh on the 28th.

Averaged over the plains of India the rainfall during July was 14 per cent in excess.

*August*—The month of August was marked by the formation of a cyclonic storm and two depressions in the head Bay of Bengal and associated wet spell over a large belt of the country.

A depression formed at the head Bay of Bengal on the 1st and rapidly intensified into a cyclonic storm the same night. It was centred about 100 miles to the south of Calcutta on the 2nd morning. Moving in a westerly direction it crossed coast near Balasore during the night and weakened into a deep depression, centred near Sambalpur on the 3rd morning. Moving in some northwesterly direction and weakening at the same time, it lay as a depression over northwest Madhya Pradesh on the 5th. Weakening further into a low pressure area

it moved away westwards across north Gujarat, Kutch and Sind. In association with the above, strong monsoon prevailed in the Konkan during the 1st week, and in Kutch and Saurashtra on the 4th. The monsoon was vigorous in Orissa on the 3rd and in Madhya Pradesh between the 3rd and 5th. Angul in Orissa reported 10″ of rain on 3rd morning. Kanker in Madhya Pradesh recorded 7″ on 4th and Pachmarhi 8″ on 5th.

The monsoon was vigorous in the north Punjab (I) on the 2nd and 3rd. Madhopur in Gurdaspur district recorded 18·6″ of rain during the 72 hours ending at 0830 IST of the 3rd, which is reported to be the highest record for that station. Due to these very heavy falls in the Punjab (I), the communication systems in the Pathankot area were seriously interrupted.

A shallow depression formed at the head Bay of Bengal on the 10th, with centre at 0830 IST about 150 miles southeast of Calcutta. Moving slowly westwards it intensified into a deep depression and was centred about 80 miles south of Saugor Island on the 12th morning. It continued to move slowly in a westerly direction and weakened into a depression by the 14th morning. Crossing coast near Chandbali the same night it weakened into a low pressure area over Orissa, Chota Nagpur and east Madhya Pradesh. On the 13th morning some very heavy falls of rain were reported from southeast Madhya Pradesh, Kanker and Sironcha recording 8″ and 7″ respectively. Following these very heavy falls, the river Godavari was in spate and overflowed its previous record height at Rajahmundry Railway Bridge. The river Dudh washed away the bridge over it and isolated the two halves of Kanker town. The low pressure area then moved northwestwards and persisted over the central parts of the country for some 3 or 4 days during which some heavy to very heavy falls of rain occurred in Saurashtra, north Gujarat and north Madhya Pradesh. Surendranagar in Saurashtra, Umaria in Vindhya Pradesh and Pendra in northeast Madhya Pradesh recorded 8″, 12″ and 10″ respectively on the 18th morning. Later the low pressure area moved northwards and merged into the seasonal trough causing heavy to very heavy rains at many places in east Uttar Pradesh. Allahabad reported 13″ of rain on the 20th and 8″ on the 23rd. Gonda recorded 8″ on the 22nd and Kanpur 7″ on the 23rd. According to press reports nearly 300 villages on the banks of the Ganges were inundated.

Conditions became markedly unsettled over the head Bay of Bengal on the 22nd and concentrated into a depression on the 23rd morning with its centre about 40 miles south of Calcutta. The depression lay over Chota Nagpur on the evening of the same day. Later, it rapidly weakened and moving in a northwesterly direction it merged into the seasonal trough. During the 24 hours from the morning of the 23rd, widespread heavy to very heavy falls occurred in Chota Nagpur and south Bihar. The chief amounts of rainfall were 7″ at Jamshedpur and 6″ at Gaya.

Averaged over the plains of India, the rainfall was 14 per cent in excess.

*September*—Monsoon continued normally active over the whole country during the month, and its withdrawal from northwest India was somewhat later than usual.

Conditions became unsettled in the north and the central Bay of Bengal in the beginning of the month and concentrated into a shallow depression by the 7th morning, with its centre about 220 miles south of Calcutta. Moving in a northwesterly direction and crossing coast the same night, it lay as a low pressure area over Gangetic West Bengal and neighbourhood on the 8th morning. The low pressure area then moved into Bihar and east Uttar Pradesh, where it persisted for a few days and became unimportant later. In association with the above synoptic situation, monsoon was vigorous in the north Konkan and Gujarat on the 4th and in Saurashtra on the 5th. Dahanu and Ahmedabad recorded 7″ and 5″ of rain respectively on the 4th and Rajkot recorded 5″ on the 5th. Also, considerable strengthening of

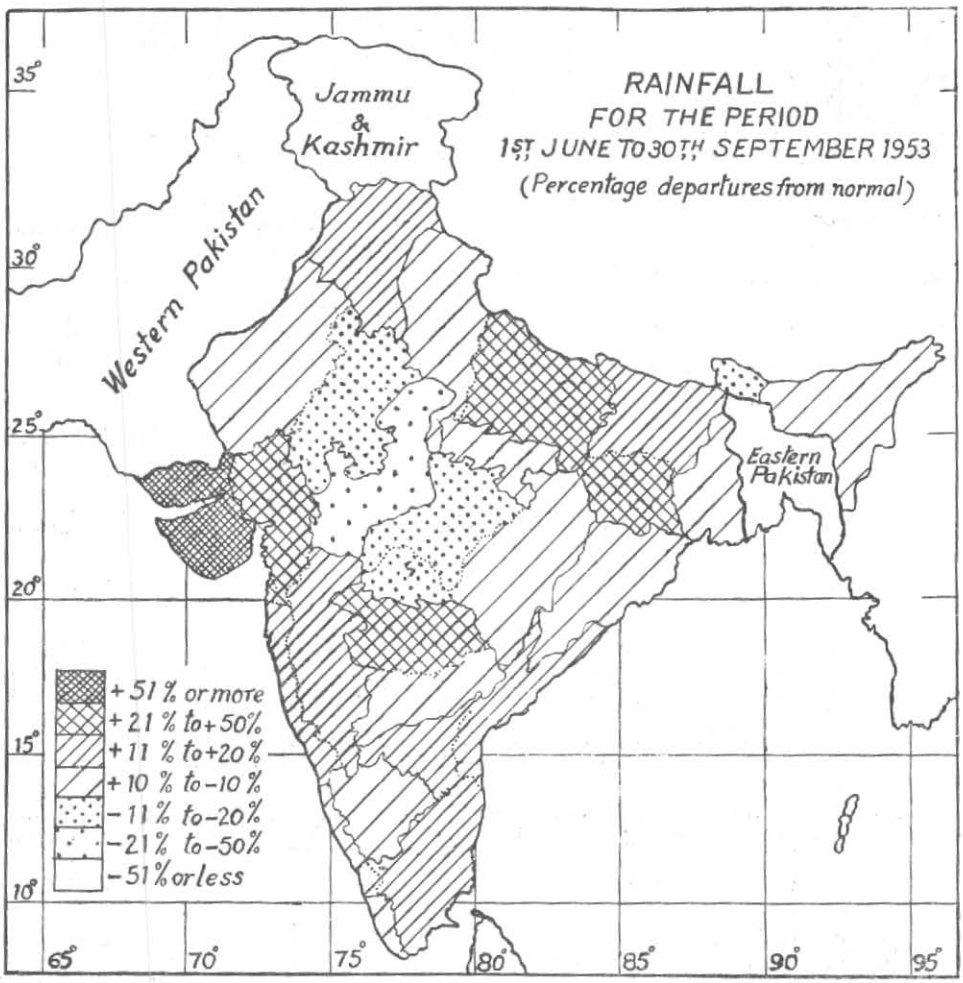

RAINFALL
FOR THE PERIOD
1ST JUNE TO 30TH SEPTEMBER 1953
(Percentage departures from normal)
Jammu & Kashmir
Western Pakistan
Eastern Pakistan
+51 % or more
+21 % to +50%
+11 % to +20%
+10 % to -10 %
-11 % to -20%
-21 % to -50%
-51 % or less
35°
30°
25°
20°
15°
10°
65°
70°
75°
80°
85°
90°
95°

Fig. 1

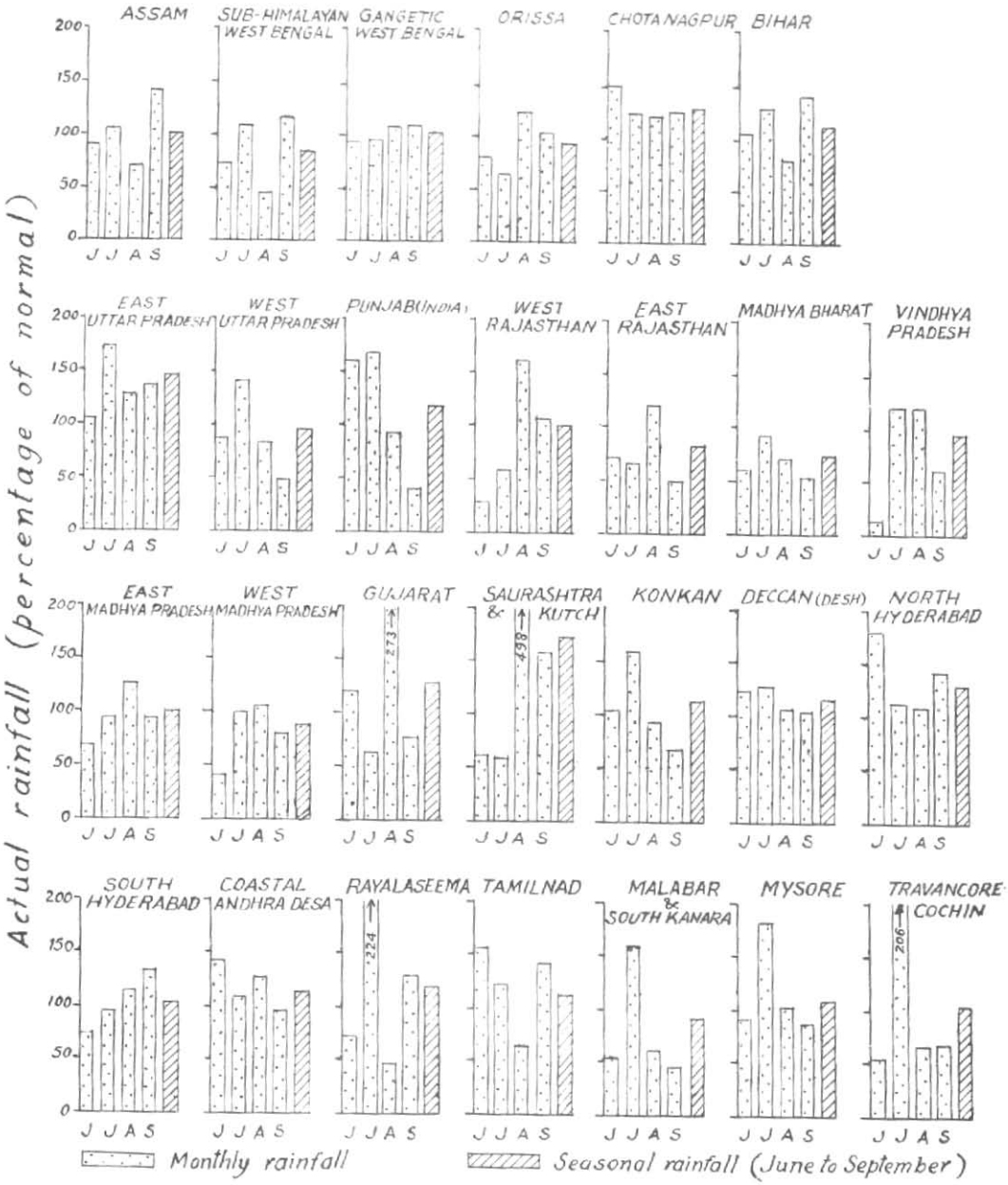



Fig. 2. Progress of the monsoon month by month—1953

monsoon occurred during the second week of the month in Assam, West Bengal, Bihar and adjoining east Uttar Pradesh. Malda and Siliguri recorded 8″ and 6″ of rain respectively on the 10th ; Chapra and Dumka 4″ and 3″ on the 11th, and Azamgarh 5″ on the 12th. In Assam Cherrapunji recorded 57″ of rain between the 10th and 14th, out of which 19″ fell during the 24 hours ending at 0830 IST on the 12th. At Dhubri there was 22″ of rain during the 72 hours ending at 0830 IST on the 13th. These heavy falls of rain caused serious floods in Assam, Bihar and southeast Uttar Pradesh.

A low pressure wave from the east moved into the central and the adjoining north Bay of Bengal on the 21st morning and caused a depression to form with its centre near Lat. 16°N, Long. 91°E by the 23rd. Moving initially westnorthwestwards and later northwards, it intensified into a cyclonic storm by the 26th morning, when it was centred 40 miles southwest of Sandheads. Later, it weakened into a depression and crossed coast near Contai during the same night. Weakening further, it then moved rapidly in a northwesterly direction, and lay as a diffuse low pressure area over east Uttar Pradesh on the 30th. Under its influence heavy to very heavy rain occurred locally in Gangetic West Bengal, Chota Nagpur and adjoining north Orissa on the 27th. Chaibasa and Ranchi recorded 6″ and 5″ of rain respectively and Contai and Purulia 4″ each on the 27th ; monsoon was strong to vigorous in east Uttar Pradesh and adjoining Bihar between the 28th and 30th, Gonda had 11″ of rain in 48 hours ending 0830 IST on the 30th.

Averaged over the plains of India, the month's rainfall was normal.

Three cyclonic storms and four depressions—one of which was deep—formed in the Bay of Bengal during the season and helped to build up the season's total rainfall as these moved west or northwestwards across the central parts of the country.

The rainfall during the monsoon season, as a whole, was in large excess in Saurashtra and Kutch and in moderate excess in Chota Nagpur, east Uttar Pradesh, Gujarat and north Hyderabad. It was in slight excess in Bihar, the Punjab (I), the Konkan, Deccan (Desh), coastal Andhradesa, Rayalaseema and Tamilnad and normal over the rest of the country, except in Sub-Himalayan West Bengal, east Rajasthan, Madhya Bharat and west Madhya Pradesh where it was in slight to moderate defect.

Averaged over the plains of India, the rainfall was 7 per cent in excess.

The rainfall distribution for the monsoon season and the progress of monsoon over the various sub-divisions of India month by month are given in Figs. 1 and 2.