

Notes and News

THE FORTIETH SESSION OF THE INDIAN SCIENCE CONGRESS HELD AT LUCKNOW IN JANUARY 1953

The 40th Session of the Indian Science Congress was inaugurated on 2 January 1953 at Lucknow by the Hon'ble the Prime Minister of India, Shri Jawaharlal Nehru. A large number of distinguished scientists from all parts of India and from a number of foreign countries were present. Debendra Mohan Bose, Director, Bose Research Institute, Calcutta, the General President, delivered the Presidential address on "The living and the non-living".

S. C. Roy, S. Basu, S. K. Pramanik, R. Ananthakrishnan, U. K. Bose and P. Jagannathan from the India Meteorological Department attended the Session. A number of papers were contributed by officers of the India Meteorological Department. S. K. Pramanik presented the paper on "Rainfall Trends in India" by himself and P. Jagannathan in the Geology and Geography Section and the paper on "The Hydro-meteorology of the Mayurakshi Catchment" by himself and K. N. Rao in the Engineering Section. U. K. Bose presented the paper on "A synoptic study of ocean swells associated with a cyclone in the Bay of Bengal" by himself and S. Basu.

There were a number of discussions, of which the following may be mentioned—

- (1) The motion of compressible fluids
- (2) Statistical problems in Econometric Models
- (3) Stochastic Processes
- (4) Recent advances in Thermodynamics
- (5) Cosmic Rays

ATMOSPHERIC RESEARCH COMMITTEE

A meeting of the Atmospheric Research Committee was held on 11 February 1953 at the Meteorological Office, Lodi Road, New

Delhi, under the Chairmanship of V. V. Sohoni, Director General of Observatories. Among the items considered by the Committee the most important was the scope for production of artificial rain in India. The Committee after taking note of the discussions in the symposium on artificial rain held in Delhi on 9 and 10 February 1953* came to the conclusion that the work done so far elsewhere has shown only that certain types of clouds can be stimulated to precipitate on a restricted scale by artificial seeding, but there is as yet very little evidence for the belief that such processes can be invoked successfully to achieve weather modification or weather control for practical use in easing difficulties arising from vagaries of natural weather. In view of the undecided nature of the results of rain-making experiments that have so far been made, the Committee felt that further sustained research work on the scientific and technological problems behind the process of artificial stimulation of clouds was necessary. The committee made the following recommendations for further work on the subject in India—

(1) A 'Rain Research Unit' should be set up by Government of India at Delhi to try out various methods of cloud seeding and also to conduct planned field experiments and to assess the value of the results on a satisfactory basis. The Committee considered that Delhi would be most proper place for the Research Unit in view of the manifold requirements of equipment such as aircraft, radar etc. and trained technical personnel to man the equipment.

(2) A research unit for the study of cloud physics should be set up at Poona which would devote itself to the study of clouds in respect of their water content, drop size spectra, vertical currents etc.

* A brief summary of the proceedings of the symposium appears as the next item of the Notes and News

(3) S. K. Banerji's experiments on seeding of clouds with the help of balloons whose results have not been conclusive so far, should be continued for another year in a more systematic manner so as to afford proper assessment of the results.

The Committee recommended the continuance of the schemes on (i) Infra-red radiation from the atmosphere and solar radiation by L. A. Ramdas; (ii) Ozone and weather by K. R. Ramanathan; (iii) Study of Microseisms and Sea waves and their correlation with cyclonic disturbances by S. K. Chakrabarty. The termination of the scheme "Colloidal Instability of Cloud particles above and below the freezing point" by S. K. Banerji was agreed to. A new scheme by S. P. Venkiteshwaran for the measurement of electrical potential gradient in the upper air was considered; it was recommended that as the work falls within the scope of the India Meteorological Department, the Director General of Observatories may be requested to give suitable assistance to the officer concerned for carrying out this work.

SYMPOSIUM ON ARTIFICIAL RAIN

A symposium on 'artificial rain' was held in the Meteorological Office, Lodi Road, New Delhi, on 9 and 10 February 1953, under the Chairmanship of V. V. Sohoni, Director General of Observatories and Chairman of Atmospheric Research Committee of the Council of Scientific and Industrial Research. S. S. Bhatnagar, F. R. S., Director, Council of Scientific and Industrial Research, inaugurated the symposium.

Opening the proceedings, Mr. Sohoni reviewed the cloud seeding experiments carried out in different countries, which have yielded results of value in understanding the physics of cloud and rain formation. Regarding the question as to how much precipitation can be induced or if the amount would be of any economic importance, he explained that the uncertainty in interpreting the results of experiments is partly due to the fact that the assessment of the results of experiments carried out by the

different organisations have not been the same, and even the experiments in one and the same country by two independent research groups have led to totally different conclusions. A stage has now come when scientists in this country should take stock of the possibilities and relative efficacy of the various methods as have been tried till now. The purpose of organising the symposium was to afford the opportunity to our scientists firstly to assess what the experiments teach us and secondly to evolve the best approach to the scientific problem of rain-making, which has to be solved satisfactorily before the practical application of the methods for the alleviation of scarcity and famine can be thought of.

Dr. Bhatnagar in his inaugural address said that the Council of Scientific and Industrial Research is interested in all genuine research schemes contributing to advancement of knowledge irrespective of their economic importance. He understood from experts on rain-making that the methods are still in an experimental stage and have not yet reached the stage of practical application in the economic field. He exhorted the Indian workers to carry out planned experiments in India also and assured that the Council of Scientific and Industrial Research will give support to any planned scheme of experiments on rain-making in India.

Papers on "The physics of cloud formation and precipitation" were then read and discussed. In a short communication, G. I. Finch indicated the process of crystal growth and explained how the greater stability of the silver iodide-ice epitaxial system was responsible in making silver iodide a successful seeding agent in freezing clouds. P. K. Das discussed the growth of cloud drops by coalescence in warm clouds and its relationship to the speed of updraught in the clouds and explained how far introduction of water droplets at the base of the clouds can go towards the release of precipitation. He concluded that more studies on the structure and physical properties of clouds were essential to assist rain-making trials. P. R. Krishna Rao read two papers on the

formation and the physical properties of cloud and rain from different types of clouds over Madras based on data collected from aeroplane meteorological flights made twice daily during the northeast monsoon season of 1944 and 1945. The papers were discussed in which several scientists took part.

The afternoon of 9 February 1953 was devoted mainly to discussion on a paper by S. K. Banerji giving the results of

- (i) his laboratory experiments on artificial cloud droplets and their seeding
- (ii) seeding trials on clouds conducted by him at Jadavpur near Calcutta during the monsoon season of 1952.

He reported that in 28 out of the 35 field experiments, the clouds yielded rain varying from drizzle to heavy rain. Of the remaining 7 trials, 6 were demonstrational experiments whose effects could not be ascertained, while in one experiment a cumulonimbus cloud dissipated away on seeding.

Considerable discussion followed this paper in which many meteorologists present took part, many of the questions being directed to eliciting details of the conditions under which his experiments had been carried out. It was pointed out that an examination of the rainfall data of the neighbouring places and of the synoptic situation on the trial dates showed that it was difficult to ascribe the rainfall at Jadavpur on most of the trial days to the seeding. Dr. Banerji replied to the various questions put to him and in conclusion agreed that more trials with proper control should be made to obtain results which would be amenable to scientific assessment.

On the next day A. K. Roy presented his paper in which, he indicated how the physical processes behind the production of 'artificial rain' are much the same as those which produce natural rain and stressed particularly two aspects regarding cloud seeding experiments, namely, (a) how far the seeding operation on a particular cloud succeeded in making it yield rain and (b) how far rain-making operations can be expected to solve problems of scarcity of water in the arid

zones or areas where failure of rains has occurred; the latter aspect can be studied only after a series of systematic trials has been made in an area for a number of seasons. This was followed by papers by L.A. Ramdas and S. Mazumdar on the methods of inducing artificial rain together with requirements of proper controlled experiments. C. Dakshinamurti, in indicating the role of artificial rain in agriculture, described the extent of the interest which the agriculturist has in these rain-making trials. S. Mull read a paper on the suitability of various methods of rain-making in different parts of India during various seasons.

S. K. Pramanik gave statistical information regarding freezing levels and cloud tops in India in the different seasons. V. Satakopan showed charts of number of non-rainy cloudy days in different seasons. B. N. Desai examined the possibility of artificial rain in the States of Bombay, Saurashtra and Kutch. D. Mehta from Bihar stressed the need for more widespread experiments on rain-making in India after reviewing experiments in other countries. The symposium was concluded with a paper by K. R. Ramanathan who outlined the set up of a rain research unit for conducting planned experiments in this country.

The Chairman wound up the proceedings with the remarks that the papers and discussions, which covered a wide range, would go a long way to clarify the ideas among the many workers in the field in India. To the Atmospheric Research Committee which had originally proposed the holding of the symposium, the discussions would be helpful in enabling it to formulate its recommendations to the Council of Scientific and Industrial Research regarding the future activities on rain-making experiments in India.

INDIA METEOROLOGICAL DEPARTMENT DIRECTORS' CONFERENCE

The Directors' Conference of the India Meteorological Department was held at the Kodaikanal Observatory from 15 to 20 January 1953, under the Chairmanship of

V. V. Sohoni, Director General of Observatories. Deputy Directors General and Directors of the Department attended.

2. The Conference discussed several administrative and technical problems concerning the department, such as, Co-ordination of work in the development and research sections at the different offices of the department; The functions of the Poona Weather Central; Possibility of assessment of results of experiments on artificial rain carried out in India by S. K. Banerji; Correlation between ionosphere and weather and the scope of the Meteorological Training School at Poona.

3. The Conference programme included lectures by S. C. Roy on the "Evolution of Stars", by A. K. Das on "Curved space-time and some connected astrophysical problems" and by R. Ananthakrishnan on "Solar Prominences".

In addition, the visiting officers spent a whole day studying the work done at the Kodaikanal Observatory in various fields.

PHOSPHORESCENCE

Observers : J. H. Curry Master
 D.E.P. Colley 3rd Officer
 M.S. Shrauti Cadet
Vessel : R.M.S. Dara (B.I.S.N. Co.)
Voyage : Dubai to Bahrain
Position (Radar-checked) 25° 31½'N 54° 19' E
 Bar 1005.5 mb
 Air Temp 90½° Sea Temp 92°
 Wind 280° 15 knots

On 15 September 1952 at 1812 GMT a patch of phosphorescent water was observed at a distance of approximately three miles, the patch itself covering an area of about three miles in a locality charted as "Overfalls".

The phosphorescence was so bright and the wave crests so brilliant that in extending itself above the apparent horizon the illumination gave all the appearances of sea-front lights of any coastal town. There was

no land nor were there any shoals in the near vicinity.

Various patches of phosphorescent water distended into approximately North/South lines of one mile in width were traversed the same night but none compared in brilliancy with the above mentioned patch.

AWARDS TO VOLUNTARY OBSERVING SHIPS

Nine ships whose work during the year 1951-52 was considered to be of outstanding quality were each presented by the India Meteorological Department with awards comprising of a set of maximum and Minimum Thermometer suitably mounted and inscribed. The details of the ships are given below.

Two ships' officers—Captain J.H. Curry, Commander of S. S. DARA of British India Steam Navigation Co., Ltd., and Mr. G. T. Edwards ex-2nd officer of the Mogul Lines Ltd.—were presented with special awards consisted of meteorological publications for long meritorious service in meteorological work in the Indian Waters.

1. <i>Name of ship</i>	S. S. BHARATJAL
<i>Owners</i>	The Bharat Line Ltd.
<i>Captains</i>	Fernandes M. X. Forster J. A. Morris J. F. Swan J. S.
<i>Observing Officers</i>	Adam M.A. Gomez R. S. Gopalan E. Hunter V. L. Kazi I. A. Modak A. K. Monia Y. A. Mukaddam E. K. Shaikh A. F.
<i>Radio Officers</i>	Carnerio J. Cupte M. B. Sundaram P. M.
2. <i>Name of ship</i>	S. S. HAVILDAR
<i>Owners</i>	The Asiatic Steam Navigation Co.
<i>Captains</i>	Kelly A. B. Palmer P.W.

- Observing Officers* Barker R.A.
Ducher J.
Kelsey Y.
Macmillan R.
Mc Alister R.
Piner H. O.
Robinson C. J.
- Radio Officers* Cunningham E. J.
Mackenzie A. B.
3. *Name of ship* S. S. ISLAMI
Owners The Mogul Lines Ltd.
Captains Mountford J. W.
Palmer H. J.
- Observing Officers* Dyson N.S.W.
Greig
Glem I.
Kaka G. R.
Mirza Z. N.
Turnbull A.N.
- Radio Officers* Carty J. F.
Couchman J. P.
Smith L.
4. *Name of ship* S. S. JEHANGIR
Owners The Mogul Lines Ltd.
Captain Morini H.
Observing Officer Edwards G. T.
5. *Name of ship* R. M. S. KAMPALA
Owners British India Steam Navigation Co.
Captains Polkingborne C.R.
Spenceley F.A.
Observing officers Bates
Beal F.D.
Coxe J.D.
Jones W.P.
Joss E.W.
Mellor
Pudden
Ralph R.
Stokes F.
Thomas A. L.
Whitton P.
- Radio Officers* Heath J. A.
Lemon A.
Presswell A.
Wake A.
Whiting R.
6. *Name of ship* S. S. KHOSROU
Owners The Mogul Lines Ltd.
Captains Cochrane J.W.E.
Mc Clenachan B.
Observing Officers Chelliah K.
Richards E. Q.
Sethu R.C.
Ward R. J.
- Radio Officers* Curran J. P.
James J. T.
Lemon A.
Mart Lieu J.
Smith G.
Smith P.
7. *Name of ship* S. S. NADIR
Owners The Asiatic Steam Navigation Co.
Captain Mason F.C.M.
Observing Officers Colins E.
Duchar J.
Garman J.
Lyras J.R.W.
Robinson E. D.
Wharton G. H.
Woollam J.
Dore M.
- Radio Officer*
8. *Name of ship* S. S. NURANI
Owners The Asiatic Steam Navigation Co.
Captain Thompson J.
Observing Officers Bapty
Hammond
Stephenson V.P.
Wickham W.A.
Shawcross A.T.
- Radio Officer*
9. *Name of ship* S. S. RAJULA
Owners British India Steam Navigation Co.
Captains Jamieson
Macdonald H. M.
Observing Officers Bennet
Ford
Griffiths
Iles V.A.H.
Jenkins C. W.
Webb
- Radio Officers* Davis
Henderson P.
Stewart R.E.

WEATHER, POST MONSOON SEASON—1952

Chief features—(1) Three cyclonic storms in the Bay of Bengal, the last of which was the most severe and caused much havoc in southeast Tamilnad (2) A generally very feeble northeast monsoon.

October—There were four Bay of Bengal depressions, one of which developed into a cyclonic storm. The first depression formed in the southeast Bay of Bengal on the evening of 4th. Moving initially north-west and then north it crossed the Orissa coast as a low pressure area on 9th morning. It then passed away northeastwards across Gangetic West Bengal by the 11th. In association with this depression, fairly widespread rain occurred in Tamilnad, Rayalaseema and coastal Andhradesa till about the 8th. The rain area then gradually shifted northwards giving fairly widespread rain in Orissa between the 6th and 10th and in Assam, West Bengal, Chota Nagpur and east Madhya Pradesh between the 8th and 10th. Heavy to very heavy falls were recorded locally in coastal Andhradesa on the 7th and in Orissa on the 8th. Assam continued to get widespread rain till about the 13th, Cherrapunji getting 20" of rain during the 48 hours ending at 0830 IST of 11th. According to press reports, the river Brahmaputra and its tributaries were in spate and flooded a number of villages on their banks. About 80,000 acres of ripening paddy fields were reported to have been washed away and 30,000 people rendered homeless.

The second was a shallow depression formed in the west central Bay of Bengal by the 14th evening. Moving initially westwards and later northnorthwestwards, it crossed the south Circars coast between Ongole and Masulipatam on the 16th night, lay as a "diffuse low" over coastal Andhradesa on the 17th morning, and became unimportant the next day. It caused local or fairly widespread rain in coastal Andhradesa till the 17th. Fairly widespread showers also occurred in Gangetic West Bengal and Orissa between the 12th and

16th, and in east Madhya Pradesh and Hyderabad on the 16th and 17th.

The third depression formed by the 19th morning in the east central Bay of Bengal, centred about 250 miles northnorthwest of Port Blair. It moved northwards and lay as a shallow depression with centre about 200 miles southeast of Calcutta on the 22nd morning. It then weakened and passed inland as a low pressure wave by the next morning, giving fairly widespread rain in Assam and coastal West Bengal on that day.

Under the influence of a low pressure wave from the east, conditions became unsettled in the north Andaman Sea by the 22nd, which concentrated into a deep depression by the next morning with centre about 150 miles to the southwest of Rangoon. Moving in a northwesterly direction, it intensified into a cyclonic storm the same evening when it was centred about 100 miles west of Bassein. It crossed the Burma coast near Akyab on the 24th morning, weakened into a depression and moved further in a northeasterly direction.

In addition to the rainfall caused by the above cyclonic disturbances, there was also fairly widespread or local rainfall in the south Konkan and south Deccan (Desh) during the first 10 days of the month and in Malabar-south Kanara, Mysore and Travancore-Cochin throughout the first half of the month. Bombay was struck by a squall of about 53 miles per hour on the 6th evening which grounded a launch of the I.M.M.T.S. *Dufferin* off Bombay harbour. Local showers also occurred in Hyderabad between the 5th and 11th, in Tamilnad between the 18th and 22nd and on 25th and 26th, in Mysore on the 25th and 26th and in Travancore-Cochin between the 25th and 29th. Weather remained mostly dry in northwest India, Uttar Pradesh, Madhya Bharat, Vindhya Pradesh, West Madhya Pradesh, Gujarat and Saurashtra and Kutch.

Three western disturbances moved across the extreme north of the country during October but they were all feeble.

November—This month was characterised by the failure of the northeast monsoon rains in the south Peninsula, where except for fairly widespread or local showers in Travancore-Cochin during the first and the third week and in Tamilnad on the 22nd, 23rd and 30th, practically no rainfall was recorded on the other days. The rest of the country also remained mostly dry during the month.

Two cyclonic storms formed in the Bay of Bengal during this month. The first began as a shallow depression in the west central Bay of Bengal which was centred on the 8th morning near Lat. $14\frac{1}{2}^{\circ}$ N Long. $87\frac{1}{2}^{\circ}$ E. Intensifying rapidly as it moved in a northerly direction, it developed into a deep depression the same evening and into a cyclonic storm by the 9th morning when it was centred near Lat. 18° N, Long. 88° E. Thereafter the storm moved northeastwards and rapidly weakened. As a shallow depression it crossed the Chittagong coast by the 12th morning, and finally the residual "low" associated with it passed away northeastwards across Assam by the 13th. It caused fairly widespread or local rain in Assam between the 10th and 13th and a few showers in Gangetic West Bengal between the 9th and 11th.

Details of the severe cyclonic storm which struck the Coromandel coast near Nagapattinam on the 30th afternoon have been included in the January issue of this Journal. (Vol. 4 No. 1, p. 94, 1953). The barogram of Nagapattinam of that date which indicated a rapid pressure drop of about 40 mb (1.18 inches) is reproduced in Fig. 1. Under the influence of this storm, widespread rain occurred in Tamilnad on 1 and 2 December with locally heavy to very heavy falls on the 1st. Local or fairly widespread rain also occurred in Rayalaseema, Malabar-south Kanara, Mysore and Travancore-Cochin on these two days. The main havoc was caused in south Tamilnad on account of the high gales which raged over the area traversed by the storm. According to the Chief Minister of Madras State, about 168 people were killed, 7570 cattle lost, 11,954 huts and mud houses

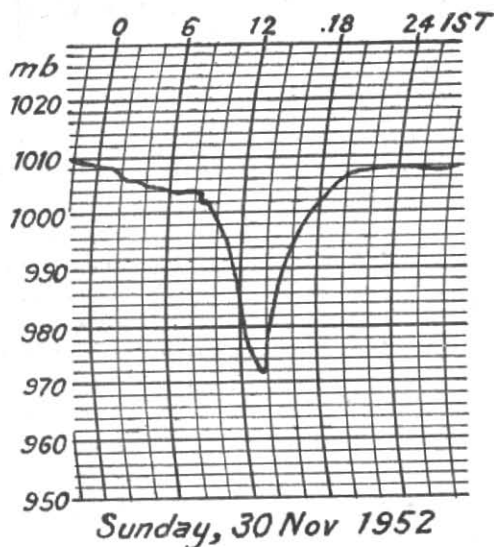


Fig. 1

damaged or destroyed and crops over an area of nearly 10,000 acres severely damaged in Tanjore and Tiruchirapalli districts.

A western disturbance moved across the extreme north of the country between 11 and 12 November. It induced a feeble secondary "low" over west Rajasthan and the neighbourhood on the 11th morning, and the two disturbances together caused a few light showers in the Punjab hills, Kutch and north Gujarat on the 12th. A second feeble western disturbance moved eastwards across the extreme north of the country by the 24th.

December—Under the influence of a low pressure wave from the east, the seasonal trough over the southeast Bay of Bengal became well-marked by the 5th morning and a shallow depression was formed by the next morning, with its centre near Lat. 8° N, Long. 85° E. It moved northwestwards, passed inland across the south Coromandel coast by the 7th morning and weakened into a trough extending over the south Peninsula and the adjoining Arabian Sea. In association with this depression, the northeast monsoon was active over the south Peninsula between the 7th and 13th. Locally heavy to very heavy falls occurred

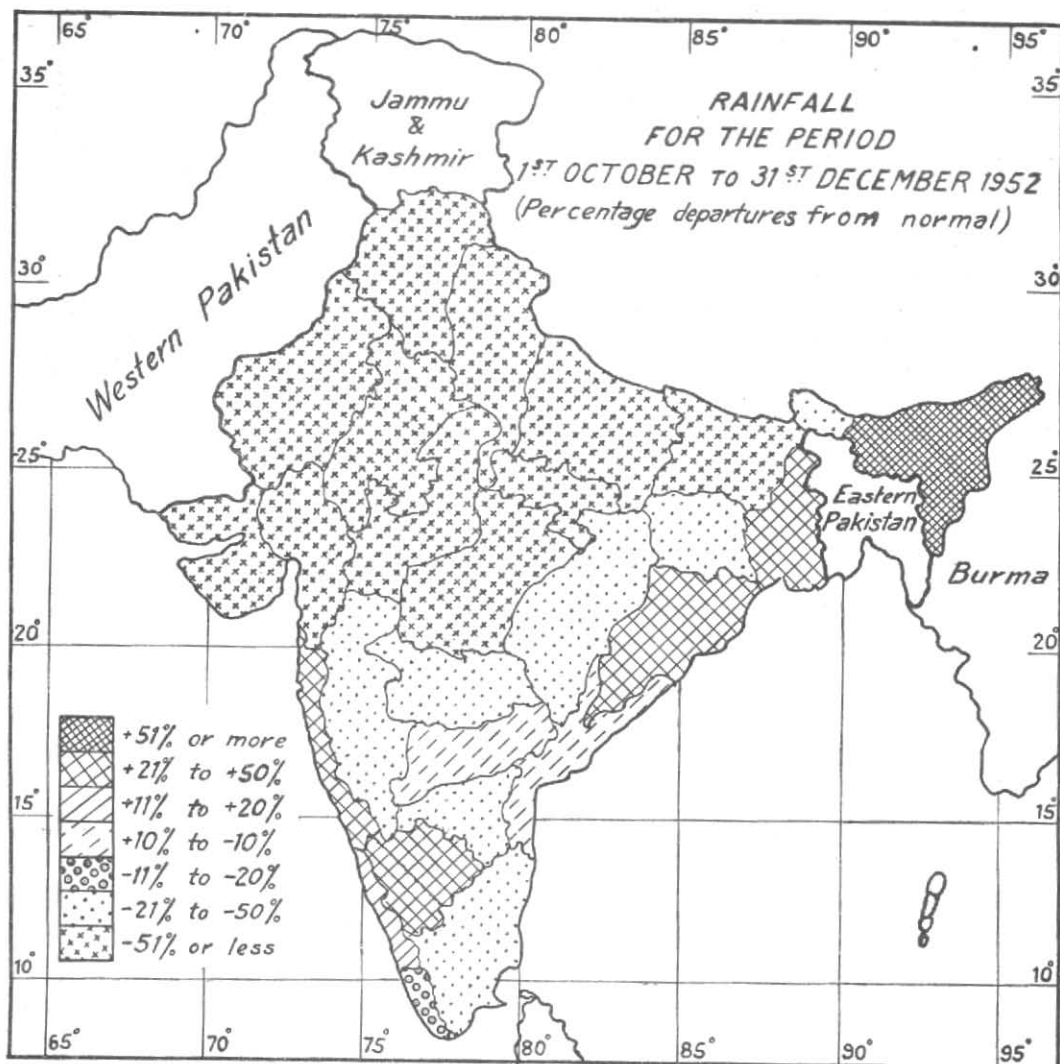


Fig. 2

in south coastal Andhradesa and Tamilnad on the 7th and 8th. State raingauge stations Villupuram and Vallam in Tamilnad recorded 11.1" and 8.9" respectively on the 7th.

After the cessation of the above spell, the northeast monsoon remained inactive and but for local showers in Tamilnad and Travancore-Cochin on 25th, weather remained generally dry over the Peninsula during the rest of December.

Out of the seven western disturbances which moved across northwest India

during December, three were feeble and the remaining four caused local or fairly widespread showers in the Punjab hills on the 19th, between the 22nd and 24th and on the 31st. Local showers also occurred in Uttar Pradesh on the 21st and 22nd, in north Madhya Bharat on the 22nd and 23rd, in Vindhya Pradesh between the 22nd and 24th, in southeast Rajasthan on the 22nd and in west Rajasthan on the 31st.

The distribution of rainfall over the country during the period under review is shown in Fig. 2.