Notes and News

THE NINTH GENERAL ASSEMBLY OF THE INTERNATIONAL UNION OF GEODESY AND GEOPHYSICS, HELD AT BRUSSELS FROM 20 AUGUST TO 1 SEPTEMBER 1951

The International Union of Geodesy and Geophysics (IUGG), affiliated with UNESCO through the International Council of Scientific Unions since 1946, is concerned with the development and progress of the various Earth Sciences, ranging from the study of the Interior of the Earth to that of the uppermost layers of the Atmosphere even including extra-terrestrial relations. The IUGG functions through its seven International Associations. The Union, its Associations and Commissions function continuously but meet at a 'General Assembly' once every three years, to review progress during each triennium and to discuss results of researches sponsored by the Union from its own funds as well as those conducted by member countries, to hold symposia on major problems and evolve plans for future work on a global basis.

The Ninth General Assembly of the IUGG took place at Brussels from 20 August to 1 September 1951. F. A. Vening Meinesz (Holland) was the General President. The Presidents of the seven Associations were—*Geodesy* (IAG)—W. D. Lambert (USA), *Seismology* (IAS)—R. Stoneley (UK), *Meteorology* (IAM)—J. Bjerknes (USA), *Terrestrial Magnetism and Electricity* (IATME)—S. Chapman (UK), *Oceanography* (IAO)—H. U. Sverdrup (Norway), *Volcanology* (IAV)—B. G. Escher (Holland) and *Hydrology* (IAH)—Merrill Bernard (USA).

More than 900 distinguished Scientists came as delegates from all parts of the world. The Indian delegation consisted of L. A. Ramdas (Chief delegate), C. A. Hart and J. N. Nanda. The President of IUGG, the Secretary General and the Chief delegates of the member nations constitute the Council of the Union which makes decisions on the various items of the Union's programme for the formal approval of the General Assembly.

The Ninth General Assembly commenced with a Plenary Session on 21 August 1951 in the presence of Her Majesty Queen Elizabeth of the Belgians, when the General President, Vening Meinesz, delivered his presidential address. Thereafter, the Union functioned through the seven Associations, until 1 September when the final Plenary Session took place.

The Association began with the presentation of national reports of progress of research during the last triennium by representatives of the member countries. Next came the Presidential addresses in each Association. The presentation and discussion of scientific papers and symposia on major aspects of the sciences dealt with by each Association kept the meetings during the next ten days very fully occupied. Some of the symposia were held by more than one Association in joint session.

In the Association of Meteorology symposia were held on, the Physics of Clouds, the Physics of the Upper Atmosphere (jointly with IATME), General Circulation of the Atmosphere and the Oceans (jointly with IAO), Radiation, Problems of Micrometeorology, Atmospheric Ozone, Evaporation from the Surface of the Globe (jointly with IAH).

The Radiation and Ozone Commissions met and made various decisions aiming at the extension of their activities and world net-work of " Radiation " stations.

The meetings came to a very successful conclusion with the final Plenary Session on 1 September 1951. The Presidents of the Associations presented reports on work done during the session and submitted technical Resolutions for adoption. The Secretary General presented various decisions of the Council for adoption, among them the proposals for " World Days " and the next " Polar Year " and the decision to redesignate IAS as " Association of Seismology and Physics of the Earth's Interior ".

Several workers from India have been elected to offices under the IUGG for the

triennium 1951-54 : K. R. Ramanathan—President, Association of Meteorology, A. N. Khosla—Vice President, Association of Hydrology, S. L. Malurkar—Member, Executive Committee, Association of Terrestrial Magnetism and Electricity, J. N. Nanda—Member, Executive Committee, Association of Seismology, V. V. Sohoni—Member, Joint Commission of High Altitude Research, S. K. Pramanik—Member, Commission on Solar and Terrestrial Relations, K. R. Ramanathan—Member, Ozone Commission, Association of Meteorology, L. A. Ramdas—Member, Radiation Commission, Association of Meteorology and S. P. Venkiteshwaran—Member, Joint Commission of Radio Meteorology.

The next meeting of the General Assembly of the IUGG will take place at Rome in 1954 under the General Presidentship of S. Chapman, F.R.S.

WORLD METEOROLOGICAL ORGANISATION

The second session of the Executive Committee of the WMO was held at Lausanne (Switzerland) from 3 to 20 October 1951. From India Mr. V. V. Sohoni, Director General of Observatories attended the session. Many subjects relating to the organisation and the working of the WMO were deliberated upon and decisions taken. A few of the important ones are—

(1) Proposal to start a Quarterly Bulletin of the WMO.

(2) Shifting of the Secretariat from Lausanne to Geneva. This will take place shortly, the offices moving into temporary accommodation which was until recently occupied by WHO. Permanent buildings for the WMO will be planned and may be constructed in 2 or 3 years.

(3) The appointment of the Deputy Secretary-General. Mr. J. Rivet has been appointed.

(4) Speeding up of the work of the Regional Associations and the Technical Commissions.

(5) Budget of the Organisation. This amounts to about $ 2,72,000, the revenue being principally derived from the proportionate contributions from Member States.

(6) Part provision in the budget for 1952 for the Cloud Atlas project. This will be a new Cloud Atlas based on knowledge on the subject that has accrued since the last edition of the International Cloud Atlas which is 20 years old.

(7) Steps to bring Technical Regulations of the former IMO uptodate by preparing a provisional edition.

THE GOLDEN JUBILEE OF THE KODAIKANAL OBSERVATORY

An article reviewing the work of the Kodaikanal Observatory during the half-century of its existence, 1901-1950, was published in the April 1951 issue of this Journal. The Golden Jubilee of the Observatory was celebrated on 18 September 1951 by a simple ceremony at which H.E. Sir Krishna Kumarsinhji Bhavsinhji, the Maharaja of Bhavnagar, Governor of Madras, presided. The Hon'ble Rajkumari Amrit Kaur, Minister for Communications, Government of India, was not able to be present, but sent a message which has been reproduced as *frontispiece* in this issue. The Hon'ble Shri Raj Bahadur, Deputy Minister for Communications, attended as a representative of the Government of India (Pictures on page 37).

The proceedings opened with an address of welcome to the assembled guests by Mr. V. V. Sohoni, the Director General of Observatories, in which he reviewed the work of the Observatory during the last fifty years and outlined the plans for its future expansion. The Hon'ble Shri Raj Bahadur congratulated the Observatory on the good work that it had done in the past and for having achieved in recent years the extension of its activities in two or three directions. He said that the Central Government would do everything possible within its financial resources to implement the recommendations of the Astronomical Planning Committee of which Prof. Saha was the Chairman. He appealed for munificent gifts from liberal benefactors for promotion of astronomical research in our country.

H. E. the Governor of Madras recalled in his address the great astronomical tradi-

Fig. 1. Inauguration of Ionospheric Laboratory

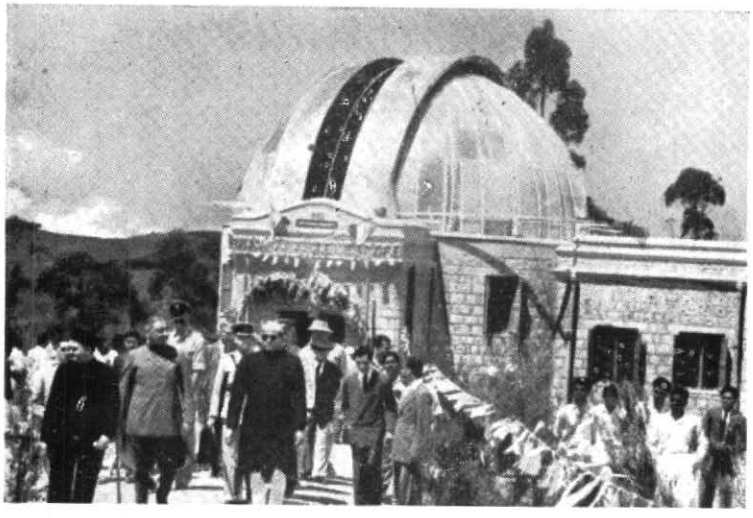

Fig. 2. H. E. and party returning from the Dome

(By courtesy of Films Division, Ministry of Information and Broadcasting, Government of India)

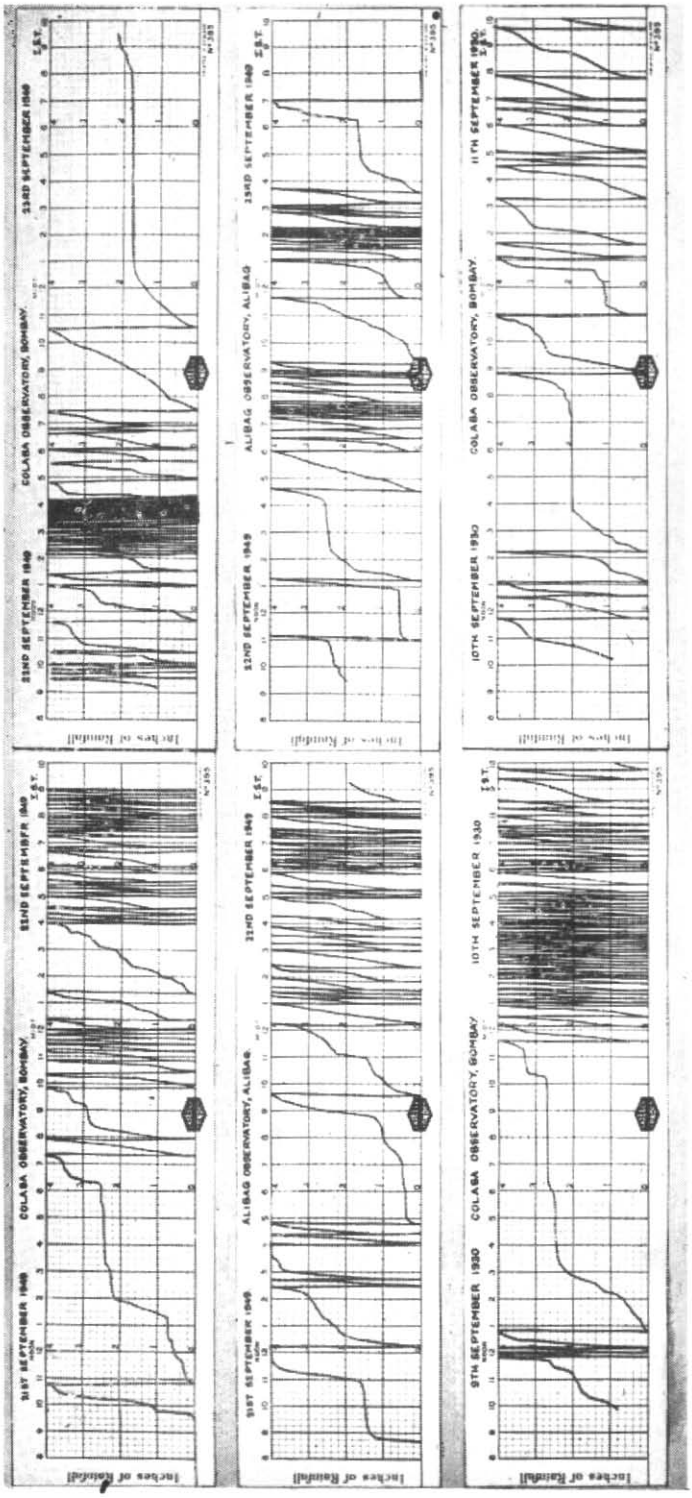

Fig. 1. Syphon raingauge records of heavy rainfalls at Bombay and Alibag in 1930 and 1949

tions of ancient and medieval India. He said it was very necessary to bring up the equipment of the Kodaikanal Observatory as soon as possible in line with that of the observatories in the west, but that the progress of an institution depended not entirely on equipment but on the devotion of the workers to their subject. In this respect, the Kodaikanal Observatory deserved high credit because throughout its existence its staff had shown initiative in overcoming difficulties and in obtaining excellent results with improvised equipment. In view of the assurance for facilities given by the Hon'ble Deputy Minister for Communications, and the great devotion to astronomy which has been a mark of the institution, he said he was sure the Observatory would flourish in the coming years, and when the time came for celebrating its centenary, he hoped, its record would shine with even greater light than in the first fifty years.

The occasion was marked by the formal opening of the newly installed 20-inch Grubb telescope for work in stellar spectroscopy ; and of the new ionospheric recorder for observations of the ionosphere. The Grubb telescope originally belonged to the Maharaja Takhtasinghji Observatory of Poona, and was donated to the Kodaikanal Observatory on the closing of the Poona Observatory. This instrument along with other equipment had been acquired through the munificence of His Highness the late Maharaja Sir Takhtasinghji of Bhavnagar. Therefore the newly installed telescope has been named the " Bhavnagar " telescope. For the ionospheric observations the Observatory has been equipped with an automatic ionospheric recorder of the latest type designed and constructed by the U.S. Bureau of Standards. The proceedings terminated with thanksgiving by A. K. Das, the Director of the Observatory.

MEETING OF THE STANDING ADVISORY BOARD FOR ASTRONOMY

The second meeting of this Board was held at the Kodaikanal Observatory on 19 September 1951. A. K. Das (Kodaikanal Observatory), Secretary of the Board, presented a report on the implementation of the recommendations made by the Board at its first meeting held in April 1949. The principal items discussed were : programme of work to be undertaken at Kodaikanal with the newly installed 20-inch Grubb reflecting telescope, programme of magnetic and ionospheric observations, observation of solar and galactic noises and of meteors by the radio method, acquisition of new equipment for the Observatory in the four-year period 1951-1955, conclusions drawn from two years' observations of sky and seeing conditions at Kodaikanal and Indore and proposal for location of the projected Central Astronomical Observatory at or near Ujjain.

The Board emphasised the need for the establishment of astronomical observatories at the Universities. Regarding choice of site for the proposed Central Astronomical Observatory, the Board thought that scientific considerations alone should decide the choice of the site. If the neighbourhood of Ujjain proves, after adequate scientific enquiry, to be suitable for a first-class modern astronomical observatory, then the Central Observatory can be located there.

SANDSTORM AT ADEN

Observer: G. R. Kaka, 2nd Officer
Vessel: S. S. Islami (Captain — H. J. Palmer)
Voyage Aden to Bombay

At about 0130 GMT on 19 August 1951 gentle northerly breeze sprung up, when vessel was at moorings at Aden. Force reached 4 to 5 at 0145 GMT and visibility was impaired owing to sand in atmosphere. Barograph started falling. Lightning without thunder was all over the sky. There was a brief lull in wind from 0150 GMT to 0200 GMT. Then again the breeze sprung up to force 9 and atmosphere was thick with sand, and visibility became very poor. This storm lasted for about 7 minutes. Wind dropped to force 5 and atmosphere started clearing up. It was all clear by 0300 GMT. But at the same time a fresh breeze sprung up from exactly the opposite direction (south) rising to force 4 to 5 bringing no sand, and eased off to force 3 to 2 by the time the vessel left Aden at 1000 GMT.

An experienced Aden pilot stated to the observer that these sandstorms were to be expected at this time of the year mostly at nights. The present observation is interesting because of the unusual time of occurrence. The barograph chart is reproduced below.

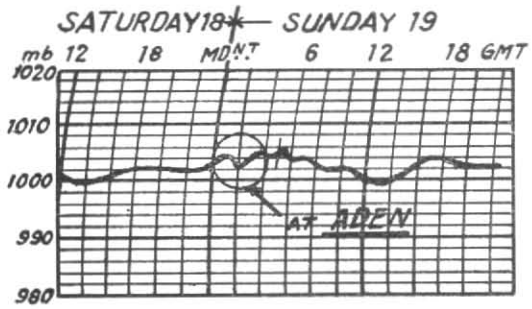

Fig. 1. Barograph chart 18-19 August 1951

WATERSPOUT OBSERVED ON ROUTE CAPE TOWN TO BARBADOS

Observer: P. I. Morgan

Vessel: S. S. Subedar (Captain—T.H.B. Tottle)

0948 GMT 15-3-51

Pos. 04° 39′ S, 35° 07′ W

Course 305°, Speed 12·4 knots

Bar. 29·847″ Rising

Air Temp. 83°, Sea Temp. 82°, Wind E 4

Cloud about 4/8 Cu. cust, with a belt of Cunb, carrying heavy rain.

A waterspout (See Fig. below) was observed forming from above position, bearing 220° (T) dist. 1 M., the belt of Cunb had passed ahead of the ship approximately five minutes before the spout commenced to form.

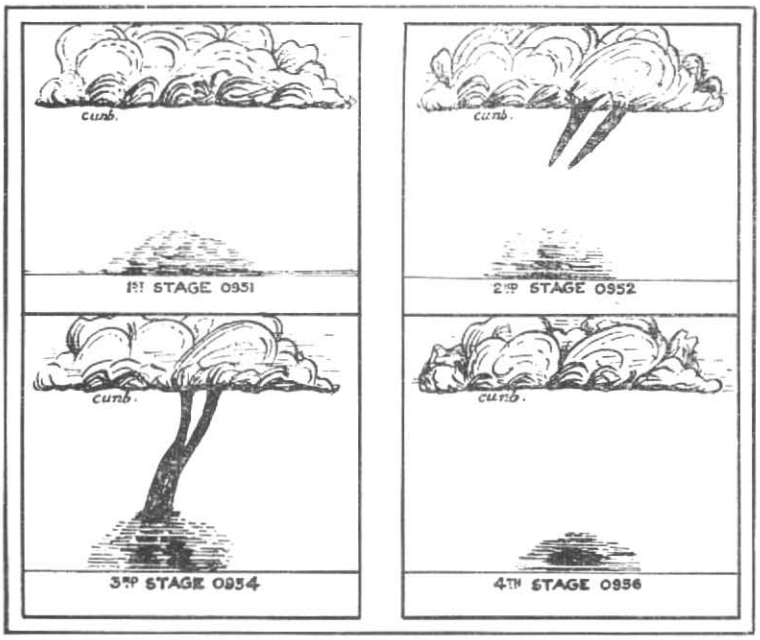

Fig. 1. Waterspout on 15 March 1951

HIGH ALTITUDE CLEAR AIR TURBULENCE NEAR MUSCAT ON 8 OCTOBER 1951

In accordance with the recommendation No. 2 of the Third Session of the Meteorological Division of ICAO, the Air India International Ltd., as the chief Indian airline operating at high altitudes has agreed to originate reports of high altitude turbulence on the routes, Bombay-Cairo, Bombay-Calcutta and Bombay-Karachi-Aden-Nairobi.

One of the early reports of clear air turbulence was given by Captain Gazdar and Navigating Officer R. S. Mani, flying from Cairo to Bombay. The details are as follows—

> "On 8-10-1951 at 0715 GMT the Constellation Aircraft flying at a height of 17,500 ft experienced mild turbulence in clear air at the position 23°00′ N and 59°30′ E. The turbulence lasted four minutes and there was a progressive diminishing of turbulence. The nearest clouds were 2/8th Cumulus with base 4000 ft and top 5000 ft, 45 miles due East and 40 miles southeast of the position of the aircraft. Air temperature was 0°C. The ground speed was 240 knots."

The winds observed during the flight show that along track the mean wind between longitudes 55° and 60°E was 025°—10 knots, while between 60° and 65°E it was 135°—14 knots. It would appear that the turbulence might be associated with the zone of change of wind and as the winds were light, the turbulence was mild.

WEATHER, JULY—SEPTEMBER 1951

The chief features of weather during the period under review were—

(a) Weak monsoon conditions, in general, throughout the period,

(b) an extension of monsoon into south-west Uttar Pradesh and the Punjab (I) by the beginning of July but its temporary withdrawal from north-west India and Uttar Pradesh between the 5th and 24th of the month,

(c) continued drought conditions over Gujarat, Saurashtra and Kutch, and Rajasthan from about the middle of August onwards resulting in famine conditions there

and (d) withdrawal of the monsoon from the country by 21 September much in advance of the normal date.

There were two spells of very heavy rain in Assam—the first between 12 and 17 July and the second between 24 and 28 August—both resulting in floods, while a spell of hot weather prevailed over Rajasthan, Gujarat, Saurashtra and Kutch and west Madhya Pradesh in the last week of September.

July—The monsoon extended into west Uttar Pradesh and the Punjab (I) on 1 July. By about the 5th, however, the Bay branch of the monsoon withdrew temporarily from northern India, and till about the 18th its activity was mainly confined to Assam where widespread and locally heavy rain occurred between the 12th and 17th resulting in floods there. Cherrapunji recorded 9″ to 19″ of rain in 24 hours during each day between the 11th and 17th. According to newspaper reports, the Brahmaputra and its tributaries, the Kopila, the Jumna and Barpari overflowed their banks inundating an area of more than 700 square miles, and causing heavy damage to jute and paddy crops in Kamrup and Nowgong districts and also affecting rail communications in some parts of Assam. The Arabian Sea branch of the monsoon continued to be weak since the beginning of the month, but strengthened slightly along the west coast between the 12th and 14th when widespread rain occurred there with locally heavy fal's in the Konkan.

During the rest of the month, the activity of the monsoon was associated with the formation of three depressions in the north-west Bay of Bengal in rapid succession and their movement inland. The first depression developed off the Orissa-Circars coast on the 21st morning, crossed coast to the south of Calingapatam next day, and became unimportant. Under its influence, monsoon strengthened over the Peninsula, and

active monsoon conditions prevailed there outside Tamilnad and Rayalaseema between the 18th and 24th. The second depression, which formed on the 24th, intensified into a cyclonic storm next day. Crossing the coast between Puri and Gopalpur, it moved westnorthwestwards, and became unimportant over northwest India on the 29th. The third depression moved from northwest angle of the Bay to northwest Madhya Pradesh between the 30th and 31st. Under the influence of these two disturbances, the monsoon was vigorous in south Madhya Pradesh and the Konkan on the 26th and 27th, in Saurashtra and Kutch, and Gujarat on the 27th, and in east Madhya Pradesh and north Hyderabad on the 31st. In northern India, however, the monsoon remained generally weak.

Averaged over the plains of India, the rainfall during July was in defect by 10%.

August—During this month, the Arabian Sea branch of the monsoon was generally weak over the Peninsula. The Bay Branch, however, continued its activity during the first three weeks over northern India and the central parts of the country, particularly under the influence of three disturbances. The first one was a shallow depression which formed in the northwest Bay on the 4th and passing inland as a low pressure area, moved from Orissa to southwest Rajasthan and lower Sind where it became unimportant on the 9th. In association with this disturbance, the monsoon was active over the belt of the country extending from Orissa to Saurashtra and Kutch, and Gujarat between the 4th and 10th. Very heavy falls of rain were reported from west Madhya Pradesh, the Konkan-Kathiawar coast and Saurashtra between the 8th and 9th. Fairly well-distributed rain also occurred over Uttar Pradesh, the Punjab (I) and the central parts of the country between the 10th and 13th with locally heavy falls in and near Vindhya Pradesh on the 10th and 11th. The second disturbance formed as a shallow depression in the northwest Bay of Bengal on the 16th, moved northwest over to east Uttar Pradesh where it became unimportant on the 20th. Under its influence the monsoon was active from Gangetic West Bengal and Orissa to the Punjab (I) and north Madhya Bharat on the 16th and 17th. Locally very heavy falls were also reported from northwest Uttar Pradesh and the hills of the Punjab (I) between the 21st and 24th, Dehra Dun reporting an exceptionally heavy fall of 13″ on the 22nd—the heaviest fall on record during past 70 years. A "break" in the monsoon set in from the 24th, and rainfall was mostly confined to Assam and sub-Himalayan West Bengal between the 24th and 28th. Locally very heavy falls occurred over the Khasi-Jaintia hills, and there were severe floods in Assam again, Cherrapunji reporting 21″, 15″, 22″ and 9″ successively between the 24th and 27th. Under the influence of a third depression in the northwest Bay of Bengal, the monsoon revived over the eastern half of the Peninsula towards the end of the month. Well-distributed rainfall occurred over the region extending from Assam and sub-Himalayan West Bengal to Hyderabad and coastal Andhradesa on 31 August and 1 September.

Averaged over the plains of India, the rainfall for August was in defect by 15%.

September—The monsoon was generally feeble over the country during the first week excepting in Orissa, Hyderabad and Rayalaseema. In association with a low pressure wave, however, which moved inland across the Orissa coast on the 6th and became unimportant over Vindhya Pradesh on the 9th, widespread or local rain occurred in northeast India outside Assam, in Uttar Pradesh, the central parts of the country and Hyderabad during this period. There was a further strengthening of the monsoon in these parts under the influence of another depression which formed over Eastern Pakistan on the 9th and broke up over the Kumaon hills on the 14th. The track of the depression and the associated rainfall are shown in Fig. 1 (p. 46). Widespread rain occurred over the belt extending from West Bengal and Orissa to west Uttar Pradesh between the 10th and 13th, with locally heavy falls along the track of the depression. Locally heavy falls continued in northwest Uttar Pradesh on the 14th as well; Nainital recorded a very heavy fall of 12″ and Dhampur (in Bijnor District) 11″. The monsoon withdrew from the Punjab (I) and Uttar Pradesh on the 15th, and by the 21st it had withdrawn from the rest of the country also, well in advance of the usual date. Local or widespread rain,

however, continued to occur in Assam and sub-Himalayan West Bengal between the 14th and 20th with locally heavy falls in and near the Khasi hills; Cherrapunji recorded 25″ and 15″ on the 14th and 15th respectively. There was a temporary revival of the monsoon towards the end of the month in association with a trough of low pressure in the Bay of Bengal and another in east Arabian Sea off the Konkan-Kanara coast. These were responsible for fairly widespread or local rain in the southern half of the Peninsula, coastal Andhradesa, Orissa and Gangetic West Bengal between the 27th and 30th with locally heavy rain in Malabar and south Kanara, and the south Konkan on the 30th. Rainfall in Rajasthan, Gujarat, Saurashtra and Kutch, was in defect by 90 to 100%and in Madhya Bharat by 74%. The crops suffered badly in these regions and have caused famine conditions.

Averaged over the plains of India, the rainfall for September was 30% in defect.

Abnormally warm weather prevailed over Rajasthan, Saurashtra, Gujarat and west Madhya Pradesh between the 23rd and 30th. Day temperatures were as much as 12—15°F above normal in Gujarat on the 27th and 28th, and in Saurashtra on the 29th. The highest temperature of 109°F (15°F above normal) was recorded both at Rajkot and Bhuj on the 29th afternoon (vide table below).

Name of Station	Highest maximum temperature recorded in September 1951 with date of occurrence		Departure from normal	Previous record temperature for September
	Temp(°F)	Date		(°F)
Bhuj	109	29	+15	105
Rajkot	109	29	+15	105
Ahmedabad	107	28	+12	105
Jamnagar	107	29	—	—
Bhavnagar	106	29	+11	105
Surat	106	25	+16	102
Dwarka	104	30	+18	103

Rainfall distribution for the quarter July-September 1951 (in terms of percentage departures from normal) are shown in Fig. 2 (p. 46).