

## Notes and News

### FIRST SESSION OF THE COMMISSION FOR HYDROLOGICAL METEOROLOGY OF THE WORLD METEOROLOGICAL ORGANIZATION

The First Session of the Commission for Hydrological Meteorology of the World Meteorological Organization is scheduled to be held in Washington D.C. from 12 to 26 April 1961. The provisional agenda for the session includes technical questions concerning (i) Hydrological forecasts, (ii) Hydrometeorological networks, (iii) Publication and exchange of data, (iv) Analysis and publication of data on Flood Producing Storms, (v) Avalanche warnings and forecasts, (vi) Climatic atlases with respect to water resources development, (vii) Study of seiches, and (viii) Standardisation of terminology, codes and units. The session will also discuss working relations with Regional Associations, other Technical Commissions and other International Organisations. Some general questions relating to drafting of technical regulations for Hydrological Meteorology, preparation of International Guide on Hydrological Meteorology, International seminars and symposia and establishment of working groups, have also been included in the agenda.

### VISIT OF THE SECRETARY-GENERAL, WORLD METEOROLOGICAL ORGANIZATION TO NEW DELHI

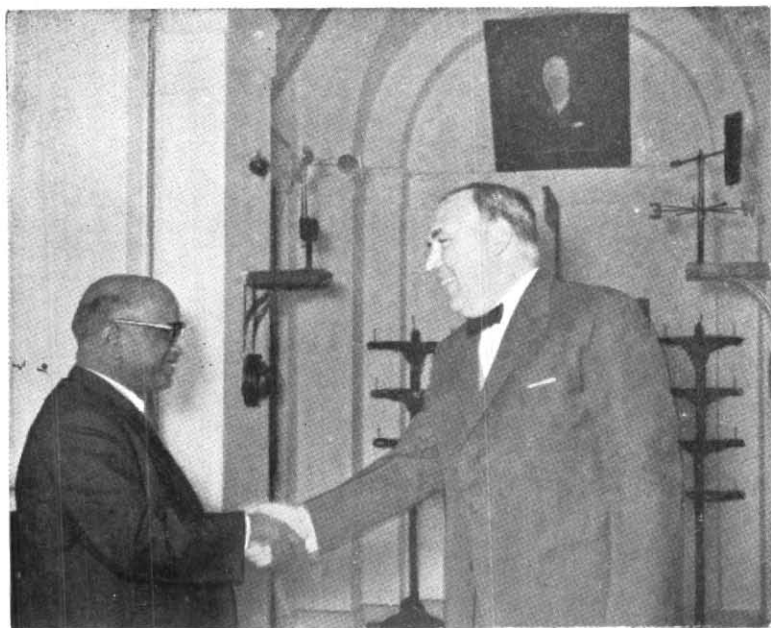
Mr. D. A. Davies, Secretary-General, World Meteorological Organisation visited New Delhi on 21 and 22 November 1960 during a round-the-world tour of visits to U.S.A., Antarctic Continent, Australia, New Zealand, Japan, Thailand, Burma, India, Iran and United Arab Republic.

During his short stay in the country, he

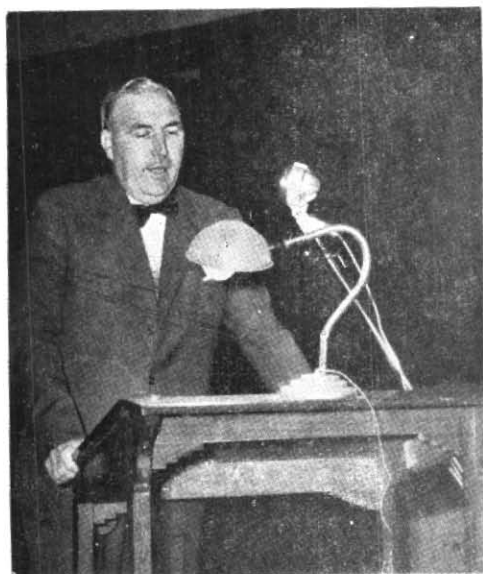
called on Dr. P. Subbarayan, Minister for Transport and Communications, Shri Ahmed Mohiuddin, Deputy Minister for Civil Aviation, Shri D. C. Das, Joint Secretary and had discussions with Shri P. R. Krishna Rao, Director General of Observatories. He visited the headquarters of the Meteorological Office at New Delhi including the workshops and the wind finding and storm detection radars. He also saw the working of the Delhi Sub-continental Broadcast Centre and the Delhi—Moscow Radio-teleprinter channel of the Northern Hemispheric Data Exchange Centre at the Safdarjung Airport, New Delhi.

Among the subjects discussed with the Secretary-General were the arrangements for the ensuing meeting of the World Meteorological Organisation's Commission for Instruments and Methods of Observation to be held in New Delhi in January 1962 and the possible ways in which WMO may assist in the establishment and working of the Institute of Tropical Meteorology proposed to be established by the India Meteorological Department in the Third Five Year Plan. Mr. Davies gave an interesting talk before the Indian Meteorological Society on the afternoon of 21 November on the scientific aspects of his tour in which he dealt with the recent developments in the U.S.A. in Satellite Meteorology, the scientific studies being conducted over the Antarctic Continent, the International Seminar of numerical weather prediction held at Tokyo in November 1960 and the development programmes in Meteorology in Far Eastern countries.

The Director General of Observatories gave an official lunch in Asoka Hotel in honour of Secretary-General on 22 November 1960. Mr. Davies left Delhi for Tehran on the morning of 23 November.



**Mr. D. A. Davies, Secretary-General of WMO is being received by Shri P. R. Krishna Rao, Director General of Observatories at the Meteorological Office, Lodi Road, New Delhi**



**The Secretary-General of WMO addressing the meeting of the Indian Meteorological Society**



Mr. D. A. Davies at the Controls of the Decca Wind Finding Radar (Type WF 2) at the Observatory, New Delhi



Mr. Davies with some officers of the India Meteorological Department at the Asoka Hotel, New Delhi

## SECOND PLENARY ASSEMBLY OF THE INTERNATIONAL TELEGRAPH AND TELEPHONE CONSULTATIVE COMMITTEE

At the invitation of the Government of India, the Second Plenary Assembly of the International Telegraph and Telephone Consultative Committee was held in New Delhi from 8 November to 16 December 1960. A number of study groups and sub-groups on specialised subjects met from 21 November to 7 December 1960. The Assembly which met for the first time in Asia was inaugurated by the Prime Minister, Shri Jawaharlal Nehru, on 8 December. Shri R. C. Vaish, leader of the Indian delegation was elected President of the Assembly. The Assembly was attended by about 400 delegates, experts and observers from 55 nations of the world and 25 international organisations and operating companies.

Shri C. Ramaswamy, Deputy Director General of Observatories and Chairman of RA-II Working Group on Telecommunications represented the India Meteorological Department. On the Indian delegation Dr. P. Koteswaram, Director Aviation Services Division, represented the World Meteorological Organisation as observer. Among the items of meteorological interest, the Assembly discussed high speed telecommunications for data transmission and phototelegraphy including facsimile transmissions. The Asia Plan for land line circuits which was drawn up at Tokyo was revised and provision made therein for a number of direct land line and radio-teleprinter circuits for meteorological data transmissions from one part of Asia to another.

## CENTRAL BOARD OF GEOPHYSICS

A meeting of the Central Board of Geophysics held on 26 October 1960 at Ahmedabad was attended by Shri P. R. Krishna Rao, Director General of Observatories, who is a member of the Board. The meeting

discussed the Government decision regarding the transfer of the Central Board of Geophysics with its Central Office and two research wings from the Ministry of Scientific Research and Cultural Affairs to the Council of Scientific and Industrial Research. It was recommended that in reorganising the Board the Council of Scientific and Industrial Research may assign to the Board appropriate financial and administrative powers. The functions of the new Board will be, in addition to its co-ordinating activities, to foster and assist geophysical research and also creation of new research units for undertaking lines of work which cannot be looked after by the existing organisations and which in the opinion of the Board are important and urgent. The meeting also discussed the programme of World Magnetic Survey to be carried out during 1961-65 and requested the Survey of India to expedite the setting up of a Magnetic Station at Dehra Dun. The Board also recommended that the Director General of Observatories should explore the possibility of establishing a magnetic observatory at Shillong.

## ANNUAL SESSION OF THE NATIONAL ACADEMY OF SCIENCES, INDIA

Thirtieth Annual Session of the National Academy of Sciences, India will be held from 3 to 5 February 1961 at Allahabad at the invitation of the University of Allahabad. A symposium on 'Collisional Problem' has also been organised along with the Annual Session.

## INDIAN ACADEMY OF SCIENCES

The twenty-sixth meeting of the Indian Academy of Sciences will be held at Madras from 27 to 30 December 1960. As usual, Symposia in Physical, Mathematical, Chemical and Biological Sciences will be arranged. The programme includes also scientific meetings and a series of public lectures.

### INDIAN NATIONAL COMMITTEE FOR OCEANOGRAPHIC RESEARCH

The Government of India has appointed a new Indian National Committee for Oceanography primarily to advise the Government on questions relating to India's participation in the 'Indian Ocean Expedition (1961-64)' organised by the Special Committee on Oceanic Research (SCOR). India Meteorological Department is represented on this Committee by Shri C. Ramaswamy, Deputy Director General of Observatories. The first meeting of the Committee was held on 6 October 1960 at New Delhi. The Committee discussed India's programme for the Indian Ocean Expedition and formed working groups on (i) Meteorology and Physical Oceanography, (ii) Marine Biology and Fisheries, (iii) Marine Geology and Geophysics, and (iv) Chemical Oceanography and Radioactivity and related subjects, to finalise the national programme. The India Meteorological Department is planning to take an active part in organising the meteorological observations on board the Indian ships taking part in the Indian Ocean Expedition.

### PHYSICAL RESEARCH COMMITTEE

A meeting of the Physical Research Committee of the Council of Scientific and Industrial Research was held on 13 September 1960 at New Delhi. Dr. S. Mull, Deputy Director General of Observatories attended the meeting on behalf of the India Meteorological Department. The Committee discussed its draft proposals for the Third Five Year Plan and decided that as the future programme of work would depend on the final allocation of funds by the Planning Commission, a concrete programme be drawn at a later date. A number of new research schemes and the progress of old research schemes were also discussed.

### GANGA BRAHMAPUTRA RIVERS COMMISSION

The eleventh meeting of the Ganga-Brahmaputra Rivers Commission was held at

Vigyan Bhavan on 11 November 1960. Shri S. Banerji, Meteorologist, represented the India Meteorological Department at this meeting. The meeting recommended that the programme of inspection by the India Meteorological Department of non-departmental rain-gauges should be accelerated to cover one-third of the rain-gauges in the country every year.

### SECOND U.S. WEATHER SATELLITE IN ORBIT

U.S. A. successfully launched into orbit the Tiros II Weather Observation satellite on 23 November 1960. Weighing about 280 lbs, the satellite is designed to orbit the earth at a distance of 400 miles and send back photographs of the earth and its cloud cover as well as data regarding earth's radiation in the infra-red. According to the National Aeronautics and Space Administration (NASA) of the U.S.A., the perigee of the satellite is 406 miles and its apogee 431 miles. The orbital period is 98.2 minutes. Mounted inside a spherical cage designed to produce magnetic fields resembling those of the earth, the satellite has been provided with a 'de-spin' arrangement to prevent blurring of photographs taken by it.

21 countries including India will participate in a programme of intensive meteorological observations at standard hours and arranging special observations, when necessary, at the times of the passage of the satellite over their respective countries. The photographs relayed by the satellite will be supplied by NASA to the participating countries for further researches regarding interpretation with the aid of meteorological observations.

Two composite photographs depicting the area extending from East Africa to Western Himalayas prepared from the photographs transmitted by Tiros I during its transit over the Arabian Sea are given in Figs. 1 and 2. These photographs are published by courtesy of the NASA and U.S. Weather Bureau.

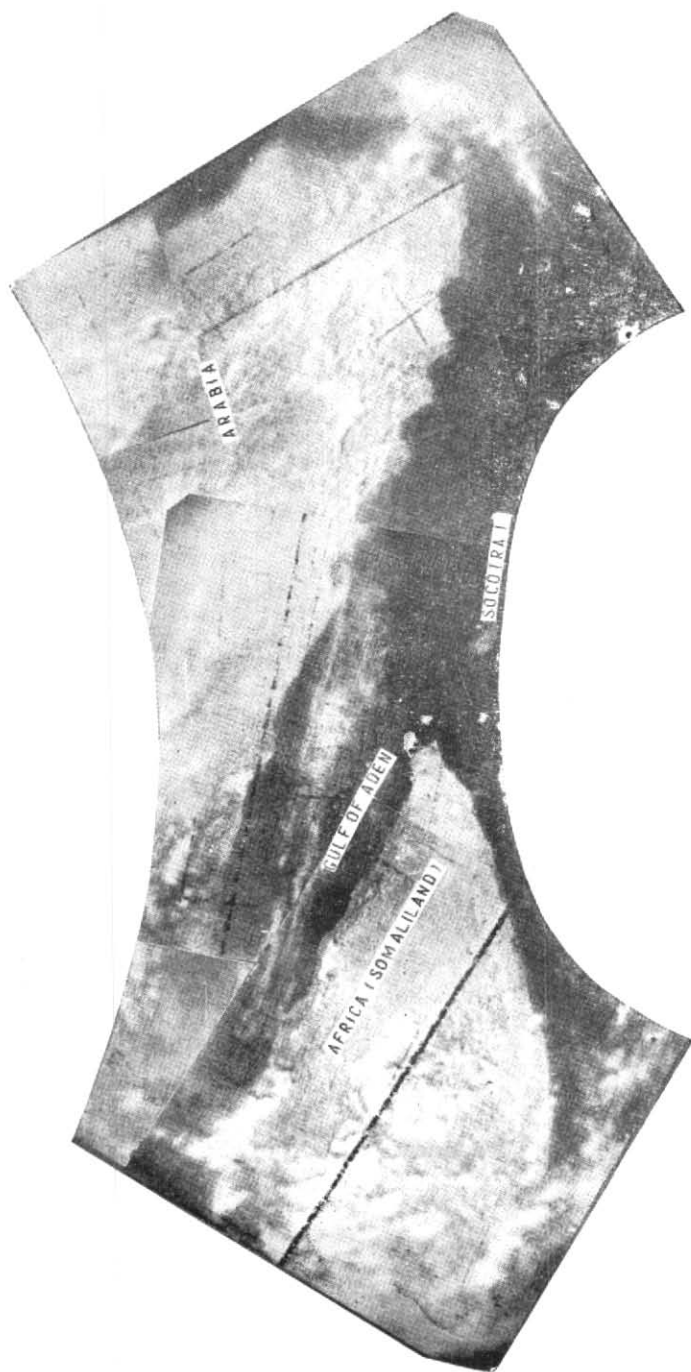


Fig. 1. Composite photograph of the coasts of East Africa and Arabia taken by Tiros I at about 1200 GMT on 9 May 1960  
(Courtesy U. S. Weather Bureau and NASA)

(Composite prepared by Dr. P. Koteswaram)



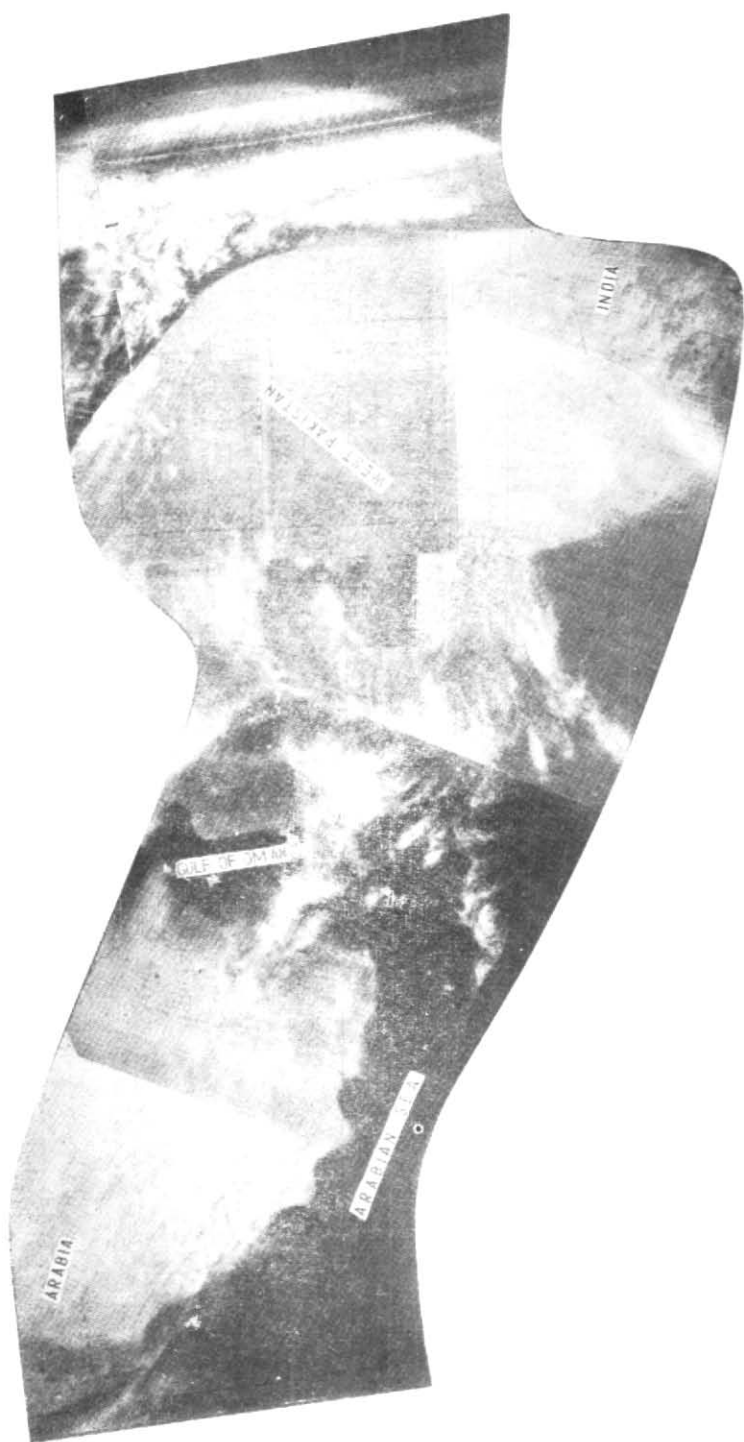


Fig. 2. Composite photograph of Gulf of Oman and West Pakistan taken by Tiros I at about 1200 GMT on 9 May 1960  
(Courtesy U. S. Weather Bureau and NASA)

(Composite prepared by Dr. P. Koteswaram)

## INDIAN METEOROLOGICAL SOCIETY

The annual General Body meeting of the Indian Meteorological Society was held at the Meteorological Office, Poona, on 30 October 1960 under the presidentship of Dr. K. R. Ramanathan. Dr. P. Koteswaram, Secretary, presented the annual report of the society. Dr. K. R. Ramanathan gave his presidential address on the 'Middle Atmosphere'. Dr. R. P. Paranjpe, ex-High Commissioner for India in Australia and ex-Vice Chancellor of the Lucknow and Poona Universities was the chief guest at the annual general body dinner of the society held the same evening.

Under the auspices of the Society, Prof. E. C. LaFond of the University of California, who is now in Bangkok serving as Oceanographer to Expedition 1959-61 of the U. S. Navy Electronic Laboratory, San Diego (California) spoke on 'Oceanographic Research' at the Meteorological Office, New Delhi on 18 November 1960. With the aid of a number of slides and a movie, Prof. LaFond explained three different aspects of oceanography with which he has been associated in the recent past, viz., Submarine Expedition in the Arctic Ocean on board the U. S. Atomic Submarine *Nautilus*, studies on internal waves, slicks, turbidity of water etc with the help of an oceanographic tower constructed in the waters off the Scrips Institute of Oceanography, California and studies of slicks off California in the Pacific Ocean by slow motion photographic techniques.

## VISIT OF DIRECTOR GENERAL OF OBSERVATORIES, TO JAPAN

Shri P. R. Krishna Rao, Director General of Observatories, and Dr. P. Koteswaram, Director, Aviation Services Division, India Meteorological Department accompanied the Air India International's Boeing 707 Proving Flight to Tokyo on 5 November 1960. While in Tokyo from 8 to 12 November they

held discussions with the Japanese Meteorological Agency regarding the proposed Delhi-Tokyo Radio-teletype link for exchange of Meteorological data and visited the Japanese Meteorological Research Institute and the Aerological Observatory. They also attended a few sessions of the International Symposium on Numerical Weather Prediction which was being held in Tokyo. Visits were also made to the aviation meteorological forecast centres at Bangkok, Hongkong and Tokyo.

## VISIT OF FOREIGN METEOROLOGISTS TO INDIA

Adm. C.V. Bunnag, Director, Meteorological Department, Royal Thai Navy, visited the Headquarters Office of the India Meteorological Department at New Delhi on 28 and 29 November 1960. He was shown round the workshop, laboratories and the storm detecting radar at the Meteorological Office and at the Cloud Physics Research Unit of the National Physical Laboratory.

Dr. Joseph Smagorinsky, Chief, General Circulation Research Section of the United States Weather Bureau, visited the Meteorological Offices at Poona and Colaba on 25 and 26 November 1960 while on his return journey to the U.S.A. after attending the International Symposium on Numerical Weather Prediction in Tokyo. Dr. Smagorinsky was shown round the various units of the India Meteorological Department functioning at Poona and Colaba. Under the auspices of the Poona Branch of the Indian Meteorological Society and also at the Meteorological Office, Colaba, Dr. Smagorinsky gave talks on the recent work on General Circulation problems being carried out in the U.S. Weather Bureau.



### SYMPOSIUM ON PHYSICS OF CLOUD AND RAIN IN THE TROPICS

A symposium on 'Physics of Cloud and Rain in the Tropics' was held at the Meteorological Office, Poona from 29 October to 1 November 1960 under the joint auspices of Council of Scientific and Industrial Research, India Meteorological Department, Indian Air Force (Met. Branch) and Indian Meteorological Society. The symposium which was inaugurated by Prof. M. S. Thacker, Director-General, Council of Scientific and Industrial Research, was addressed by Dr. K. R. Ramanathan, Chairman of the Advisory Committee on Rain and Cloud Physics Research of the Council of Scientific and Industrial Research and Shri P. R. Krishna Rao, Director-General of Observatories. Dr. K. R. Ramanathan presided. 41 papers were presented in the fields of atmospheric nuclei, cloud and raindrop size spectrum, atmospheric electricity, cloud forms and development, dynamics of cumuliform clouds, thunderstorms and hailstorms, radar studies of cloud and rain, atmospheric electricity in relation to precipitation, radioactive fall-out and cloud modification studies. The participants included research workers of the India Meteorological Department, the Council of Scientific and Industrial Research, Indian Air Force (Met. Branch), Atomic Energy Commission, Tata Institute of Fundamental Research, Bombay, Central Water and Power Commission, Government of Madras and the Universities of Bihar and Poona. It is proposed to publish the papers presented at the Symposium in a special issue of the Indian Journal of Meteorology and Geophysics.

### SYMPOSIUM ON UNDER-WATER ACOUSTICS AND OCEANOGRAPHY

The symposium on Under-water Acoustics and Oceanography, which was to be held in October 1960 at the Indian Naval Physical Laboratory, Cochin, has been

postponed till 13—14 February 1961, provisionally.

### SYMPOSIUM ON GEOPHYSICS IN RELATION TO GEOLOGICAL PROBLEMS

A symposium on Geophysics in relation to Geological Problems will be held at Calcutta on 4 and 5 August 1961 under the auspices of the National Institute of Sciences of India. The papers may deal with any aspect of geodesy, geo-magnetism and electricity, radioactivity, oceanography and physics of the solid earth including seismology and interior of the earth.

### SYMPOSIUM ON ATMOSPHERIC OZONE

The International Ozone Commission of International Association for Meteorology and Atmospheric Physics (I.A.M.A.P.) jointly with the World Meteorological Organisation (W.M.O.) is planning a symposium on 'Atmospheric Ozone and general circulation' at Arosa, Switzerland, in August 1961. The tentative programme for the symposium includes discussions on (i) Results on total ozone from IGY network and discussion of problem relating to the Dobson Instrument, (ii) Results on vertical ozone distribution from different methods and discussion of units to be adopted for representation, (iii) Behaviour of atmospheric ozone in special weather situations, (iv) Photochemical theory in comparison with our present observational knowledge of vertical ozone distribution in different seasons and latitudes, (v) Energy consideration in the Upper Atmosphere, (vi) Secondary high ozone layer at night, (vii) Infra-red measurements of atmospheric ozone, (viii) Other atmospheric traces, *i.e.*, radioactive fall-out, water vapour etc, and (ix) General Circulation in the atmosphere.

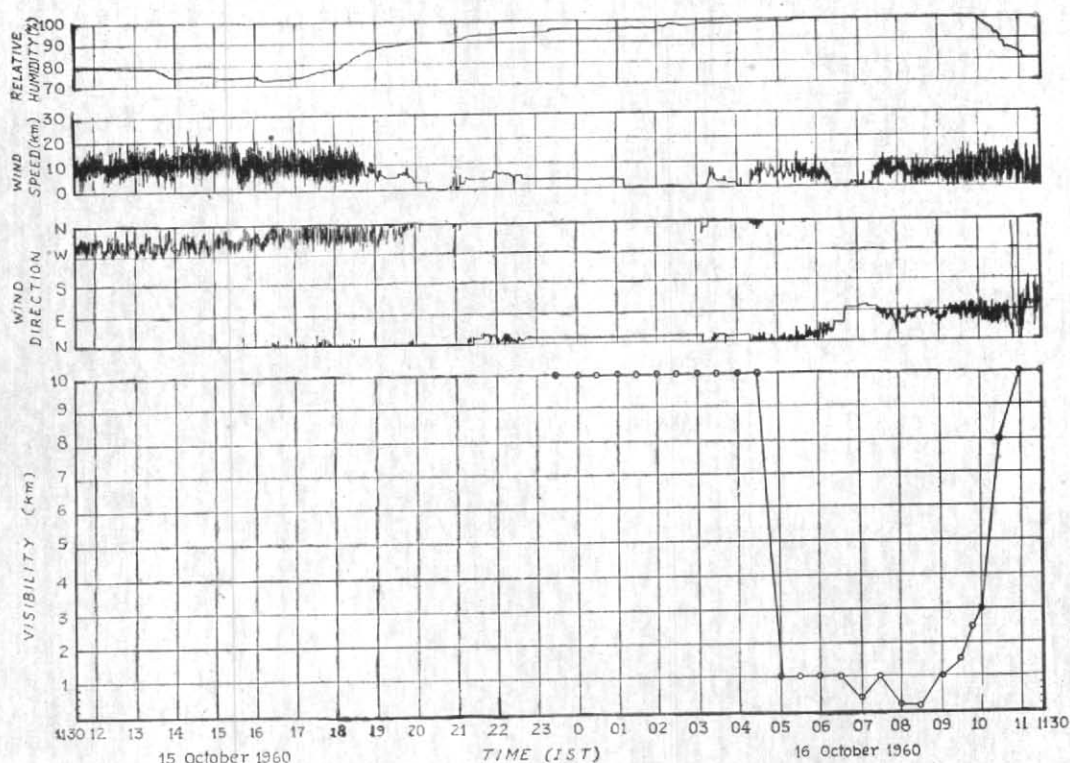


Fig. 1

### AN UNUSUAL INSTANCE OF FOG AT BOMBAY

An unusual fog occurred at Santaacruz airport on the morning of 16 October 1960. The visibility which had been 10 km only half an hour earlier abruptly dropped to 1 km at about 5 A.M. and deteriorated further till it was less than 50 metres at about 0830 IST. It then improved to about 1 km at 0930 hrs. Mist persisted for another half an hour thereafter. The dimming of the sun and the consequent reduction in daylight gave the airport a strange and weird appearance. The lowering of visibility due to the fog had its repercussion on aviation activity; some incoming planes had to be diverted from Santaacruz airport and take-offs delayed.

Thick fog is rather rare at Santaacruz,

During the past 16 years for which records are available, thick mist or fog has occurred only during the months November to April. This is the first instance of fog in October. On the day in question there was considerable advection of moisture at the lower levels from the sea due to the presence of a low pressure area over Sind and Rajasthan and to the north of Bombay. The relative humidity at Santaacruz was about 75 per cent at 1730 IST on 15 October 1960 increasing to 95 per cent at 2330 IST and becoming 100 per cent later. There was also a ground inversion extending to about 970 mb at 2330 IST on 15th and to 910 mb at 0530 IST on 16th. The sky was practically clear throughout the night. The condensation of the moisture due to radiational cooling led to the formation of the fog. The hygrogram, anemogram and the visibility records for the relevant period are shown in Fig. 1.

It will be seen that the surface wind was practically calm at night till about 4-30 A.M. Thereafter, northerly surface wind of 5-7 kt began to blow over the airfield. This produced turbulence which apparently facilitated the formation of fog. It may be added that on the same day, fairly widespread fog also occurred in north Konkan, coastal Gujarat and Kutch and Saurashtra, due to the incursion of moist air in the lower levels over the above region under the influence of the low pressure area mentioned earlier.

### SEVERE CYCLONES IN THE BAY OF BENGAL IN OCTOBER 1960

Two severe cyclonic storms from the Bay of Bengal struck the East Pakistan coast in October 1960 within a period of 3 weeks and caused widespread disaster. The tracks followed by the cyclones are shown in Fig. 1.

Following the westward movement of a low pressure area across Burma, a depression formed in the Bay of Bengal on the night of 8-9 October with centre about 200 km west-southwest of Akyab. The depression intensified into a cyclonic storm of small extent by 9th evening which became severe by the 10th morning when it was centred about 130 km west-southwest of Cox's Bazar. It struck the East Pakistan coast near Noakhali (Lat.  $22^{\circ}49'N$ , Long.  $91^{\circ}07'E$ ) on 10th night, weakened thereafter and broke up over the Assam hills by 13th. Barisal, which lay about 80 km north-northwest of the centre of the cyclone reported 40 knots wind and a pressure of 993.5 mb (14 mb below normal) at 1730 IST on 10th. According to press reports, the wind speed in the storm reached 70 mph.

The second disturbance developed in the southeast Bay of Bengal and concentrated into a depression centred midway between Madras and Port Blair on the morning of 29 October. Moving first in a northerly and later in a north-northeasterly direction it intensified into a severe cyclonic storm with centre at about Lat.  $19^{\circ}5'N$ , Long.  $89^{\circ}E$  on 31st

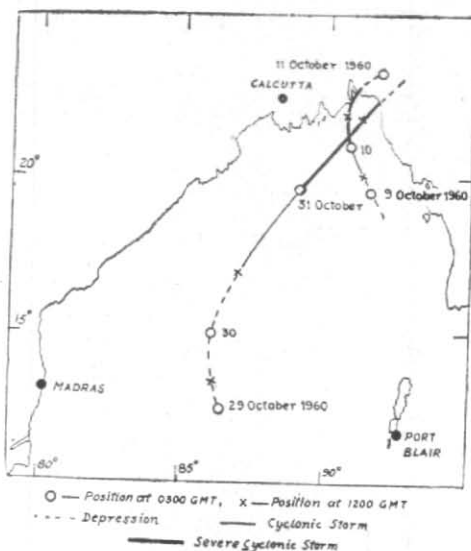


Fig. 1. Tracks of Bay of Bengal cyclones in October 1960

morning. Moving rapidly northeast it struck the East Pakistan coast near Chittagong (Lat.  $22^{\circ}21'N$ , Long.  $91^{\circ}50'E$ ) on the same night and weakened rapidly thereafter. Barisal, about 125 km northwest of the storm centre reported a pressure of 997.4 mb (13 mb below normal) and wind speed of 65 knots on 31st evening. According to press reports, wind speed exceeded 80 knots at several places; the anemometer on the Swedish ship, *S. S. Bali*, recorded a maximum wind speed of 130 mph.

Both these cyclones were accompanied by storm surges, a steep wall of water travelling at a speed of about 15 knots towards shore, the wall being as high as 20 to 30 ft according to eye witnesses. This was responsible for the large number of deaths in the coastal area of East Pakistan. According to the Pakistan Official estimates appearing in the press, about 15,000 to 20,000 people lost their lives and more than 200,000 were left homeless. Patenga aerodrome (Chittagong) was submerged under ten feet of water. Standing crops were destroyed and all vegetation had been 'burnt' by the extraordinary force of the wind. In the Chittagong

area, railway wagons were swept right off their tracks and steel cranes were knocked off their rails. The cyclone havoc has been described as one of the "greatest tragedies in the world in recent times", comparable to the devastation caused by the earthquake which shook Agadir in Morocco in 1959.

By a curious coincidence, exact to the day 84 years ago, on 31 October 1876 the Bakarganj (Lat.  $22^{\circ} 29' N$ , Long  $90^{\circ} 18' E$ ) cyclone and associated tidal wave claimed  $2\frac{1}{2}$  lakhs of lives. An examination of the past records reveals that during the last 70 years (1890-1960), there was no other occasion when two severe storms struck the same area within a few days of each other.

#### WATERSPOUT

*Vessel* : M. V. *Santhia*  
*Captain* : D. M. Gill  
*Voyage* : Jedda to Chittagong  
*Observer* : Britton, 2nd Officer

23 July 1960. 1500 L.M.T. Position  $17^{\circ} 35' N$   
 $89^{\circ} 32' E$ . Ship's course  $035^{\circ}$ , speed 14 kt.  
Wind  $250^{\circ}$ , 10 kt. Temp.  $86^{\circ} F$ , Bar.  $29.78''$ ,  
Rain showers.

Observed waterspout at 0900 GMT (Fig. 1).

Wind veered considerably. Heavy rain between 1000-1300 GMT.

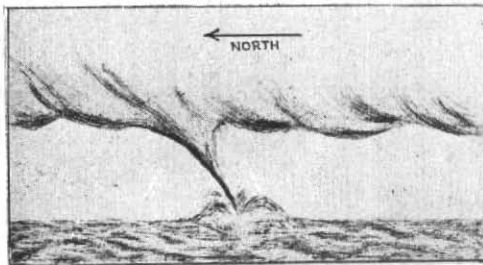


Fig. 1. Waterspout