Notes and News

DELHI—MOSCOW RADIO-TELETYPE CHANNEL

As reported in the previous issue (page 70), the direct radio-teletype channel between Delhi and Moscow commenced operation from 0600 GMT on 1 January 1960. At the time of inauguration of the channel, the following messages were exchanged between the Governments of India and U.S.S.R.

(1) From Dr. P. Subbarayan, Minister for Transport and Communications, India to Dr. D. Psurtsev, Minister of Communications, and Dr. A. Zolotukhin, Chief of the Hydrometeorological Service, U.S.S.R. :

> "Kindly accept sincere greetings on behalf of Government of India and on my behalf on the occasion of the inauguration of the radioteletype channel between Delhi and Moscow for exchange of meteorological information, which constitutes a major step in implementing programme of the World Meteorological Organisation for exchange of Northern Hemisphere data. The opening of this new channel adds one more field of co-operation between the Governments of India and the U.S.S.R. and I am sure it will result in increased co-operation and mutual interchange of information and knowledge between the meteorological services of the two countries. I send you the season's greetings and best wishes for a happy New Year".

(2) From Dr. D. Psurtsev, Minister of Communications of the U.S.S.R. and Dr. A. Zolotukhin, Chief of the Hydrometeorological Service of the U.S.S.R. to Dr. P. Subbarayan, Minister for Transport and Communications, India :

> "We have the honour of requesting you to accept our congratulations on the occasion of the inauguration on January 1, 1960, of a direct radioteletype circuit between the capitals of our states for the purpose of exchanging meteorological and aerological data.
>
> The setting up of this channel of radioteletype communication is a significant measure in the implementation of the W.M.O. decisions on the exchange of meteorological and aerological information in the Northern Hemisphere.
>
> The establishment of direct Duplex radioteletype communication is of a great importance for the activities of the meteorological services of the U.S.S.R. and India.
>
> The exchange of meteorological and aerological data between our two countries by means of direct transmissions will contribute to an improved quality of the weather forecasts and meet the growing requirements of the civil aviation now making fast progress in developing flights on international air routes. Besides that, the mutual exchange of meteorological and aerological data through a direct radioteletype communication channel will promote the extension of research for an improvement in the methods of short-range and long-range weather forecasts.
>
> The radioteletype communication between Moscow and New Delhi will be effected through the use of powerful radio-transmitter and modern letter-printing apparatus.

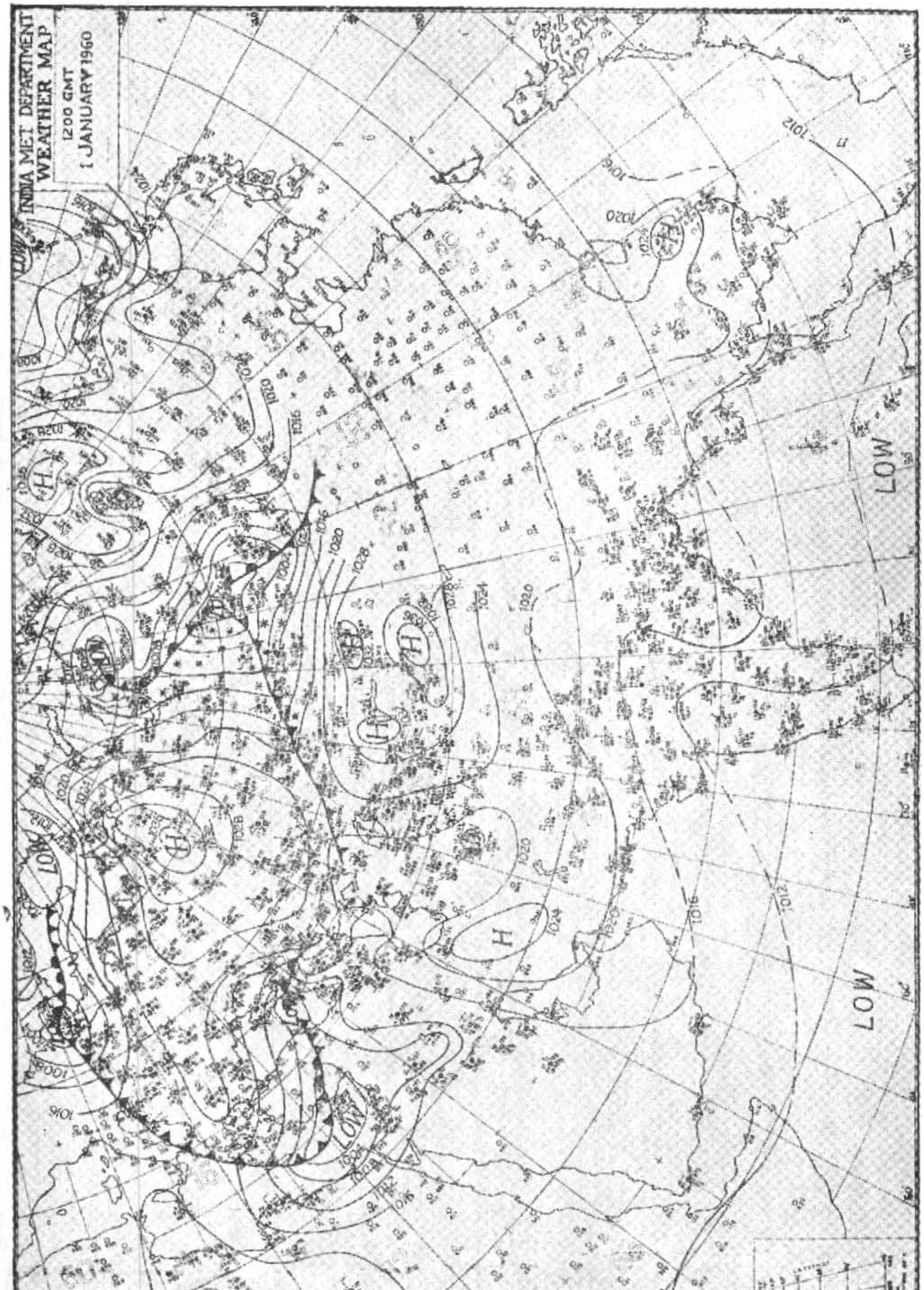
INDIA MET. DEPARTMENT
WEATHER MAP
1200 GMT
1 JANUARY 1960
LOW
LOW
LOW
LOW

Fig. 1

A trial radioteletype exchange of information via the direct channel between Moscow and Delhi carried a few days prior to the New Year, has brought good results and confirmed the readiness of both sides to commence regular operation from January 1, 1960.

In connection with the inauguration of the direct radioteletype circuit between Moscow and New Delhi, we offer our congratulations to the officials and the staff of the meteorological services and communication services of the U.S.S.R. to India and wish them the best success in using this circuit. The direct radioteletype circuit between Moscow and New Delhi is one more step towards all round development of mutual relations and friendship between the U.S.S.R. and India".

(3) From Shri P. R. Krishna Rao, Director General of Observatories, India, to Dr. A. Zolotukhin, Chief of U.S.S.R. Hydrometeorological Service, Moscow:

"Kindly accept my felicitations on this important occasion of inauguration of Delhi-Moscow radioteletype channel for exchange of meteorological data. Besides being a major step for implementation of WMO plan of establishment of Northern Hemisphere exchange centres, it has strengthened ties between the Meteorological Services of U.S.S.R. and India. With sincere assurance of continued co-operation with U.S.S.R. Service and best wishes for the New Year from myself and staff of India Meteorological Department to you and staff of your service".

The meteorological data of observatories in Russia and a few East European countries are being received at Delhi and data of observatories in India and a few neighbouring Middle East and Near East countries are being transmitted to Moscow. The meteorological data exchanged include surface observations for the 4 main synoptic hours, *viz.*, 00, 06, 12 and 18 GMT and the intermediate hour 03 GMT, aerological information for 00 and 12 GMT, Climat data and surface weather chart analyses.

The radio-teletype circuit works on two-channel frequency (duplex) system and exchange of data is effected at 50 bauds speed of transmission by automatic transmitters, reperforators and page-printers. The terminal equipment located at the Main Meteorological Office, Safdarjung Airport, has been leased by the Overseas Communications Service of the Government of India.

A photograph of the first synoptic chart prepared on 1 January 1960 using the data received on the newly established channel is shown in Fig. 1. (p. 177)

FOURTH REGIONAL TECHNICAL CONFERENCE ON WATER RESOURCES DEVELOPMENT

The Fourth Regional Technical Conference on Water Resources Development is proposed to be held at Colombo, Ceylon, from 5 to 13 December 1960 under the auspices of ECAFE. The three previous conferences were held at New Delhi in 1951, at Tokyo in 1954 and at Manila in 1957. The conference aims at contributing towards the improvement of techniques and the promotion of various phases of water resources development in the region. The provisional agenda of the conference includes a review of water resources development in the countries of the region during 1951-1960; Organisation for planning, design, construction and operation of river valley projects; Development of ground water resources; and Flood problems in deltaic regions. The conference will be followed by field trips for about five days to study the water resources development projects in Ceylon.

FORTYSEVENTH SESSION OF THE INDIAN SCIENCE CONGRESS HELD AT BOMBAY IN JANUARY 1960

The Fortyseventh Session of the Indian Science Congress Association was held at the University of Bombay from 3 to 9 January 1960. Over 2500 delegates from all over India and nearly 70 delegates from 23 foreign countries and International Organisations attended the session. The Prime Minister of India, Shri Jawaharlal Nehru, while inaugurating the session on the forenoon of Sunday the 3rd at an impressive function, appealed to the scientists, that they should remember to direct their work towards the benefit of humanity, while being otherwise detached in their search for truth. The Presidential address on the "Impact of Society on Science" was delivered by Prof. P. Parija, Vice-Chancellor of the Utkal University.

The India Meteorological Department was represented by Shri P. R. Krishna Rao, Director General of Observatories, and seven other officers.

As usual, the Science Congress Session was preceded by the annual meeting of nearly two dozen scientific bodies of India as well as the meetings of the Association of Scientific Workers of India and of the National Institute of Sciences.

The scientific deliberations of the Congress were held in 13 different sections, *viz.*, (*i*) Mathematics, (*ii*) Statistics, (*iii*) Physics, (*iv*) Chemistry, (*v*) Geology and Geography, (*vi*) Botany, (*vii*) Zoology and Entomology, (*viii*) Anthropology and Archaeology, (*ix*) Medical and Veterinary Sciences, (*x*) Agricultural Sciences, (*xi*) Physiology, (*xii*) Psychology and Educational Sciences and (*xiii*) Engineering and Metallurgy. Besides the presentation of a large number of original papers, 26 symposia and 5 joint discussions on subjects of topical interest were held under the aegis of the various sections. Some of the topics which formed the subject matter of symposia were—Fluid Dynamics, Normed Linear Spaces, Elementary Particles and High Energy Physics, Drainage Problems in India, Environmental Physiology, Marine Biological Studies, Selection of Technical Personnel, Electronic Instruments, Alloy Steel, Fuel Problems, Dynamics of Soil Fungi and Instrument Industry in the Third Five-Year Plan.

Under the auspices of the Physics section, a symposium on *Solar Activity and Associated Geophysical Phenomena* was held on the afternoon of 5 and 6 January. The symposium was called "Moos Centenary Symposium" in honour of Dr. N.A.F. Moos, the first Indian Director of the Colaba and Alibag Observatories (born : 25 October 1859), who had made outstanding contributions to the methodology of the study of geomagnetic variations. In all, sixteen papers were contributed (although only twelve were presented) to the symposium, by delegates from the following Institutions—(1) the India Meteorological Department, (2) the Tata Institute of Fundamental Research, Bombay, (3) the Physical Research Laboratory, Ahmedabad, (4) the National Physical Laboratory, New Delhi, (5) the Air Headquarters, New Delhi, (6) the University of Banaras, (7) the University of Calcutta, (8) the University of Osmania, (9) the Research Department of the All India Radio and (10) the Central Building Research Institute, Roorkee.

Shri P. R. Krishna Rao, Director General of Observatories, made a short introductory speech giving some of his personal reminiscences concerning Dr. N.A.F. Moos. He also referred to some of the latest observations on solar terrestrial relationships made through rocket flights and artificial satellites carried out under the I.G.Y. programme. Dr. K. R. Ramanathan, Director of the Physical Research Laboratory, Ahmedabad and a former Director of the Colaba and Alibag Observatories was elected Chairman of the symposium. He briefly outlined the contribution to Geophysics made by Dr. N.A.F. Moos. The papers contributed to this symposium fell into five categories—(*i*) Solar Activity and Geomagnetism (3 papers),

(*ii*) Solar Activity and Cosmic Rays (4 papers), (*iii*) Solar Activity and Weather (2 papers), (*iv*) Solar Activity and the Ionosphere (5 papers) and (*v*) Solar Flare Patrol (2 papers). On the second day, the symposium was presided over by Prof. S. R. Khastgir, Sectional President-elect for Physics. Useful discussions were held after the presentation of papers under each category. The symposium was well attended and proved a great success.

Besides the symposia and joint discussions, there were a number of special lectures of which the one on the "Problem of Atmospheric Ozone" by Dr. K. R. Ramanathan was of particular interest to meteorologists.

Another feature of the Congress was the large number of "Popular Lectures" delivered in the evenings by distinguished scientists. These lectures served to provide the general public with accurate and authoritative knowledge on abstruse and varied topics like: Atomic Energy for peaceful purposes (Prof. H. J. Bhabha), Origin and Evolution of the Universe (Prof. G. Gamow), Atoms and Human knowledge (Prof. Niels Bohr), Science and Industry (Sir Ewart Smith), Elementary Particles (Prof. Abdus Salam), Drugs that shape Human Mind (Prof. B. Mukherji), etc. These lectures were attended by large audiences with great interest and appreciation.

A Scientific and Technological Exhibition in which most of the Instrument manufacturing firms in India participated, was held at the Institute of Science and Cowasji Jehangir Hall during this Session; it attracted a large number of visitors.

Prof. N. R. Dhar, Director, Sheila Dhar Institute of Social Sciences, Allahabad, assumed the office of General President of the Association for one year from 1 February 1960. The Fortyeighth Session of the Indian Science Congress will be held at Roorkee in January 1961.

The local arrangements made for the work, stay and entertainment of the large number of delegates were good.

INDIA METEOROLOGICAL DEPARTMENT DIRECTORS' CONFERENCE

The Annual Directors' Conference of the India Meteorological Department was held at the Meteorological Office, New Delhi, from 3 to 12 March 1960 under the Chairmanship of Shri P.R. Krishna Rao, Director General of Observatories. The Conference was inaugurated by Dr. P. Subbarayan, Minister for Transport and Communications on 3 March 1960.

Among other subjects, the Conference considered—The meteorological facilities for service to long distance, high altitude and high speed jet aviation; Preparation of extended charts based on data received from recently installed New Delhi-Moscow radioteletype channel; Projected improvements in the weather service to aviation in the eastern regions of the country, *viz.*, Assam and NEFA; Weather Warnings to Community Development and National Extension Blocks; Storm warning procedures for cyclones in the Bay of Bengal and the Arabian Sea; Development of small area forecasting techniques and Establishment of additional upper air and surface meteorological stations.

SYMPOSIUM ON THUNDERSTORMS

As a part of the programme of activities of the Annual Directors' Conference, the India Meteorological Department organised, jointly with the Indian Meteorological Society, a Symposium on 'Thunderstorms' at the Meteorological Office, New Delhi from 9 to 11 March 1960. Shri Ahmed Mohiuddin, Deputy Minister for Civil Aviation, in the Ministry of Transport and Communications, inaugurated the Symposium on 9 March 1960.

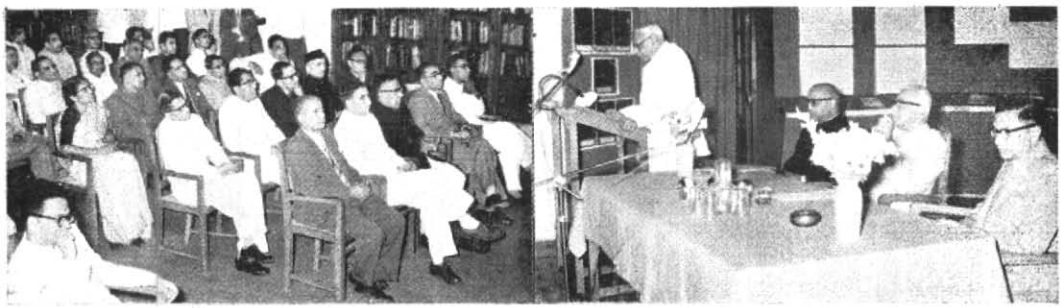

Fig. 1. Dr. P. Subbarayan, Union Minister for Transport and Communications, inaugurating the Annual Conference of the Directors of India Meteorological Department, New Delhi, on 3 March 1960

The conference was presided over by Shri P. R. Krishna Rao, Director General of Observatories

Fig. 1. Shri Ahmed Mohiuddin, Union Deputy Minister for Civil Aviation, inaugurating the "Symposium on Thunderstorms" in New Delhi, on 9 March 1960

The 3-day symposium was organised by the India Meteorological Department in collaboration with the Indian Meteorological Society

(*Photos*: *Press Information Bureau, New Delhi*)

Fig. 1. Agricultural Meteorology pavilion at the World Agricultural Fair, 1959

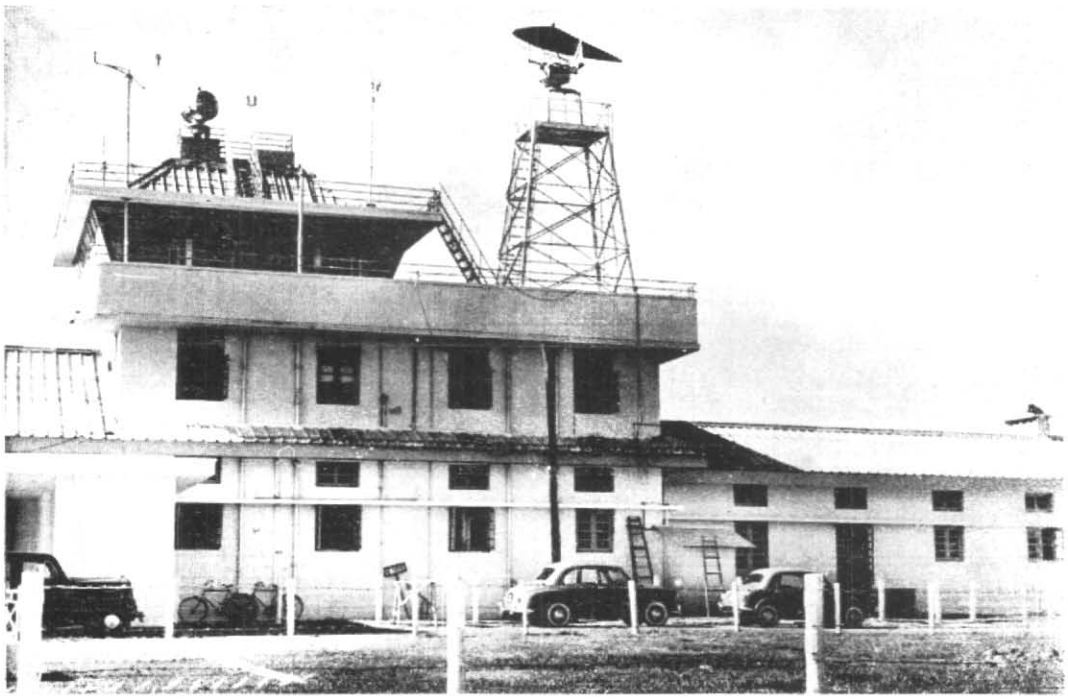

Fig. 1. Weather radar at Gauhati

38 papers were presented at the symposium by officers of the India Meteorological Department, Indian Air Force (Met. Branch) and Rain and Cloud Physics Research Unit of the C.S.I.R.— covering aspects like formation and structure of the thunderstorms, radar studies of thunderstorms, thunderstorm electricity, Climatology of thunderstorms and microseisms and disturbances on magnetic records caused by thunderstorms.

Prof. K.R. Ramanathan, President of the Indian Meteorological Society, delivered two lectures on the evening of 10 and 11 March 1960, on Problems of tropical and subtropical meteorology with special reference to India.

WORLD AGRICULTURE FAIR—AGRICULTURAL METEOROLOGY PAVILION

The India Meteorological Department participated in the World Agriculture Fair at New Delhi which was inaugurated by the President of India on 11 December 1959. The exhibits showing the activities of, and services rendered by, the India Meteorological Department to agriculture included a model of Farm Weather Observatory set up with model instruments and crops (sugarcane and wheat); Charts showing (*a*) the network of Agricultural Meteorological Observatories in India and expansion in the number of these observatories during the period 1935—59; (*b*) a 'transparency' of crop weather calendar, depicting the various stages of the growth of main crops in the different States of India, starting from sowing to harvesting stage, and the climatic factors favourable to the growth of the crops; (*c*) the progress of rainfall in India week by week; (*d*) microclimate of sugarcane crops; (*e*) results of studies made on climate and crops; (*f*) forecasts and warnings for heavy rainfall and frost and (*g*) network of AIR broadcasting stations from which Weather Bulletins for Farmers are broadcast in various regional languages. Also on display were : Various instruments used for collecting meteorological data, Instrumental devices used for agricultural purposes, such as, (*a*) an electronic alarm for scaring away birds from instruments measuring evaporation from water surfaces, (*b*) small-scale working models of (*i*) frost alarm apparatus, and (*ii*) continuous solar radiation record, (*c*) a model of sferics equipment used for locating thunderstorms, (*d*) a working model of weather radar, and charts showing network of weather radar stations in India as also typical weather echoes observed on the radar

The Agricultural Meteorology pavilion (Fig. 1) attracted a large number of visitors to whom the exhibits were explained.

WEATHER RADAR AT GAUHATI

A weather radar (Decca type 41) has been installed on the terminal building of Borjhar Airfield, Gauhati in Assam and put into commission with effect from 18 January 1960. A photograph of the radar on completion of the installation is shown in Fig. 1. For facilities of meteorological briefing and control advices to operating aircraft, two additional repeater scopes have been provided—one in the Meteorological Briefing room and the other in the aerodrome Control Tower.

The necessity of installing a few storm-detecting weather radars at important Assam airports to issue weather forecasts and warnings to aircraft operating in the difficult mountainous terrain, especially over the NEFA and adjoining areas, has been recognised for sometime. The installation of this radar which was taken up on priority basis and has been completed with the utmost expedition is the first important step in the plan of expansion and improvement of the existing meteorological organisation for aviation in these areas. With the help of this

radar it will be possible to keep a round-the-clock watch on weather in the storm season and alert aircraft regarding Nor'wester thunderstorms and storms of lesser intensity within the radar range. It is planned to instal similar weather radars at Mohanbari and Agartala when the necessary equipment and other facilities become available.

The radar operates at 3 cm wave band and has a peak power output of 30 K.W. The vertical and horizontal beam widths of this radar are 4° and 0°·75 respectively. The antenna can be tilted in elevation from —2° to +12°. The maximum range of the radar is 250 miles.

The same type of weather radars have also been installed at Santacruz (Bombay), Sonegaon (Nagpur) and Meenambakkam (Madras) airports to provide improved ground facilities to aircraft. Two more powerful weather radars with provision of RHI and A-Scope have been installed at Dum Dum (Calcutta) and Safdarjung (New Delhi) airports.

INDIAN STANDARDS CONVENTION 1959

Indian Standards Convention 1959, was held at Hyderabad from 27 December 1959 to 2 January 1960, as announced in these columns in Vol. 10 No. 3 . It was the 5th in the series of Conventions organised by the Indian Standards Institution, New Delhi, the earlier ones having been held at Calcutta, Bombay, Madras and New Delhi. Representatives from U. K., Germany, Lebanon and Japan participated in the above Convention. Nearly 550 delegates representing various Union and State Government Departments, business houses, local bodies, statutory concerns and technical and research institutions in India participated in 9 Technical Sessions held on (1) Implementation of Indian Standards, (2) Certification for Small Industries Poducts, (3) Standardization as a prerequisite to Productivity, (4) Preparation of Standards in Terms of Metric Units, (5) Design for Industrial Experimentation, (6) Tropicalization of Electrical and Electronic equipment, (7) Latest Techniques in Chemical Analysis, (8) Non-Ferrous Metals Industry and Standardization and (9) Documentation and Communication.

PHYSICAL RESEARCH COMMITTEE

A meeting of the Physical Research Committee of the Council of Scientific and Industrial Research was held at the Indian Institute of Science, Bangalore from 1 to 3 February 1960. A number of new research schemes including some concerning Geophysics and Meteorology and renewal applications of old schemes came up for discussion. A symposium on 'Solid State Physics' was also held on the same dates. Shri P. R. Krishna Rao, Director General of Observatories, attended the meeting and the symposium on behalf of the India Meteorological Department.

CENTRAL BOARD OF IRRIGATION AND POWER

The Central Board of Irrigation and Power held its annual session at New Delhi from 23 to 25 November 1959. Shri P. R. Krishna Rao, Director General of Observatories, and Shri K. Parthasarathy attended the meeting on behalf of the India Meteorological Department. The subjects of interest to the India Meteorological Department, discussed at the meeting were (*i*) the measurement of evaporation over the country and (*ii*) systematic storm studies for the purpose of providing data for planning flood control and river valley development over the country. The results of experiments carried out in Mysore and Delhi in some tanks for assessing the efficacy of the monomolecular film cover of cetyl alcohol on water surface in reducing evaporation were presented at the meeting.

RIVER COMMISSIONS MEETINGS

The seventh meeting of the Northwest Rivers Commission, held at Bhopal on 16 October 1959, was attended by Shri K. Parthasarathy, Meteorologist and the tenth meeting of the Ganga-Brahmaputra Rivers Commission held at New Delhi on 10 December 1959 was attended by Shri P. R. Krishna Rao, Director General of Observatories and Shri K. Parthasarathy. Some defects noticed during the inspection of State raingauge stations recently started by the India Meteorological Department were considered at the above meetings. The meteorological and other features of the major floods in the monsoon season of 1959 were also discussed.

ASSIGNMENT OF INDIAN METEOROLOGIST TO IRAQ

Shri S. Mazumdar, Meteorologist, India Meteorological Department, was appointed as an expert to the Technical Assistance Mission of the International Civil Aviation Organisation at Iraq.

We wish him all success in his new assignment.

AWARDS TO VOLUNTARY OBSERVING SHIPS

The following ships of the voluntary observing fleet of the India Meteorological Department were selected for 'Excellent Awards' for outstanding meteorological work during the year 1958-59. The awards, which were in the form of books, were sent to Captains, Observing Officers and Radio Officers, who had been for more than six months on the ship concerned during the award year. Details of the recipients are given below—

S. S. *State of Bombay* (Eastern Shipping Corporation Ltd.)—S. K. Kaikobad (Captain), K. V. Hora (Observing Officer), C.D. Joshi and S. M. Villait (Radio Officers).

S. S. *Rajula* (British India Steam Navigation Co. Ltd.)—H. C. Turner (Captain), P. Keith and T. Shield (Observing Officers), L. Philiphs and W. Hall (Radio Officers).

S. S. *Islami* (Mougal Line Ltd.)—G. C. Greig (Captain), E. G. Davis and A. A. Nazarath (Observing Officers), T. J. Kutinho and S. G. Choudhury (Radio Officers).

S. S. *Kampala* (British India Steam Navigation Co., Ltd.)—C. L. Broadhurst (Captain), B. M. Curtis and A. R. Ross (Observing Officers), H. Ranall and R. C. Berry (Radio Officers).

S. S. *State of Madras* (Eastern Shipping Corporation Ltd.)—M.K. Nambiar (Captain), B. S. Patwardhan and P. D. Bhansali (Observing Officers), P. Mallik and P. Bajaj (Radio Officers).

The useful work put in by the other officers who served on the ships listed above for lesser periods than six months is also very much appreciated.

WATERSPOUTS

Vessel : S. S. *Rajula*

Captain : G. A. Brignall

Voyage : Penang to Negapatam

Observer : T. Shield, 3rd Officer

6 March 1959. At 0330 GMT, 3 waterspouts were observed bearing 020° at a height of about 1500 ft. The spouts did not touch surface of the sea and lasted for about 4 minutes (Fig. 1).

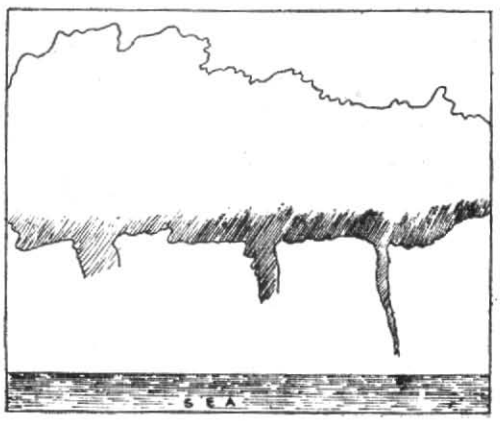

Fig. 1

Accompanying clouds were heavy cumulonimbus and towering cumulus. Cirrostratus running north and south across the sky.

Wind NNE, force 2; Barometer 1012·5 mb; Dry bulb 85°F; Wet bulb 78°F.

Position of ship : 6°57′N, 92°07′E

PHOSPHORESCENCE

Vessel : M. V. *Dumra*

Captain : G. Mackay

Voyage : Bombay to Persian Gulf

Observer : F. D. Routledge, 3rd Officer

8 September 1959, 0125 GMT. Parallel lines of phosphorescence of great luminosity were seen on starboard side of the vessel, ship's head 316° T; seen from ahead reaching to a fair way astern, faded at 0130 and were completely gone at 0135 GMT. Echo sounder in use. Echo sounding 40 Fms. These lines travelled in waves out to starboard and at the same time astern at great speed. At 0137 GMT, lines reappeared in greater brilliance from right ahead moving at right angles to ship's heading. At 0143 GMT, lines commenced a rotary motion either side moving ahead and then inwards; at 0145, lines faded out and at 0150 were gone completely leaving only odd patches of phosphorescence. The waves of luminosity were spaced about six feet apart and were of about the same breadth. They were travelling at great speed, first in a clockwise motion, then towards the bows in a clockwise motion on the port side and an anti-clockwise motion on the starboard side (Fig. 1). Sea water temperature 81°F, but the sample was tested by flicking and reacted in the same manner as described in *The Marine Observer* (April 1959) by observer on M. V. *British Commerce*. Unfortunately the sample was mislaid and thrown overboard by one of the crew. The wind at time of observation was from SSW, force 5.

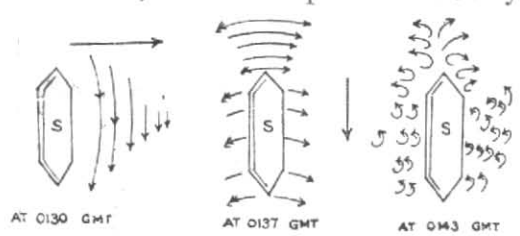

Fig. 1

Arrows represent direction of movement of phosphorescent waves

Position of ship : 23°37′ N, 67°18′ E.

Note: A similar phenomenon reported by *M. V. British Commerce* on 14 April 1958 in the Persian Gulf is as follows—when a sample of sea water, collected from area where phosphorescence was observed, was slightly disturbed in darkness, phosphorescence flashed. Successive tappings (with intervals of a few seconds) at the surface of the sample gave flashes of decreasing intensity for about eight times. When the experiment was repeated after a few minutes once again the glowing was seen.

RAINBOW

Vessel : S. S. *Mahadevi*

Captain : H. S. Cutts

Voyage : Bombay to Calcutta

Observer : R. A. C. Jacob, 3rd Officer

17 October 1959. A well developed rainbow was sighted towards west from 1250-1300 GMT (50 minutes after sunset).

Sky 5/8 cloudy with cumulonimbus. Partly moonlit. Clouds gathered on the west half of the sky with a few scattered clouds on the other half. Wind NNE, force 4. Bar. 1008·3 (corrected).

Position of ship : 16°41′ N, 86°16′ E.

Note: This rainbow appears to have been caused by the rays of moon. 17 October 1959 was the first day after the full moon; moonrise and sunset being 1225 and 1147 GMT respectively at the ship's position.

THUNDERSTORM

Vessel : S. S. *Nadir*

Captain : A. W. C. Jolly

Voyage : Singapore to Thevenard

Observer : M. Macey, 3rd Officer

On 27 October 1959 between 1000 and 1030 GMT the barograph rose by 6·4 mb,

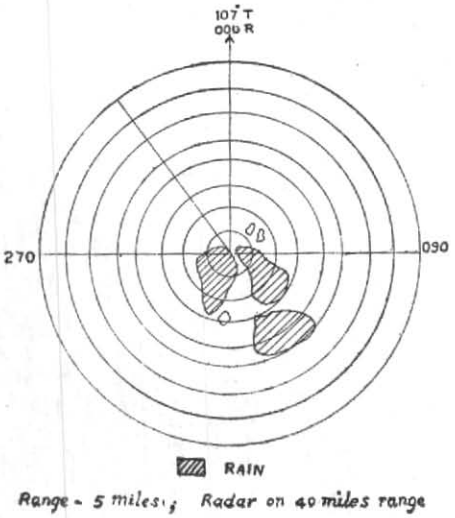

Fig. 1(a)

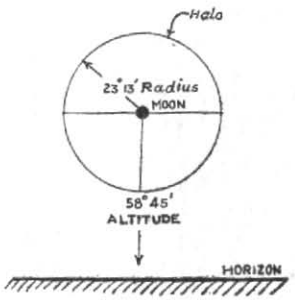

Fig. 1(b)

the rise being 5·4 mb in the last ten minutes of this period. It then fell by 4·6 mb from 1030 to 1230 GMT, falling 2·0 mb from 1030 to 1100 GMT. At the time of the observation, a thunderstorm passed at about 6 miles distant. The other details are as follows—Sea Temp. 66°F (18·9°C); Air Temp. 63°F (17·2°C); Wind 230°, force 4.

Position of ship : At Singapore

LUNAR HALO

Vessel : S. S. *Rajula*

Captain : G. A. Brignall

Voyage : Negapatam to Penang

Observer : J. Thomson, 3rd Officer

15 November 1959, 1600 GMT. Observed Lunar Halo 23°13′ radius. Altitude of moon 58°45′ (Fig. 1 b). Barometer reading 1009·8 mb (corrected), air temp. 27·2°C, wet bulb 24·4° C by Assman Psychrometer, wind 110°, 8/8 cloud—*Cu St, Sc, Cs* present.

Precipitation observed on radar—5 miles approx. 110° (Fig. 1 a). At 1610 GMT, Moon obscured. Wind varying as rain approached. At 1615 GMT vessel in rain, Course 107°T, speed 12·5 kts.

Position of ship : 7°46′ N, 89°52′ E.