<table>
<thead>
<tr>
<th>country/pays</th>
<th>d</th>
<th>d</th>
<th>f</th>
<th>f</th>
<th>d</th>
<th>d</th>
<th>f</th>
<th>f</th>
<th>d</th>
<th>d</th>
<th>f</th>
<th>f</th>
</tr>
</thead>
</table>

**ANNÉE GEOPHYSIQUE INTERNATIONALE**

1957 - 1958

INTERNATIONAL GEOPHYSICAL YEAR
At all modern meteorological stations, the precision instruments of Jules Richard provide a permanent answer to the questions: Temperature? Pressure? Wind speed and direction?

**BAROGRAPHS**
Recording aneroids with continuous charts, adopted for over 40 years by the French Meteorological Service. Standard equipment in the French Navy.

**THERMOGRAPHS**
Which can be combined with our barometers and hygrometers. These instruments are outstandingly sensitive.

**HYGROGRAPHS**
Direct recording of air humidity on ruled charts. All types of indicators and recorders, including upper-air and dew-point instruments.

**SOLARIMETERS**
Direct reading and recording instruments for measuring the intensity of solar radiation. Pyrheliographs.

**ANEMOGRAPHs**
All types of anemometers, including "Popillon" electro-magnetic instruments for recording instantaneous wind speed at a distance.

**RAINGAUGES**
All types of float, balance and siphon rain gauges, both recording and non-recording.

Catalogues upon request.

ETs RE JULES RICHARD
25. RUE MELANGE - PARIS-19 - TELEPHONE: BOTZARIS 88.80
OFFICERS OF THE WORLD METEOROLOGICAL ORGANIZATION

President: Mr. A. ViAUT
First Vice-President: Dr. M. A. F. BARNETT
Second Vice-President: Prof. Dr. H. AMORIM FERREIRA

EXECUTIVE COMMITTEE

Mr. A. ViAUT Dr. R. V. GARCIA Dr. F. W. REICHLDERFER
Dr. M. A. F. BARNETT Mr. A. THOMSON Mr. A. A. SOLOTOUKHINE
Prof. Dr. H. AMORIM FERREIRA Dr. C. DEL ROSARIO SIR GRAHAM SUTTON
Mr. J. RAVET Dr. A. NYBERG Mr. M. F. TAHIA
Mr. S. BASU Mr. L. DE AZCARRAGA Prof. Dr. J. LUGKEON

TECHNICAL COMMISSION PRESIDENTS
Aerology: Prof. Dr. J. VAN MEUGHEN
Aeronautical Meteorology: Mr. A. H. NAGLE
Agricultural Meteorology: Mr. J. J. BURGO
Bibliography and Publications: Dr. M. MEZIN
Climatology: Mr. R. G. VERRYARD
Instruments and Methods of Observation: Mr. A. PRULAT
Maritime Meteorology: Mr. H. THOMSON
Synoptic Meteorology: Prof. Dr. W. BLEEKER

REGIONAL ASSOCIATION PRESIDENTS
Africa (I): Mr. J. RAVET
Asia (II): Mr. S. BASU
South America (III): Dr. R. V. GARCIA
North and Central America (IV): Mr. A. THOMSON
South-West Pacific (V): Dr. C. DEL ROSARIO
Europe (VI): Dr. A. NYBERG

SECRETARIAT
Secretary-General: Mr. D. A. DAVIES
Deputy Secretary-General: Mr. J. R. RIVET

THE PURPOSES OF THE WORLD METEOROLOGICAL ORGANIZATION

“(a) To facilitate world-wide co-operation in the establishment of networks of stations for the making of meteorological observations or other geophysical observations related to meteorology and to promote the establishment and maintenance of meteorological centres charged with the provision of meteorological services;

(b) To promote the establishment and maintenance of systems for the rapid exchange of weather information;

(c) To promote standardization of meteorological observations and to ensure the uniform publication of observations and statistics;

(d) To further the application of meteorology to aviation, shipping, agriculture, and other human activities; and

(e) To encourage research and training in meteorology and to assist in co-ordinating the international aspects of such research and training.”

From the Convention of the World Meteorological Organization, Article 2.

THE CONSTITUENT BODIES OF THE ORGANIZATION

(a) The World Meteorological Congress which meets at least once every four years;

(b) The Executive Committee, which meets at least once annually;

(c) Regional Associations made up of Members of the Organization the networks of which lie in or extend into one of the six meteorological Regions of the world. They meet as often as necessary to ensure compliance with the policies of the Organization.

(d) Technical Commissions composed of experts in the various meteorological fields which meet at least once every four years.

THE SECRETARIAT

The Secretariat of the Organization is located at Campagne Rigot, Avenue de la Paix, Geneva, Switzerland.
Several years of intense preparation reached their climax on 1 July 1957 with the opening of the International Geophysical Year. For meteorologists, the next 18 months will be a period of unprecedented activity in carrying out the most comprehensive programme of observations ever undertaken. The ultimate success of the meteorological programme depends largely on the accuracy and regularity with which the basic observations are made; the task of the meteorological observers is therefore of vital importance.

The next step is to make the observations available to the research worker and here again the observers are called upon to make an essential contribution by entering the results of their observations accurately and neatly on the special WMO forms. Major responsibility then rests with the IGY Meteorological Data Centre in the WMO Secretariat to reproduce the forms in a convenient order on microcards and to ensure that copies of the microcards are made available to the research worker. Only then will it be possible to embark on the main objectives of the meteorological programme of the IGY — the solution of the outstanding problems of the general circulation of the atmosphere.

The picture on the cover symbolizes a meteorological observer recording his IGY observations on a special WMO form.

The WMO Bulletin is published quarterly in two separate editions: English and French. The price is 1 Swiss franc per copy, including postage. Annual subscriptions (4 Swiss francs) and all other correspondence about the Bulletin should be addressed to the Secretary-General, World Meteorological Organization, Campagne Rigot, Avenue de la Paix, Geneva.

Signed contributions do not necessarily represent the views of the Organization.
TECHNICAL ASSISTANCE IN METEOROLOGY

The inclusion of a section giving information on some of the current activities of WMO in the United Nations Expanded Programme of Technical Assistance has become a regular feature of the Bulletin but no single account of the programme as a whole and of how WMO activities fit into the programme has as yet been given; such is the purpose of this present article.

Birth of technical assistance

Technical assistance, in the present context, may be said to have begun with the signing of the Charter of the United Nations in San Francisco in 1945. Under article 55 of the Charter, the United Nations is pledged to "promote higher standards of living, full employment and conditions of economic and social progress and development". The principle having thus been established, the next step was to devise machinery whereby this principle could be converted into practice. Without delay, the General Assembly gave consideration to this matter and in its first four sessions various resolutions were passed, details of which it is unnecessary to stress at this time — but it is clear from a study of these early resolutions that the practical problems involved were becoming clearer, as were also the methods whereby these problems could be solved. From the very outset the need for co-operating with the specialized agencies of the United Nations was recognized.

Much useful technical assistance work has been and indeed is still being carried out by the United Nations and some of the specialized agencies with funds from their respective regular budgets, although WMO is not one of these, but a decisive turning point in the implementation of the technical assistance concept was the adoption by the Economic and Social Council of the United Nations in August 1949 of a resolution which recommended the introduction of what was called an Expanded Programme of Technical Assistance for Economic Development. This resolution was adopted by the General Assembly in December of the same year, 1949. Looking at this resolution in retrospect and in the light of the successful experience of its application in the eight years which have since elapsed, it becomes clear what a bold, far-sighted and well-conceived plan of action was established.

Thus the United Nations Expanded Programme of Technical Assistance was born.

The primary object of the programme is to help the less developed countries "to strengthen their national economies ... with a view to promoting their economic and political independence" and "to ensure the attainment of higher levels of economic and social welfare for their populations" — an object which is in accord with the highest ideals and principles which are the raison d'etre of the United Nations itself.

Turning now to the financial side, the Expanded Programme is financed by voluntary contributions from the Member States of the United Nations and a special account is maintained — separate from the general budgets of the United Nations and the specialized agencies. As an example of the scope of activities under the programme it
may be mentioned that the funds pledged for 1957 amount to over 30 million US dollars.

It is important to note that although contributions are made by Members of United Nations, they are available not only for technical assistance rendered by the United Nations itself, but also by the specialized agencies, including of course WMO.

At this stage, it is necessary to mention the Technical Assistance Administration (TAA). TAA is a department of the United Nations; it is the department which handles such forms of technical assistance as the United Nations itself — as opposed to the specialized agencies — may render. For WMO, however, TAA has a special significance, since it has been agreed that all administrative and financial aspects of WMO’s activities in the Expanded Programme shall be handled by TAA. The alternative, of course, would be for WMO to set up its own administrative and accounting machinery, which at the present scale of operations would be uneconomical. Thus, the system is that WMO deals with the scientific and technical aspects of meteorological technical assistance projects and TAA handles the administrative and financial aspects. It may be mentioned that WMO has received unfailing co-operation at all times from the Director-General of TAA, Dr. Hugh Keenleyside, and his staff, and the arrangements work smoothly and well.

Different forms of technical assistance

Returning now to the more general aspects of the story of technical assistance, the basic resolution to which reference has already been made makes provision for assistance to be rendered in various ways which fall basically into four categories — first, appointment of technical experts recruited on a world-wide basis, who undertake specific missions in the receiving countries; secondly, awards of fellowships and scholarships whereby
selected persons from the receiving country may be trained in other countries where higher training facilities are available; thirdly, by the purchase of equipment for demonstration purposes; and fourthly, by dissemination of knowledge and information by the holding of meetings and seminars. All four types of assistance in the field of meteorology are being currently sponsored by WMO.

It should be stressed that an essential feature of all technical assistance work is that it can only be given at the specific request of a government and the initiative for inaugurating a technical assistance programme in any particular field rests with governments. The WMO Secretariat is, however, able to give considerable assistance to governments (or, as more usually happens, to the directors of meteorological services acting on behalf of their governments) in formulating requests for assistance and in arranging for their approval. Once the scheme has commenced, of course, the bulk of the administrative work devolves upon WMO and TAA. The WMO Secretariat is, of course, at all times willing to give any advice and guidance required.

Mention should now be made of the Technical Assistance Board (TAB). This is the body which is responsible for the centralized co-ordination and planning of the Expanded Programme of Technical Assistance. All specialized agencies of the United Nations participating in the programme and of course the TAA are represented on the Board. There is a permanent Executive Chairman, Mr. David Owen. TAB maintains resident representatives in many countries to assist the respective governments in the administration of all technical assistance planned or in operation in the recipient countries. These officers are available to advise and assist the programmes of all specialized agencies and their services are of great value to WMO since WMO has no regional offices and visits to recipient countries by officers of the Secretariat are inevitably very limited.

Development of WMO programme

Turning now more specifically to WMO activities in the Expanded Programme, it may be recalled that the first WMO projects in this field were initiated in 1952, i.e. the year following WMO's establishment. The 1952 programme was on a very modest scale but it has since increased year by year and the total authorized programme for 1957 exceeds US $300,000. The 1957 projects involve expert missions to 20 countries, the award of 16 fellowships and one regional project in the form of a water resources training seminar which will open in Belgrade, Yugoslavia, in October 1957 - see p. 104. It may be mentioned in passing that many meteorological problems are essentially regional in character and regional projects are thus a particularly appropriate form in which technical assistance can be rendered in meteorology. The seminar in Belgrade is the second of its kind sponsored by WMO, the first being the seminar on Caribbean hurricanes held in Ciudad Trujillo, Dominican Republic, in 1956 — see Bulletin, Vol. V, No. 2, p. 42.

It is not the purpose of this article to explain in detail the individual projects which WMO has sponsored and is sponsoring in various countries, as information on current developments in this field is included in each issue of the Bulletin. Some general comments on the nature of assistance given by WMO may, however, be of value.

In some countries, where no meteorological service exists, WMO encourages the governments concerned to
apply for an expert mission to assist in the establishment of the basic essentials of a meteorological service, including in particular a network of meteorological stations, properly equipped with instruments and manned by trained personnel. There are many countries in which this type of assistance has been and is now being given.

In other countries, the basic requirements of a meteorological service may exist but little more; in particular the application of meteorological knowledge and techniques to all aspects of national activities may not be fully understood or provided for. In such cases an expert mission in some specialized branch of meteorology may be sent to the country. For example, a country with a meteorological service may not have given much attention to agricultural meteorology and one or more experts in this field may be sent to assist in the establishment of a suitable programme.

In other cases, quite highly developed meteorological services may wish to avail themselves of facilities in other countries to train their own experts in very specialized fields. In other cases countries may apply for regional schemes such as those already mentioned.

It is important to note that in this overall programme, which is aimed at interchanging between the countries of the world knowledge and techniques in meteorology, the recipient and the donor countries do not fall into distinct and separate categories. There are many cases where technical assistance is given to one country in one field of meteorology while the same country is supplying experts in other fields to give assistance to other countries. There is thus no one-way traffic rule in the WMO technical assistance programme.

**Future needs**

Although much help has already been given to many meteorological services, there are clear indications that much more remains to be done; indeed the information available in the Secretariat from the various countries of the world as to what assistance is needed shows that, were the financial resources available, the WMO programme could be doubled or even trebled. To prognosticate in financial matters is, however, a more difficult procedure than to prognosticate the weather. Suffice it to say that everything possible should be done to obtain the funds necessary to meet all the needs for meteorological technical assistance, for experience has shown that through this medium WMO can do much to ensure the useful application of meteorological knowledge and techniques in many fields of national development and so to help in the fulfilment of many of the purposes laid down in its Convention.

D. A. D.
THE INTERNATIONAL GEOPHYSICAL YEAR 1957-58

By the time this issue of the Bulletin is published, the International Geophysical Year will have started. Much publicity has been given to this great project, especially to those aspects — the satellite programme and the expeditions to the Antarctic — which appeal to the popular imagination, but little has been said about the less spectacular work which will be carried out at meteorological stations all over the world. As the meteorological observations will be much greater in number than the observations made in any other branch of geophysics during the IGY and will probably exceed the total of all the other disciplines put together, it is perhaps desirable to bring things back into perspective by calling attention to the routine work of the meteorological observer.

In what ways will the national meteorological services be contributing to the IGY programme? In the first place they will be carrying out expanded programmes of observation; this is illustrated by the fact that more than 300 additional upper-air ascents will be made each day during the IGY over the world as a whole. Several new stations will be established in isolated places, 22 in Antarctica alone. Many services are also branching out into new types of observations, such as ozone and radiation; what optimist would have guessed that WMO would be able to publish a list of over 700 radiation stations for the IGY? Last but not least, services will be entering their main observations on standard WMO forms which will be collected and subsequently published on microcards by the IGY Meteorological Data Centre in the WMO Secretariat. This surely is the basic contribution of the meteorologist to the IGY, that for the first time in history the meteorological data of the world will be published in a single convenient form for the use of the research worker. As Professor J. Van Mieghehm said in 1953 (Bulletin, Vol. II, No. 4, p. 98): "The major obstacle which research workers come up against is the absence of a publication on an international scale, containing observational data presented in a suitable form. All too frequently it is more difficult to gather the information needed for solving a problem than to solve the problem itself." When the IGY meteorological data have been published they will present a challenge to the research worker who will be expected to produce results to justify the efforts made on his behalf during the IGY by the meteorological observers, their parent services and the WMO.

IGY Meteorological Data Centre

The existence of the IGY Meteorological Data Centre has already been brought to the notice of meteorological services in a tangible form by the publication of a series of Centre reports. Four of these reports have already been issued as follows: No. 1 Summary of the IGY Meteorological Programme and Procedures; No. 2 Use of Radiosonde Balloons during the IGY; No. 3 Micro-opaque Card Readers; No. 4 Results of the Trial Period for the IGY. Further reports dealing with marine observations, microcards, ozone forms and radiation forms are under preparation. These reports are issued in English and French and copies may be obtained on request from the WMO Secretariat.

The most important activity of the Centre at the moment is planning the
layout and contents of the IGY microcards. The object is to arrange the microcards as economically as possible taking account of the desirability of grouping the observations geographically for the convenience of the user. In this connexion the forms minor doubtful points were brought to light which have now been cleared up in a revised version of the instructions.

One of the major lessons of the trial period was to emphasize the need for legibility and neatness in entering the received for the trial period, 6 to 10 January 1957, have proved to be invaluable. Several specimen microcards have already been produced, one of which is illustrated above. These specimens will be useful for distribution to meteorological services, universities and other institutes interested in obtaining partial or complete sets of the IGY meteorological data.

Trial period

Forms containing the meteorological observations made during the trial period have now been received from 76 of the then 94 Members of WMO, a really magnificent response. On the whole little difficulty was experienced in completing the forms according to the WMO instructions, but several observations on the forms. It may not always have been realized that the original forms will be photographed and will therefore become a permanent record of the work of each individual observing station. Many countries supplied forms which were models of neatness and showed that great pains had been taken to provide a result of which the meteorological service concerned could justifiably be proud, and it is believed that the same high standard will be achieved by all countries during the IGY.

Other trials are also being made in preparation for the IGY, in fact the month of June 1957 has been designated as an advance trial period for all IGY activities, during which participating countries were called upon to
make sure that all their arrangements had been completed so that they would be ready for the start of the IGY itself on 1 July 1957.

ALERT warnings

As reported in the last issue of the Bulletin, the results of the trials held from January to April, in the international distribution of SWI (Special World Interval) messages over the meteorological telecommunication networks have been studied by the WMO Secretariat. Reports from 60 locations all over the world were received (Regions I-18; II-7; III-5; IV-4; V-6; VI-20). Based on these studies, alternative sources of reception have been suggested to a few countries which complained of poor or no reception at all. Changes in the re-broadcast times of some centres have been introduced, and these have been brought to the attention of Members in separate circular letters. Certain measures have been taken to improve the reliability of reception, chief among them being the addition of the abbreviated heading "KWWA YY 1600Z" in teleprinter exchanges between Europe and North America, the inclusion of the SWI messages both at the beginning and the end of broadcasts whenever possible, and the issue of a daily message at 1600 GMT; this message will simply indicate "No Alert" when appropriate. Recipients should therefore expect a message every day at 1600 GMT and this should ensure that none is missed. The scheme of distribution of the messages is now working smoothly all over the world except in the South American area and this problem is still under study.

World data centres

The IGY Meteorological Data Centre is only one of the centres at which IGY observations will be collected. The whole question of these centres was discussed at a conference called by the Co-ordinator of the Special Committee for the International Geophysical Year (CSAGI), held at Uccle, Belgium, in April 1957. The conference recommended procedures that should be followed by all centres with regard to such questions as publishing catalogues of the data received and supplying copies of the data at a cost price. Two centres are being established, Centre A in the U.S.A. and Centre B in the U.S.S.R., where data for all the IGY disciplines will be collected. For each discipline there will in addition be one or more specialized centres, known collectively as Centre C, of which the IGY Meteorological Data Centre in WMO is recognized as the only centre for meteorology. CSAGI is planning to publish a guide to the IGY centres containing full information about the material that each of them will be collecting.

There can be no doubt that these world data centres will play a vital role in facilitating the task of anybody wishing to obtain copies of any of the IGY observations. If they are successfully operated, there will probably be considerable pressure from the scientific world for some at least of the centres to be continued on a permanent basis. This need has already been recognized by some of the constituent bodies of the International Council of Scientific Unions and the possibility of creating more permanent services will no doubt be debated during the eleventh General Assembly of the International Union for Geodesy and Geophysics at Toronto, in September 1957. In view of the general awakening of interest in this subject, the president of the Commission for Aerology has provided some background information as a basis for discussion during the
WMO Bulletin

second session of the commission in Paris.

Conclusion

It will be seen from what has been said above and from previous reports in the Bulletin that the preparatory stage for the IGY meteorological programme has been successfully completed. In conclusion, it seems appropriate to repeat the words of the President of WMO, Mr. André Viaut, published in the foreword to publication WMO-No. 55. IGY, 1. "The next step, which is still more important, is to carry out the programme itself, and for this I am sure that we can count on the continued collaboration of the meteorological services. The IGY represents the largest international research programme ever undertaken and is a challenge which I am confident will be taken up with enthusiasm by countless professional meteorologists and observers in every corner of the globe. There can be no doubt that the results of this enterprise will lead to a further significant advance in that science which is so dear to us all — meteorology."

O. M. A.

UNITED NATIONS CALLING

Eleven years ago listeners first heard This is the United Nations calling the peoples of the world, the opening of a radio service which brings news, interviews and feature programmes on United Nations activities to the peoples of all nations. This service, known as United Nations Radio, began its broadcasts in 1946 using the five UN official languages and it now broadcasts daily in more than 25 languages.

Throughout this period, having no transmitter of its own, UN Radio has been dependent on co-operation with national radio services in order to reach the millions scattered across the globe to whom its programmes are of interest. How successful this co-operation has been may be judged from the fact that the programmes are broadcast regularly in more than seventy countries. One reason for such wide acceptance is that in transmitting one story in many voices, United Nations Radio provides unbiased, authoritative information and assures listeners of a full hearing of both sides of any discussion.

The primary task of the service is to provide programmes which are rebroadcast by national stations and networks throughout the world; the subject matter of these programmes ranges over the whole field of activity of the United Nations and its specialized agencies. It is, therefore, a highly efficient means of drawing attention to the scope and purpose of international projects as a contribution to the welfare of mankind.

WMO broadcasts

As a specialized agency of the United Nations, WMO has provided a number of programmes designed to tell radio listeners of various aspects of the Organization's work. These programmes were prepared and recorded by the office of the Deputy Secretary-General which is responsible for public information services in the WMO Secretariat.

Of particular interest to most people will be the strenuous efforts made to assist the under-developed countries in
ways which will ultimately bring economic and social benefits to many of the population. Such projects form part of the United Nations Expanded Programme of Technical Assistance, under which WMO sends experts to carry out specified tasks and provides scholarships and fellowships abroad for the advanced training of the meteorologists who will later hold the key posts in their national services.

Mission to Jordan

The mission of Mr. Jacques Cochemé to Jordan is a typical example of this work. In a broadcast recorded for United Nations Radio, Mr. Cochemé has described his work in Jordan, and its aims:

"Some time ago, an engineer who had come to Jordan to study the possibility of setting up a textile factory came to ask me for climate data which would help him to decide whether during the summer the proposed factory would need a refrigerating plant or could be cooled by evaporation of water. The second device is far more economical than the first, the difference being comparable with the cost of running a national meteorological service in Jordan. Fortunately he had chosen his site near Amman Airport where meteorological observations had been collected daily for the last 30 years. I gave him the summaries and averages which he needed and he was able to decide that cooling by evaporation would be sufficient. Without this information he might have been compelled to play safe and recommend the more expensive installation.

I have been sent to Jordan by the World Meteorological Organization which is one of the technical agencies of the United Nations, in order to help that country to set up a meteorological service adequate to its needs. My work here is part of the Expanded Programme of Technical Assistance. The prior thing that needs to be done is to cover the country with a sufficiently dense network of observing stations. This means buying suitable instruments, selecting sites for the observing stations, training personnel who will make the observations and setting up a central organization to maintain the standard of the observations, to collect them regularly, to keep them safe, to analyse them and to publish periodical abstracts and summaries. All the observations are not, of course, done by full-time meteorologists; they are done by people working at agricultural or irrigation stations, by schools and, further east, by members of the camel mounted desert patrols. Observations from the desert in the south-east of Jordan are most useful in times of threat of invasion by locusts. Locusts do not believe in travelling long distances on their own motive power, they like rising currents to take them up and steady winds to carry them along.

Our meteorological observations are not of course limited to observations at the surface; the weather is a three-dimensional activity taking place in a three-dimensional element, the atmosphere, and we obtain information about the upper air not only by sending up balloons, but also by flying up to take measurements. Meteorological flights are carried out every morning by Jordanian aircraft.

One must talk about forecasting sooner or later; it is not the sum total of the activities of a meteorological service but it must be attempted, with varying success and, we like to think, with steady improvement as
experience builds up. Long-range forecasting, such as an ability to predict how much rain will fall during the next growing season, is still a thing we cannot do, but short-range forecasts based on accurate and well spread out information on past and present meteorological section have to keep pace with this development.

Ultimately the lasting success of my mission will depend on my having been able to find and train Jordanian technicians to carry on with the work."

Members of the staff of the UN Radio Division recording a special broadcast: (United Nations photograph)

weather are within our means, and for this part of our work the demand comes mainly from aviation. It is a demand which is immediate and imperative, and that is why I am attached to the Ministry of Civil Aviation, working in close co-operation with Assayed Abdullah Alaedin, the director of Civil Aviation; it is my duty to advise and help him in setting up a forecasting organization to protect the relatively dense air traffic of this country. Because of its inland position, Jordan relies a great deal on air traffic for its communication with the outside world. The number of pilgrims and tourists who come by air to Jerusalem Airport to visit the Holy Places is increasing all the time, and the Department of Civil Aviation and its

Mission to Turkey

In another recorded broadcast, Mr. Walter T. Wilson, a hydrologist of the United States Weather Bureau, was interviewed on his return from a mission to Turkey:

Interviewer: Now, Mr. Wilson, we just said you are a hydrologist. Can you explain what a hydrologist does?

Wilson: Well, as the word suggests, he works with water — the natural water of the earth. Hydrology is a combination of hydraulic engineering and meteorology.

Interviewer: Can you give us some examples that will illustrate in more detail the kind of work a hydrologist does?
WILSON: Certainly; hydrologists help decide how high a dam should be built, and how large its spillway should be so that it will not be overtopped by run-off from a large storm, and fail. Hydrologists see that a city is supplied with water for drinking and other purposes, and they help design the storm sewers so that rainwater is quickly and conveniently disposed of. About 20 per cent of the cost of a modern highway is for drainage. A hydrologist determines the correct size for culverts and bridge openings. Hydrologists forecast floods and seasonal water supply. So, you see, he helps plan and operate structures that many of us take for granted in our daily lives.

Mr. Wilson went on to explain how floods are forecast; how hydrologists and meteorologists co-operate in collecting and analysing rainfall observations to this end and how these forecasts are used for irrigation, power, navigation and other purposes. In reply to a question asking how his work had been of help to Turkey he had this to say:

WILSON: Well, you see, parts of Turkey are extremely dry and other parts receive very large amounts of rain and snow. Turkey is developing its hydro-power and irrigation. Water is one of its most important resources and the future development of agriculture and industry requires measurement of, and wise planning in the use of this resource — water.

Now my job was to make a survey of the hydrologic work being done there at the present time and to recommend methods for expanding and improving it.

Interviewer: Have you anything you would like to add about your experiences as a technical assistance expert?

WILSON: Since what one reads in the newspapers and hears on the radio may give the impression that most international activity consists of dealing with political issues, it was certainly gratifying to know that this kind of practical, useful work is being done and on such a large scale.

When I arrived in Turkey I found that there were more than 40 UN experts there; doctors, economists, nurses, labour experts, forecasters, communications people and many others. Several nationalities were represented among them, in fact over 15 different nationalities. And I understand that Turkey is just one of the 85 countries and territories which receive technical assistance.

As far as I am concerned, I feel it has been a privilege to participate in the technical assistance programme and hope that this kind of work can continue.

Mission to Afghanistan

Afghanistan is one of the 85 countries referred to by Mr. Wilson which, for some years, has been making a strenuous effort to improve living conditions. Mr. H. Treussart, a French specialist in weather observing and instruments, was sent there by the WMO to organize the instruments division of the Royal Afghan Meteorological Institute. He had this to say of the task which faced him when he arrived in Afghanistan:

TREUSSART: Although in the past a weather service had worked quite well during a few years, when I arrived there was no workshop, no comparison laboratory, no staff trained in instrument work.
Interviewer: How did you go about your work?

Treussart: The first step was to train personnel and therefore a school was started with eight students who were taught how to use and maintain weather instruments and to set up observing stations.

Interviewer: Let me interrupt you at this stage. Did you set up weather stations?

Treussart: Just one for training purposes. Seven stations will be set up during spring 1957 by my successor and my students.

Interviewer: ... Now, Mr. Treussart, what further work did you do during your mission?

Treussart: I set up a complete workshop and a comparison laboratory with equipment and instruments supplied by the technical assistance programme. The tools came from France and the meteorological instruments were purchased in the U.S.S.R.

Interviewer: Is this equipment sufficient for the weather stations which are being set up?

Treussart: Yes, but we also needed a mobile workshop in order to enable the WMO mission to equip and inspect the stations in the various parts of the country. We therefore received a jeep station wagon which had been bought for the technical assistance programme in the United States.

Interviewer: Why did you need a jeep?

Treussart: Well, Afghanistan is a mountainous country and communications are difficult. There are no railways at all and the roads are often rough ...

Interviewer: How does the Weather Service help with the development of the country?

Treussart: In many ways! By contributing to make communications safer and also more economical. This includes forecasting and climatological information for air and road transport. Also by helping the farming and irrigation experts with weather and water information they require. Even the engineers involved in establishing a sewerage system for sanitation asked for rainfall measurements.

These extracts from WMO recorded interviews show how UN Radio provides a medium for the distribution of news on current WMO activities. Naturally many other broadcasts are available to national radio services, covering subjects of interest to most or all of the 96 WMO Member States and Territories.

Obtaining material

How are these programmes made available for national broadcasts? To provide the widest possible service, UN Radio leases short-wave transmitters in some of the UN Member States in order to carry daily reports on meetings of world interest. Feature programmes and recorded interviews of less topical appeal are made available to national radio services on request and without charge. Each radio service is advised of the programmes which may be of particular interest to it and these programmes are normally provided in the desired language and in a recorded form.

Many Members of WMO will be familiar with the work of UN Radio; some already devote a regular weekly feature to reporting UN activities both within and beyond their own frontiers. Others may find in this service a welcome means of creating new interest in their own contribution to international co-operation and harmony.

P. R.
VISIT TO SOUTH-EAST ASIA

The chief of the WMO Technical Assistance Unit, Mr. W. R. Dyer, recently completed a brief visit to a number of countries in South-East Asia to discuss the technical assistance being rendered by WMO under the Expanded Programme. Unfortunately the time available did not permit this visit to include all the countries in South-East Asia; it was only possible to make short stops in Pakistan, India, Burma, Thailand, Philippines, Hong Kong, Republic of Korea and Japan. This was the first time that a member of the Secretariat staff had visited some of these countries.

Discussions were held with the directors of the meteorological services in each country and also, where appropriate, with the representatives of the Technical Assistance Board.

REGIONAL TRAINING SEMINAR

At the invitation of the Government of the Federal People's Republic of Yugoslavia, a regional training seminar will be held in Belgrade starting on 28 October 1957 and lasting approximately three weeks. The seminar is being organized under the WMO technical assistance programme.

All the countries in the area have been invited to send one or two participants to the seminar, the purpose of which is to provide advanced training in hydrologic forecasting, with special attention to the problems of the Mediterranean/South-West Asia area. The question of the water balance will also be covered.

Lectures and practical demonstrations will be given by a small team of
consultants. Opportunity will be provided for the participants to work on specific problems under the guidance of the consultants and it is hoped that some of the participants will also speak about the main aspects of hydrologic forecasting in their own countries.

The director of the seminar will be Mr. M. Perović, director of the Yugoslav Hydrometeorological Service.

### AERONAUTICAL METEOROLOGY

As stated in the previous issue of the *Bulletin*, various amendments proposed to Chapter 12 of the WMO Technical Regulations were submitted to the members of the Commission for Aeronautical Meteorology for comments. The comments received have been taken into consideration during the preparation of a series of draft amendments, carried out jointly by the International Civil Aviation Organization (ICAO) and WMO.

It has been decided that the amendments relating to the concept of operational control, developed at the ICAO third Air Navigation Conference, should be studied by a panel of experts designated by member countries and by certain international organizations. The role of this panel will be to examine and develop the concepts put forward in recommendation 19 of the third Air Navigation Conference, to report on the implications of the application of the concepts so developed in the fields of meteorological air traffic and communications services, and lastly to indicate the manner in which the developed concepts, if internationally agreed, would affect the present standards and procedures.

It should be remarked that the work of this panel affects the four aeronautical spheres, MET, COM, ATS and OPS, and that from the WMO viewpoint it is essential that meteorological interests should be adequately represented on the panel.

Of the other amendments initially proposed to CAeM, only those relating to "the downgrading or cancellation of meteorological messages carried over Aeronautical Fixed Telecommunications Network channels" and to "information on swell and state of sea in observations for forced landings at sea" have been retained. Both of these will be submitted to an immediate vote by correspondence with a view to their adoption as a CAeM recommendation which will then be submitted to the ninth session of the Executive Committee for decision.

The amendments which have not been retained will be re-examined at the next simultaneous session of CAeM and the ICAO/MET division.

### CLIMATOLOGY

Since the end of the second session of the Commission for Climatology in Washington in January 1957, an account of which was published in the last issue of the *Bulletin*, steps have been taken to complete the necessary formalities for setting up the eight working groups established by the commission.
The presidents of regional associations have been requested to study the requirements for reference climatological stations (i.e. those at places where the exposure would remain essentially unchanged over a very long period) in their respective regions, with a view to taking early action within their regions for establishing and maintaining such stations; CCI considered that reference stations are of great value for the study of important problems such as the general circulation of the atmosphere, and the trends and long period fluctuations of temperature and rainfall.

At the request of the commission, regional associations and other technical commissions have been invited to consider the problems involved in establishing national data control authorities in which the responsibility for the collection, cataloguing and dissemination of reliable and useful basic meteorological, aerological and hydrologic data would be centralized within a single unit.

The president of CCI has initiated an inquiry among members of the commission to ascertain the climatological implications of the proposal put forward in Recommendation 1(CMM-II) for a new table of wind speed equivalents of Beaufort numbers. He suggests, as an alternative solution to the problem, that Beaufort numbers might be abolished altogether but that appropriate specifications of the visible effects of wind and the corresponding ranges of wind speeds might be retained, the observers to be instructed to record and report the corresponding mean wind speed in knots.

SYNOPTIC METEOROLOGY

Preparations for the second session of the Commission for Synoptic Meteorology form the principal activity of the commission at present.

The Working Group on Networks held its first session at De Bilt (Netherlands) from 19 to 30 March 1957 under the chairmanship of Mr. J. Bessemoulin; the president of CSM, Professor W. Bleeker, also took an active part in the work of the group. Important conclusions were reached on quantitative criteria for the spacing of stations and on the definition of a basic network. A full report of the discussions will be sent to the president of CSM shortly.

Although the work of the group reached an advanced stage, further discussions by correspondence between the participants will be necessary.

The other important questions at present under study include the possibility of broadcasting meteorological bulletins for shipping in code, supplementary observations from ocean weather ships and a number of symposia in the field of weather forecasting.
MARITIME METEOROLOGY

The President of the WMO has approved, in the name of the Executive Committee, two recommendations of the Commission for Maritime Meteorology.

The object of the first of these recommendations is to obtain as many observations as possible during the IGY from ships traversing ocean areas from which little or no meteorological information is normally available. Many ships, other than selected and supplementary ships, navigating in these waters, are equipped with instruments for measuring air temperature and pressure and it is desirable that even limited information should be reported. Following this recommendation the Secretariat prepared a map showing these areas and also the coastal radio stations which will accept meteorological information without charge.

The second recommendation amends the code for reporting the state of sea in order to make it clearer and more accurate.

Several recommendations of the second session of CMM have been referred to other constituent bodies for comment prior to submitting them to the ninth session of the Executive Committee.

ACTIVITIES OF REGIONAL ASSOCIATIONS

ASIA

At the request of the president of Regional Association II, the Secretariat is at present carrying out an inquiry into the implementation of three recommendations of the former Regional Commission II of IMO which, as reported in the last number of the Bulletin, were re-adopted by postal ballot as resolutions of RA II. These resolutions concern special equipment and investigations for agricultural meteorology, rainfall observations on ships and the development of techniques for determining winds at high altitudes by pilot balloon.

NORTH AND CENTRAL AMERICA

The president of Regional Association IV has decided, on behalf of and after consultation with the Members of the Region, to adopt, as resolutions of RA IV, the resolutions derived from recommendations of the 3rd Caribbean Regional Air Navigation meeting and the 1st Pacific Regional Air Navigation meeting of ICAO. No adverse comments on these recommendations were received from Members. These resolutions concern surface and upper-air networks, the replacement of pilot balloon by radiowind observations, the requirements for high level upper-air data and the establishment of ocean weather stations and of a sferics network.

EUROPE

Action in connexion with the inquiries mentioned in the last number of the Bulletin is still in progress. A report on the result of the inquiry concerning aerological observations during the IGY has been submitted to the president of Regional Association VI for his final decision.
With regard to observations from fishing vessels registered in Europe and operating north of 60°N, it has been ascertained that the majority of the countries concerned are unable to do anything about the matter at the present time. They have given various reasons for this, the most important being their having no shipping plying the northern waters north of 60°N or the reluctance of their fishing vessels and trawlers to disclose their locations; five countries (France, Netherlands, Norway, Portugal and Sweden), though not broadcasting these observations at present, are taking steps to encourage their vessels to make and transmit observations when in waters north of 60°N; and five countries (Denmark, Federal Republic of Germany, Iceland, the United Kingdom and the U.S.S.R.) are already obtaining reports from their vessels and including them in their territorial or sub-continental broadcasts and teleprinter exchanges as appropriate.

Following up Resolution 8 (EC-VIII), which requests regional associations to examine meteorological problems of the arid zone within their own fields of competence, the president of RA VI has initiated a preliminary inquiry concerning the collection of the necessary information prior to the elaboration of regional plans.

The RA VI Working Group on Meteorological Transmissions held its third meeting at Utrecht from 12 to 14 April 1957. The main purpose of this meeting was to prepare the WMO material for the ensuing joint WMO/ICAO meeting to be held in February 1958, on meteorological telecommunications in Europe. However, advantage was taken of the occasion to deal with various other matters relating to the work of the group. As a prerequisite to the development of a plan for the exchange of basic meteorological information between ground stations in Europe in the most efficient and economical manner, the working group felt it necessary to conduct an inquiry among the countries concerned regarding their actual requirements for synoptic and upper-air data. A questionnaire has been prepared which is being sent to these countries by the chairman of the working group.

The Western European teleprinter network having now been connected with that of Central and Eastern Europe, the meeting took into account the effect of this interconnexion. Certain tentative proposals were made to equalize the traffic handled by Frankfurt, Dunstable and Paris and the comments of the Members of the Region have been invited. In the light of the replies from the administrations regarding their requirements and their comments on the proposals the working group hopes to develop a plan in October.

Among other matters dealt with by the working group at this meeting were the reception of the WSY broadcasts in Europe, and a review of all the relevant resolutions and recommendations of the second session of RA VI. After examining the reception from several countries in Europe for the period July to December 1956, the working group decided to recommend that, to ensure better reception in Europe, the power of the WSY transmitter should be increased to 10 or 15 kW and that an additional frequency of the order of 20 Mc/sec should be used between 1000 and 1800 GMT daily from April to October. During the discussions it was stated that the power of the transmitters at Santa Maria has been increased to 10 kW from 8 April 1957, that transmissions to Paris were being made on the frequencies 6775 and 8174 kc/s, and that electronic regenerators were being installed.
The possibility of making radiosonde observations from merchant ships has been studied for a number of years by various meteorological services as a means of supplementing the observing programme of the ocean station vessels, and as a possible method of securing additional upper-air data over the oceans at minimum cost. During 1950 and 1951, personnel of the United States Weather Bureau made several trial runs on transport vessels in the North Atlantic. These proved that, with sufficiently light radiosondes and a small balloon, it was possible to make successful launchings without interfering with the ship’s operation. In 1955 the first regular programme was started on the MSTS General Gaffey in the Pacific with two Weather Bureau observers making two daily radiosonde observations and four synoptic observations while the ship was at sea (see WMO Bulletin, Vol. IV, No. 3, p. 123). Only three soundings were missed during 240 days at sea.

Encouraged by these results and the value of the information thus obtained, a short programme was conducted aboard two freighters of the A. H. Bull Lines operating between the east coast of the United States and the island of Puerto Rico. Three ships plying in the Gulf of Mexico were added to the programme during 1956; a tanker, an ore carrier and an oceanographic research vessel of Texas Agricultural and Mechanical College, and the number of vessels participating in the Pacific was increased to a total of five, operating from the west coast of the United States to the Orient and to Alaska. A programme on the USNS Henry Gibbins, sailing alternately from New York to the Canal Zone and from New York to the Mediterranean was planned to begin in March 1957.

The vessels carry two Weather Bureau observers, who take two radiosonde observations and four surface synoptic observations daily. The lightweight radiosondes (modulated audio-frequency type), are carried on 300-gram balloons to an average altitude of about 16,000 m. Radiosondes are not released when the vessels are in territorial waters foreign to the United States, and parachutes are used when a release is made within 100 miles of land. All observations are transmitted in WMO codes to the international...
When speaking of radioactivity, we often overlook the fact that we are constantly and permanently subjected to the influence of either cosmic radiation or natural radioactivity and that the effects of these two phenomena are in no way harmful to our health. Whilst the value of cosmic radiation may be considered as a negligible constant, the variations in natural radiation are mainly the result of variations in the decay products of radon and thoron. Moreover, these variations depend on several natural factors, in particular geographical position, weather conditions and sometimes the wind direction (especially in coastal areas).

Thanks to advances in research, the ionizing alpha, beta and gamma radiations can be detected and measured. As a result of their nature and their energy, they are capable of ionizing matter through which they pass. The energy of ionizing radiation is expressed in electron volts (eV), kilo-electron volts (keV) and mega-electron volts (MeV).

The electron volt is the energy acquired by an electron when accelerated through a potential difference of one volt. Other units of measurement are often encountered in connexion with radioactivity. First, there is the Curie, the unit of radioactivity, which is defined as that quantity of a radioactive isotope which produces $3.7 \times 10^{10}$ disintegrations per second.

There is also the Röntgen, which is the quantity of X or gamma radiation such that the associated corpuscular emission per 0.001293 gm of air produces, in air, ions carrying one electrostatic unit of electric charge of either sign. Finally, if we speak of the intensity of

The U.S. Weather Bureau would be very glad to correspond with other meteorological agencies who are interested in such programmes.

F. W. Reichelderfer

MONITORING THE RADIOACTIVE CONTENT OF THE ATMOSPHERE
radiation at a given point, we mean the energy passing through a unit area, in unit time, at right angles to the direction of the rays at the point in question.

Atomic tests and the ever-growing industrial application of nuclear energy add an unstable element to the natural background radiation. The level of radioactivity varies, although these variations are not sufficiently large to cause us anxiety. It therefore appears desirable to keep a regular and accurate watch on the content of radioactive substances in the air. Bearing in mind the fact that these are to be routine measurements, it is necessary to possess instruments for continuous recording.

Appropriate procedures have been worked out for this purpose and instruments have been developed which are capable of solving the problems of detection and measurement. A few years ago the firm Landis and Gyr in Zug (Switzerland) had already produced air sampling equipment, which was installed at the aerological station of the Swiss Meteorological Institute at Payerne and has since recorded the radioactivity of the air in Switzerland (figures 1 and 2). This equipment complies perfectly with all the requirements of meteorology. Identical equipment will be set up during the International Geophysical Year at Murchison Bay at a latitude of 80°N and will be supervised by the Swiss expedition which is spending the winter on Spitzbergen. Figure 3 illustrates some records which are of special interest to the Meteorological Service in Payerne.

The success of our work in Payerne and the results obtained lead us to hope for the establishment of a network of similar stations covering the entire world. The application of these measurements on a worldwide scale and at regular time intervals, and using the same observational procedures, would produce reliable scientific and statistical results which would be of undoubted value for synoptic meteorology in the proper sense of the term — it would provide a new contribution to the study of the general circulation. A complete network of stations for checking the radioactivity of the air would provide us with information which would be extremely valuable in weather forecasting. Reference might be made in this connexion to the article entitled Meteorological Aspects of Atomic Energy, written by the Secretary-General of WMO, which appeared in the WMO Bulletin, Vol. VI, No. 2, p. 50.

Jean Lugeon
The Economic Commission for Asia and the Far East has recently issued a Glossary of Hydrologic Terms used in Asia and the Far East as No. 10 of its Flood Control Series. This publication, which is on sale at a price of US $0.40 from all sales agents for United Nations publications, contains definitions of about 1000 terms related to the science of hydrology and its applications. The meteorological terms included are limited to those which are widely used by hydrologists and this same criterion was adopted for selecting terms for other related subjects, such as hydraulics and oceanography.

The publication results from a meeting of a group of experts at Bangkok in September 1955 at which WMO was represented; it is therefore a tangible expression of the collaboration between ECAFE and WMO.

Representation of ground profiles on flight forecast forms
Projection and scales of weather charts included in flight forecast folders and the isohypses drawn on the charts
Reporting of swell and state of sea in ditching reports.

Further details of this matter are given on page 105 under Aeronautical Meteorology.

IFALPA

The 12th Conference of the International Federation of Air Line Pilots Associations was held in Athens from 13 to 21 March 1957. The International Civil Aviation Organization and the World Meteorological Organization were represented, the latter by Mr. N. L. Veranneman, chief of the Operations Section of the WMO Secretariat.

In view of the rapid development of aviation and the resulting new requirements, the conference gave particular attention to meteorological questions. Among the subjects discussed were operational control, special air reports on variations in upper winds and/or upper-air temperatures of particular operational significance, high altitude turbulence and in-flight reports.

Regarding operational control, the conference supported the relevant conclusions of the third Air Navigation Conference but insisted, however, on the need for distinguishing between managerial control and flight control by the aircraft commander.
During the discussion on upper-air temperatures and winds, several pilots pointed out the considerable influence of the ambient temperature on the performance of turbo-prop and turbo-jet aircraft, and stressed especially the difficult situation which confronts such aircraft when the temperatures encountered are higher than those forecast and used as the basis of the flight plan. The conference insisted on the need for meteorologists to bear this fact in mind.

High altitude turbulence is of great concern to the pilot and the conference expressed the hope that the ICAO programme of turbulence reports could be speeded up. In the same connexion, the need was pointed out for a sufficiently accurate and reliable classification of turbulence according to its intensity.

As regards in-flight reports, the conference adopted a position which will certainly be greatly appreciated by meteorologists. Being convinced that the continual insistence of meteorologists on in-flight reports is justified and that it is in the interest of the pilot himself to assist in providing the meteorologist with the data which he requires for reliable weather forecasts, the conference condemned any attempt to decrease the number of in-flight reports. It was decided to invite airline operators to take steps to ensure that in-flight observations are carried out and transmitted regularly in accordance with existing regional procedures, and to ask member associations of IFALPA to convince their pilots of the need for carrying out and transmitting such observations regularly. At the same time, it was decided to request WMO to ensure that full use was made of these data by the meteorologist responsible for weather forecasting for aviation.

As readers are aware the International Telecommunication Union (ITU) had three technical organs, known as the International Consultative Committees, for studying various technical problems of telecommunication services. The International Telegraph Consultative Committee (CCIT) was charged with the task of studying technical, operating and tariff questions relating to telegraphy and facsimile and issuing recommendations thereon; the International Telephone Consultative Committee (CCIF) was concerned with corresponding problems relating to telephony, and the International Radio Consultative Committee (CCIR) with radio services. WMO is interested in the activities of all these committees in so far as they affect meteorological telecommunication problems.

With the advances made in the techniques of carrier telegraphy and telephony in the post war years, the problems relating to these two types of services have gradually become more identical. It was therefore decided that the CCIT and the CCIF should be merged into one Consultative Committee. Accordingly both these committees held their eighth and last plenary assemblies at Geneva in December 1956; and after that ceased to exist as separate bodies.

The new and combined organ, known as the International Consultative Committee for Telegraphy and Telephony (CCITT), held its first plenary assembly immediately after the last plenary assemblies of the CCIT and CCIF. The WMO was represented at these meetings, as necessary, by Mr. V. Sundaram, telecommunications expert in the Secretariat.

The CCITT has taken over the problems formerly studied by the
CCIT and CCIF. WMO is closely interested in the work of the CCITT and, as in the case of the old CCIT, close liaison is kept with this committee.

UN
Administrative Committee on Co-ordination

The Secretary-General attended the session of the Administrative Committee on Co-ordination, held in Geneva on 2-3 May 1957. Mr. Dag Hammarskjöld was chairman and the heads of all other specialized agencies were present or were represented.

The committee approved its report to the forthcoming session of the Economic and Social Council of the United Nations. Included in this report was reference to WMO's collaboration with the United Nations and other agencies in the field of water resources. Other items of particular interest to WMO discussed at the meeting included the peaceful uses of atomic energy, the United Nations Expanded Programme of Technical Assistance and the arrangements for the United Nations pavilion at the Brussels Universal and International Exhibition of 1958 (see page 116).

Scientific Committee on the Effects of Atomic Radiation

The third session of the United Nations Scientific Committee on the Effects of Atomic Radiation was held in the Palais des Nations, Geneva from 8 to 18 April 1957. WMO was represented by Mr. B. Guilmet who is a member of the WMO Panel of Experts on Atomic Energy.

Amongst the subjects studied were the measurement of total radioactive fallout, of the natural radioactivity of defined regions and of strontium-90 and caesium-137. The exchange of standards and samples between laboratories and the standardization of methods of sampling were also discussed.

Attention was given to the effect of soil calcium on the absorption of radioactive strontium and above all to the effect of the deposits on vegetation. Various factors differ too much in space and time to make valid conclusions possible but the problem is of interest from the ecological and micro-climatological point of view.

Numerous attempts have been made to correlate strontium-90 fallout and total precipitation. Present indications are that such a correlation is possible for limited areas but that it cannot be applied to entire continents.

The rate of fallout varies during the year but there seems to be no uniformity, on a world scale, of the period when it is at a maximum. The variations of the rate of fallout as a function of latitude reveal a maximum between 50° and 60° north and south of the equator with a minimum near the equator. The southern hemisphere shows distinctly less radioactivity than the northern hemisphere. Studies of this problem seem to be under way in several countries and particularly in England. There may be a close connexion between radioactive fallout maxima and discontinuities in the tropopause on the one hand and the existence of jet-streams on the other. Either of these phenomena could be responsible for the introduction into the troposphere of radioactive particles carried by stratospheric winds.

In connexion with the probable adoption by CSAGI of the recommendations made at the Utrecht meeting of the CSAGI Working Group on
Nuclear Radiation (see Bulletin, Vol. VI, No. 2, p. 58), it is hoped that all WMO Members will make measurements of the radioactivity of the air and take samples of precipitation and dry fallout. These measurements are desirable at as many land stations as possible and at least one station per 100,000 sq. km, as well as on board stationary and selected ships. The choice of land stations is limited by the need to locate them at radiosonde stations and in the neighbourhood of a radio-chemical analysis centre.

The WMO representative stressed the importance of meteorology for the study of the problems discussed and expressed the belief that it would eventually be possible for meteorologists not only to advise but also to take part in the research programme. It was similarly to be hoped that the data accumulated by the committee would help indirectly in solving some meteorological problems.

**UNESCO**

**Arid zone research**

The 12th session of the Advisory Committee on Arid Zone Research of the United Nations Educational, Scientific and Cultural Organization (UNESCO) was held in Paris from 3 to 5 April 1957 with Dr. Herbert Green (U.K.) in the chair and in the presence of representatives of the specialized agencies — the Food and Agriculture Organization, the International Labour Office, the World Health Organization and the World Meteorological Organization, and also of a number of international non-governmental scientific and technical organizations.

In the course of the meeting the WMO observer, Dr. K. Langlo, chief of the Technical Division of the Secretariat, made a statement on the activity of WMO in this field since the previous session of the advisory committee and made special reference to some of the decisions adopted at the recent session of the WMO Commission for Climatology in Washington.

The main item for discussion by the committee was a general consideration of the proposals of the Director General of UNESCO for the "Major Project on Arid Lands Research". The meeting was mainly of an administrative character but readers of the Bulletin may be interested to learn that the project will now be concentrated in any or all of the following 16 UNESCO Member States:

Afghanistan, Egypt, Ethiopia, India, Iran, Iraq, Israel, Hashemite Kingdom of Jordan, Libya, Morocco, Pakistan, Saudi Arabia, Sudan, Syria, Tunisia and Turkey.

A sum of US $486,632 is available for the project for the period 1957-1958. An important part of the programme is the assistance to be given by UNESCO to the development of certain research institutes which can be considered as organizations of international standing for the attack on desert problems. In this connexion it should be mentioned that the committee recommended assisting the Desert Research Institute at Beer-sheba, Israel, in its research on solar energy and climatology.

The committee also recommended that Dr. C. W. Thornthwaite's associates should be asked to complete three maps of the Middle East giving a complete picture of the water balance for that area.

With regard to the liaison with UN and the specialized agencies, the com-
committee acknowledged with gratitude the co-operation received from FAO, WHO and WMO and stressed the need for UNESCO to consult with these agencies on particular aspects of its work on arid zone research.

The next session of the advisory committee is scheduled to be held in November 1957 in Pakistan in connexion with a symposium on soil erosion to be organized by the Food and Agricultural Council of Pakistan.

**OBITUARY**

The news of the death of Dr. Leon Sherman in an accident on 3 March 1957 has been received with deep regret. Dr. Sherman became a member of the CSU Working Group on Networks when it was enlarged to include experts in tropical meteorology. Originally a mathematician, he had served in the U.S. Navy during the war and it was during this period that he first became interested in tropical weather.

The solution of the network problem requires mathematical as well as practical ability and Dr. Sherman took a keen interest in the tasks of the working group, to which he made a useful personal contribution.

After a university career at Los Angeles and Tallahassee he became meteorological expert at the Los Alamos laboratories. His death is a great loss to science, to the working group and to the many friends who appreciated his kindness, honesty and integrity.

W. Bleeker

**NEWS AND NOTES**

**Membership of WMO**

**Ghana**

On 6 May 1957, the Government of Ghana deposited an instrument of accession to the World Meteorological Convention with the Department of State at Washington, under the provisions of Article 3 (b) of the Convention. Ghana thus became a Member State of WMO on 5 June 1957. Up to this date it had participated in WMO within the framework of the British West African Territories.

**Chile**

The Government of the Republic of Chile deposited an instrument of ratification to the World Meteorological Convention with the Department of State at Washington on 9 May 1957, under the provisions of Article 3 (a) of the Convention. Chile thus became a Member State of WMO on 8 June 1957.

WMO now has 96 Member States: 74 States and 22 Territories.

**Brussels International Exhibition 1958**

The Universal and International Exhibition which will take place in Brussels, Belgium, from 3 April to 30 November 1958, will be the first world exhibition since 1939; 51 nations will be participating. In the international section there will be a pavilion
of the United Nations and the specialized agencies including WMO, as well as pavilions of six other international organizations. Preparations for WMO's part in the pavilion are already in an advanced stage.

At the kind invitation of the Royal Meteorological Institute of Belgium, WMO will also participate, with the Design of the UN pavilion

Institute, in the meteorological part of the hall of science; this will be one of a large number of such specialized pavilions in the general section of the exhibition.

METRIC UNITS IN METEOROLOGY

The arguments in favour of the use of metric units in meteorological reports for international exchange are too well known to require repetition. It will be recalled that Second Congress decided, by Resolution 28 (Cg-II), to adopt in principle the Celsius degree and the metric system of units for meteorological elements included in these reports, and to ask WMO Members not using these units to consider the possibility of introducing them within a fixed time limit.

The long history of this problem indicates that complete uniformity is not likely to be achieved quickly but since the above decision by Congress substantial progress has been made towards the desired end. In 1956 the WMO Secretariat addressed an inquiry to 29 Members known to be using the English units system, asking them to state their plans regarding the adoption of the metric system for coding their reports for international exchange. The replies to this inquiry showed that the Celsius temperature scale had been adopted for these purposes by 15 of the 29 countries and that metric units had been adopted in 13 of these countries. Some other countries indicated that the question was still under study.

Information has since been received from Japan that the metric system of units is now in use for all meteorological reports. More recently India has announced its intention of using metric units not only for international reports but also in daily observational practice. This change-over is part of a plan to introduce metric measurements into all spheres of life in India and has been made earlier than anticipated in order to simplify the task of collating meteorological observations made during the International Geophysical Year.

These changes, together with the decision that Celsius degrees and metric units will be used for all meteorological reports made in Antarctica during the IGY, give welcome proof of the accelerating trend towards uniformity in meteorological practice throughout the world.
AWARD TO PROFESSOR J. LUGEON

At Warsaw, on 8 May 1957, the Polytechnic University of Warsaw conferred the honorary degree of doctor of science on Professor Jean Lugeon, director of the Swiss Meteorological Service and former president of Regional Association VI. The diploma, signed by the Rector, Professor Dr. Araszkiewicz, the senior professor, Dr. Mamak, and the proposer, Professor Dr. J. Lambor, past director of the Polish Institute of Meteorology and Hydrology and a former vice-president of RA VI, recalled the pioneering work of Dr. Lugeon in hydrology, aerology and radio-meteorology.

The Polytechnic University of Warsaw, which today has 12,500 students, has awarded only seven honorary doctorates during the 58 years of its existence, two of these to foreigners. Professor Lugeon is well known in Poland, having served as director of the Polish Meteorological and Hydrological Service from 1930 to 1936.

On behalf of his many friends in WMO, we offer our congratulations to Professor Lugeon on this well-merited award.

INTERNATIONAL CONFERENCE ON SCIENTIFIC INFORMATION

The National Science Foundation, the National Academy of Sciences-National Research Council, and the American Documentation Institute are sponsoring an International Conference on Scientific Information to be held in Washington, D.C., in November 1957. The conference will be concerned with problems of scientific information, in particular the storage and retrospective search of information for all groups of users from the individual scientist to the large-scale mechanized documentation centre.

Participation in the conference will be limited to specialists in the fields covered by the agenda — working scientists, documentalists, and librarians. Proposals for papers will be welcomed from individuals throughout the world, provided they meet the criteria that have been adopted for papers if they are to be accepted for inclusion on the conference programme.

Further information may be obtained by writing to the International Conference on Scientific Information, National Academy of Sciences-National Research Council, 2101, Constitution Avenue, N.W., Washington 25, D.C., U.S.A.

RECORDS OF RIVER-FLOW IN VENEZUELA

To meet an ever-increasing demand for river-flow data, the Ministry of Public Works of Venezuela has published, through its Hydrology Division, in a single volume of 1225 pages,* the records of 51 hydrologic stations established along 47 rivers in the country.

The following data are tabulated for each station and each year: mean daily, monthly and annual flow, the maximum flow recorded, the total monthly and annual flow and the annual sediment run-off; these data are arranged according to the climatic year in Venezuela, which is defined as from 1 April to 31 March. In many instances missing river-flow observations have been replaced by estimates

based on rainfall data. In addition to the valuable numerical data, the publication contains detailed descriptions of each station and graphical information about the station and the river basin.

EXCELLENCE AWARDS TO AUSTRALIAN OBSERVING SHIPS

Following the practice of last year when the first Excellence Award was made (see WMO Bulletin, Vol. V, No. 3, p. 116), the Bureau of Meteorology has, this year, selected three ships for the Award in recognition of the high quality maintained in the making of observations and of the regularity in the furnishing of such reports. The vessels selected were m.v. Charon (Alfred Holt & Co.) and m.v. Westralia (Huddart Parker Ltd.).

Although the world fleets of selected ships have varied little over the past year or so it is pleasing to note that the number of reports received by the Australian Service for the year ending 30 June 1956 showed an increase of approximately 19.5 per cent and this increase shows signs of being maintained for the current year. Such increases therefore can be attributed to a general increase in interest by ships’ observing personnel and to a greater regularity of reports taken and transmitted.

During the past whaling season the co-operation received from the Japanese whaling fleet was extremely good, the number of reports received showing a marked and very substantial increase over previous years. Another fruitful source of reports from Antarctic regions was through ships of various nationalities on voyages connected with the setting up of stations in Antarctica for the IGY.

SPEED-UP IN CANADIAN METEOROLOGICAL COMMUNICATIONS

Vast distances, when coupled with the remote location of some stations, create formidable problems in providing meteorological communications in Canada. Recently, when it was decided to increase the speed of the entire teletype network from 60 to 75 words per minute, the best method of accomplishing this speed-up without causing serious delays in the transmission of weather reports was very carefully studied.

Consultations with the Canadian National and the Canadian Pacific Telegraph Companies, who provide the
service on lease, enabled plans to be made one year ahead. On the day of the change-over, 30 March 1957, a servicing engineer was present at each of the 300 stations extending across Canada from Gander in Newfoundland to Victoria in British Columbia. In this way the change-over, which involved more than 1,000 pieces of equipment and 30,000 miles of teletype circuit, was successfully completed.

An even more significant advance in operating speeds was carried out on 23 April 1957 when the speed of the Canadian Weatherfax system was increased from 60 to 120 revolutions per minute.

No changes were made apart from the addition of equipment to equalize phase delays on various carrier sections and the refinement of recorder sections. The same voice frequency band width is still being used to transmit the 1800 c/s carrier which is modulated by the facsimile signal.

Whilst it is too early to give final results, it can be said that the majority of stations are enjoying good reception. Charts examined at Vancouver, 3,000 miles from the transmitting station at Montreal, reveal little or no ghosting and the loss of definition is minute. The few difficulties remaining at present are not insurmountable and there is good reason to think that the new speed of 120 rpm will become the permanent operating speed of the system.

VISIT OF THE PRESIDENT OF WMO

Mr. André Viaut, President of WMO, paid a visit to the Secretariat from 5 to 8 May 1957, in the course of which many questions were discussed with the Secretary-General and the Deputy Secretary-General, mainly regarding preparations for the ninth session of the Executive Committee. The chiefs of divisions and sections concerned also had an opportunity to take part in discussions on problems relating to organizational, programme, finance and staff matters of interest to them.

During his stay in Geneva, the President attended a meeting in the Secretariat of the WMO Staff Pension Board, and also visited the Meteorological Data Centre for the International Geophysical Year and the Technical Assistance Unit attached to the Secretariat.

EXECUTIVE COMMITTEE

Arrangements for the ninth session of the Executive Committee, which will open in the Palais des Nations, Geneva, on 24 September 1957, are now well under way. The provisional agenda and an explanatory memorandum were recently distributed to members of the committee and the working papers will follow as they are produced.

Amongst the reports submitted to the Executive Committee will be those covering the second sessions of Regional
Association I and the Commissions for Maritime Meteorology, Climatology, Aerology and Instruments and Methods of Observation. The committee will examine the progress achieved in various technical projects such as climatic atlases, the meteorological aspects of atomic energy, arid zone and humid tropics research and WMO’s participation in the water resource development programme. Particular attention will undoubtedly be given to the activities of the Organization in the field of technical assistance and the meteorological programme for the International Geophysical Year. The agenda also contains various procedural and administrative questions.

The Executive Committee will draw up the programme of the Organization for 1958 and adopt the annual budget to cover the implementation of this programme. If the committee decides not to hold its tenth session until the autumn of 1956 it will be necessary for it to draw up the agenda and fix the date for Third Congress during the ninth session.

A report on the decisions of the ninth session of the Executive Committee will be included in a later issue of the Bulletin.

VISIT OF THE ADVISORY COMMITTEE ON ADMINISTRATIVE AND BUDGETARY QUESTIONS (ACABQ)

As part of a general programme of visits to the specialized agencies, the Advisory Committee on Administrative and Budgetary Questions of the United Nations visited the Secretariat of the World Meteorological Organization on 4 and 5 April 1957. The purpose of the visit was to enable consultations on various matters of administrative and budgetary co-ordination with particular reference to WMO’s participation in the Expanded Programme of Technical Assistance to take place. The chairman of the ACABQ is Mr. Th. Aghnides.

CLEVELAND COUNCIL ON WORLD AFFAIRS

The Council on World Affairs of Cleveland, Ohio, U.S.A. visited the Secretariat on 25 May 1957, as part of a programme of visits to several international organizations in Geneva. The Secretary-General gave a short talk to the visitors on the activities of WMO and answered questions.

VISIT OF DR. PAUL JOLLES

Dr. Paul Jolles, the newly appointed executive secretary of the preparatory commission of the International Atomic Energy Agency visited the Secretariat on 9 and 10 April 1957, for informal discussions with the Secretary-General.

RECENT WMO PUBLICATIONS


This report contains a general summary of the work of the second session of the Commission for Maritime Meteorology (Hamburg, October 1956) with the full text of the resolutions and recommendations adopted, together with the final agenda and lists of representatives present and of the documents distributed before and during the session. The 12 annexes to the report relate to such questions as the maritime observing programme for the International Geophysical Year, recommended instructions for filling in IGY Form No. 2 b, proposed amendments to relevant sections of the WMO Technical Regulations and recommendations adopted prior to the second session of CMM and still in force.

An account of the session was given in WMO Bulletin, Vol. VI, No. 1, p. 10.

This supplement to WMO Publication No. 8.TP.3 contains Chapter 14 — Observations of Atmospherics. Much of the information given in the WMO Technical Note No. 12 — Atmospherics Techniques, and the substance of certain recommendations of the Commission for Aerology are included in this new chapter. Definitions of terms used in this field, proposed at the World Symposium on Sferics (Zürich, 1953), are followed by descriptions of the types of equipment already in use in various meteorological services. Further sections deal with the sources of errors and calibration of the different types of equipment, the recording of data and the training of staff.

The chapter concludes with a list of references to relevant works published since 1936.


Volume I of the complete Cloud Atlas contains a detailed descriptive study of clouds and meteors and of the techniques for observing and reporting them, both by surface and by airborne observers. The contents are arranged in five parts. Part I concerns the classification, definitions and descriptions of clouds and Part II covers meteors in the same way. Part III gives guidance on the observation and identification of clouds and meteors. Two model journals are included in Part IV, together with instructions for the entering of observations, and Part V contains detailed instructions and pictorial guides for the coding of clouds.

The volume concludes with three appendices giving the etymology of the Latin names of clouds, an historical bibliography of cloud classification and a bibliography of cloud nomenclature, and an alphabetical index of words and expressions.

The Abridged Atlas and Volume II, which contains the 224 plates illustrating the text of Volume I, were described in a previous issue of the Bulletin (Vol. VI, No. 1, p. 42).

International Cloud Album for Observers in Aircraft (World Meteorological Organization) 1956. 32 plates. Price : Sw. fr. 4.—

This Album, containing 19 plates in black and white and 13 in colour, is specially intended for the use of pilots and airborne observers. The plates are a selection from Volume II of the complete Atlas; the first ten illustrate the basic cloud types as seen from the ground while the remainder provide examples of clouds as seen from the air, with an explanation of the appropriate coding.

A list of the plates in numerical order is provided to help the observer to find quickly the illustrations corresponding to the respective code figures.

International Cloud Atlas. Bare plates of (i) Volume II, (ii) the Abridged Atlas and (iii) the Album. (World Meteorological Organization) 1956. Prices: (i) Sw. fr. 15.— (ii) Sw. fr. 5.— (iii) Sw. fr. 2.—

Bare plates, identical with those contained in the volume indicated, but without the printed legends and reference arrows, are available for the benefit of meteorological services and others who wish to print the explanatory legends in languages other than English or French.
La météorologie du navigant (Meteorology for the navigator). By A. Viaut, Paris (Blondel la Rougery) 1956. 284 pages; 144 figures; 20 plates; 12 tables; 7 charts (separate from text). Price not indicated.

This new edition of Manuel de Météorologie du Navigant by Mr. André Viaut will receive a warm welcome. The work is widely used throughout the world of aviation, and its value is greatly enhanced by being brought up to date frequently thereby enabling the user to follow step by step the rapid development which is taking place both in the science of meteorology and in its application to aviation.

In addition to the new information about meteorological services for air navigation, the revised edition contains a whole section on jet-streams, which constitutes a practical synthesis of our present knowledge of this subject, which is of ever-growing interest in modern air navigation.

Although the main purpose of the work is to inform navigators about the basic elements of meteorology and the methods of applying this knowledge in the accomplishment of their tasks, the theoretical part of the book, on the physical processes of the atmosphere and the general or secondary circulation, has been re-arranged and brought up to date. It will be noted in particular that considerable space has been devoted to the circulation in the southern parts of the world and that the text on this subject has been extended and brought into line with our latest knowledge. It will also be noted that details of this subject — which are often omitted in similar works — are included logically in the chapter on the general circulation, whereas in the previous edition they were inserted at the end of the book.

It is interesting to see the degree to which this new edition brings out the development which has taken place in aeronautical meteorology. A glance at the changes made in the additional maps added to the new edition provides sufficient evidence of this. The book now includes charts showing the topography of the isobaric surface and temperature charts for 500 and 300 mb, covering North America, the North Atlantic and Europe as far as the Urals, in place of charts showing the 700 and 500 mb isobaric topography for the Eastern Atlantic and Western Europe.

The presentation of the book has been improved and the inclusion of coloured diagrams and also of cloud photographs in colour will be especially appreciated. It will be noted that the nomenclature given with the cloud photographs — the number of which has been increased once again — has been brought into agreement with the new Cloud Atlas.

All these improvements, for which the author and his publisher deserve our unreserved congratulations, lead us to hope that in the next edition, which we hope to see in the not too distant future, the reproductions on pages 266–270 (specimen forms for forecasts, vertical sections and composite charts) will be enlarged and printed in a lighter tone.

It seems almost unnecessary to mention the clarity, precision and elegance of the text, which makes the book attractive and easy to read. The various editions which have already appeared show that the public fully appreciates the value of this work, and there is no doubt that this new edition will meet with the same success as its predecessor.

J. R. R.


Part I of this work, which is designed for practical use, provides a comprehensive survey of the climatic elements of Vienna. It is illustrated by numerous tables and some diagrams and is based on the long series of records of meteorological data available for that city. Temperature observations, which began in 1775, cover a period of 176 years; since 1872 they have been made at the site where they are still...
made to-day. Discussions on cloudiness, precipitation and pressure are supported by data covering 100 years, sunshine data cover 70 years, and wind, humidity and ground temperature data are available for 40 years. In the case of radiation, data are only available for the last few years. The account ends with a short explanation of technical climatological terms.

Part II deals first with the secular changes in the various climatic elements, illustrated by diagrams, which include 30-year overlapping means of temperature and 5-year overlapping means of temperature, precipitation, sunshine and wind-direction. This section is followed by a series of special studies relating to the relationship between several meteorological elements (precipitation and wind; fog and wind) and to factors which have a bearing on the hygiene of a large city, or which are important for building (e.g. distribution of city haze, duration of freezing temperature, insolation of walls). A discussion on the spatial temperature distribution in and around Vienna follows; this is based partly on observations carried out at 30 local observing stations, and partly on temperature recording surveys through the area; these began in 1927 and later covered up to 5000 measuring points during a single survey, using electrical thermometers.

The production of a third part is planned; this will deal, amongst other things, with the effect of various weather situations on the climatic conditions in Vienna and with the results of special observations such as those concerning lighting conditions, the microclimate of streets and air pollution.

H. S.
Planning and Installation of Military and Civil Radar Systems

TYPE SNW 50 3 cm
STORM WARNING RADAR
Storm Warning Radar can now be recognised as an important element of an Airport Surveillance and Control system. The SNW 50 provides an accurate and up-to-the-moment picture of storm and rain producing clouds over ranges up to 200 n. miles. Remote displays, static or mobile versions are available.

TYPE S232 AIRFIELD CONTROL RADAR
Operates at full efficiency in all weathers because the wavelength is long enough to be unaffected by cloud. Removes ground clutter which obscures aircraft response by means of an extremely efficient moving target indicator (M.T.I.) system which feeds only echoes from moving targets to the display. Is instantly operational at its rated performance because it is crystal controlled and needs no adjustment after switching on. Conventional valves are used throughout ensuring complete reliability under the most arduous conditions of service.
World Meteorological Services order Decca Windfinding Radar

Decca Windfinding Radar — the first equipment designed specifically for upper windfinding — is being ordered by Meteorological services throughout the world. Achieving a high performance over a 100 km range this accurate, cheap and robust radar is easy to operate and requires little maintenance.

A cost-cutting system of reflectors

To reduce the day to day cost of operating an upper windfinding network, Decca have developed a novel system of reflectors; four types of reflectors can be made up from a few simple, inexpensive, expendable, flat-stored, piece parts.

A copy of the Decca Windfinding Radar brochure giving detailed information and data will be sent to you on request.

UNITED KINGDOM
Royal Society International Geophysical Year Expedition, Halley Bay, Antarctica.

AUSTRIA
Zentralanstalt für Meteorologie und Geodynamik

BELGIUM
Institut Royal de Météorologie de Belgique

ARGENTINA
Servicio Meteorológico Nacional

BELGIAN CONGO
Service Météorologique

FRANCE
Météorologie Nationale

CANADA
Meteorological Division, Department of Transport

DECCA RADAR LIMITED, LONDON, ENGLAND
We have been supplying La Météorologie Nationale de France with ordinary and recording pilot-balloon theodolites since 1914.

This Service has now adopted, as its only official model, a new theodolite of modern design which we have recently developed in collaboration with them.

All other meteorological and precision instruments

Catalogues and descriptive leaflets will be supplied free on request
Why you should specify

Beritex

SEAMLESS

SOUNDING AND
PILOT BALLOONS

Made by THE GUIDE BRIDGE RUBBER CO. LTD

They're the finest available for meteorological work because:

Beritex Balloons have years of research and development behind them. Every balloon is guaranteed and has been rigorously tested and individually inspected. Made from the finest Rubber Latex they require no special pre-flight treatment.

* * *

Les ballons 'Beritex' ont des années de recherches et de mise au point derrière eux. Chaque ballon est garanti et a fait l'objet d'un essai rigoureux et d'une vérification individuelle.

* * *

Fabriqués en latex de caoutchouc de la meilleure qualité ils n'ont besoin d'aucun traitement spécial avant l'envol.

* * *

Los globos Beritex están respaldados por muchos años de investigación y fabricación. Todos los globos están garantizados y han sido rigurosamente probados e individualmente verificados.

Los globos, fabricados con inmejorable caucho látex, no requieren ningún tratamiento especial antes del vuelo.

OVERSEAS SALES
Phillips Patents Limited · 250 Western Avenue · Acton · London · W3

HOME SALES
Guide Bridge Rubber Co. Ltd · Vulcan Mill · Butcher Lane · Bury · Lancs.
For Your Upper Air Soundings

USE

THE G.I.P. HYDROGEN GENERATOR

(By ferro-silicon process)

Much more economical than aluminium or calcium hydride. Gas production with no sudden increases in pressure. (Used successfully in Adelie Land.) Available in different models producing 3, 6 or 9 cubic metres by special patented ready-for-use refills. Excess gas production impossible.

Most of the special expeditions for the International Geophysical Year are being equipped with G.I.P. No. 3 hydrogen generators.

LA G.I.P.

SOCIÉTÉ DES GAZ INDUSTRIELS DE PROVINCE

155, Boulevard Malesherbes, PARIS. Téléphone WAGram 2296

USINE A SAINT-ÉTIENNE (LOIRE), RUE SCHEURER-KESTNER
UMBRAWIN
MARK IV
THE CORNER REFLECTOR FOR
RADAR WIND-FINDING

Easily erected

Very accurately tensioned planes

Lightest weight for size

For use with 10 cm. radar

CHEMRING LIMITED
Marban Place  Queen’s Park  London W9  Telephone LADbroke 4774
Cables Rawin London
CONTRACTORS TO METEOROLOGICAL AUTHORITIES THROUGHOUT THE WORLD
ELECTRIC ANEMOGRAPH 90z

for remote transmission of gusts, wind direction, and average wind velocity taken over 10 minutes. Permanent record by terminal voltage between registering pens instead of ink assures neat, clear and dry diagrams and minimum attention. Up to 3 additional instrument stations can be connected.

Maximum transmission distance 3 kms.

R. FUESS

SINCE 1865 METEOROLOGICAL INSTRUMENTS

& DUENHHER STRASSE, BERLIN-STEGLITZ

(Germany, American Sector)

INTERNATIONAL GEOPHYSICAL YEAR 1957-58

METEOROLOGICAL PROGRAMME

Recent publications issued by WMO

No. 55. IGY. 1 - General Survey

Price : Sw. fr. 10.—

This volume contains all the essential information at present available concerning the meteorological programme of the International Geophysical Year.

No. 58. IGY. 2 - Lists of Stations

Price : Sw. fr. 8.—

This volume contains the lists of surface, upper-air, radiation, ozone and sferics stations at which observations will be made during the IGY.

ON SALE FROM WMO

Avenue de la Paix

GENEVA

Since 1945 H. C. van de Hulst, an astronomer noted for his work on interstellar dust, has been collecting the published data in the field of small particle scattering. This material, formerly scattered throughout the world literature, plus van de Hulst's own calculations, now comes to you in a coherent, unified treatment of the status of research in this field...

Light Scattering by Small Particles

By H. C. van de Hulst,
University of Leiden

This new work stresses practical numerical and graphical results. Workers in many areas of science will find here the curves and calculations they need to carry out their research.

Many actual curves are given as examples; in cases where the final curve may not be given, the author has summarized the most convenient methods for finding it. Order your copy today. 1957. 470 pages. $12.00

JOHN WILEY & SONS, Inc.

440 Fourth Ave., New York 16, N.Y.
MUFAKX Recorders
think
for themselves

They switch on; make an accurate, visual record of any graphic material transmitted and switch off again—entirely automatically.

They operate for long periods without any attention and then only for replenishment of MUFAKX recording paper at 30-hour intervals or longer.

For absolute accuracy, dependability and minimum attention—it's MUFAKX every time.

Publications 8749, 8691 and 8696 tell you all about it.

MUFIHEAD
PRECISION ELECTRICAL INSTRUMENTS

MUFIHEAD & COMPANY LIMITED, Beckenham, Kent, England
MUFIHEAD INSTRUMENTS INC., 677 Fifth Avenue, New York 22, N.Y., U.S.A.
MUFIHEAD INSTRUMENTS LIMITED, Stratford, Ontario, Canada
MONITORING of
ATMOSPHERIC RADIOACTIVITY

Landis & Gyr System

- Automatically measures and records level of atmospheric radioactivity.
- System adopted by several European and overseas countries; measurements taken are therefore capable of strictly accurate comparison.
- For technical literature and references, please apply to:

LANDIS & GYR Ltd., ZUG (SWITZERLAND)
Specialists in Meteorological Balloons
Twenty years experience behind
DIRECT EXPORT ALL OVER THE WORLD
COMPLETE SERVICE

for

WEATHER FORECASTING EQUIPMENT

Radio Sonde Transmitter as supplied to the British Meteorological Office and many foreign Governments, also Ground Station in rack-mounted form, as illustrated. Full details gladly sent on request.

WHITELEY ELECTRICAL RADIO COMPANY LTD
MANSFIELD · NOTTS · ENGLAND
VÄISÄLÄ
SOUNDING
SYSTEM

for observing the
upper air pressure,
temperature,
humidity,
wind direction and
speed

- RADIOSONDES
- PTU GROUND
  EQUIPMENT
- RADIOTHEODOLITES
- SOUNDING BALLOONS

Technical assistance available
Training courses arranged

For further information write to:
KOMMANDIITTIYHTIÖ VÄISÄLÄ
Box 2191, Helsinki-Töölö, Finland