

International Scientific Radio Union

U. R. S. I.

INFORMATION BULLETIN

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Xth GENERAL ASSEMBLY

Resolutions and Recommendations

EXECUTIVE COMMITTEE

On proposals of the Executive Committee, the following decisions were taken by the General Assembly.

1. NEW NATIONAL COMMITTEES. — The Canadian, Spanish and Western Germany National Committees were recognized by the General Assembly.

2. STATUTES. — New statutes, By-Laws and Rules for Commissions were adopted by the General Assembly.

3. ELECTIONS. — The following were elected :

3.1 *Honorary Presidents* :

Sir EDWARD V. APPLETON,
Doctor J. HOWARD DELLINGER,
Professor Doctor B. VAN DER POL.

3.2. *Officers of the Board* :

President : P. LEJAY.

Vice-Presidents : Dr. Ch. R. BURROWS ; Dr. D. F. MARTYN ; Prof.
B. D. H. TELLEGEN.

Treasurer : Prof. Ch. MANNEBACK.

Secretary General : E. HERBAYS.

3.3. *Chairmen of Commissions* :

Commission I : Dr. R. L. SMITH-ROSE

Commission II : Dr. Ch. R. BURROWS

Commission III : Sir EDWARD V. APPLETON

Commission IV : Mr. J. A. RATCLIFFE

Commission V : Mr. M. LAFFINEUR

Commission VI : Dr. L. C. VAN ATTA

Commission VII : Professor G. A. WOONTON.

3.4. *Delegates of U.R.S.I. to other International Organizations :*

- a) *International Council of Scientific Unions :* The President of U.R.S.I.
- b) *International Union of Geodesy and Geophysics :* M. P. LEJAY.
- c) *Joint Commissions of the International Council of Scientific Unions :*
 - 1) Joint Commission on the Ionosphere : Sir EDWARD V. APPLETON; P. LEJAY; Dr. D. F. MARTYN; Dr. Newbern SMITH.
 - 2) Joint Commission on Radio-Meteorology : Dr. Ch. R. BURROWS; Dr. H. G. BOOKER; Dr. H. BREMMER; Prof. J. LUGEON.
 - 3) Joint Commission on Relationship between solar and Terrestrial Phenomena : Dr. C. W. ALLEN; Mr. R. BUREAU; Mr. J. S. HEY; Dr. D. H. MENZEL.
- d) *International Consultative Committee for Radio-Communications (C.C.I.R) :*
 - for Study Group n° IV : Dr. H. BREMMER
 - for Study Group n° V : Dr. R. L. SMITH-ROSE
 - for Study Group n° VI : Mr. H. G. WELLS
 - for Study Group n° VII : Mr. B. DECAUX.
- e) *World Meteorological Organization :* Prof. Dr. J. LUGEON.

4. FINANCES. — The General Assembly :

- 4.1. Approved the accounts for 1950 and 1951 and the budget for 1952 and the following years.
- 4.2. Fixed to 450 gold francs the contributory unit.

5. NEW COMMISSIONS :

5.1. Considering the scientific importance of observations and measurements to be carried out during the International Geophysical Year, the General Assembly constituted a Special Commission of the International Geophysical Year, under the Chairmanship of Sir Edward APPLETON, the membership being as follows :

for Commission II : Dr. BURROWS and Dr. BOOKER;

for Commission III : Sir EDWARD V. APPLETON (*Chairman*) and Dr. D. F. MARTYN ;

for Commission IV : Mr. J. A. RATCLIFFE and Dr. RIVAUT ;

for Commission V : Dr. M. LAFFINEUR and Dr. LOVELL.

5.2. Considering a proposal from Commission n° 18 of the International Astronomical Union, it was decided to appoint a sub-commission of Commission III to consider the probleme of longitude determination, the membership being as follows Prof. BOELLA (*Chairman*), P. LEJAY, J. C. W. SCOTT, R. L. SMITH-ROSE, J. J. VORMER and Dr. WOOLLEY.

6. Ith. GENERAL ASSEMBLY. — It was decided to hold the XIth. General Assembly in Netherlands in 1954.

7. JOINTS COMMISSIONS OF THE INTERNATIONAL COUNCIL OF SCIENTIFIC UNIONS :

7.1. *Joint Commission on the Ionosphere.* — It was decided to recommend to I.C.S.U. that this Commission continue its work until the General Assembly of I.C.S.U. following the end of the International Geophysical Year. Such a decision would allow the Commission to use the results of observations to be carried out during the International Year.

7.2. *Joint Commission on Radiometeorology.* — It was decided to ask this Commission to pursue its programme until the next General Assembly of U.R.S.I. which will then consider the constitution of a Commission on Radiometeorology.

SUB-COMMITEE ON PUBLICATIONS

A. — PROCEEDINGS OF THE GENERAL ASSEMBLY

(a) Part I should continue to be published as at present in two volumes containing respectively the French and English versions of the minutes of Sessions, reports of National Committees, Secretary's report, financial report, and other administrative documents.

(b) It is felt that the publication of Part II in its present form should be discontinued. Not only does Part II consist, to a great extent, of incomplete summaries of the papers presented to the Commissions but many of the papers have appeared in recognized scientific journals prior to their publication in Part II. Further-

more, the limited circulation and availability of Part II has lessened its potential value.

(c) A more useful object might be achieved if the number of special reports offered by U.R.S.I. were to be increased.

(d) Such progress reports would be of considerable interest to the scientific world, and, to ensure that they would be universally available, they should be advertised widely and put on sale, either by the Secretariat directly, or by contract with a suitable scientific publishing firm.

B. — GENERAL

(a) Despite the recommendations of the IXth General Assembly at Zurich the number of papers presented at Sydney has increased considerably compared to previous Assemblies. It appears from an examination of these documents that many of them are not of « international » or « fundamental » interest. Their very number has necessitated such condensation of the texts that a considerable part of their value is lost. Steps should be taken to alleviate this condition, and the following procedure might be contemplated :

(i) An author who feels that he may have material which would be suitable for, or pertinent to, a general discussion topic should furnish two summary copies to his National Committee for forwarding to the Chairman of the appropriate Commission via the Secretary General.

(ii) The Commission Chairmen should plan the agenda of Sessions by drawing up lists of subjects suitable for general discussion, based on the material submitted to them.

(iii) The Commission Chairmen should then notify those authors who are to engage in the discussion as principals, and only the pertinent documents should be reproduced in toto by the Secretariat.

(iv) The Commission Chairmen should send to the Secretariat the lists of documents to be reproduced.

(v) Every paper submitted to and accepted by the National Committees, whether or not selected by the Commission Chairmen for discussion purposes, should be included by title and abstract in the report of the author's National Committee.

(vi) For convenience the National Committee reports should be issued in separate parts corresponding to each Commission of the Union.

(b) The number of copies of the Proceedings should remain as in 1950, and they should be issued without additional charge to adhering countries as is the present practice.

(c) The number of copies of the special reports should be determined by estimation of the probable sales thereof.

(d) The number of copies of the Information Bulletin might well be increased as this publication is of current and timely interest to many workers who do not now have easy access to it. It might be reasonable to suggest that a subscription rate could be established for the Bulletin to defray part or all of its publication expense.

The Sub-Committee on Publications,

Chairman Dr. M. LAFFINEUR,
Dr. J. H. DELLINGER,
Dr. D. W. R. MCKINLEY.

COMMISSION I

The following resolutions accepted unanimously by Commission I were adopted by the General Assembly.

1. As a result of investigations made in recent years by several different methods, it is recommended that the following value of the velocity of electromagnetic waves in vacuum be adopted for all scientific work :

$$299\,792 \pm 2 \text{ km/sec}$$

2. Resolution 2 of the IXth. General Assembly (Zurich 1950) ⁽¹⁾ is reaffirmed and it is requested that all national laboratories in a position to offer a standard of power measurement for frequencies in the region of (i) 3000 Mc/s and (ii) 10 000 Mc/s for comparison

⁽¹⁾ See *U.R.S.I.*, vol. VIII, P. I, p. 54.

with the standard established in Great Britain and the United States of America should communicate with

Mr. C. W. OATLEY
Engineering Laboratory
University of Cambridge
Trumpington Street, Cambridge, England

3. It is recommended that all members take into account the following conclusions of the C.C.I.R. at its 1951 Plenary Assembly at Geneva which bear upon the work of this Commission and consider them in guiding their researches as much as possible, in order that the U.R.S.I. may be in a position to furnish the maximum aid to the C.C.I.R., viz, Question 54 ⁽¹⁾, Recommendation 70, Study Program 25, all on standard frequency transmissions and time signals; and Study Program 19 and Report 4 (both on methods of measuring field strength).

COMMISSION II

1. In the light of communications relating to the scattering of radio waves by fluctuations in the refractive index of the atmosphere made to Commission II during the present General Assembly, it is formally recommended by Commission II that the study of this subject should be fostered by U.R.S.I. especially in the following directions :

a) The extent of the dependance of the scattered field on latitude, climate, and terrain to be further studied by means of observations in different countries,

b) The statistical characteristics of fluctuations in atmospheric refractive index to be explored, making use of recent developments in micro-meteorological measuring technique,

c) Quantitative knowledge of the means of relating the findings under (*b*) to practical radio results to be extended, especially in the direction of providing satisfactory approximations for all wavelengths less than 10 metres,

⁽¹⁾ *U.R.S.I. Inf. Bul.* n° 73, p. 51-54.

d) In particular that measurements of field strength from high power transmitters above 100 Mc/s at low antenna heights, and at great distances, especially beyond 200 miles, are desirable. Meteorological measurements designed to improve understanding of the propagation mechanism are also desirable.

2. In view of the situation revealed by the C.C.I.R. (Geneva) Study Programme n° 18, it is recommended that :

a) Study of the received field within or about the radio horizon receive particular attention,

b) Research should be directed towards establishing a better understanding of the correlation between readily available synoptic meteorological data and radio propagation characteristics,

c) Such work should be conducted at all wavelengths below 10 metres,

d) It should also include study of the effect of the fine structure of the atmosphere.

3. The attention of all National Committees is drawn to the C.C.I.R. (Geneva) Study Programmes n° 11, 12 and 13.

4. In view of the importance of conditions in the lower atmosphere to the propagation of the shorter radio waves, it is recommended that U.R.S.I. take steps to ensure that national meteorological authorities are aware of the need of radio scientists for aerological observations; and that aerological observations should be organised so as to provide as much information as possible for application in the radio field. More detailed meteorological measurements, including those with airborne equipment with emphasis on the study of the fine structure of the atmosphere are considered advisable.

5. The Commission wishes to ask the Joint Commission of the International Geophysical Year to take into consideration the needs of radio meteorology when planning their meteorological measurements for 1957-58.

COMMISSION III

1. *Ionospheric wind measurements.* — It is strongly recommended that a world wide study of movements in the ionosphere should be made. It is recognized that information on such movements can be obtained by a variety of methods but for a world-wide study there may be advantages in comparing results obtained by the same method e. g. that involving the study of echo fading on spaced receivers.

2. *Ionospheric absorption measurements.* — The method of measuring ionospheric absorption employing galactic noise signals merits close attention and development. The observation of Sudden Ionospheric Disturbances by this method also merits attention.

3. *Radio observations of aurorae.* — The work on the study on aurorae by the radio echo method should be intensified and also that on the effects of aurorae on galactic noise fluctuations.

4. *Ionospheric storm studies.* — The Commission strongly urges the need for an extended study of the development and morphology of ionospheric storms.

5. *Propagation of very high frequencies.* — The American experiments on the propagation of very high frequency waves over distances of 1000 to 2000 km, by ionospheric scattering should be repeated in other parts of the world.

Sub-Commission on the Study of the Propagation Time of Radio Signals

Considering :

(a) the great interest placed by the I.A.U. and the I.G.G.U. on the determination of the propagation time of radio signals over long distances ;

(b) the fact that the next world-wide cooperation on determination of longitudes will take place in 1958 ;

(c) that experiments recently undertaken using short waves over a single path of about 6800 km indicate the possibility of attaining by statistical methods an accuracy of 0.1 milliseconds in the measurement of this time and

(d) that the designation of some delegates of the U.R.S.I. for a Joint Commission has been suggested by I.A.U.

it is recommended that :

(a) such experiments should be repeated and extended within the next few years by as many laboratories as possible over long paths in various parts of the world ;

(b) the experiments should be undertaken in such a way that statistical results may be derived, i. e. the mean value of the propagation time over a short period (e. g. one minute) ;

(c) the experiments should be coordinated by the responsible permanent Sub-Commission of the Commission III of U.R.S.I. ;

(d) the delegates of U.R.S.I. at the Joint Commission eventually to be constituted by I.C.S.U. should be, at the right time, designated by the Sub-Commission ;

(e) this resolution should be communicated to the General Assembly of I.A.U. at Rome, September 1952.

COMMISSION IV

Commission IV resolved :

1. To recommend U.R.S.I. to comment as follows on the C.C.I.R. Study Programmes :

(a) *Study Programme 23* ⁽¹⁾ :

§ 1-4. — We agree that the Thomas Method is valuable and its use be continued until supplanted by an accepted objective method.

Steps are now being taken to carry out the studies indicated in these paragraphs.

⁽¹⁾ *U.R.S.I. Inf. Bul.*, **73**, p. 61-64.

§ 5-8. — We believe that simple stroke counters installed at a few places will provide information that may result in more complete thunderstorm analysis data that long-range direction finders will provide more useful scientific data for use in drawing world maps of thunderstorms activity.

§ 9-12. — We agree with the need for studies expressed in paragraphs 9-11, but before drawing maps it is necessary to know what parameters are to be represented in the maps.

(b) *Question 54, item 13* ⁽¹⁾. — We favour support for this resolution, but wish to point out that consideration should be given to the time constants of the proposed noise measuring equipment in establishing the length of the interruptions.

2. To ask National Committees to encourage research designed to answer the question :

« What are the most easily measured characteristics of terrestrial radio noise from which the interference to different types of communication system can be determined ? »

3. To hold a discussion on the question mentioned in resolution (1) at the next (XIth.) General Assembly, and to ask National Committees to submit papers, including summarising reports, on that occasion.

4. That the international programme of simultaneous recording of atmospheric waveforms arranged at the VIIIth. General Assembly of the U.R.S.I. (Stockholm) ⁽²⁾ be continued and developed, and that the workers concerned should make necessary arrangements between themselves.

5. That the phenomenon known as « Whistlers » be observed or recorded at as many stations as possible, at all latitudes. Special attention should be paid to the polar and equatorial regions, and to the synchronization of the observations.

6. To recommend that during the International Geophysical Year :

⁽¹⁾ *U.R.S.I. Inf. Bul.*, **73**, p. 51-54.

⁽²⁾ *U.R.S.I.*, vol. VIII, P. I, p. 62.

(a) Measurements of a high standard should be made of the radio noise at as many places as possible, including the Polar and Auroral regions. The standard routine methods of recording should be used.

(b) Observations of the waveforms of Atmospherics, including « Whistlers », should be made at several places, including the equatorial and polar regions. Use should be made of any special facilities provided for synchronization.

(c) The optimum use should be made of organizations set up for the locations of thunderstorms and lightning flashes.

COMMISSION V

1. Referring to Recommendation n° 56 (Question n° 9) of C.C.I.R., it is considered impracticable to make general use of the frequencies specified therein for solar observations; however, it is suggested that C.C.I.R. ask the Frequency Allocation authorities to give all possible protection to those engaged in radio astronomical measurements in the radiospectrum from 10 Mc/s to 30 000 Mc/s.

2. Referring to Resolution n° 20 of the U.S. National Committee it is agreed desirable to emphasize again to C.C.I.R. the importance of preserving a band of frequencies for the hydrogen line at 1420 Mc/s. At present a bandwidth of 3 Mc/s is required, but it seems probable that such observations may extend to lower frequencies, perhaps to 1400 Mc/s, in the future.

3. Referring to the statement by the Indian National Committee on « Standardization of Solar Radio Equipment » it is agreed that the precision of such equipment is still unsatisfactory. However, no specific recommendations for improvement can be made at present.

4. It is recommended that further observations be made on :

(a) quiet sun radiation at the lower frequencies.

(b) the maximum intensity of bursts on all frequencies.

5. It is recommended that observational data for cooperating observatories be submitted at monthly intervals to Mr. SMERD

as soon as possible after the end of each month. The assembly of such monthly data and its general distribution to cooperating observatories will be continued.

6. The continuance of Sub-Commission (Va) is recommended.

7. It is recommended that Dr. D. F. MARTYN be appointed Historian of Commission V.

8. It is recommended that the Report of Sub-Commission Vb (Terminology and units) be forwarded to Commission 40 and 3 of I.A.U. for consideration at the Rome Assembly and that part (3) of the Report, bearing on the Universal Decimal Classification, be forwarded to the Fédération Internationale de Documentation with a recommendation that it be incorporated in the tables of the Universal Decimal Classification.

9. The Commission notes the valuable preparatory work by Dr. MENZEL and Professeur MASSEY on the preparation of a report on the Dynamics of Ionized Media (Special Report n° 3) and urges the early collation of the United States and European contributions.

10. Special Reports :

(a) *Interstellar Hydrogen* : OORT (Chairman), PURCELL, PAWSEY.

(b) *Discrete Sources*. — BOLTON (Chairman), HANBURY BROWN (Manchester), SMITH (Cambridge).

(c) *The Distribution of Radio Brightness on the Solar Disk*. — CHRISTIANSEN (Chairman), HAGEN, LAFFINEUR, SMITH.

(d) *Meteors*. — (Covered partially by Commission III, but Commission V urges the inclusion of material on the origin of meteors).

11. *Basic Solar Index*. — The conclusions on this matter were arrived at in joint session with Commission III. The Commission stresses the value of measurements on 3000 Mc/s and supports the recommendations of Sub-Commission Vc.

Sub-Commission Vc on Basic Solar Index

(a) The Sub-Commission considers that an index of solar activity based on radio-frequency observations, although it has been the object of several important researches, cannot be considered as perfectly defined at present.

(b) The Sub-Commission nevertheless proposes a provisional index on the observation of two groups of phenomena :

(i) The intensity of the radiation on a frequency near 3000 Mc/s (wavelength 10 cm), whose correlation with the total area of sunspots seems well established.

(ii) The presence and intensity of noise storms connected with the appearance and activity of disturbing regions on the surface of the sun.

(c) The index thus be composed of the intensity of solar radiation on 2800-3000 Mc/s expressed in units of 10^{-22} watts $m^{-2}(c/s)^{-1}$.

(d) This number would be followed by the sign / and a number from 0 to 3 expressing the intensity of noise storms in progress between 60 and 300 Mc/s (1 and 5 m), as in Quarterly Bulletin.

(e) The Sub-Commission will continue its work by correspondance between its members, and endeavour to propose an observing programme in the world's observatories on the wavelength of 10 cm, following the recommendation made at Zurich. It will also encourage work on the correlation between ionospheric phenomena and various metre wave radiations within Sub-Commission Vc.

COMMISSION VI

Recommendations concerning future work :

1. Attention of the Members of Commission VI and of National Committees was called on the following subjects for intensive work :

(a) a more precise understanding of the relation between the bandwidth of a circuit and its decay time.

(b) a study of the relation between continuous or discrete distributions of currents on surfaces of particular shapes and their radiation patterns, and the synthesis of such patterns by control of the currents.

(c) Continued emphasis on radio applications of work in the field of non-linear circuits.

(d) Continued emphasis on information theory and its practical applications.

(e) A study of the solutions and approximate solutions of the integral equations describing the field distribution near a diffracting aperture.

Sub-Commissions :

2. It was recommended that the work of the Sub-Commission VIa on Information Theory ⁽¹⁾ be continued.

3. It was agreed to constitute a Sub-Commission (VIb), jointly with Commission IV, to study what are the parameters required to describe Terrestrial Radio Noise so that circuit engineers can evaluate its effect in communication circuits. The Membership of this Sub-Commission is as follows : Prof. TELLEGEN (*Chairman*) ; Prof. A. BLANC-LAPIERRE ; Dr. H. BREMMER ; Dr. TASNY-TSCHIASSNY.

4. It was agreed to constitute a Sub-Commission (VIc) to study Fourier Transforms, the membership being as follows : Dr. R. C. SPENCER (*Chairman*) ; Prof. A. BLANC-LAPIERRE ; Dr. H. BREMMER ; Prof. G. A. WOONTON.

5. It was agreed to constitute a Sub-Commission (VI d) under the Chairmanship of Dr. VAN ATTA on Circuit Theory and Antennas. The Sub-Commission constituted by Presidents of National Commissions VI or their delegates has the specific purpose of summarizing, for the next General Assembly, the work in the fields of circuit theory and antennas.

Recommendations to National Committees :

6. It was recommended to the National Committees that they give serious consideration, prior to the next General Assembly to their position relative to the following proposed resolution :

« That the use of rationalized M.K.S. units and of the time » periodic factor $e^{+i\omega t}$ be recommended. »

(1) *U.R.S.I.*, vol. VIII, P. I, p. 64.

Collaboration with the C.C.I.R. :

7. Concerning the study Programme n° 10 of the C.C.I.R. ⁽¹⁾, it was acted :

(a) That a working group on « Problems relative to the Theory of Information » submitted a report which contained a reply to Point I of the Study Programme, consisting of a bibliography.

(b) That a Report (Doc. n° 241) prepared by the French National Committee answered Point 2 with the following definition of quantity of information.

« The unit of quantity of information corresponds to a « message unit » consisting of a random choice between two equally » probable signals. »

(c) That point 3 was of great interest and that work bearing thereon should be continued because it might lead to results of great practical consequence.

⁽¹⁾ *U.R.S.I. Inf. Bul.*, **73**, p. 54-58.

NATIONAL COMMITTEES

Membership

GERMAN FEDERAL REPUBLIC

Honorary Chairman : Prof. Dr. J. ZENNECK (München).

Chairman : Prof. Dr. J. BARTELS (Göttingen).

Assistant Chairman : Prof. Dr. G. LEITHÄUSER (Berlin).

Chairman : Prof. Dr. E. REGENER (Weissenau).

Secretary : Dipl.-Ing. W. MENZEL (Darmstadt, Rheinstrasse, 110).

SPAIN

President : D. José BALTA ELIAS, Professeur à la Faculté des Sciences, Isaac Peral nº 1, 1º Moncloa, Madrid.

Secretary : D. Joaquin CATALA ALEMANY, Professeur à la Faculté des Sciences, Université de et à Valence.

Members :

D. José GARCIA SANTESMASES, Professeur à la Faculté des Sciences, Chef du Département d'Electricité, Université de et à Madrid.

R. P. Antonio ROMANA, S. J., Directeur de l'Observatoire de l'Ebre, Tortose.

D. Juan MA TORROJA, Ingénieur, Directeur de l'Institut du Matériel Scientifique du Consejo Superior de Investigaciones Cientificas, Madrid.

INDIA

Official Members of the U.R.S.I. Commissions

COMMISSION I

Dr. K. N. MATHUR, Head of the Division of Weights and Measures, National Physical Laboratory, Hillside Road, New Delhi.

COMMISSION II

Dr. L. S. MATHUR, Meteorologist, India Meteorological Department,
Lodi Road, New Delhi.

COMMISSION III

Prof. S. K. MITRA, University College of Science, 92, Upper Cir-
cular Road, Calcutta.

COMMISSION IV

Dr. S. K. BANERJE, 3, Ramani Chatterjee Lane, Calcutta.

COMMISSION V

Prof. M. N. SAHA, F. R. S., University College of Science, 92, Upper
Circular Road, Calcutta.

COMMISSION VI

Mr. B. V. BALIGA, Adviser, Wireless Planning and Co-ordination,
Ministry of Communications, New Delhi.

COMMISSION VII

Dr. M. B. SARWATE, Director of Communications, Directorate
General of Civil Aviation, New Delhi.

UNESCO

Unesco issues guide to operation of Agreement on Importation of Educational, Scientific and Cultural Materials

Unesco has issued a Guide to the Operation of the International Agreement on the Importation of Educational, Scientific and Cultural Materials (1). The 21-page pamphlet gives the background of the Agreement sponsored by Unesco, which went into effect on 21 May 1952, and explains practically how the greatest benefits can be obtained from it.

The major purpose of the Agreement is to make it easier to import educational, scientific and cultural materials ; and the Guide points out that « the ultimate beneficiary is the individual in each country who, through the Agreement, will be able to obtain with less difficulty, and at less expense the materials he needs from abroad. »

The text of the Agreement, with five annexes listing materials covered, and a Protocol are given in full in the Guide. These follow explanatory material covering answers to such questions as : Who benefits ?, How to benefit ?, In case of difficulty, where to apply for information ?

Unesco Coupon Scheme

Information Circular No. 9

New participating countries

Since the issue of Information Circular n° 8, five additional countries have joined the Unesco Coupon Scheme and the

(1) Published by Unesco, Paris.

Price : \$ 20 ; 1/- ; 50 frs.

On sale as from 30-10-52.

addresses of their respective distributing bodies are given below :

Iraq. — Ministry of Education, Baghdad : Book Coupons and Coupons for Scientific Material.

Laos. — Commission Nationale pour l'Unesco, Ministère de l'Education, Vientiane : Book Coupons.

New Zealand. — National Film Library, New Zealand Education Department, 96 The Terrace, Wellington : Film Coupons.

Turkey. — La Bibliothèque Nationale, (Milli Kütüphane), Ankara : Book Coupons.

Viet-Nam. — Le Secrétaire Général, Commission Nationale pour l'Unesco, Ministère de l'Education, 160, rue Pellerin, Saigon : Book Coupons.

Distributing bodies in Ceylon

We give below the addresses of distributing bodies which have now been appointed by the Government of Ceylon for the sale of Book Coupons and Film Coupons :

The University Bookshop, University of Ceylon, Colombo : (Book Coupons).

Photo Cinex Ltd., 2 Galle Face Court, P. O. Box 1101, Colombo : (Film Coupons).

New address of book tokens limited

Book Tokens, Ltd., which is the distributing body for Unesco Book Coupons in the United Kingdom, has changed its address, as follows :

14 Buckingham Palace Gardens, London, S. W. 1., England.

« Science and Film »

The attention of Film Coupon users is drawn to the new quarterly journal *Science and Film*, published in London for the International Scientific Film Association.

In Vol. I, n° 1, which appeared in February 1952, the journal describes itself as an international review devoted to the rôle of film in science. The first four issues, it is stated, intend to be largely a factual record, carrying news of happenings, of films made, of technical enquiry and advance. It aims at being a

vehicle for the international exchange of knowledge, criticism and expertise. *Science and Film* wishes to reflect the contribution of cinematography to the advancement of science - as a medium of expression, as an aid to learning, and as a weapon of research. It will therefore carry items of information likely to interest a wide range of specialists : those engaged in popularizing science through public relations and adult education generally, in teaching at all levels, in technical training and in film making, as well as those who are concerned with specialized research in university and industrial laboratories.

Science and Film will appear for the time being in English ; a French edition will follow as soon as sufficient interest is indicated to make it feasible. The subscription is 10s. 6d. a year for four quarterly issues. Subscription and enquiries should be addressed to *Science and Film*, International Scientific Film Association, 164 Shaftesbury Avenue, London W.C.2., England.

Film coupons for British Colonial Territories

FILM COUPONS may now be obtained by institutions and individuals in British Colonial Territories. Applications for coupons should be made to the Colonial Office, 15 Victoria Street, London S.W.1.

Orders for electronic equipment

Purchasers of electronic equipment, paid for with Unesco Coupons for Scientific Material, may send their orders to the following supplier :

Terminal Radio Corporation, 85 Cortland Street, New York 7, N. Y.

Gift coupons

The German Federal Republic has joined the Unesco Gift Coupon Programme as a donor country and arrangements are being made to launch the Scheme this autumn. Until now the Gift Coupon Programme has operated in the U.S.A., the United Kingdom, France and Canada.

In addition to the Unesco Gift Coupons already in use (\$ 10, \$ 50, £ 1 sterling and 1000 French francs) Unesco is issuing new Gift Coupons in UNUM denominations. Each UNUM (Unesco Unit of Money) has a purchasing value equivalent to 5 U.S. dollars.

and suppliers accepting these coupons will be reimbursed by Unesco in the usual way in their own currency at the official rate of exchange. UNUM coupons will be available in denominations of 1-UNUM, 2-UNUMs and 10-UNUMs.

Countries participating in Unesco Coupon Scheme

Country	Book Coupons	Film Coupons	Scientific Material Coupons
Austria	×	—	—
Belgium	×	×	×
Burma	×	—	—
Cambodia	×	×	×
Canada	—	×	—
Ceylon	×	×	×
Czechoslovakia	×	—	—
Egypt	×	×	×
France	×	×	×
Germany	×	—	—
Hungary	×	—	—
India	×	×	×
Indonesia	×	×	×
Iraq	×	—	×
Israel	×	—	—
Italy	×	—	—
Laos	×	—	—
Netherlands	×	—	—
New Zealand	—	×	—
Pakistan	×	×	×
Persia	×	—	—
Switzerland.....	×	×	×
Syria	×	—	—
Thailand	×	×	×
Turkey	×	—	—
Union of South Africa	×	×	×
United Kingdom	×	×	×
United States of America.....	×	×	×
Viet-Nam	×	—	—
Yugoslavia	×	—	—
Unesco Science Co-operation Offices	×	×	×

INTERNATIONAL COUNCIL OF SCIENTIFIC UNIONS

Officers

At the General Assembly of the International Council of Scientific Unions held in Amsterdam, October 1-3, 1952 the following officers were elected :

Professor B. LINDBLAD, *President.*

Professor H. SOLBERG, *Vice-President.*

Colonel E. HERBAYS, *Vice-President.*

Professor W. ALBERT NOYES, Jr., *Treasurer.*

Professor A. V. HILL, *Secretary General.*

Letters for the Secretary General, Professor A. V. HILL should be addressed in future to the Headquarters of the Council at :

THE ROYAL SOCIETY,

Burlington House,

London, W.1.,

England.

INTERNATIONAL UNION OF THEORETICAL AND APPLIED MECHANICS

Officers

1 November 1952-31 October 1956

President : H. L. DRYDEN, Director, National Advisory Committee for Aeronautics, 1724, F Street, N.W. Washington 25, D. C. U.S.A. ;

Vice-President : J. PERES, 95, Boulevard Saint-Michel, Paris V, France ;

Secretary : F. H. VAN DEN DUNGEN (until November 1st., 1954 ⁽¹⁾), 41, Avenue de l'Arbalète, Boitsfort, Bruxelles ;

Treasurer : G. TEMPLE, King's College, Strand, London, W.C.2 ;

Members :

J. M. BURGERS, c/o Laboratorium voor Aero en Hydrodynamica, Nieuwe Laan 76, Delft, Holland ;

K. ERIM, Istanbul Universitesi, Fën Fakültesi, Matematik Enstitüsü, Istanbul, Turkey ;

R. GRAMMEL, Robert — Bosch — Str. 101, Stuttgart — N., Germany ;

F. K. G. ODQVIST (until November 1st., 1954), Royal Institute of Technology, Stockholm 26, Sweden.

⁽¹⁾ The nomination of Professor van den Dungen as a member of the Bureau is valid until November 1st, 1956.

MIXED COMMISSION ON THE IONOSPHERE

Third Meeting at Canberra. August 24-26th 1952

RESOLUTIONS

1. *Third International Polar Year 1957-58.* — The Commission supports the proposal that the title of this special year be changed to « International Geophysical Year ».

2. *Organisation of observations during the International Geophysical Year.* — The Commission urges that National Committees should be formed as soon as possible, to consider both the National and International aspects of work during the International Geophysical Year.

3. *Financial support for work during the International Geophysical Year.* — During the two previous Polar Years the organisation and observational work were substantially assisted by grants or by the provision of apparatus from various sources such as International Trusts or Foundations, by certain Government Departments or by Scientific Societies. Whilst such support may again be forthcoming the Commission proposes that on this occasion an application for support be made to Unesco.

4. *Reduction and analysis of records.* — The Commission recommends that organisations be set up in the Geophysical Year to pursue energetically the analysis of geophysical records accumulated during the past, and in the case of ionospheric records that some of the best $h'f$ records should be analysed in detail to determine the way in which electron density depends on height.

5. *Network of observing stations.* — The Commission stresses the need for ensuring that during the Third Geophysical Year the network of magnetic, auroral and ionospheric stations should not be less dense than during the previous Polar Years.

6. *Southern Hemisphere observations.* — The Commission feels that there should be an increased effort to make adequate observations in the Southern Hemisphere, it being highly desirable to have geophysical data on a scale comparable with that available for the Northern Hemisphere.

7. *Observations by ship and air personnel.* — The Commission recognises that in collecting geophysical data valuable contributions might be made by ship and air personnel and suggests that efforts should be intensified to obtain geophysical data by this means. The value of meteorological observations at sea and of the observation from aircraft of aurorae above cloud level, may be cited in this connection.

8. *Magnetic Gradient measurements.* — The Commission has considered the possibility of using magnetic gradiometers or other techniques for measuring the gradient of magnetic field and their rates of change. In this way the height, dimensions and structure of the auroral current sheet might be determined. It is suggested that work should be undertaken now in an attempt to develop a practical method of doing this before the Geophysical of 1957-58.

9. *Rocket Experiments.* — The Commission reaffirms its earlier resolution on this subject (resolution 5 of meeting of September 6th. 1950) and urges that the use of rockets for geophysical research purposes should be intensified during the Geophysical Year.

10. *Ionospheric Wind Measurements.* — The Commission feels that there should be extended efforts to determine the world distribution of ionospheric winds. To this end it is suggested that a simple method should be used at several places, so that results from different stations may be readily compared. In addition special methods, including those involving the scintillation of radio stars should be used wherever possible.

11. *Geophysical work in southerly latitudes.* — The Commission notes with satisfaction the valuable geophysical work now in progress at Macquarie Island, Campbell Island and at Heard Island and urges that such studies should be continued and expanded during the Geophysical Year. The Commission also draws attention to the desirability of establishing a station on the mainland of Antarctica.

12. *Observers at Geophysical Out-stations.* — The Commission wishes to call the attention of all organisations concerned with operating geophysical observatories in remote sites to the desirability of properly interesting the observers at these stations in the work in hand. To this end the provision of a certain minimum of suitable scientific books and periodicals is strongly recommended.

13. *Auroral Investigations.* — The Commission is of the opinion that extended work on both the radio and optical observation of aurorae is very desirable. In the case of the radio methods it is desirable that as much knowledge as possible be gained before the next Geophysical Year concerning this technique. Further laboratory and theoretical work relating to this subject is also necessary.

14. *Alerting of aurorae and meteor observers.* — The Commission calls the attention of those concerned to the need for having a close network of auroral and meteor observatories with a communication link whereby observers in the western zones may be warned concerning the onset of these phenomena. This alerting procedure should be particularly valuable for those engaged in spectroscopic work.

15. *Auroral observations in Northern and Southern hemispheres.* — The Commission reaffirms its resolution of 1950 concerning the measurement of the intensities of selected lines in auroral spectra. It also stresses the need for auroral observations at both Northern and Southern hemisphere stations, for observations of the zenith occurrence of aurorae and if possible for observations of aurorae at stations located on the same geomagnetic meridian.

16. *World Days in upper atmospheric research.* — The Commission reaffirms its recommendation XVI of 1950 concerning « World Days in Upper Atmospheric Research » and calls the attention of the I.C.S.U., Geophysical Year Committee to the need for its implementation prior to and especially during the International Geophysical Year.

17. *Tidal Phenomena in the Ionosphere.* — In view of the great importance of tidal phenomena in the ionosphere the Commission urges all ionospheric observatories to aim at the maximum pos-

sible accuracy in virtual height and critical frequency measurements so that the tides in the various layers can be accurately deduced. The need for an accurate determination of the E-layer lunar tide at southern hemisphere stations is particularly emphasised.

18. *Special Radio Time signal transmissions.* — The Commission urges the need for suitable special radio transmissions whereby workers may readily establish accurately the time relations between events at different places on the earth.

19. *Ionospheric research workers.* — The Commission has considered recent progress in the field of ionospheric research and calls attention to the need for suitably trained theoretical and experimental physicists. A knowledge of the electrodynamics of ionised media is an important requirement for such workers.

1953 CONFERENCE ON RADIO METEOROLOGY

The University of Texas will be host to a Conference on Radio Meteorology scheduled for the second week in November, 1953. This meeting will be jointly sponsored by the American Meteorological Society, the Radar Weather Conference, the Institute of Radio Engineers through the Professional Group on Antennas and Propagation, U.S.A. National Commission II on Tropospheric Radio Propagation of the International Radio Scientific Union and the Joint Commission on Radio Meteorology. An approximate four day conference is planned with sessions on such topics as tropospheric radio wave propagation mechanisms, radar storm detection and rainfall determination, cloud physics, turbulence, spherics, refractive index climatology and forecasting and atmospheric reflections. No simultaneous sessions are planned and a combination of invited review type papers will supplement individually submitted reports on specific research activities.

A call for papers will be issued during the first months of 1953 in sufficient time to permit the advance publication of approximate 1000-1500 word abstracts. Further information may be obtained from any of the following members of the Steering Committee for the 1953 Conference on Radio Meteorology :

1. L. G. CUMMING, Technical Secretary, Institute of Radio Engineers, 1 East 79 Street, New York City.
2. J. R. GERHARDT, Assistant Director, Electrical Engineering Research Laboratory, The University of Texas, Austin, Texas.
3. W. E. GORDON, Secretary, Joint Commission on Radio Meteorology, School of Electrical Engineering, Cornell University, Ithaca, New York.
4. Martin KATZIN, Director, Wave Propagation Research Branch, Naval Research Laboratory, Washington, D. C., representing U.R.S.I. National Commission II.

5. J. S. MARSHALL, Associate Professor of Physics, McGill University, Montreal, Canada, representing the Radar Weather Conference.

6. Newbern SMITH, Director, Central Radio Propagation Laboratory, National Bureau of Standards, Washington, D. C., representing the I.R.E. Professional Group on Antennas and Propagation.

7. K. C. SPENGLER, Executive Secretary, American Meteorological Society, 3 Joy Street, Boston, Massachusetts.

C. C. I. R.

Meetings of Study Groups I, III, V, VI and IX (The Hague and Stockholm, 1952)

We are publishing hereunder a brief summary of the most important results obtained from the meetings for what concerns items which are of some interest to U.R.S.I. (Abstract from *Telecommunication Journal*, n° 9, September 1952).

Study Programme n° 10 and Question n° 44 (Information Theory).

The existing question was somewhat amplified by inclusion of the determination, for radiotelephony, of the relation between the amount of useful information (intelligibility) and the shape and width of the pass band.

Study Programme n° 17 (Tropospheric propagation curves for distances well beyond the horizon).

Study Programme n° 18 (Tropospheric wave propagation).

The Study Group modified the tropospheric wave propagation curves given in Recommendation n° 55, mainly on the basis of measurements made in the United Kingdom, which were in agreement with as yet unpublished reports of similar measurements made in the U.S.A.

The Study Group was of the opinion that, for the future, certain methods of presentation and of statistical analysis should be followed, corresponding to the method used by some participants and by the C.C.I.R. Secretariat.

Suggestions were made for further work in the study of propagation over fixed optical links.

Study Programme n° 23 (Measurement of atmospheric radio noise).

In order to make effective the collaboration with the WMO in the study of thunderstorm distribution over the world, it was

stressed that it is urgently necessary that a suitable simple device to count automatically lightning discharges should be constructed.

Question n° 53 (Choice of a basis index for ionospheric propagation).

While it was agreed that eventually it would be preferable to use as an index some characteristic of the ionosphere itself, rather than a characteristic of the sun, no concrete proposal was made.

PUBLICATIONS

We inform our readers that copies of U.R.S.I. publications are available at the General Secretariat at the following prices :

Information Bulletin :

Annual subscription	Belgian Fr. 200	£ 1.8.3	\$ US 4,00
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Proceedings of the General Assemblies :

Volume II — 1928 —	Belgian Fr. 100	£ 0.14.6	\$ US 2,00
Volume III — 1931 —	Belgian Fr. 100	£ 0.14.6	\$ US 2,00
Volume IV — 1934 —	Belgian Fr. 100	£ 0.14.6	\$ US 2,00
Volume V — 1938 —	Belgian Fr. 150	£ 1.1.6	\$ US 3,00
Volume VI — 1946 —	Belgian Fr. 200	£ 1.8.3	\$ US 4,00
Volume VII — 1948	Belgian Fr. 250	£ 1.15.4	\$ US 5,00
Volume VIII — 1950			
Part. I	Belgian Fr. 300	£ 2.3.0	\$ US 6,00
Part. II	Belgian Fr. 350	£ 2.10.0	\$ US 7,00

Special Reports :

N° 1 — On Solar and Galactic Radio noise	Belgian Fr. 50	£ 0.7.3	\$ US 1,00
N° 2 — On Tidal Phenomena in the Ionosphere	Belgian Fr. 50	£ 0.7.3	\$ US 1,00

Proceedings of the Joint Commissions :

On the *Ionosphere* :

First meeting, Brussels 1948	Belgian Fr. 100	£ 0.14.6	\$ US 2,00
Second meeting, Brussels 1950	Belgian Fr. 150	£ 1.1.6	\$ US 3,00

On *Radio-Meteorology* :

First meeting, Stockholm 1948	Belgian Fr. 25	£ 0.3.3	\$ US 0,50
Second meeting, Brussels 1951	Belgian Fr. 50	£ 0.7.3	\$ US 1,00

