INFORMATIONS

Secretariat

Accordingly to a recommendation taken by the Executive Committee during the General Assembly of Stockholm, the U. R. S. I. Bulletin shall in the future be issued every two months and shall be published separately in French and in English.

Readers wishing to receive another edition that the one sent to them are requested to apply either to their National Committee either to our Central Office in Brussels.

Sir Edward V. Appleton, President of the Union, has been appointed Principal and Vice-Chancellor of the University of Edinburgh.

He is resigning from the post of Secretary of the Department of Scientific and Industrial Research which he has held since February 1939.

It is expected that Sir Edward will assume his new duties in May 1949 when his new address for all U. R. S. I. correspondence will be : Old College, The University, Edinburgh (Scotland).

We beg him to accept our warmest congratulations for this new appointment which will allow him to go back to scientifical researches.

British National Committee

From January lst, 1949, this committee is composed as follows :

Sir Edward V. Appleton, F. R. S., *Chairman*, Department of Scientific and Industrial Research, Dorland House, 14-16, Regent Street, London S. W. 1.

Sir Charles Darwin, F. R. S., Bushy House, Teddington, Middlesex.

Prof. P. M. S. Blackett, F. R. S., The Physical Laboratories, Th University, Manchester.

Prof. S. Chapman, F. R. S., 43, High Street, Oxford.

Prof. J. Sayers, Electron Physics Department, The University Edgbaston, Birmingham, 15.

J. A. Ratcliffe, Esq., Cavendish Laboratory, Cambridge.

Group-Captain H. G. Leonard-Williams, Wireless Telegrap Board, 143, Piccadilly, London W. 1.

Prof. M. G. Say, Electrical Engineering Department, Heriot Watt College, Chambers Street, Edinburgh.

Prof. J. T. Randall, F. R. S. King's College, Strand, Londo W. C. 2.

Col. Sir A. Stanley Angwin, Engineer-in-Chief, G. P. O., Alde House, London E. C. 1.

H. Bishop, Esq., Broadcasting House, London W. 1.

Dr. W. J. G. Beynon, University College, Singleton Park, Swansea

C. W. Oatley, Esq., 89, Gilbert Road, Cambridge.

H. W. L. Absalom, Esq., c/o The Meteorological Office, Air Minis try, Kingsway, London W. C. 2.

A. H. Mumford, Esq., Engineer-in-Chief's Office, G. P. O., Alde House, London E. C. 1.

Group Captain W. Proctor Wilson, British Broadcasting Corpo ration, Engineering Research Department, 42/44, Nightin gale Square, Balham, London S. W. 12.

Dr. R. L. Smith-Rose, National Physical Laboratory, Teddingtor Middlesex.

Prof. R. W. Ditchburn, The University, Reading.

Prof. E. T. S. Walton, 26, St. Kevin's Parks, Dartry, Dubli (Eire).

International Council of Scientific Unions

Dr. A. Establier, Liaison Officer of the International Counc of Scientific Unions at the Unesco has been nominated Head the Scientific Co-operation Office of Unesco in Latin America.

We beg him to accept our warmest congratulations and thank him for the help he always gave to our Union in its relations with Unesco.

Dr. Ronald Fraser has been appointed to succeed to Dr. Establier.

Unesco

INTERNATIONAL RESEARCH LABORATORIES

On August 10 th, 1948, *the Economic and Social Council of the United Nations* took the following resolution :

The Economic and Social Council,

Having noted the report on the problem of establishing international United Nations Research Laboratories submitted by the Secretary-General in pursuance of Resolution 22 (III),

Requests the Secretary-General to convey the Council's thanks to the specialized Agencies, international or national scientific organizations and scientists for their expert and fruitful co-operation in the inquiry conducted ;

Affirms its interest in the furthering of the development, in all sciences, of research and discovery which are the essential source and stimulus of all economic and social progress ;

Considers that, owing to the magnitude and diversity of the problem, the studies ought to be actively pursued ;

Invites the Secretary General

(i) to communicate to all Governments the Council's desire to have the problem of establishing international United Nations Research Laboratories discussed by the governing bodies of all the important national scientific institutions for higher education and research, and to be apprised of their findings through the intermediary of the Secretary-General of the United Nations ;

(ii) to send a similar communication to the United Nations Educational, Scientific and Cultural Organization and the other specialized Agencies concerned and to the leading international scientific organizations ;

(iii) to form, during next year, in co-operation with the United Nations Educational, Scientific and Cultural Organization, a small

committee of experts in the basic sciences (exact, natural and social) to examine, in consultation with the Specialized Agencies, the question of the possible establishment of international research laboratories, including the advisability of, and appropriate procedure for, convening an international conference of scientists with instructions to submit a general report to the Council on this subject ;

(iv) to submit to the Council in due course this preparatory committee's report and the result of the further consultation referred to in paragraphs 1 and 2 above.

Being consulted, in 1947, as an individual on the opportunity of International Laboratories, the President of U. R. S. I., Sir Edward Appleton, stated that in regards to researches undertaken in the field of Radioscience he found more useful to ensure, if possible, a financial support to U. R. S. I. rather than to organize International Laboratories.

He added that the above remarks apply to the general work of the Union and thought, however, in very special cases that some advantage might accrue from the establishment of international bases for scientific work in geophysics in relatively inaccessible regions (e. g. the Antarctic). Such bases would then provide accomodation and facilities for anyone who required to conduct investigations under those special geophysical conditions.

Sir Edward stated also that if a subject were wanted for an international laboratory he would suggest that of *Solar and Terrestrial Relationships*. Such a laboratory could be, on the experimental side, furnished with equipement for a watch on the sun and also a watch on the terrestrial atmosphere. But, more than that, it could be a world centre for theoretical study of these problems if it could collect, from all other observatories working in this field, their detailed observations, The work on the solar side would include solar physics in the widest sense while on the terrestrial side there would be included the study of solar radiations and emanations and of their effects on the terrestrial atmosphere (both upper and lower atmosphere). Geomagnetic variations which have a solar control would also be included.

The work on the atmospheric absorption of radiation would include not only the study of the ionosphere, the ozonosphere

but also the study of absorption of infrared radiations in the lower atmosphere. All these matters have important bearings on practical subjects like radio and meteorology.

The matter being of importance, we found necessary to consult the Presidents of National Committees and Commissions and we beg all the members of U. R. S. I. to communicate their suggestions either to our Central Office, either to their National Committee.

The Secretary.

Pure and Applied Physics International Union

Document S. G. 48-9

ABSTRACTS OF THE PROCEEDING OF THE NINTH CONFERENCE ON WEIGTHS AND MEASUREMENTS

The Ninth General Conference on Weigths and Measurements was held in Paris and Sèvres (France) from October 12 to 21, 1948.

The following decisions seem to be of interest to Radiophysicists.

1. The Conference decided to give the name of *candela* (symbole *cd*) to the luminous intensity unit, called previously *international candle*, based on the brillancy of the integral radiator at the solidication temperature of platinum. That unit has to be substituted to the units previously in use (international candle and hefner).

2. The unit of warmth is the *joule*.

3. The conference adopted the *International Scale of Temperature* proposed by the Consultative Committee on Thermometry and Calorimetry and decided to give to the temperature degree the name of *Celsius degree* instead of centigrade or centesimal degree.

4. The Conference decide to start an inquiry by the scientific educational and technical agencies of all countries, in view of establishing and using in international relations, an *international practical system of units*.

5. The Conference adopted a list of unit symbols.

a) *Principles.* — Symbols of units are written in Roman letters generally small figures; nevertheless for symbols derived from proper names, capital Roman letters are used. Those symbols are not followed by a stop.

In numbers, the semi colon (French mode) or the stop (English mode) are only used to separate the decimal part of the numbers. In order to facilitate the reading, numbers may be divided into slices of three figures, slices are never separated by stops or semi colons.

b) *Symbols* :

metre	m	hour	h
square metre	m^2	ampere	A
cubic metre	m^3	volt	V
micron	μ	watt	W
liter	l	ohm	Ω
gram	g	coulomb	C
ton	t	farad	F
second	s	henry	H
erg	erg	hertz	Hz
dyne	dyn	poise	P
Celsius degree	°C	newton	N
Kelvin degree	°K	candela (new candle)	cd
calory	cal	lux	lx
bar	bar	lumen	lm
		stilb	sb

c) *Note.* — When it is question not of a temperature but of temperature interval, « degree » has to be written in full letter or by the abbreviation « deg ».

COMMISSIONS

Commission I.
On Measurements and Standardization

References concerning documents presented at the General Assem-
ıly of 1948 *and summarised in the Proceedings of the Meeting*
Vol. VII, in printing).

)ocument nº 137 : Appareils de mesure de champs électrique sur ondes métriques, by F. CARBENAY. Preliminary note nº 125, L. N. R.

)ocument nº 138 : Observations sur la modification des fréquences étalonnées de l'émetteur WWV par l'effet Doppler, by B. DECAUX, C. R. de l'Académie des Sciences, Meetings of January 26 and July 12, 1948. Preliminary note, nº 112 L. N. R.

Commission II.
On Troposphere and Wave Propagation

Commission III.
On Ionosphere and Wave Propagation

AMATEUR CO-OPERATION

Hereafter, recommendation III made by the previous Com-
ıission II (On Wave Propagation) concerning amateur co-opera-
on in the fields of Commissions II and III.

The Commission

considering the valuable support given by amateurs to scienti-
: researches on radio wave propagation, for example the aid given
y the Swiss and Swedish amateurs in their work on propagation
ı the troposphere, by the studies made by French amateurs

on the sporadic E Layer, by the Danish amateurs in their obser vations on interaction phenomena ;

Suggests :

(*a*) that some appreciation of this kind of work should be give by U. R. S. I. and that the attention of the amateurs should b called to the real value of their collaboration ;

(*b*) that it would be desirable that amateurs of different nation should be organized, as has been done in some countries, in differen sections which would be responsible for studying definite point such as ionospheric reflection, solar influences, tropospheric pro pagation, interaction phenomena, hissing due to meteors, etc. et

(*c*) that this work should be organized by the amateur league themselves to which technical advice should be given and pro grammes should be proposed ;

And recommends :

(*a*) that National committees should ask amateur organiza tions to publish an article giving a general review of the activitie they consider should be possible ;

(*b*) that, in order to facilitate the establishment of internationa connections by amateur organizations and to extend to othe countries works seriously organized in one country, their programm should be published in the U. R. S. I. Bulletin, and that, whil the detailed results should be published in the amateurs ow journals, an abstract of the main conclusions should be made b the National Committee for the pointing in the U. R. S. I. Bulleti

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The Central Office in Brussels reminds that the National Commi tees may dispose of the U. R. S. I. Bulletin to publish any infor mation and particularly informations concerning amateur cooperatio

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Commission IV.
On Terrestrial Atmospherics

We draw the attention of the Members of U. R. S. I. on a pap by Prof. J. Lugeon, published in the *Annales de la Station centra*

suisse de Météorologie : « Monthly curves of atmospherics at Zurich from 1939 to 1947 » (In French).

Reprints are available at the Central Office of U. R. S. I.

Commission V.
On Extra Terrestrial Radio Noise

Abstract of a letter, dated November 12th., 1948, from Father Gherzi, Director of the Meteorological Observatory of Zi-Ka-Wei (China).

« During the annular solar eclipse (0.98%) of last May, I made » some measurements on the radio solar noise on a frequency » of 61 Mc/s. All disappeared when the sun had reached the » optical maximum of the eclipse. This seems to show that it » is not the chromosphere which generates solar radio noise on » 61 Mc/s. ».

DOCUMENTATION

Works and periodicals under this heading may be communicated to members of National Committees by request to the Central Office.

Periodicals

UNESCO

List of Scientific Papers published in the Middle East. Science Cooperation Office in Middle East, October 1948, nº 2.

Pure and Applied Physics International Union

General Information Circulaire, Nov. 1948.

International Union of Chemistry

Troisième Circulaire d'Informations, Janv. 1949.

BELGIUM

Monthly Review of the Union of International Associations, nº 1, Jan. 1949.

Ionospheric forecasts for March 1949, Institut Royal Météorologique de Belgique, Service du Rayonnement.

In this Bulletin forecasts are given for the following new paths : Brussels-Oslo ; Brussels-Stockholm ; Brussels-Copenhagen ; Brussels-Helsinski ; Brussels-Moscow ; Brussels-Roma ; Brussels-Madrid ; Brussels-Lisbon ; Brussels-New York ; Brussels-Casablanca ; Brussels-Kano ; Brussels-Shanghai ; Léopoldville-Toulon ; Léopoldville-Tripoli.

Centre de Contrôle des Radiocommunications des Services Mobiles (C. C. R. M.).

Monthly Reports M 11/48, November 1948, and M 12/48, December 1948.

Results of frequency measurements at Brussels during November and December on transmissions of costal radiobeacons and Radio Stations and on ship stations.

Monthly Reports Aé 11/48, November 1948, and Aé 12/48, December 1948.

Results of frequency measurements at Brussels during November and December on transmission of aeronautical radiobeacons and stations and on aircraft stations.

Ciel et Terre, Monthly Bulletin of the Société Belge d'Astronomie, de Météorologie et de Physique du Globe, LXV^{e} Year, n^{o} 1-2, Jan. Feb. 1949.

Abstracts of contents : Aurora borealis observations : Nov. 20, 1948, Aug. 8/9, 1948. Sunspot observations from Aug. 16 to Nov. 5, 1948.

UNITED STATES

Basic Radio Propagation Predictions, National Bureau of Standards.

C. P. R. L., Ser. D. n^{o} 50 for January 1949, issued October 1948 ; n^{o} 51 for February 1949, issued November 1948 ; n^{o} 52 for April 1949, issued January 1949.

Ionospheric Data, Central Radio Propagation Laboratory, National Bureau of Standards.

C. R. P. L., F. 51, issued November 1948 ; C. R. P. L., F. 52, issued December 1948.

Contents : Terminology and scaling practices. — Monthly Average and Median Values of World-Wide Ionospheric Data. — Ionospheric Data for Every Day and Hour at Washington, D. C. Ionosphere Disturbances. — American and Zurich Provisional Relative Sunspot Numbers. — Solar Coronal Intensities observed at Climax, Colorado. — Tables of Ionospheric Data. — Graphs of Ionospheric Data.

N^{o} F. 51 contains a « Note on $f^{o}F_{1}$ at tropical stations ».

FRANCE

Bulletin d'Information du Laboratoire National de Radioélectricité (L. N. R.), Bureau Ionosphérique Français (B. I. F.), Bagneux, 3rd Year, 1948, n^{o} 5.

Contents : I. General Matters.

II. Ionosphere from 1 to 31 May. — Table of Bagneux mean values. — Ionospheric soundings of Bagneux. — Comparison of

Bagneux soundings with C. R. P. L. forecasts. — Tables of ionospheric disturbances observed at the L. N. R. and at the receiving stations of Noiseau et Villecresnes.

III. Sun and Terrestrial Magnetism, May 1948. — Solar Phenomena. — Synoptical map of solar phenomena mentioned in Ursigrams during the Carrington rotation n° 1266 (April-May 1948). — Sunspots. — Magnetic storms.

IV. Ursigrams from 1 to 31 May 1948.

Annales de Radioélectricité, Paris, T. III, October 1948, n° 14.

Abstract of Contents : On properties of constant magnetic field tubes. Wave propagation tubes with magnetic field, by J. Brossart and O. Doehler (in French).

Summary : The authors study the behaviour of magnetron as wave propagation tube ; they describe a new type of tube, the wave propagation tube with magnetic field, and neglecting the space charge influence they calculate the gain of this tube used as amplifier. Finally they compare the wave propagation tube of the Kompfner-Pierce type to the wave propagation tube with magnetic field.

Bibliographic Bulletin of Periodicals Publications received during 1945, 1946 *et* 1947, Académie des Sciences de l'Institut de France.

GREAT BRITAIN

Predictions of Radio Wave Propagation Conditions, issued by Radio Division, National Physical Laboratory, Teddington.

Bulletin A, Nr. 25 for March 1949 ; Bulletin A, Nr. 26 for April 1949 ; Bulletin A, Nr. 27 for May 1949.

Contents : Ordinary ray critical frequencies. — M. U. F. Factors for 3000 km. — Maximum usable frequencies for 4000 km. — Optimum working frequencies.

Monthly Bulletin of Radio Atmospheric Noise, issued by the Department of Scientific and Industrial Research, Radio Research Board.

Bulletin C, Nr. 19 for June 1949 ; Bulletin C, Nr. 20 for July 1949.

Measurements from Tatsfield, Aden, Accra, Colombo, Fanning Island and Malta.

The Marconi Review, Vol. XI, Nr. 4, October-December 1948.

Abstract : Wave-Guide Modes, by E. M. Wells, B. Sc.

Summary : The propagation of an electro-magnetic wave down a hollow pipe, called in this use a « wave guide », can be shown, by considering the boundary conditions involved, to be possible only for certain definite field configurations. A field configuration which is propagated unchanged in a wave-guide is called a wave-guide mode. The three dimensional views of wave-guide modes which are the feature of this article are intented as aids to the visualisation of these field configurations.

ITALY

Quaderni di Sludi e Nolizie, October 1948, Vol. 4, Nr. 36.

Abstract of contents : Experiments with Petersen coils in a 36 K. V. net (in Italian).

Geofisica Pura e Applicata, Vol. XIII, Fasc. 3-4, September-October 1948.

Abstract of contents : Variations in the index of refraction of the Atmosphere, by N. C. Gerson. (in English). — The Stockholm meeting of the Commission on Radio-Meteorology (in Italian). — The Brussels meeting of the Commission on Ionosphere (in Italian).

Geofisica Pura e Applicata, Vol. XIII, Fasc. 5-6, November-December 1948.

Elettrotecnica, Bibliography of the Giunta Technica del Gruppo Edison. Ann. II, Nr. 7 and 8, July and August 1948.

Elettrotecnica, Bibliography of the Electrotechnical Documentation Center of the Padova University (in Italian).

Ann. VI, Nr. 1, January-March 1948 ; Nr. 2, April-June 1948 ; Nr. 3, July-August 1948.

Articles - Works - Books

GREAT BRITAIN

A method of determining the polar diagrams of long-wire and horizontal rhombic aerials, by W. R. Piggott, B. Sc. Special

Report nº 16, Department of Scientific and Industrial Research, Radio Research, published by His Majesty's Stationery Office, London, 1948.

Summary : The elementary theory of an end-fed long-wire aerial is discussed and the factors influencing the polar diagram described. The effect of terminating the aerial is analysed and it is shown that the impedance at the feeder end of the aerial does not affect the shape of the polar diagram. A method of calculating the positions and amplitudes of the main lobes of the polar diagram rapidly and easily for a large number of frequencies is described and typical design charts presented. These methods are also applied to the determination of the polar diagrams of horizontal rhombic aerials. The final results may be presented as families of contour curves of constant directivity against angle of elevation and azimuth for a constant frequency, or as curves giving the position and relative amplitude of the main lobes in the vertical plane through the aerial against angle of elevation and frequency.

The methods described may be easily applied to other types of long-wire aerial or to linear of aerials having constant input amplitude in each aerial and constant relative phase shift between aerials.

ITALY

Determination of mechanical characteristic of engines by an acceleromotive method, by Sergio Bruno Toniolo. Reprinted from *Ingegneria Ferroviaria*, June 1947, II, 6, p. 25-258 (in Italian).

Variable speed metatransformer, by Antonio Carrer. Reprinted from *Energia Elettrica*, October 1947, XXIV, 10, p. 465-470 (in Italian).

Synchronous engine rapid excitation. Synchronous engine excitation with a main exciter and a pilot dynamo, by Antonio Carrer. Reprinted from *Elettrotecnica*, December 1947, XXXIV, 12, p. 480-493 ; January 1948, XXXV, 1, p. 2-11 (in Italian).

Variable selectivity amplifiers for low frequencies, by Emilio Gatti. Reprinted from *Alta Frequenza*, February 1948, XVII, 1, p. 20-31.

Activities of the Galileo Ferraris Electrotechnical Institute during its 30th. year of being (1946-1947), by G. VALLAURI. Reprinted from *Ricerca Scientifica*, March-April 1948, XVIII, 3-4, p. 331-373 ; and *Alta Frequenza*, April 1948, XVII, 2, p. 88-96 (in Italian).

Approximative integration of Maxwell equations in a resonance cavity, by Manlio ABELE. Reprinted from *Atti Accad. Sic. Torino*, 1945-47, LXXXI-LXXXII, p. 159-167 (in Italian).

Graphical numerical calculation method for resonance cavities, by Manlio ABELE. Reprinted from *Alta Frequenza*, July-Aug. 1947, XVI, 3-4, p. 174-191 (in Italian, with summary in English, French and German).

Summary : A new method for the calculation of the parameters of resonator cavities is described. Dealing with a cavity limited by a revolution surface, it is possible to obtain the configuration of the electric lines and to calculate the fundamental resonance frequency and the value of the damping factor. If the shape of the resonator is not too complicated, the method converges quickly and with a moderate amount of calculation it is possible to obtain an approximation within 3% of the exact solution of Maxwell's equations. In this paper two examples are given : the cylinder with circular cross-section and the cavity obtained by introducing into the same another coaxial cylindre with circular cross-section of shorter height.

SWITZERLAND

Monthly curves of atmospherics at Zurich from 1939 *to* 1947, by J. LUGEON. Reprinted from *Annales de la Station Centrale Suisse de Météorologie*, 1947 (in French).