

International Scientific Radio Union

U. R. S. I.

INFORMATION BULLETIN

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Published by the Secretary General of U. R. S. I.
42. Rue des Minimes, BRUSSELS

NATIONAL COMMITTEES

Canada

U.R.S.I. FALL MEETING 1953

A meeting of the Canadian National Committee of the International Scientific Union (U.R.S.I.) is to be held jointly with the U. S. A. National Committee of U.R.S.I. and the Professional Group on Antennas and Wave Propagation of the Institute of Radio Engineers on October 5, 6, 7, and 8, 1953 at Ottawa, Canada. The hosts at this first joint U. S. A. and Canadian meeting of these organizations are the National Research Council and the Defence Research Board.

Sessions will be held on electronics, radio measurements, radio propagation, noise, and antennas, sponsored jointly by the following U. S. A. and Canadian Commissions :

1. Radio Measurement Methods and Standards :

Canadian Chairman : Dr. J. T. HENDERSON, Div. of Physics, National Research Council, Ottawa.

3. Ionosphere and Wave Propagation :

4. Terrestrial Radio Noise :

Canadian Chairman : Mr. J. C. W. SCOTT, Radio Physics Laboratory, Defence Research Board, Ottawa.

5. Extraterrestrial Radio Noise :

Canadian Chairman : Mr. A. G. COVINGTON, Radio and Electrical Engineering Div. National Research Council, Ottawa.

7. Electronics :

Canadian Chairman : Dr. Pierre BRICOUT, Physics Department, Laval University, Quebec, Que.

All those interested in radio science are invited to attend and to participate in the technical sessions. This is a unique opportunity

to meet engineers and scientists with similar interests to your own, coming from all over North America.

It is hoped that representative contributions from Canadian authors will be available at the meetings of all Commissions. Persons having papers on topics of one more commissions listed above are urged to submit their titles with 200-word abstracts to the appropriate Commission Chairman before August 1, 1953.

A program of titles and abstracts including all Canadian and American papers will be printed for distribution at the time of the meeting. In addition a mimeographed tentative program of titles and sessions will be circulated prior to the meeting.

(sgd) James C. W. SCOTT,
Secretary,
National Research Council,
Associate Committee on Radio Science,
(Canadian National Committee U.R.S.I.).

CANADIAN PAPERS ON RADIO SCIENCE FOR 1952 and 1st QUARTER, 1953

II. — TROPOSPHERIC PROPAGATION

MARSHALL, J. S. — Frontal precipitation and lightning observed by radar. *Canad. J. Phys.*, **31**, 194, February 1953.

Proceedings of the third radar weather conference, McGill University, Montreal, 15-17 September 1952 :

Including the following Canadian contributions :

Precipitation trajectories and patterns, J. S. Marshall, M. P. Langleben and Caroline Rigby, A-25.

Rain formation without ice, T. W. R. East, A-49.

The microwave properties of precipitation particles, K. L. S. Gunn and T. W. R. East, F-1.

Detectability of threshold echoes, Walter Hitschfeld, G-15.

Comparative detectability on various indicators, W. H. Paulsen, GRD, AFCRC, and K. L. S. Gunn, G-21.

III. — IONOSPHERE AND WAVE PROPAGATION

CHAPMAN, J. H. — A study of winds in the ionosphere by radio methods. *Canad. J. Phys.*, **31**, 1, 120, January 1953.

- FORSYTH, P. A., CURRIE, B. W. and VAWTER, F. E. — Scattering of 56 Mc/s radio waves from the lower ionosphere. *Nature*, **171**, 352, 21, February 1953.
- HINES, C. O. — Electromagnetic Energy Density and Flux. *Canad. J. Phys.*, **30**, 2, 123, March 1952.
- HINES, C. O. — Reflection of waves from varying media. *Quart. appl. Math.*, II, 1, 9, April 1953.
- MCKINLEY, D. W. R. — Variation of meteor echo rates with radar system parameters. *Canad. J. Phys.*, **29**, 403, September 1951.
- MCKINLEY, D. W. R. and MILLMAN, P. M. — Long duration echoes from aurora, meteors, and ionospheric backscatter. *Canad. J. Phys.*, **31**, 171, February 1953.
- MEEK, J. H. — Ionospheric disturbances in Canada. *J. geophys. Res.*, **57**, 2, 177, June 1952.
- PETRIE, W. and SMALL, R. — The intensities of ultraviolet features of the auroral spectrum. *J. geophys. Res.*, **57**, 1, 51, March 1952.
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- SCOTT, J. C. W. — The solar control of the E and F, layers at high latitudes. *J. geophys. Res.*, **57**, 3, 369, September 1952.
- PETRIE, W. — Forbidden line of NII in the aurora. *Phys. Rev.*, **87**, 6, 1002, 15 September 1952.
- THAIN, R. S. — Ground wave field intensity curves (20 kc to 540 kc). RPL Report B3, April 1952.
- WAIT, J. R. and CAMPBELL L. L. — Transmission curves for ground wave propagation at low radio frequencies. RPL R-1, April 1953.
- WAIT, J. R. — The electric field of a long current carrying wire on a stratified earth. *J. geophys. Res.*, **57**, 4, 481, December 1952.
- WAIT, J. R. — Receiving properties of a wire loop with a spheroidal core. *Canad. J. Technol.*, **31**, 1, 9, January 1953.

WAIT, J. R., CAMPBELL, L. L. — Effect of a large dielectric constant on ground wave propagation. *Canad. J. Phys.*, **31**, 3, 456, March 1953.

WAIT, J. R. and CAMPBELL, L. L. — The fields of an electric dipole in a semi-infinite conducting medium. *J. geophys. Res.* **58**, 1, 21, March 1953.

French National Committee

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The Head, Service des Etudes Electroniques, Compagnie Air-France.

Germany

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Japan

Dr. D. F. MARTYN'S VISIT TO JAPAN

Due to unavoidable circumstances Japan did not send delegates to the 1952 General Assembly of U.R.S.I. in Australia. In order to remedy the resulting hiatus in Japan's international co-operation Dr. Martyn visited Japan at the request of the Japanese National Committee, and with the kind co-operation of U.R.S.I., and the Australian government. Dr Martyn arrived at Tokyo on April 26 and left on May 18. During his stay in Japan he reported the outline of the general proceedings of the General Assembly, and had numerous discussions with radio-scientists in Tokyo and Kyoto. He also visited various institutes devoted to ionospheric, atmospheric, and astronomical research.

On April 28 at 10 a.m. a formal meeting of the Japanese National Committee was held in the Science Council Building at Ueno Park, Tokyo, in the presence of His Excellency the Australian Ambassador, Dr. Walker. The session was opened by Dr. Kameyama, President of the Science Council of Japan, who was followed by Dr. Walker. The latter presented to the Council a framed photograph of an Australian scene brought by Dr. Martyn as a gift from Australian radio scientists to their Japanese colleagues. Then Dr. Martyn described the general outline of administrative business at the last General Assembly of U.R.S.I.

After a few minutes' interval Dr. Martyn proceeded, with Hagihara as Chairman, to his report of the various sessions of the commissions and their resolutions. Questions were raised by Maeda, Nagata, Morita, Kimpara, Kotani, Hatakeyama, Uyeda, Aono, Seki, Hara, Murakami, Koga and Asami.

On April 30 Dr. Martyn visited the Radio Research Laboratories at Kokubunji. After a short description of the general work of the laboratory by the Director, Mr. Amari, a symposium was held for an hour, the speakers being Aono, Yonezawa, and Nakata on the subject of the regular and anomalous variations of the ionosphere. Dr. Martyn inspected the equipment and saw a movie of the ionosphere activity by Nakata. The symposium was continued after lunch, when Honjyo talked on the sporadic E layer and Shinno, Obayashi and Miya on ionospheric storms.

In the afternoon of May 1 Dr. Martyn visited the Technical Research Laboratory at Setagaya of the Broadcasting Corporation of Japan and the Broadcasting studio in the city.

On May 3 Dr. Martyn made a trip to Hakone conducted by a few staff members from the Electrical Communication Laboratory and from the International Telephone and Telegraph Company.

On May 4 and 5 he visited the Geophysical Institute of the University of Tokyo and discussed for many hours various problems of the ionosphere and geomagnetism with Nagata and his collaborators.

On May 6 Dr. Martyn visited the Tokyo Astronomical Observatory at Mitaka in the morning, where he saw the equipment, especially for radio-astronomy, and talked with the staffs working on radio-astronomy. After lunch at the Observatory he visited the Electrical Communication Laboratory at Kichijoji of the

Nippon Telegraph and Telephone Public Corporation, discussed their works, and inspected the Laboratory with Dr. Walker.

On May 7 he left Tokyo for Kyoto accompanied by Matsushita, visiting the Research Institute of Atmospheric at Toyokawa belonging to the Nagoya University on the way and arriving at Kyoto in the evening. On the morning of May 8 he visited the University of Kyoto.

In the afternoon of May 8 and for the whole day of May 9 he attended a colloquium at the University conducted by Prof. Hasegawa. The topics discussed were :

- T. MATSUSHITA : Lunar tidal variations in the sporadic E region.
- Y. INOUE : On the ionizing radiation field in the ionosphere.
- S. KATO : On the contribution of the solar Lyman beta to the ionospheric ionization.
- T. YONESAWA (Radio Research Laboratories) : A model ionosphere.
- H. MAEDA : On the electrical state of the upper atmosphere deduced from geomagnetic daily variations.
- M. HIRONO : On the vertical movement and conductivity of the ionosphere.
- M. HASEGAWA : On the diurnal variation of the electric conductivity of the upper atmosphere deduced from an analysis of geomagnetic data.
- K. MAEDA : Theoretical approach to the interpretation of the geomagnetic variation of the world-wide distribution and the diurnal variation of the ionospheric F2 region.
- K. NAGASHIMA : On the variation of cosmic rays.
- T. SATO : On the thermal effect in the F2 layer.
- D. F. MARTYN : On drift motion and the mechanism of the formation of the sporadic E.

On May 12 Dr. Martyn returned to Tokyo accompanied by Hasegawa.

On May 13 he was present at the symposium held by the Ionosphere Research Committee, with Hagihara as chairman, at the Department of Astronomy of the University of Tokyo from 10 a. m. to 5 p. m.

- H. UYEDA : Ionospheric storms in middle and low latitudes.

D. F. MARTYN : Morphology of ionospheric storms.

T. NAGATA : Ionospheric storms in high latitudes.

Leading discussions were opened by Fukushima, Obayashi, Shinno, Kamiyama and Miya, and short discussions were made by Maeda, Uyeda, Matsushita, Sekido, Nagata, Kato, Miya, Nakata and others. The proceedings will be published in the « Report of the Ionosphere Research in Japan » with the kind help of Dr. Martyn.

In the afternoon of May 14 in the Science Council room we heard from Dr. Martyn of the proceedings at the Canberra meeting last year of the joint Commission on the Ionosphere. We discussed especially the third Geophysical Year and also the topics mentioned in the colloquium held at Kyoto on May 8-9. Dr. Kimpara proposed joint observation in Australia and Japan to determine the motion of the sources of atmospherics during the various seasons of the year. We talked about exchange of publications and observational data between both countries, and about co-operative simultaneous observations on the ionosphere and associated phenomena by extending the co-operative observation now being made all over Japan. Then the chairman, Y. Hagihara, thanked Dr. Martyn who came from beyond the equator, for having provided such excellent opportunities of discussion on subjects of common interest, and expressed the opinion that this happy opportunity would promote mutual understanding, and the progress of science, by the co-operation of research workers of the two countries, which are equally isolated from both Europe and America.

On May 15 Dr. Martyn visited the University of Tokyo, especially the Departments of Electrical Engineering and of Physics. Afterwards Dr. Martyn gave a talk in the auditorium of the Electrical Engineering Society under the joint auspices of the Institute of Electrical Engineers of Japan, the Institute of Electrical Communication Engineers of Japan, the Illuminating Engineering Institute and the Television Institute of Japan, from 3.30 to 4.30 p. m. on the subject « Some Facts about Australia ».

Y. HAGIHARA

Chairman,

National Committee for U.R.S.I.,
Science Council of Japan.

COMMISSIONS

List of Official Members

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Commission II. — Dr. J. GROSSKOPF, Darmstadt, Rheinstrasse, 110
Commission III. — Dr. W. DIEMINGER, Lindau über Northeim-
Hannover.
Commission IV.— Dr. A. EHMERT, Weissenau/über Ravensburg.
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strasse, 35.
Commission VI. — Dipl. Ing. A. HEILMANN, Darmstadt, Rhein-
strasse, 110.
Commission VI. — Prof. Dr. H. Rukop, Ulm/Donau, Söflinger-
strasse, 96.

COMMISSION VI

Australia (Bull. n° 77, p. 15) Instead of Prof. Jaeger, read :
Prof. L. G. H. HUXLEY, Physics Department, University
of Adelaide, S. A.

Commission I

CONFERENCE ON HIGH-FREQUENCY MEASUREMENTS, WASHINGTON, D. C., 1953

(Reprinted from Telecommunication Journal, June 1953, n° 6)

The third Conference on High-Frequency Measurement was held in Washington, D. C., 14-16 January 1953, in the auditorium of the Department of the Interior. The sponsors were the A.I.E.E., the Institute of Radio Engineers (I.R.E.), and the National

Bureau of Standards (N.B.S.). Twenty seven technical papers were presented at the four sessions and two demonstration lectures were given. More than 700 engineers and guests attended the sessions.

The first session was devoted to papers dealing with the measurement of frequency, wave-length and time. Dr. L. Essen, National Physical Laboratory, Teddington, England, presented the results of a long series of his experiments determining the velocity of electromagnetic waves and the refractive indexes of gases.

The second session dealt also with the same measurement of velocity of electromagnetic waves, a report being given by Dr. K. Bol. Five other papers presented at this session dealt with the measurement of resonant cavity characteristics, microwave frequency calibration procedure, time counters, etc.

Six papers were presented at the session devoted to the measurement of power and attenuation.

STANDARD FREQUENCY TRANSMISSION

Hereunder abstracts from a pamphlet « MSF-New Programme of Experimental Standard Frequency Transmissions from the United Kingdom commencing 26th May 1953 ».

Due to the kindness of the National Physical Laboratory, which issued the pamphlet, it has been distributed to the Official Members of Commission I.

TRANSMISSIONS FROM THE UNITED KINGDOM

Transmissions, each of 31 minutes duration, on 5 and 10 Mc/s have been made daily since February, 1950, from the Post Office station at Rugby, under the call sign MSF. Numerous reception reports have been received and have helped in planning the second stage of this experiment which will be inaugurated on the 26th May, 1953. The transmission period will be extended to 24 hours per day and the power will be reduced from 10 kW to 0.5 kW. The transmission will be interrupted during the interval between 15 and 20 minutes past each hour to enable one station alone to be measured under those conditions in which two stations such as MSF and WWV are being received at

nearly equal strengths. The break in transmission will also permit radio noise measurements to be made if no other transmission is present.

Transmissions will be made initially on 2.5, 5 and 10 Mc/s : later, 15 and 20 Mc/s may be used but only three frequencies will be broadcast simultaneously. The carriers will be modulated in accordance with the following 60 minutes schedule :

Minute past each hour		Modulation
0- 5	30-35 45-50	1000 c/s
5-10	20-25 35-40 50-55	1 c/s pulses the 59th pulse in each minute being omitted
10-14	25-29 40-44 55-59	unmodulated
14-15	29-30 44-45 59-60	speech announcement

ACCURACY OF THE TRANSMISSIONS

The carrier and modulation frequencies are all derived from the same 100 kc/s standard and are maintained within ± 2 parts in 10^8 of their nominal values. The frequency of the received signal may vary throughout the day, however, if there are ionospheric reflexions in the transmission path. The frequency error is due to the movement of the reflecting layers ; it seldom exceeds ± 2 parts in 10^7 and for a large part of the day is not more than a few parts in 10^8 . The transmitted frequencies do not, in general, vary from day to day by more than ± 2 parts in 10^9 .

SPECIAL EXPERIMENTAL TRANSMISSION ON 60 KC/S

A special transmission at a frequency of 60 kc/s and a power of 10 kW is made for use in the United Kingdom. This transmission period will be 1429-1530 G.M.T. and the modulation programme will be the same as for the short waves.

PUBLICATION OF FREQUENCY VALUES

The values of the transmitted frequencies are published monthly in the Wireless Engineer.

RECEPTION REPORTS

The M.S.F. service of transmissions is still experimental and reports concerning reception will be welcomed.

They should be addressed to the Director, National Physical Laboratory, Teddington, Middlesex, England.

Commission II

BIBLIOGRAPHY

Attention of the Members is drawn on the Canadian bibliography published on p. 4 and on the book « Meteorological Factors in Radio-Wave Propagation » mentioned on p. 36.

Commission III

BIBLIOGRAPHY

Attention of Members of Commission III is drawn on the Canadian Bibliography published on page 4.

SUB-COMMISSION IIIb

ON WAVE INTERACTION

Hereunder translation of a letter sent on June 3rd by the Chairman of the Sub-Commission.

Dear Colleague,

I want to communicate the first remarks concerning the radio wave interaction experiments carried out from March 24 to 28, 1953 ⁽¹⁾. These remarks are only a basis for discussion. Therefore I would appreciate to be informed for the forthcoming experiments of your suggestions and comments.

⁽¹⁾ See Inf. Bull., n° 77, p. 17.

The first experiments suggested by Mr. Cutolo (Naples), aimed to verify the « self-interaction » phenomenon for frequency apart from the gyrofrequency ; such phenomenon is characterized by the variation of the modulation depth of the received wave with the geographic location of the receiver when the transmitter emits a modulated wave of constant frequency and with a constant depth of modulation.

I want to thank all those who took part in the experiments and particularly Mr. Angles d'Aurignac, Director of the technical center of the European Broadcasting Union in Brussels who interested in the work European broadcasting agencies.

I have not received all the results of the measurements ; some experimenters have not concluded the discussion of their results. The tentative conclusions appended to this letter were drafted by a small committee constituted by MMs. Lépéchincky, Rivault and Colonel Lochard.

I would be grateful if you would consider such conclusions and keep me informed of your suggestions for new experiments. Results should be reached and it is important to specify as far as possible for the future experiments the conditions, the observation and recording method, and the discussion processus of the results.

I remain...

(sgd) E. PICAULT.

EXPERIMENTS OF MARCH 1953

The transmissions of the Strasbourg and Paris stations were carried out as plotted.

Measurements were made at the following locations : Cambridge, Belgium, Netherlands, Torino, Milano, Naples, Cagliari, Athena, Poitiers, Alger and Paris.

Nearly in every laboratory, particularly in those above 45° N a large random variation was observed in the received wave. At some sites, very large modulation variations were observed although the carrier seemed about constant.

The provisional conclusions are as follows :

1. To interpret the results of the measurements, statistical methods should be used, that means the recording of a large number of values by means of a camera.

2. Modulation variation when the carrier is constant seems to be due to selective fading.

3. Ionospheric sounding should be made on the wave path during the experiments.

4. The measurements are effected by the distance and the geographic location of the receivers; hencefore in the future observations should be made in various directions around the transmitters.

These tentative conclusions and the subsequent proposals are submitted to the experimenters interested in the experiments.

SUB-COMMISSION IIIc

ON STUDY OF PROPAGATION TIME OF RADIO SIGNALS

All National Commillees, Laboralories and Observalories intending to co-operate in the work to be carried out by Sub-Commission IIIc are kindly requested to inform the Chairman of the Sub-Commission : M. Boella, c/o Istitulo Elelltrotecnico Nazionale, Corso Massimo d'Azeglio 42, Torino, Italy.

The work required consists in arranging for special observations wherever possible over a number of short-wave radio links covering distances from some hundreds to some thousands of kilometres. Suitable periodic signals, with the same repetition frequency and using essentially the same carrier frequency should be emitted at both ends of each link and time differences between the local signals and those received from the opposite end of the path should be measured. The algebraic sum of the two differences measured simultaneously at the two ends gives the total propagation time over the double path.

The signals should be time signals of the WWV type or pulses with a low repetition frequency. The use of pulses would probably involve a simpler technique. In any case the repetition frequency of the signals should preferably be derived from a standard of very high accuracy and stability. Nevertheless, in the case of not very long distances, useful work can be done and much less stability of the repetition frequency is required by producing

independent emissions at only one of the ends, and by rebroadcasting, on a slightly different carrier frequency, the signals received at the opposite end. This system of rebroadcasting signals can be adopted in connection with existing regular standard time transmissions from WWV (Beltsville), MSF (Rubgy), IBF (Turin), JJY (Tokyo).

Measurements of the time differences should preferably be made for successive seconds in order to deduce the mean value of the propagation time on a period of about one minute. The use of a cathode-ray oscilloscope provided with photographic recording has the advantage of an easier elimination of errors due to statics and interference. Moreover it gives some more information on the ionospheric propagation and for the study of short period variations of the propagation time, giving the shape of the received signals. In alternative the use of electronic counters requires a less working-out time and should also be recommended for systematic and statistical determinations of the propagation time. Detailed informations on this point can be supplied on request.

From the point of view of ionospheric studies, a coordination between determination of propagation time and ionospheric vertical incidence observations along the path would be highly desirable.

Commission VI

Hereunder copy of a letter to Official Members of Commission VI.

Dear Sir,

I have to inform you that Dr. L. C. van Atta, elected as Chairman of Commission VI by our Xth. General Assembly, has resigned his position due to illness.

The Executive Committee of U.R.S.I. is being consulted in order to appoint a Chairman till the next General Assembly. I will keep you informed of the decision reached by the Executive Committee.

In the meanwhile correspondence concerning the activities of the Commission should be addressed directly to me.

In thanking you,

I remain,

Sincerely yours,

The Secretary General,

(sgd) HERBAYS.

Commission VII

LETTER FROM THE CHAIRMAN TO THE MEMBERS OF THE COMMISSION

The next General Meeting of the International Scientific Radio Union will take place in Holland in the summer of 1954. In order to make the meetings of Commission VII best serve the needs of its members, it is necessary to decide during this summer on the form of the meetings and the topics to be covered. It is for this reason that I am writing to you; I would very much appreciate an early reply so that we can interchange at least several letters during the summer.

Last summer, in Australia, many of the U.R.S.I. meetings took the form of a discussion period; formal papers were kept to a minimum and the greater part of the meetings was given over to discussions between experts in various fields. It is certain that a number of the Commissions of U.R.S.I. will be organized again on this basis in Holland and it is my opinion that Commission VII should also follow this procedure. I would like to hear your opinion in this point.

Commission VII, Electronics, is a very new commission and cannot be said to have proved its value to U.R.S.I. In fact, in Australia, it was suggested that the 1954 meeting would be a test of its value and that if it were not shown to have the same international reason for existence as some of the other Commissions, it should be dissolved. My opinion is that Commission VII is valuable in so far as it is able to co-operate with the other Commissions by bringing to their attention fundamental advances

in the physical basis of electronics. I base this suggestion on the fact that technique is common to all Commissions of U.R.S.I. ; in example, members of the Commission on Ionospheric Propagation are probably more competent in the design of equipment and instruments for their measurements than we are to do it for them ; what they need from us is information in fundamental advances that will permit them to design better instruments.

Reasoning from my statements in the previous paragraph, I have some suggestions concerning the topics to be covered at our 1954 meetings, but of course it is for us to decide jointly whether my statements are correct and what topics should be covered ; on these matters, I would like to have your opinions and comments.

If my opinion of the place of Commission VII in the U.R.S.I. organization is correct, then we should co-operate with the other Commission. In Australia, the most successful and best attended meeting of Commission VII was one on Gas Discharges ; members from the Commission on Radio Astronomy found much that they could discuss with members from the Commission on Electronics. The one group were interested in the phenomena which they measured in space, the other group were interested in the fundamentals of the same phenomena when examined in the laboratory. I suggest that one of our meetings should be devoted to the phenomena of discharges in gases.

It has been suggested to me, by members of the commission on tropospheric propagation, that much is yet to be done in specifying the characteristics of Radar equipment for the measurement of rain, snow and cloud. I suggest that one of our meetings be devoted to a joint discussion between electronics and propagation people on the design of radars for scientific measurement.

The scientific literature seems to indicate that the future of electronics (and with it, instrumentation for all kinds of measurements) is being controlled by the development of materials rather than by the design of circuits. I suggest that we devote at least two meetings to the discussion of those topics from solid state physics which relate to electronics, for example to ferrites, to ferro-electric materials, to semi-conductors and to magnetic properties of materials in general.

In Australia last year, only one of all the authors was present who had submitted papers to be read in Commission VII. I suggest that the authors of papers should be present at our meetings and should be prepared to consider their paper only as a basis for discussion. For this reason, would you consider which of your countrymen are apt to attend the 1954 U.R.S.I. meetings and would you suggest a list of topics, which they would be willing to discuss. I wish to thank you for your efforts on behalf of Commission VII. I shall write to you from time to time and inform you of progress in the organization of the next meeting.

Sincerely yours,

(sgd) G. A. WOONTON,

Chairman, Commission VII, U.R.S.I.,
McGill University, Montreal,
The Eaton Electronics Research Laboratory.

IONOSPHERIC STATIONS

Table n° 2

Notes :

1. The information of the following table completes the data given in Bulletin 77, p. 24 and following.

2. * Stations not mentioned in Table n° 1, p. 20, Bulletin 77.

3. « Information on Publication of Results » contains the following informations :

Column 1 :

M = only median values are published.

H = daily hourly (and median) values are published.

G = Hourly values are available free of charge.

R = they are available but not free of charge.

Column 2 : Month and year of the beginning of publication.

Column 3 : A limited number of record available, free of charge (G) or not (R).

Column 4 : Publication in which the results are issued.

Controlling country	Station	Geographic		Geomagnetic latitude (°)	Magnetic dip (°)	Power (kW)
		Latitude	Longitude			
India	Ahmedabad *	23°02' N	72°38' E	13.1 N	34 N	1.5
	Bombay	19° N	73° E	9.8 N	24.77 N	0.5
	Calcutta	22°33' N	88°21' E	12 N	32 N	0
	Delhi	28°35' N	77°5' E	18.75 N	42.75 N	
	Kodaikanal *	10°14' N	77°28' E	0.1 N	3.5 N	10
	Madras	13° N	80°15' E	3.2 N	13.5 N	0.5
	Tiruchirapalli	10°50' N	78°50' N	1 N	3.5 N	0.5

(1) 1.5 kW for 0.6 à 1.4 Mc/s.

1.2 kW for 1.4 à 3.2 Mc/s.

1-0.45 kW for 3.2 à 15 Mc/s.

0.24-0.37 kW for 15 à 24 Mc/s.

Frequency range Mc/s	Date of begin- ning of opera- tion	Time used or reference meridian	Information on publication of results			
			(1)	(2)	(3)	(4)
24 (1)	2-53	75° E	H		G	
5-21	1-45	73° E	H-G	9-45	G	Bull. Ionospheric Data, Research Dep., All India Radio New-Delhi.
5-18	1932-38 and since 6-44	90° E	H-G	6-44	G	Bull. Ionosp. Data, Inst. Radiophysics and Electronics Calcutta 9.
5-20	1-42	77.8° E	H-G	9-45	G	See Bombay.
5-25	1-52	82.1° E	M-H R	7-53	R	Median values published in Indian Jour. of Meteor. and Geoph.; Hourly values in half-yearly bull. of the Kadaikanal Obs.
5-15	3-44	80.25° E	H-G	9-45	G	See Bombay.
5-18.5	2-49	78.83° E	H-G	2-49	G	See Bombay.

Under geographic and magnetic location of Canadian ionospheric stations on
List. Values of magnetic dip are given by Mr. Loomes, Dominion Observatory (see *Bull.*
No. 24).

	Latitude	Longitude	Latitude Geom. (°)	Dys (°)
Chimo Lake	64°18' N	96° W	73.7 N	86.5 N
Chimo Hill	58°48' N	94°12' W	68.7 N	83.8 N
Chimo	58°6' N	68°18' W	69.6 N	80.6 N
Chimo Bay	45°24' N	75°42' W	56.8 N	75.5 N
Chimo Bay	54°18' N	130°18' W	58.4 N	73 N
Chimo Bay	74°42' N	94°54' W	82.9 N	89 N
Chimo's	47°32' N	52°42' N	58.3 N	72.3 N
Chimo's	49°54' N	97°24' N	59.6 N	78 N

C.C.I.R. = U.R.S.I.

Hereunder copy of a letter to the National Committee.

Dear Mr.

I have to inform you that U.R.S.I. will be officially represented at the Plenary Assembly of the C. C. I. R., to be held in London in September next, by a delegation under the chairmanship of Doctor J. H. Dellinger, Honorary President of U.R.S.I.

Members of your National Committee attending this Assembly are kindly requested to serve on the U.R.S.I. delegation.

I should very much appreciate if you would send the names of such members to Doctor Dellinger, R. C. A. Frequency Bureau, 1625 K. Street, N. W., Washington, 6., D. C., U. S. A.

Yours truly,

The Secretary General,

From August 31 to October 7, Dr. Dellinger address will be St Ermin's Hotel, Carlton Street, London S. W. 1.

INTERNATIONAL COUNCIL OF SCIENTIFIC UNIONS

I.C.S.U. Abstracting Board

REPORT ON THE ACTIVITIES OF THE BOARD TO DATE IN THE FIELD OF ABSTRACTING IN PHYSICS

The Board came into existence officially on June 1st, 1952. In fact, its activity had begun at a much earlier date (circa November 1951).

The results obtained by the major activity of the Board are outlined as follows :

I. — AUTHORS' SUMMARIES

Unesco's decisions and Royal Society rules have been formally accepted by all periodicals printing papers on physics and published in the following countries :

United States of America,

U. K. of Great Britain and Northern Ireland,

The Netherlands,

Belgium,

France,

Italy,

with the exception of a very few publications printed in the United Kingdom.

In each case the Board has communicated with the Editor responsible and this person has accepted to verify that the summaries prepared by their authors have correctly and clearly summed up what is contained in their papers.

The Board was successful in all cases but a few, which are coming up for review from time to time.

2. — PAGE-PROOFS

Another important measure taken by the Board was to ask the publishers of the more important journals printing papers on physics to forward a set of the final page-proofs of each of their issue to one or both of the editors of « Science Abstracts » and the « Bulletin Analytique du C. N. R. S. ». At the request of Dr. Crowther and Dr. Kersaint this action was at first restricted to a few selected journals in each country and, again at the request of the same persons, has been extended from time to time to other journals. The present situation is summed up in the following list :

JOURNALS AT PRESENT SENDING PAGE-PROOFS TO EITHER
« SCIENCE ABSTRACTS » OR THE « BULLETIN ANALYTIQUE
DU C. N. R. S. » OR BOTH :

Published in the U. K. :

Proceedings Institution Electrical Engineers,
Proceedings Royal Society,
Philos. Transactions Royal Society,
Proceedings Physical Society A and B,
J. Scientific Instruments,
British J. Applied Physics,
Proceedings Cambridge Philos. Society,
Philosophical Magazine,

Published in the U. S. A. :

Physical Review,
Review of Scientific Instruments,
J. Chemical Physics,
J. Applied Physics,
J. Acoustical Society of America,
Review of Modern Physics,
American J. of Physics,
Bell system Technical Journal,
Astrophysical Journal,

Published in France :

Revue d'Optique,
J. Chimie Physique,
Bulletin Sté Chimique de France,
Bulletin Sté Fse Minéralogie et Cristallographie,

Annales d'Astrophysique,
Annales de Géophysique,
Annales de Télécommunication,
J. Recherche du C. N. R. S.
Annales de Physique,
J. de Physique,
Revue Générale de l'Electricité,
Cahiers de Physique,

International :

Acta Crystallographica,

Published in the Netherlands :

Physica Acta,

Published Overseas :

Australian Journal of Scientific Research,

Journal of the Physical Society of Japan.

Canadian Journal of Research.

A net result of the action described in the last paragraph has been to speed up considerably the appearance of the most important abstracts in the two journals : a delay from 6 to 8 weeks is thus saved.

When only one set of the page-proofs (or other abstracts) is sent on by a journal, this set is photocopied and communicated to the editor of both « Science Abstracts » and the « Bulletin Analytique du C. N. R. S. ». The working of this has been, up to now, quite simple. It may become a little more elaborate when I.C.S.U. Abstracting Board has a greater number of member journals as at present. A regular exchange of page-proofs will then have to be organized.

3. — COVERAGE IN RESPECT OF NON-PERIODICAL JOURNALS

Measures have also been taken to deal with nonperiodical publications.

(a) The proceedings of various physical societies in the world appear from time to time at irregular intervals in the pages of some journals (A. J., *Journal de Physique* and *Sté de Physique*). Often these proceedings give a short account of the papers which have been read at the meeting without specifying whether these

papers are to be published more fully later on in some journal. Physical Societies have now been contacted about this question; but it has been agreed that when the full paper is to be published elsewhere, mention of this later publication must appear in the account of the meeting.

(b) The non-periodical publications which appear in France from time to time (Universities publications, government reports and so on) will be reviewed by the Editor of the French member-journal (the Bulletin Analytique du C. N. R. S.), Dr. Kersaint, who will send to the editor of «Science Abstracts», Dr. Crowther, the documents which, in his opinion, ought to be abstracted.

For non-periodical publications printed in the U. K., the same service will be undertaken by the editor of «Science Abstracts» who will send to the editor of the «Bulletin Analytique» the documents which should be abstracted.

(c) From time to time colloquia and symposia are organized under the auspices of I. U. P. A. P. The General Secretary of I. U. P. A. P. has agreed to ask the organizers of all such meetings to communicate to the Board at an early date all documents regarding the organization of the meetings and advance proofs of the papers to be read, if such proofs are printed: the abstracting journals should be informed as soon as possible whether the papers are to be published in a volume (non-periodical publication).

The Board also recommends that papers read at such international meetings be published in one of the regular journal of physics whenever possible. This recommendation arises out of the necessity to avoid the multiplication of non-periodical publications.

4. — NEGOCIATIONS WITH THE AUTHORITIES IN GERMANY :

(a) *With the Physikalische Berichte as a potential member Journal*
— The Board has received from the Association of German Physical Societies letters announcing officially that the German Physical Journal «Physikalische Berichte» is resuming publication. The editor of «Physikalische Berichte» has also announced his intention to apply for membership in I. C. S. U. Abstracting Board. The various members of the Board have been consulted on this point. Their opinion was unanimously favorable. Consequently,

the editor of «*Physikalische Berichte*» has been supplied with the desirable information about the Board activities and the services this organization can render to its member-journals.

(b) *With the firm Springer in the supply of page-proofs, or copies of published journals at reduced prices.* — The representatives of the member-journals of the Board have asked that this body comes in contact, with the various German publishing houses with a view of obtaining special subscription rates and/or advance proofs. Long negotiations proceeded with the firm of Julius Springer, Heidelberg. The house of Springer while refusing to supply proofs, even subject to payment, offered to reduce the price of subscription for the journal-members of the Board. This firm is now willing to reduce of 20 % the subscription rates of all periodicals provided that the subscription be taken out by I. C. S. U. Abstracting Board.

5. — ESTABLISHING OF LISTS OF JOURNALS IN PHYSICS PUBLISHED
IN VARIOUS COUNTRIES

At the request of one of the members of the Board, the lists of Journals of Physics published in the Spanish and Portuguese languages have been recently reviewed. These lists have been communicated to the members.

Inquiries have been made with a view to establish correct lists of physical journals published in Japan and the Northern countries : Finland, Norway, Sweden, Denmark, Netherlands. These lists will be communicated to the members in the very near future.

6. — ASSISTING I. U. P. A. P. IN THE DOCUMENTATION OF PAPERS
IN PHYSICS, PUBLISHED IN THE U. S. S. R. AND ASSOCIATED
COUNTRIES

One minor activity of I. C. S. U. Abstracting Board has consisted to help materially the I. U. P. A. P. in an undertaking which concerns documentation in the field of physics papers published in the Russian and Allied languages. It has now been agreed that the Italian Journal «*Il Nuovo Cimento*» will publish in 1953 an extra number which contents will include 10 to 12 articles

reviewing the work of Russian schools in certain specialized subjects :

- | | |
|------------------------|-----------------------------|
| — physics of solids, | — optics, |
| — conductivity, | — cosmic rays, |
| — semi-conductors, | — thermodynamic, |
| — theoretical physics, | — statistical mechanics, |
| — magnetism, | — quantic theory of fields. |

The help of the Board in this matter has greatly and materially speeded up the development of this project.

7. — CHEMICAL ABSTRACTING

Steps have been taken by the Board to help Chemical Abstracting and to this end has already asked and obtained the furnishing of page-proofs of « Annales de Chimie » which are regularly sent to the « Bureau of Abstracts ».

G.-A. BOUTRY,
Secretary.

INTERNATIONAL GEOPHYSICAL YEAR

Membership of the Special Committee

Bulletin n° 77, p. 41

For the International Astronomical Union, read as follows :
Sir Harold Spencer JONES (United Kingdom),
Mr. M. NICOLET (Belgium),
Prof. A. DANJON (alternate) (France).

Special Committee appointed by the International Geodesy and Geophysics Union

Prof. S. CHAPMAN (CHAIRMAN),
Prof. J. COULOMB,
Prof. P. TARDI,
Dr. V. LAURSEN,
Prof. J. VAN MIEGHEM,
Prof. H. MOSSEY,

The Committee is to be completed by the following members,
chosen on the basis of widest possible geographical distribution :

Dr. F. T. DAVIES (Canada),
Dr. BASU (India),
Dr. J. M. RAYNER (Australia),
Prof. Chuji Tsuboi (Japan),
Prof. WORDIE (Great Britain),

National Committees III

This list should be added to the lists published in Information Bulletin n° 77, p. 42 and 78, p. 61. National Committees to which amendment or addition is made are reproduced in full and indicated by an asterisk.

AUSTRIA

Chairman : Dr. HEINRICH Ficker.

Secretary : Hofrat Prof. Dr. KARL Mader, Hietzingen Hauptstrasse, 123, Wien 13.

Members : Prof. OTTO BURKHARDT, Prof. Dr. Albert DEFANT, Privat Dozent Dr. Josef FUCKS, Dr. Ing. OTTO LANSER, Dr. HEINRICH MACHE, Dr. FRANZ SAUBERER, Prof. Dr. FERDINAND STEINHAUSER, Privat-Dozent Dr. MAX TOPERCZER.

BELGIUM

Chairman : E. LAHAYE.

Alternate Chairman : J. VAN MIEGHEM,

Rapporteurs : P. BOURGEOIS, L. KOENIGSFELD, L. MALET, P. SWINGS.

Secretary : M. NICOLET, 3, avenue Circulaire, Uccle.

FINLAND

Correspondence may be addressed, to Dr. E. Sucksdorff, Meteorological Central Office, Helsinki, Finland.

INDIA

Chairman : Dr. K. S. KRISHNAN, F. R. S., Radio Research Committee, Hill Side Road, New Delhi, India.

Members : Prof. S. K. MITRA, Science College, Calcutta University ; Dr. H. J. BHABHA, F. R. S., Director Tata Institute of Fundamental Research, Bombay ; Dr. K. R. RAMANATHAN, Physical Research Laboratory, Navaranghpur, The Director, Solar Physics Laboratory, Kodaikanal.

NEW ZEALAND*

Dr. M. A. F. BARNETT, Director Meteorological Office, Wellington ;
Dr. G. A. BOGLE, Director, Dominion Physical Laboratory,
Wellington ; Mr. R. G. DICK, Surveyor-General ; Dr. E. I.
ROBERTSON, Geophysics Division, Department of Scientific
and Industrial Research, Wellington, Mr. L. L. THOMSEN,
Director, Carter Observatory, Wellington ; Prof. C. N.
WATSON-MUNRO, Professor of Physics, Victoria University
College, Wellington ;

Secretary : Mr. J. W. BRODIE, Geophysics Division, Department
of Scientific and Industrial Research, Box 8018, Government
Buildings, Wellington.

SPAIN

Mr. le Contre-Amiral W. BENITEZ, Directeur de l'Observatoire
de San Fernando.

Chairman : Rév. P. A. ROMANA, Directeur de l'Observatoire
de l'Ebre, Tortosa.

Secretary : Prof. J. BALTA ; Ing. J. M. BONELLI ; Prof. R. CARRASCO.

Members : Ing. L. CADARSO ; Prof. F. MORAN, Ing. J. RODRIGUEZ-
NAVARRO.

NEW BOOKS AND WORKS

Meteorological Factors in Radio-Wave Propagation. Report of a Conference held on 8th April 1946 at the Royal Institution, London, by the Physical Society and the Royal Meteorological Society. 325 pages, paper covers. Price 24 s., inclusive of postage. For bulk orders of one dozen or more, from research organisations a special price of 15 s. per copy. Application at the Physical Society, 1 Lowther Gardens, Prince Consort Road, London S. W. 7.

Contents :

- The influence of tropospheric conditions on ultra-short-wave propagation, Sir Edward Appleton, G. B. E., K. C. B., F. R. S.
- An experimental study of the effect of meteorological conditions upon the propagation of centimetric radio waves, R. L. Smith-Rose, D. Sc., Ph. D. and Miss A. C. Stickland, Ph. D.
- The structure and refractive index of the lower atmosphere, P. A. Sheppard, B. Sc.
- The mode theory of tropospheric refraction and its relation to wave-guides and diffraction, R. G. Booker, M. A., Ph. D. and W. Walkinshaw, B. Sc.
- Practical methods for the solution of the equations of tropospheric refraction D. R. Hartree, F. R. S., J. G. L. Michel and Phyllis Nicolson.
- The attenuation and radar echoes produced at centimetre wave-lengths by various meteorological phenomena, J. W. Ryde.
- Radar storm detection : I. Instr. Lt. Cdr. F. L. Westwater, M. A., R. N.
- Radar storm detection : II. Lieut. (Sp) R. G. Ross, M. A., R. N. V. R.
- Radio climatology, C. S. Durst, M. A.
- Meteorological investigations in connection with radio propagation, Sir Nelson K. Johnson, K. C. B., D. Sc.
- The dielectric properties of water vapour at very high frequencies, J. A. Saxton, Ph. D.
- The vertical distribution of radar field strength over the sea under various conditions of atmospheric refraction, J. A. Ramsay.
- Observations of unorthodox radar vision in the vicinity of New Zealand and Norfolk Island, Mrs. F. E. S. Alexander B. A. Ph. D.

A method for deducing the refractive-index profile of a stratified atmosphere from radio observations, G. G. MacFarlane, Dr. Ing., B. Sc.

Refraction in the lower atmosphere and its application to the propagation of radio waves, Miss A. Stickland, Ph. D.

A standard radio atmosphere for microwave propagation, A. C. Best, M. Sc.

Note on errors in measurement of the refractive index of the air for high-frequency radio waves consequent upon errors in meteorological measurements, G. A. Bull, B. Sc.

The anomalous dispersion of water at very high frequencies. Part. I. — Experimental determination of the dielectric properties of water in the temperature range 0° C to 40° C for wave lengths of 1.24 cm and 1.58 cm, J. A. Saxton, Ph. D. and J. A. Lane, B. Sc.

The anomalous dispersion of water at very high radio frequencies. Part II. — Relation of experimental observations to theory, J. A. Saxton, Ph. D.

The anomalous dispersion of water at very high radio frequencies. Part III. — The dipole relaxation time and its relation to the viscosity, J. A. Saxton, Ph. D.

The anomalous dispersion of water at very high radio frequency. Part IV. — A note on the effect of salt in solution, J. A. Saxton, Ph. D.
