

2061  
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## INFORMATIONS

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### IN MEMORIAM: Raymond JOUAUST

Born in Rennes on November 8th., 1875, Jouaust studied in this town and obtained the diploma of Electrical Engineer at the Ecole Supérieure d'Electricité. In 1903, he was appointed as Chef des Travaux at the Laboratoire Central d'Electricité and as Director in 1937. Honorary Director since 1942, he still worked at the Laboratoire Central as Counsellor.

In 1910, he started to co-operate with General Ferrié who suggested to nominate Jouaust as Secretary of the Comité Français de Radiotélégraphie Scientifique which had just been constituted in France under the Chairmanship of Blondel.

Jouaust was connected to all the researches made by General Ferrié. Amongst the works they undertook together one must mention applications of radioelectricity to astronomy, organization of the first time signals, their broadcasting by wireless telegraphy, their application to the worldwide longitude determination and also the first ionosphere study in France.

As Secretary of the Comité Français de Radiotélégraphie Scientifique, Jouaust took part to the creation of the International Scientific Radio Union. The spreading out of U. R. S. I. has always been one of Jouaust's main cares.

Jouaust carried on the researches on propagation undertaken by General Ferrié when he died in 1932. His part in the discovery of sudden variations in the ionosphere was essential; he promoted co-operation between technicians; he drew the attention of radio users, radioelectricians and physicists upon sudden fading of radio waves. Jouaust was the first to mention the importance of refraction of the very low atmosphere on meter waves. His last years were mainly devoted to theoretical study on ionosphere.

Jouaust was a member of the Bureau des Longitudes and was awarded five times a prize from the Académie des Sciences. He was Officier of the Légion d'Honneur for Military Services.

Since 1913 Jouaust took an important part in the Comité Français de Radiotélégraphie Scientifique (French National Committee of the U. R. S. I.) of which he has been General Secretary until 1948 when he was elected Honorary General Secretary.

We remind that Jouaust was Vice-President of U. R. S. I. from 1946 to 1948.

We regret not to be able to mention here all the books and publications Jouaust wrote but all those who are interested in radioscience are aware that the lucid and accurate mind of our friend helped several research workers to understand some intricate phenomena of the science which lost in Jouaust one of its most known pioneers.

*Note : We thank the French National Committee for the data mentioned in the present article.*

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## Secretariat

### 1950: SUBSCRIPTION

We remind that in accordance with art. 24 of the Statutes, the value of the annual unit of subscription for 1950 has been fixed to 450 gold francs by the General Assembly of 1948. The value of the gold franc as determined by the Statutes is at the time being equivalent to 16.3346 Belgian francs.

### DELEGATES OF NATIONAL COMMITTEES TO U. R. S. I. COMMISSIONS

*Commission VII.* — Mr. James H. KOEHLER as delegate of the U. S. A. National Committee has been appointed in place of Dr. G. F. METCALF (Bull. n° 58, p. 7).

### C. C. I. R.-U. R. S. I.

In our Bulletin n° 56 we published the list of the Study Groups appointed by the Fifth Meeting of the C. C. I. R. ; U. R. S. I. has nominated delegates to the four Study Groups with which our Union will co-operate.

Study Group n° 4 : Professor S. SACCO, Lungotovere Flaminio, 22, Roma (Italy).

Study Group n° 5 : Dr. H. W. L. ABSALOM, c/o Meteorological Office, Air Ministry, Kingsway, London, W. C. 2.

Study Group n° 6 : Mr. Harry W. WELLS, Carnegie Institution of Washington, Department of Terrestrial Magnetism, 5241, Broad Branch Road, N. W., Washington, D. C.

Study Group n° 7 : Mr. B. Decaux, Ingénieur en Chef au Laboratoire National de Radioélectricité, 196, rue de Paris, Bagneux (Seine), France.

### RADIO-SCIENTIFIC ACTIVITIES IN JAPAN

The Radio Research Committee which was previously the Japanese National Committee of U. R. S. I. was dissolved about ten years ago and an institute called the Physical Institute for Radio Waves was installed at Kokubunji near Tokyo. In 1948 it was incorporated in the Electric Communication Laboratory of the Ministry of Telecommunication, but now it is again transferred to the Radio Bureau of the same ministry. It has been working on regular ionospheric observations and research. Apart from this the National Research Council of Japan has organised the Ionosphere Research Committee since 1946 consisting of scientists and research-workers all over Japan in the field of solar phenomena, terrestrial magnetism, ionospheric study, telecommunication study, night-sky light, cosmic ray and the related phenomena.

Doctor Yusuke HAGIHARA to whom we owe the present information was elected as Chairman of the Committee from the beginning.

The Committee is now transferred to the newly organised Science Council of Japan due to the dissolution of the National Research Council.

The work and the results of the study of the Committee are reported to the International Astronomical Union, the Terrestrial Magnetism Association of the International Union for Geodesy and Geophysics, and also to the Central Radio Propagation Laboratory in Washington, in addition to the results of the joint co-operative observations of ionospheric and associated phenomena by various institutes all over Japan. All the publications of the Ionosphere Research Committee have been published in Japanese with abstracts in English. This year the Committee is publishing in English reports and lists of anomalous events in the associated phenomena.

The Physical Institute for Radio Waves, incorporated in the Electrical Communication Laboratory, has published « Ionospheric Data in Japan », vol. 1, n° 1-n° 4. The « Provisional Reports on the Eclipse Observation of May 9, 1948 » were published by the Eclipse Committee of the National Research Council last year. The Civil Communication Section of the General Headquarters published the report of the eclipse on radio science's part.

*Radiophysicists or scientific organizations wishing to receive copies of the documents mentioned in this article may apply to the Secretariat of U. R. S. I.*

## INTERNATIONAL ORGANIZATIONS YEARBOOK

The 1950 Edition of the International Organizations Yearbook will shortly be out of press.

This book, in French and in English, includes the following : 1) Structure of the Organization for European Economic Co-operation ; 2) The Council of Europe ; 3) The Brussels Treaty Organization « Western Union » ; 4) The Organization of American States ; 5) The United Nations ; 6) The Specialized Agencies ; 7) *Governmental and Non-Governmental Organizations.*

The Yearbook contains also a chronological list of events during 1949, a list of Embassies, Chambers of Commerce, as also a calendar of the principal international manifestations.

This book, which completes the Monthly Review of the Union of International Associations, is published jointly by the Editions

de l'Annuaire des Organisations Internationales (2, avenue Bellefontaine, Lausanne, Suisse) and the Union of International Associations (Palais d'Egmont, Bruxelles, Belgique).

Requests for, further informations or subscription forms, may be sent to either of these addresses.

## INTERNATIONAL COUNCIL OF SCIENTIFIC UNIONS

### GENERAL ASSEMBLY

Copenhagen, September 14-16, 1949

The EXECUTIVE COMMITTEE of the Council met on 13 September, and transacted chiefly the following business :

*New Commissions* : The following Joint Commissions were established or ratified :

(a) A new Joint Commission on *Physics Abstracting* to represent the needs of the user opposite the subject Committee of Unesco on Physics and Engineering Abstracts. Mother Union : International Union of Pure and Applied Physics.

(b) Joint Commission on *Radiobiology*, formerly a Commission of the International Union of Biological Sciences (Mother Union).

(c) Joint Commission on *Physico-Chemical Constants and Data*. Mother Union : the International Union for Chemistry.

*Unesco Grants-in-aid*. — Advantage was taken of the presence of all the Union Secretaries to form a working party under the chairmanship of the ICSU-Unesco Liaison Officer, to discuss outstanding problems of principle and procedure. The working party had two full meetings, and reached decisions on all major points.

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The FIFTH GENERAL ASSEMBLY met 14 to 16 September, and transacted the following chief business :

*Revision of the Statutes*. — Important changes were adopted in the Statutes of the Council. The two most important are :

(1) The creation of a small Bureau to manage the day-to-day business of the Council.

(2) The classification of the Unions as General or Specialized.

The General Assembly classified the existing Unions as follows :

General : Astronomy, Biological Sciences, Chemistry, Geodesy and Geophysics, Physics ;

Specialized : Cristallography, Geography, History of Sciences, Theoretical and Applied Mechanics, Radio-Science.

*Relations with Unesco.* — The discussion centred on the resolution adopted by the Executive Board of Unesco at their meeting in Paris, June, 1949, namely :

« That grants-in-aid be given only in a limited number of cases, in particular with the purpose of assisting new international organizations sponsored by Unesco. »

The following resolution was adopted by the Assembly :

« The Fifth General Assembly of the International Council of Scientific Unions, met at Copenhagen on 14 to 16 September :

» recognizing that Unesco is the principal Agency of the United Nations in the field of international scientific relations ;

» that Unesco has, as such, acknowledged ICSU and its Unions as the competent authority in regard to the international organization of Science ;

« that Unesco has invited the Council to undertake important tasks in this domain, and has supported such undertakings financially ;

» recognizing that the agreement concluded in December 1946 between Unesco and ICSU calls for constant mutual consultation, which cannot be other than most profitable to both organizations in the accomplishment of their international tasks ;

» deeply regrets that the continuation of this fruitful co-operation between Unesco and ICSU is seriously endangered by the resolution on the subject of grant-in-aid adopted by the Executive Board of Unesco at its Sixteenth Session in June 1949 ;

» fears that such a resolution would well deal a serious blow to work now in full progress, of which the deep significance for



international understanding should suffice to place it high among the activities which further the aims of Unesco ;

» expresses the hope that the Fourth General Conference of Unesco will decide in favour of an unbroken and boldly conceived continuation of the existing agreement with ICSU, an agreement which has fostered so successfully, in the course of the past three years, the spirit of international co-operation in the domain of Science. »

Sir David Brunt, Secretary of the Royal Society, was nominated to present this resolution to the Fourth Session of the General Conference of Unesco in Paris.

*Relations with the International Council of Philosophy and Humanistic Studies (I. C. P. H. S.) and the Conseil Permanent pour la Coordination des Congrès Internationaux des Sciences Médicales (C. C. I. M. S.).*

It was agreed to instruct the Bureau of the Council to set up a small co-ordinating Committee to review the fields on common interest of the three Councils, ICSU, ICPHS, CCICMS.

*Election of Officers.* — The following members of the Bureau were elected under the new Statutes :

*President* : Professor A. VON MURALT, Bülhlplatz, 5, Berne.

*Vice-Presidents* : Professor Emile Borel, 4, rue Froidevaux, Paris 14.

Professor H. SOLBERG, Jonas Reinsgt., 6, Oslo.

*Members* : Lt-Colonel E. HERBAYS, U. R. S. I., 42, rue des Minimes, Bruxelles.

Professor F. N. MUHKERJEE, Imperial Agricultural Research Institute, New Delhi.

*Secretary-General* : Professor F. J. M. SRATTON, Gonville and Caius College, Cambridge, England.

*Retiring President* : Dr. Jno. A. FLEMING, Carnegie Institution of Washington, Washington 25, D. C.

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The *Executive Board* of the Council, constituted under the new Statutes, met on 16 September.

It was agreed to refer the whole question of the admission of new Unions to a Policy Committee of the Bureau, which would report back in good time for the next meeting of the Executive Board in August 1950.

#### FOURTH SESSION OF THE GENERAL CONFERENCE OF UNESCO

Paris, September-October 1949

The Resolution from the Fifth General Assembly ICSU, quoted above, was presented by the British delegation to the Official and External Relations Commission of the Conference.

Sir David Brunt spoke as follows :

« On behalf of the United Kingdom delegation, I present to you the resolution, copies of which have been made available to delegates this morning and which was passed by the General Assembly of the International Council of Scientific Unions at its meeting in Copenhagen, on 14 to 16 September.

» This resolution has the strongest support of the United Kingdom delegation which regards the \$ 200.000 which Unesco has granted to the International Council of Scientific Unions as among the best investments made by Unesco. In view of the draft resolution submitted to the General Conference for its consideration we are surprised by the terms of the resolution of the Executive Board, which appears to be inconsistent with the draft resolution, and my delegation hopes that the draft resolution submitted to this Conference really means that no change of policy with regard to ICSU is intended. This is all the more desirable since the Scientific Unions work in triennial periods, and if the support of Unesco is to be regarded as liable to be withdrawn at short notice, it is impossible to plan for even three years ahead.

» The work of the international co-operation carried out by the International Council of Scientific Unions is now in a stage of development which requires the continued support of Unesco. The Union are being organized so as to include new aspects of Science, and the Council has the support of all scientifically active

countries. The British delegation considers that any diminution in the support which Unesco is now giving to the International Council of Scientific Unions would be a tragic error.

» I will not take up your time with a lengthy plea, since I am convinced that scientists of all countries have benefited by the co-operation with others, which the support of ICSU by Unesco has made possible.»

On the motion of the British delegation, seconded by the Chinese delegation, the following resolution was adopted unanimously by the Official and External Relations Commission, and subsequently ratified by the Conference :

« *The General Conference,*

» *Considering* the report of the Director-General on the development of relations with the International Council of Scientific Unions ;

» *Expresses* its satisfaction with the results achieved in the furtherance of Unesco's constitutional objectives in the scientific field under the existing Agreement ;

» *Instructs* the General-Director to continue co-operation with and to maintain financial assistance by means of grants-in-aid to the International Council of Scientific Unions in 1950, on the basis of the existing Agreement.»

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## NATIONAL COMMITTEES

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### SWEDISH NATIONAL COMMITTEE

The Swedish National Committee informs us of its scheme for establishing a Geophysical Institute.

This institution will be established in Kiruna, modern town of 18000 inhabitants, at about 68° N and at 21 hours of railway from Stockholm.

The Institute will include an ionospheric observatory, a terrestrial magnetism institute, a section for cosmic ray study, a section for solar physics and a seismologic station. The ionospheric observatory is working since some months and the other parts of the institute are being constructed.

When the works will be finished, the organizers are intended to welcome foreign scientists wishing to undertake researches at the north of the polar circle ; such scientists may be welcomed at present at the ionospheric observatory.

The new organization will allow our Swedish Friends to pursue and to achieve researches undertaken by the Wave Propagation Observatory of Gothenburg.

We publish hereunder some informations concerning the installations at Gothenburg and at Kiruna.

*Gothenburg* (57°41' N, 11°58' E).

*Ionospheric research.* — Two fixed frequency ionospheric recorders, operating on 2973 kc/s, and 5800 kc/s respectively. Three field intensity recorders, 50.5, 767 and 7290 kc/s respectively. A manual sweep frequency recorder ; this equipment will in a near future be replaced by an automatic recorder. Further the observatory is equipped with a recording magnetometer.

Radio fade-outs and the occurrence of sporadic E are among the projects that are studied.

*Meteor research.* — A 500 kW pulsed fixed frequency transmitter on 33 Mc/s is recorded. The result is presented on the screen of a 12" cathode ray tube. The image on this tube is photographed continuously. The number of meteor echoes within the different height intervals is also counted on an ordinary counter.

The various meteor paths are studied and also the connection with sporadic E.

*Radio astronomy.* — Different receiving equipments for recording of solar and interstellar noise have been constructed and will shortly be put into operation.

Connection between solar flares, bursts of noise and radio fade-outs will be studied.

*Radio meteorology.* — During the last years propagation research has been carried out on 10, 3 and 1 cm wavelength over a distance of about 12 miles. The fieldstrengths have been recorded continuously. Correlation between these recordings and meteorological conditions are studied.

During the last summer vertical reflections from inhomogeneities in the atmosphere have been recorded. Reflections have been recorded for example from rain, rain clouds and thunder clouds. These recordings will be continued.

*Kiruna* (67°51' N, 20°15' E).

*Ionospheric research.* — Sweep frequency recordings are obtained with a panoramic ionospheric recorder. This recorder covers the frequency spectrum 1-20 Mc/s in 30 seconds. Further the observatory is equipped with a field intensity recorder, a recording magnetometer and a night sky spectrograph. The aurora borealis is also observed continuously.

The correlation between certain ionospheric conditions, magnetic disturbances and the aurora borealis is especially studied.

#### MEETING OF THE NATIONAL COMMITTEE

A joint meeting of the Swedish National Committee of U. R. S. I., the Swedish Association of Electrical Engineers and the Royal Swedish Academy of Engineering Sciences was held on the 24th. and 25th. November, 1949, in Stockholm. The conference,

which was the first of this kind in Sweden, had a good support and was a success. About two hundred people attended the meeting and about thirty five papers were read. They dealt mainly with the following branches of radio science : measurements ; oscillations and circuits ; electronics, wave propagation ; extra-terrestrial noise ; terrestrial noise and mathematical machines.

Fruitful discussions about the subjects took place and the general opinion of the meeting was that similar meetings should be held every year in the future.

#### LIST OF PAPERS

##### *Measurements. Oscillations and circuits*

Accurate calibration of attenuators, Dr. H. WALLMAN, S. JONSON.  
An automatic impedance meter for the frequency range 0.2-14 Mc/s, H. WERTHÉN.

Special microwave measuring methods : a) Determination of the electronic tuning range of microwave tubes ; b) Arrangement for measuring the field distribution in magnetron resonators, G. SVALA.

Investigation of the measuring accuracy of measuring lines and methods for improving the accuracy, Dr. F. TISCHER.

Determination of the speed of light, E. BERGSTRAND.

Radio beacon for determining distance and direction, C.-E. GRANQVIST.

Transformers with broad-band characteristics at radio frequencies, H. BJÖRKLUND.

Linear frequency modulation of klystrons, N.-H. LUNDQUIST.

Application of the gaussian error-function in telecommunication theory, B. HÅÅRD.

Picture quality of different television pick-up systems, B. NILSSON.

A video-amplifier for 200 Mc/s, Dr. H. WALLMAN, L. HELLERSTEDT.

##### *Electronics*

Experiments with travelling-wave tubes and electron-wave tubes for 3 cm wavelength, S. TOMNER, B. AGDUR.

Theory of the electron-wave tube, Dr. O. E. H. RYDBECK,  
B. AGDUR.

Electron tube with spacecharge-controlled beam, T. WALLMARK.  
Experimental investigation of electron paths in a non-oscillating  
magnetron with spacecharge, R. SVENSSON.

The linear electron accelerator. Its theory and design, Chalmers  
Institute of Technology : Dr. O. E. H. RYDBECK, S. FORSGREN,  
B. STJEMBERG.

The binary trochotron, L. LINDBERG.

Unstable oscillations in an electron gas, Dr. K. G. MALMFORS.  
Noise produced by electrons in a magnetic field, E. ASTRÖM.

*Wave propagation. Extra terrestrial noise*

The ionospheric observatory at Kiruna. Its activities and work  
carried out, Dr. O. E. H. RYDBECK, R. LINDQVIST.

An automatic panoramic ionospheric recorder for the frequency  
range 0.5-20 Mc/s, R. LINDQVIST.

Meteorology and propagation of microwaves, B. JOSEPHSON.

Determination of the velocity of propagation for radio waves at  
frequencies employed by the Decca navigating system (88-  
132 kc/s), H. LARSSON.

Investigation of the transmission properties at metre wave-length  
(1.6 m) between Stockholm and Mariehamn (Åland), R.  
BERGLUND.

Simultaneous wave propagation at 10, 3 and 1 cm wave-length,  
O. PERERS.

Vertical recording of rain showers by means of 3 cm radar tech-  
nique, R. FORSGREN.

Råö radio-astronomical observatory (Chalmers Institute of Techno-  
logy), Dr. H. WALLMAN, Dr. O. E. H. RYDBECK, B. STJERN-  
BERG.

*Terrestrial noise. Mathematical machines*

Evaluation of the simultaneous investigation of atmospheric at  
two distant stations, Dr. H. NORINDER.

The influence of the atmospheric on cosmic radiation. Absorption  
by the air and the decay effect, Dr. F. LINDHOLM.

Radio reflections from meteor tracks, N. HEROLFSON.

Recording of echoes from meteors using 9 m wave-length, B. STJERNBERG.

An automatic meteor counter, H. HVATUM.

An electronic integral transform computer, and the practical solution of integral equations, Dr. H. WALLMAN.

An electronic differential analyzer, Dr. A. B. MACNEE.

Fourier-analysis and Fourier-synthesis by means of mathematical machines, G. LINDÉN.

## U. S. A. NATIONAL COMMITTEE

### Report of the U. R. S. I.-I. R. E.

#### Meeting held October 31, November 1 and 2, 1949

The joint fall meeting of the International Scientific Radio Union and the Institute of Radio Engineers held this year consisted of a joint meeting of the U. S. A. National Committee of the U. R. S. I. and of the recently organized Professional Group on Antennas and Wave Propagation of the I. R. E. This represents a departure from the practice, followed in previous years, of having a general meeting in the fall as in the spring.

This fall meeting was held in Washington on October 31, November 1 and 2 and was sponsored by the following U. R. S. I. Commissions of the U. S. A. National Committee :

- II. — Troposphere and Radio Propagation (Chairman : Dr. Charles R. BURROWS).
- III. — Ionosphere and Radio-Propagation (Chairman : NEWBERN-SMITH).
- V. — Extraterrestrial Radio Noise (Chairman : Dr. D. H. MENZEL).
- VI. — Radio Wave and Circuits, including General Theory and Antennas (Chairman : Dr. L. C. VAN ATTA).

The technical sessions held on October 31 and November 1 consisted mostly of papers invited by the Chairmen of the Commissions and of informal discussions plus a few contributed papers. Considerably more time was allowed for presentation of most of the papers and for the discussions. On November 3, adminis-



trative meetings were held by the various Commissions sponsoring the fall meeting and in the afternoon a joint technical session of all the Commissions summarized the activities and closed the meeting. Three hundred and forty persons attended these sessions and many of them participated in the interesting and lively discussions which accompanied the papers.

Abstracts of the papers were prepared in booklet form as a program. Copies are still available at a price of \$ 1.00 per copy and may be obtained upon request from Dr. Newbern Smith, Secretary-Treasurer of the U. S. A. National Committee, Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D. C.

Following are the titles and authors of papers that were presented :

MONDAY MORNING, OCTOBER 31

**Commission II. — Troposphere and Radio Propagation**

*Chairman* : Dr. C. R. BURROWS

Experimental investigation of lower troposphere scattering, J. B. SMYTH, U. S. Naval Electronics Laboratory, San Diego, Calif.

Signal fluctuations in long-range overwater propagation. W. S. AMENT and M. KATZIN, Naval Research Laboratory, Washington, D. C.

Propagation at 400 Mc with a high-power transmitter, I. H. GERKS, Collins Radio Company, Cedar Rapids, Iowa.

**Commission III. — Ionosphere and Radio Propagation**

*Chairman* : Dr. NEWBERN-SMITH

Attenuation coefficients for very low frequencies, M. LINDEMAN-PHILLIPS, Central Radio Propagation Laboratory, National Bureau of Standards, Washington, D. C.

Ionospheric Propagation at 150 kc/s, A. H. WAYNICK, Radio Propagation Laboratory, The Pennsylvania State College, State College, Pa.

Low-Frequency ionospheric measurements, R. A. HELLIWELL,

A. J. MALLINCKRODT, F. W. KRUSE JR., B. W. WAMBSGANSS,  
Dept. of Elec. Eng., Stanford University, Stanford, Calif.,  
Vertical incidence ionospheric absorption at 150 kc/s, Arthur  
H. BENNER, Radio Propagation Laboratory, The Pennsylvania  
State College, State College, Pa.

**Commission VI. — Radio Waves and Circuits  
including General Theory and Antennas**

*Chairman* : Dr. L. C. VAN ATTA

Development of artificial dielectric optics in Germany, Otmar M.  
STUETZER, Wright-Patterson Air Force Base, Dayton, Ohio.  
Artificial dielectric broadside and end-fire antennas, W. E. KOCK,  
Bell Telephone Laboratories, Murray Hill, N. J.  
Metal plate media-mathematical theory, Albert E. HEINS, Car-  
negie Institute of Technology, Pittsburgh, Pa.  
Metal Plate media-extension and test of theory, B. A. LENGYEL,  
Naval Research Laboratory, Washington, D. C.

MONDAY AFTERNOON, OCTOBER 31

**Commission II. — Troposphere and Radio Propagation**

*Chairman* : Dr. C. R. BURROWS

Progression of microwave radio scintillation at wind speed on an  
overwater path., A. W. STRAITON and H. W. SMITH, Elec. Eng.  
Research Labs., University of Texas, Austin, Texas.  
A theory of radio scattering in the troposphere, H. G. BOOKER  
and W. E. Gordon, School of Elec. Eng., Cornell University,  
Ithaca, N. Y.  
The scattering of three-centimetre radio waves by snow, R. C.  
LANGILLE, Radio Propagation Laboratory, Defence Research  
Board, Ottawa, Canada.

**Commission III. — Ionosphere and Radio Propagation**

*Chairman* : Dr. NEWBERN-SMITH

Electron density and absorption measurements through the  
E-layer by a heterodyne-beat method, J. Carl SEDDON, Naval  
Research Lab., Washington, D. C.

Ion density measurements in the ionosphere by means of the NRL ion collector, T. ROBERT BURNIGHT and J. F. CLARK Jr., Naval Research Laboratory, Washington, D. C.

Investigation of soft X-ray intensity and photo-emission phenomena in the E-layer, T. ROBERT BURNIGHT, Naval Research Laboratory, Washington, D. C.

**Commission VI. — Radio Waves and Circuits  
including General Theory and Antennas**

*Chairman* : Dr. L. C. VAN ATTA

The helical antenna, John D. KRAUS, Ohio State University, Dayton, Ohio.

Transmission modes and the associated radiation fields of the helical antenna, Arthur E. Marston, Naval Research Laboratory, Washington, D. C.

Modified axial mode helices and their application to arrays, Paul W. SPRINGER, Aircraft Radiation Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio.

Helical radiators as broad-band, dragless, circularly-polarized antennas, James A. MARSH, Ohio State University Research Foundation, Columbus, Ohio.

TUESDAY MORNING, NOVEMBER 1

**Commission II. — Troposphere and Radio Propagation**

*Chairman* : Dr. C. R. BURROWS

Formation of ducts in air moving from warm land over cool water, R. A. CRAIG, Harvard College University, Cambridge, Mass.

Dynamic radio meteorology, Georges D. LUKES, Signal Corps Eng. Labs., Ft. Monmouth, N. J.

Determination of modified index-of-refraction profiles and wave attenuation from radio data, A. W. STRAITON and A. H. LAGRONE, Elec. Eng. Res. Labs., University of Texas, Austin, Texas.

JOINT SESSION

**Commission III. — Ionosphere and Radio Propagation  
and Commission V. — Extraterrestrial Radio Noise**

*Chairman* : DR. NEWBERN-SMITH

Arctic Ionospheric problems, James C. W. SCOTT, Radio Propagation Laboratory, Defence Research Board, Ottawa, Canada.  
The origin of solar flares, Donald H. MENZEL, Harvard College Observatory, Cambridge, Mass.

Possible sources of solar noise, Donald H. MENZEL, Harvard College Observatory, Cambridge, Mass.

The Geophysical Institute at the University of Alaska, S. L. SEATON, Director, Geophysical Institute, University of Alaska, College, Alaska.

**Commission VI. — Radio Waves and Circuits,  
including General Theory and Antennas**

*Chairman* : DR. L. C. VAN ATTA

Transmission and reception by arbitrary antenna systems, George SINCLAIR, University of Toronto, Toronto, Canada.

Antenna relations for elliptical polarization, John I. BOHNERT, Naval Research Laboratory, Washington, D. C.

On the representation and analysis of polarization characteristics, V. H. RUMSEY, T. E. TICE, Ohio State University, Research Foundation, Columbus, Ohio.

On the relation between the impedance characteristics and the polarization characteristic of two interconnected orthogonal radiators, Paul I. PRESSEL, Ohio State University Research Foundation, Columbus, Ohio.

TUESDAY AFTERNOON, NOVEMBER 1

**Commission III. — Ionosphere and Radio Propagation**

*Chairman* : DR. NEWBREN-SMITH

Variations in short-time fading ranges of sky-wavefield intensities at vertical incidence, using high frequencies, H. P.

HUTCHINSON, Central Radio Propagation Laboratory, National Bureau of Standards, Washington, D. C.

Lunar effects on F2-layer, A. G. Mc NISH, T. N. GAUTIER and V. L. AGY, Central Radio Propagation Laboratory, National Bureau of Standards, Washington, D. C.

Radio Wave Propagation at oblique incidence including the Lorentz polarization term, John M. KELSO, Radio Propagation Laboratory, The Pennsylvania State College, State College, Pa.

High ground conductivity in western Canada, P. A. FIELD, Radio Propagation Laboratory, Defence Research Board, Ottawa, Canada.

#### **Commission V. — Extra terrestrial Radio Noise**

*Chairman* : Dr. D. H. MENZEL

Cosmic Radio Noise in the VHF Band, H. V. COTTONY and J. R. JOHLER, Central Radio Propagation Laboratory, National Bureau of Standards, Washington, D. C.

Observations of solar noise on 205 Mc, Charles L. SEEGER, Cornell University, Ithaca, N. Y.

Solar radiation effects upon long-distance electrical-power transmission, Jack T. WILSON, Allis-Chalmers Co.

Observations of a total lunar eclipse on 1.8 cm, Winfield W. SALISBURY, Collins Radio Co, Cedar Rapids, Iowa.

Point sources of radio noise, D. H. MENZEL, Harvard College Observatory and Daniel CROWLEY, Air-Force Cambridge Research Lab.

#### JOINT SESSION

#### **Commission II. — Troposphere and Radio Propagation and Commission VI. — Radio Waves and Circuits, including General Theory and Antennas**

*Chairman* : Dr. L. C. VAN ATTA

Fields near apertures and obstacles, Samuel SILVER, University of California, Berkeley, Calif.

The field of a horn radiator and the modification produced in its far field by an obstacle in its near field, G. A. WOONTON, McGill University, Montreal, Canada.

Diffraction by a cylindrical obstacle, Charles H. PAPAS, Cruft Laboratory, Harvard University, Cambridge, Mass.

An experimental investigation of electromagnetic diffraction at 1.25 cm, Halph D. KODIS, Cruft Laboratory, Harvard University, Cambridge, Mass.

WEDNESDAY, NOVEMBER 2, 1949, A. M.

**Administrative sessions of the separate Commissions**

WEDNESDAY, NOVEMBER 2, 1949, P. M.

**Joint Technical Sessions**

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## COMMISSIONS

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### COMMISSION III

#### IONOSPHERE AND WAVE PROPAGATION

We have the pleasure to inform our readers that the Kiruna Observatory (Sweden, 67°8 N, 20°5 E) publishes every month the results of ionospheric measurements.

#### COMMISSION VII. — ON ELECTRONICS

We publish hereafter a letter from Mr. G. LEHMANN, President of Commission VII, to Presidents of National Committees and to delegates of these Committees to Commission VII.

*Suggestions inspired by the contents of this letter may be sent to the Secretary of U. R. S. I. who will forward them to Mr. Lehmann.*

« Dear Sir,

» Already a year and a half has elapsed since at the U. R. S. I. General Assembly held in Stockholm in 1948 it was decided to create a Commission VII on « Electronics ».

» This decision was taken following a recommendation by the former Commission IV « Radiophysics » which, considering the number and diversity of submitted papers, suggested the creation of the new Commissions VI and VII.

» The word « Electronics » has slightly different meanings in various countries; and anyhow covers so large areas of modern science that time has perhaps come to sketch a tentative schedule for the work of our Commission in order that it brings an useful contribution to the 1950 General Assembly.

» Several National Committees have already appointed their delegate to Commission VII; the question of this Commission's

activity has therefore been already looked upon and it is why I come today to ask your suggestion on its working agenda.

» If we go back to article 1 of the U. R. S. I. statutes we read : The object of the Union is to develop, on an international basis, scientific studies pertaining to radio, and particularly :

» a) to promote and organize researches requiring international co-operation, and the scientific discussion and publication of these researches ;

» b) to promote the setting up of common methods of measurements as well as the inter-comparison and standardization of the measuring instruments used in scientific work. »

» The term of « Electronics » is used in two meanings :

» 1° The science of electrons,

» that is the science of electronic vacuum and gas tubes, that of the theory of matter, and more recently that of the theory of semi-conductors, in full development.

» 2° The science of electronic instruments,

» which concerns the very large arsenal of apparatus and equipments using amplifier vacuum tubes, and so frequently utilized in modern scientific researches.

» Two difficulties seem to be avoided by starting the work of the Commission which I have been asked to preside by the General Assembly of Stockholm.

» U. R. S. I. should not substitute itself to national technical associations such as the Institute of Radio Engineers, the Institution of Electrical Engineers, the Société des Radioélectriciens.

» It should put aside of its program, works which do not present scientific as well as international aspect of interest.

» On the other side, the field covered by the word « Electronics » is so large that in order to avoid an unuseful dispersion of our Commission's activity, one might perhaps recommend for each period between two general assemblies a preferred list of research efforts on which we should try to obtain conclusions of scientific and international interest.

» Among the fields which can be thought of for the 1950 Assembly, may I mention, without limitation :



The theory of vacuum tubes operating at very high frequency <sup>(1)</sup> ;  
The theory of gas discharge ;  
The use of very high frequency waves for the study of matter ;  
The theory of semi-conductors ;  
The use of electronic instruments in modern physics, and especially in nuclear physics.

» I would very much appreciate if you would send me your suggestions on these questions so that I can give the various U. R. S. I. National Committees, around the end of January 1950, a tentative agenda for the work of our VIIth. Commission in Zurich in 1950.

» I thank you very much in advance for your contribution and I am,

Very truly yours,

Gérard J. LEHMANN,  
*President, Commission VII.*

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<sup>(1)</sup> See U. R. S. I. Volume VII, page 396, 3rd. Line.

## DOCUMENTATION

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Periodical, articles and books under this heading have been received at the Secretariat of the U. R. S. I. and may be communicated, on request, to Members of National Committees.

### Periodicals

#### UNESCO

*Courrier*, vol. II, n° 11, Dec. 1949; n° 12, Jan. 1950.

### INTERNATIONAL COUNCIL OF SCIENTIFIC UNIONS

*Monthly Bulletin of Information*, n° 21, Sept.-Oct. 1949.

Proceedings of the XVth Conference of the International Union of Pure and Applied Chemistry (Amsterdam, Sept. 5-10). — Proceedings of the General Assembly of I. C. S. U. (Copenhagen, Sept. 14-16) see p. 7. — Fourth Session of the General Conference of Unesco (Paris, Sept.-Oct.). — Joint Commission on Science Abstracting. Membership.

*Calendar (Extracts)* :

January 1950, ICSU, Paris : Bureau, International Council of Scientific Unions.

February, early, UNESCO, Paris : Executive Board, Nineteenth Session.

March, UNESCO, Paris : 2nd. Meeting Provisional Consultative Committee for the Sciences of the Engineer.

May, end, UNESCO, Florence : Fifth Session of the General Conference.

June 29 to-July 8, Paris : High Tension Conference.

Spring, ICSU, Paris : Committee on Science and its Social Relations.

August, end, ICSU, Switzerland : Executive Board, International Council of Scientific Unions.

September 11-23, URSI, Zurich : IXth. General Assembly, International Scientific Radio Union.

August 1951, 21 to Sept. 1, IGGU, Brussels : IXth. General Assembly, International Union of Geodesy and Geophysics.

September 1951, IUPAP, Copenhagen : General Assembly, International Union of Pure and Applied Physics.

Summer 1952, ICSU, Netherlands : VIth. General Assembly, International Council of Scientific Unions.

## INTERNATIONAL SCIENTIFIC UNIONS

*The I. G. U. Newsletter*, bulletin of the International Geographical Union, vol. I, n° 1, Jan. 1950.

*Archives Internationales d'Histoire des Sciences*, issued by the International Union of History of Science, n° 10, Jan. 1950.

*International Union of Pure and Applied Physics*. Circulaire d'Information Générale, Dec. 1949 (contains the minutes of the colloquium on nuclear physics held in Bâle in Sept. 1949). International Commission on Optics.

## BELGIUM

*Union of International Associations*, Monthly Bulletin, n° 10, Dec. 1949 ; n° 1, Jan. 1950.

*Ciel et Terre*, Monthly Bulletin of the Société Belge d'Astronomie, de Météorologie et de Physique du Globe, LXVth. year, n° 11-12, Nov.-Dec. 1949.

*Centre de Contrôle de Radiocommunications des Services Mobiles*. Montly Report M 11/49, Nov. 1949, M 12/49, Dec. 1949. Monthly Report Aé 11/49, Nov. 1949, Aé 12/49, Dec. 1949.

## CHINA

*Ionospheric Characteristics Observed at Wuchang*, issued by the Ionosphere Laboratory, National Wuhang University, n° 2, June 1949, daily hourly values from March to Dec. 1948.

## FRANCE

*Bullelin d'Information du Laboratoire National de Radioélectricité*, 4th year, 1949, n° 6, measurements of June 1949, n° 7 measurements of July 1949.

*Observations Solaires*, issued by the Service de Prévision Ionosphérique Marine, SPIM, S 28, 29, 30, June 1949, for Oct., Nov. and Dec. 1948.

*Annales de Radioélectricité*, t. IV, n° 18, Oct. 1949.

## GREAT BRITAIN

*Predictions of Radio Wave Propagation Conditions*, issued by the Radio Research Station of Slough, n° A 38, Nov. 1949 for April 1950, n° A 39, Nov. 1949 for April 1950.

*Monthly Bulletin of Ionospheric Characteristics*, issued by the Department of Scientific and Industrial Research, Radio Research Station.

N° B, 34, Nov. 1949, measurements of Aug. and Sept. 1949; n° B 35, Dec. 1949, measurements of Sept. and Oct. 1949.

*The Marconi Review*, vol. XII, n° 4, Oct.-Dec. 1949.

*Contains.* — V. H. F. and U. H. F. Propagations within the Optical Range, by M. W. Gough; The Reflection Coefficient of a Linearly Graded Layer, by G. Millington; Quarter Wave Networks, by E. Green.

## INDIA

*Ionospheric Data*, issued by the Ionosphere Laboratory, University College of Science, Calcutta, vol. V, n° 7, July 1949; n° 8, Aug. 1949; n° 9, Sept. 1949.

## NEW ZEALAND

*Cosmic Relations Bulletin*, issued by the Radio Research Office, Dominion Physical Laboratory, D. S. I. R., n° 4, Sept. 1949; n° 5, Oct. 1949.

## SWEDEN

*Ionospheric Measurements at Kiruna*, issued by the Wave Propagation Observatories, Research Laboratory of Electronics, Gothenburg, monthly charts from March to December 1949 (see p. 12).

## UNITED STATES

*Basic Radio Propagation Predictions*, issued by the National Bureau of Standards. C.R.P. 4, Series D, n° 63, Nov. 1949 for Febr. 1950; n° 64, Dec. 1949 for March 1950; n° 65, Jan. 1950 for April 1950.

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## Articles — Works — Books

### UNESCO

*List of Scientific Papers Published in the Middle-East*, n° 4, Nov. 1949.

*Abstracts*. — Formeln zur Sonnenfleckenprognose, W. Gleissberg (Summary in English). *Review of the Faculty of Science, Istanbul University*, series A, t. XIV, n° 2, 1949 and *Istanbul University Teknik Universitesi Bülteni*, n° 36, 1949.

Die säkular ausgeglichenen Daten des Sonnenfleckenzyklus, n° 16, W. Gleissberg (summaries in English and Turkish). *Ist. Tek. Univers. Büll.*, n° 32, 1948 and *Rev. of the Fac. of Sci., Ist. Univers.*, series A, t. XIII, n° 4, 1948.

On the difference between Zürich and American sunspot number, W. Gleissberg (summary in Turkish). *Ist. Tekn. Univ. Büll.*, n° 35, 1949.

On the origin of the sunspots, N. Gokdogan (summary in Turkish). *Ist. Tekn. Univ. Büll.*, n° 33, 1948 and *Rev. of Fac. of Sci., Ist. Univ.*, series A, t. XIII, n° 4, 1948.

Triode valve oscillations hysteresis with a view to radio-geophysical prospection, Faris Minaw, *Bul. de l'Institut d'Égypte*, t. XXX, session 1947-1948.

## INTERNATIONAL SCIENTIFIC UNIONS

*The Uyûn Al-Akhhbâr of Ibn Qulayba* (The Natural History Section from a 9th Century «Book of Useful Knowledge») translated by L. KOPF, M. A. (Jerusalem), issued by the Académie Internationale d'Histoire des Sciences.

## AUSTRALIA

*The Stresses in certain Cylindrical Swept Tubes under Torsion and Bending* <sup>(1)</sup>, by J. J. THOMSON and W. H. WITTRICK, Aeronautical Research Report ACA-43, Council for Scientific and Industrial Research, janv. 1949.

*Dielectric Absorption Crystalline Long-Chain Ketones* <sup>(1)</sup>, by R. J. MEAKINS, reprint from *Nature*, vol. 163, p. 840, May 28, 1949.

*Noise Spectrum of Temperature-limited Diodes* <sup>(1)</sup>, by D. B. FRASER, reprinted from *Wireless Engineer*, vol. XXVI, April 1949.

*Simplified Calculations for the Estimation of Gene Frequencies for the Rhesus factor and an Application to partially classified data*, by E. J. WILLIAMS, reprinted from the *Medical Journal of Australia*, 1949, vol. I, n° 3.

## FRANCE

*Étude des anomalies ionosphériques. Relations avec les phénomènes géophysiques et astrophysiques*, by M. LAFFINEUR and J.

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<sup>(1)</sup> Copies have been sent to the National Committees.

DURAND (Supplements to the Bulletins d'Information of the Laboratoire National de Radioélectricité, n° 1 (for Jan. 1949) and n° 3 and 5 (for March and May 1949).

*Sur l'effet de longitude dans la couche F<sub>2</sub> de l'ionosphère*, by R. GALLET, reprinted from *Annales de Géophysique*, t. 5, fasc. 3, 1949.

*Une nouvelle station ionosphérique à Dakar*, par R. GALLET, reprinted from *Annales de Géophysique*, t. 5, fasc. 3, 1949.

### ITALY

*Coefficiente di riflessione ed impedenza acustica*, by M. FERRERO and G. G. SACERDOTE, reprinted from *Il Nuovo Cimento*, June 1947, IV, 3-4.

*Determinazione dei parametri di propagazione sonora in corpi assorbenti*, by M. FERRERO and G. G. SACERDOTE, reprinted from *Il Nuovo Cimento*, Oct. 1947, IV, 5-6.

*Sulla determinazione dei parametri caratteristici di una impedenza acustica*, by M. FERRERO and G. G. SACERDOTE, reprinted from *Il Nuovo Cimento*, June 1948, V, 5.

*Parametri di propagazione sonora in corpi assorbenti granulosi*, by M. FERRERO and G. G. SACERDOTE, reprinted from *Il Nuovo Cimento*, Dec. 1948, V, 6.

*L'elettrotecnica e le comunicazioni elettriche in Italia dal 1939 al 1945*, by P. LOMBARDI, reprinted from *Pont. Acad. Scient. Relations*, de Auct. Scient. Temp. Belli, 1948, n° 31.

*Su alcune questioni di elettrodinamica classica relative al moto dell'elettrone*, by G. ZIN, reprinted from *Il Nuovo Cimento*, Jan. 1949, VI, 1.

*Summary.* — The work concerns the equations of the electron motion obtained by C. J. Eliezer. These equations differ from Dirac's for a  $2k + 1$  factor multiplying the radiation reaction term. The rectilinear motion of a particle of charge  $e$ , projected towards one of charge  $ne$ , is treated in the four cases  $2k + 1 \leq 0$ ,  $n \leq 0$ . Furthermore it results that the particles can collide with each-other when  $n(2k + 1) > 0$ ; no collision

can take place, whichever the initial conditions of the motion, when  $n(2k+1) < 0$ . The motion analysis shows that, when  $n(2k+1) < 0$ , the distance between two particles reaches a minimum different from zero; starting from which the moving particle spaces to infinity with a velocity tending to a limit. If  $2k+1 < 0$ ,  $n > 0$ , this limit results different from the velocity of light; while its value is the velocity of light if  $2k+1 > 0$ ,  $n < 0$ . Therefore the use of a factor  $2k+1 > 0$  appears unacceptable (this case concerns Dirac's equations where  $k = 0$ ). Going on, the work deals with the elementary oscillator and it is proved that, in such a problem, unacceptable results are obtained using a factor  $2k+1 < 0$ .

*Flussometri e magnetometri*, by S. B. TONIOLO, reprinted from *Elellroecnica*, July, 1948, XXXV, 7.

*Su un quadro sintetico delle macchine elettriche*, by G. VALLAURI, reprinted from *Elellroecnica*, Jan. 1949, XXXVI, 1.

*Determinazioni di una scala di sensazioni visive*, by C. M. GARELLI and G. G. SACERDOTE, reprinted from *R. C. Acc. Lincei*, (Sci. Fis.), Dec. 1948, V, 6.

*Calcolo delle funzione di sensazione acustica*, by G. G. SACERDOTE, reprinted from *Alla Frequenza*, Febr. 1949, XVIII, 1.

*Diagramma per il calcolo delle costanti di propagazione*, by E. BALBO BERTONE DI SAMBUY, reprinted from *Alla Frequenza*, Dec. 1948, XVII, 6.

*Errori e radionavigazione*, by P. LOMBARDI, reprinted from *Alla Frequenza*, Feb. 1949, XVIII, 1.

*Summary.* — As an application of the classic probability theory to the calculation of errors, the « probable ellipse » or « 50 % ellipse » in the case of the fixing of a position point with the methods of radio navigational aids is determined. The distribution of error probability is examined.

*Melodi ed apparecchiature per misure su resistori campione*, by G. ROSA, reprinted from *Elellroecnica*, Feb. 1948, XXXVI, 2.

*Il coefficiente di assorbimento di risonatori*, by G. G. SACERDOTE, reprinted from *Alla Frequenza*, Oct. 1948, XVII, 5.

*Determinazioni di fatica udiliva con l'audiometro automatico*, by G. G. SACERDOTE, reprinted from *Alla Frequenza*, Dec. 1948, XVII, 6.



*Il tempo di riverberazione limite*, by G. G. SACERDOTE, reprinted from *Alla Frequenza*, April 1949, XVIII, 2.

*Sull' analisi matriciale delle reti lineari comprendenti quadripoli attivi*, by A. PINCIROLI and A. TARABOLETTI, reprinted from *Alla Frequenza*, April 1949, XVIII, 2.

*Summary.* — Active and passive electrical networks are considered as a system of four-terminal components and this concept is applied to the study of transduction networks including vacuum tubes. This method in the experience of the authors leads to generalized results in a suggestive and simpler manner than do the usual methods of analysis.

*Allivita dell' Istituto Elettrotecnico Nazionale Galileo Ferraris, nel suo quattordicesimo anno di vita*, by G. VALLAURI, reprinted from *La Ricerca Scientifica*, June 1949, XIX, 6, and from *Alla Frequenza*, Dec. 1948, XVII, 6 et Feb. 1949, XVIII, 1.

## SWITZERLAND

*Die Sonnenaktivität im Jahre 1948*, by M. WALDMEIER, issued by the Eidgenössischen Sternwarte Zürich.

*Beobachtungen der Korona während der Sonnenfinsternis vom 1 November 1948*, by M. WALDMEIER, issued by the Eidgenössischen Sternwarte Zürich.

*Aktivitätszonen und Zirkulation in der Sonnenkorona*, by M. WALDMEIER, issued by the Eidgenössischen Sternwarte Zürich.

*Heliographische Karten der Photosphäre für das Jahr 1948*, by M. WALDMEIER, issued by the Eidgenössischen Sternwarte Zürich.

*Bréviaire des erreurs de radiosondage*, by J. LUGEON and P. ACKERMANN, reprinted from the *Annales de la Station Centrale Suisse de Météorologie* (1948).

*La radiosonde suisse*, by J. LUGEON, P. ACKERMANN and M. BOHNENBLUST, reprinted from the same publication.

*Der Neubau der Schweizerischen Meteorologischen Zentralanstalt,*  
by J. Lugeon, reprinted from the *Neuen Züricher Zeitung*,  
Dec. 28, 1949.

**UNITED STATES OF AMERICA**

*Program of the Joint Meeting U. R. S. I. U. S. A. National  
Commiltee and Insitilule of Radio Engineers, Oct. 31, Nov. 1  
and 2, 1949 (see p. 16).*

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