Bulletin nº 148 Janvier-Février 1965

U. R. S. I.

TABLE DES MATIÈRES — CONTENTS

COMITÉS NATIONAUX

France

COMPTE RENDU DES JOURNÉES D'ÉTUDE SUR LA GÉOPHYSIQUE ÉQUATORIALE (Paris, 18-19 juin 1964)

A l'initiative du Professeur Coulomb, un Groupe d'Aéronomie Equatoriale (G. A. E.) a été constitué au sein du Comité National Français de Géodésie et de Géophysique (C.N.G.G.) en 1963. Placé sous la présidence du Professeur Barbier, ce groupe se propose de coordonner et d'animer les recherches géophysiques françaises sur les phénomènes de basse latitude.

Pour permettre aux chercheurs déjà engagés dans des études équatoriales et à ceux susceptibles de s'orienter dans cette voie de faire le point des principaux problèmes posés aux basses latitudes, le G.A.E. avec le concours du Centre National d'Etudes Spatiales, a pris l'initiative d'organiser à Paris, au laboratoire de l'Ecole Normale Supérieure, des Journées d'étude sur la géophysique équatoriale les 18 et 19 juin 1964. D'éminents physiciens européens, le professeur Nicolet et les docteurs Rothwell, King et Kohl ont bien voulu s'associer aux physiciens français pour présenter des exposés de synthèse sur les différents problèmes abordés : anomalie ionosphérique équatoriale de la couche F, électrojet et couche E sporadique équatoriale, émissions optiques intertropicales. Le professeur Coulomb a accepté d'ouvrir les travaux de ces Journées d'études. Une assistance nombreuse a suivi ces travaux.

Les principales communications présentées et discutées au cours de ces journées sont mentionnées ci-après :

I. Anomalies équatoriales de l'ionosphère (résultats expérimentaux) :
   1. L'observation de l'anomalie par satellite, par J. W. KING.
   2. Les caractéristiques de l'anomalie observée au sol, par G. VASSEUR.

II. L'anomalie équatoriale de l'ionosphère (interprétations) :

1. Le rôle des phénomènes de diffusion dans l'équilibre de l'ionosphère équatoriale, par H. KOHL.
2. Existence et rôle de coquilles magnétiques d'ionisation, par P. ROTHWELL.

III. Phénomènes équatoriaux dans la basse ionosphère :

1. La formation de la couche D équatoriale, par M. NICOLET.
2. L'électrojet équatorial et le système de courant Sq, par P. N. MAYAUD.
3. La couche E sporadique équatoriale, par L. R. O. STOREY.

IV. Phénomènes optiques des basses latitudes :

1. L'émission optique du ciel nocturne aux basses latitudes, par le Prof. BARBIER.
2. Observation des vents par fusées en région équatoriale, par le Prof. BLAMONT.

Les lecteurs qui désirent de plus amples renseignements sur cette réunion ou sur le Groupe d'Aéronomie Equatoriale peuvent s'adresser à M. F. du Castel, Vice-Président du Groupe ; C.N.E.T., 3, avenue de la République, Issy-les-Moulineaux, Seine, France.

Mexique

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Foreign Secretary and Chairman of the Division of Physical Sciences, NAS-NRC.

1964 FALL U.R.S.I. MEETING

OCTOBER 12-14

List of papers presented at the various sessions

1. — COMBINED SESSION OF ALL COMMISSIONS

0.1.1. A Guided Wave Approach to Electroacoustic Wave Propagation, Nathan MARCUVITZ, Polytechnic Institute of Brooklyn, Brooklyn, N.Y.

0.1.2. Radar Observations of Electroacoustic Waves in the Ionosphere, K. L. BOWLES, Central Radio Propagation Laboratory, National Bureau of Standards, Boulder, Colo.

0.1.3. Antennas and Probes in the Ionosphere, J. A. FEJER, Southwest Center for Advanced Studies, Dallas, Tex.

0.1.4. Electrostatic Plasma Wave Propagation, G. S. KINO, Microwave Laboratory, Stanford University, Stanford, Calif.

2. — COMMISSION II

2.1. — *Tropospheric Propagation — Theories and Experiments*

2.1.1. Tentative Interpretation of Phase Measurements on a Transhorizon Path., I. H. GERKS, Collins Radio Company, Cedar Rapids, Ia.

2.1.2. Phase and Amplitude Measurements on a UHF Transhorizon Path, C. M. BEAMER, Collins Radio Company, Cedar Rapids, Ia.

2.1.3. A more Accurate Solution of the Diffraction Problem in an Exponentially Stratified Atmosphere, I. H. GERKS, Collins Radio Company, Cedar Rapids, Ia.

2.1.4. Results of Transmission Loss Measurements in the 20-100 Mc/s Range over Irregular Terrain using Low Antennas, A. P. BARSIS, Central Radio Propagation Laboratory, National Bureau of Standards, Boulder, Colo.

2.1.5. Convergence Factor for Reflections from a Horizontally Stratified Atmosphere, T. J. CARROLL, Bendix Radio Division, Baltimore, Md.

2.1.6. Microwave Attenuation Due to Precipitation as Inferred from Weather Radar Measurements, R. E. NEWELL, Massachusetts Institute of Technology, Cambridge, Mass., and M. L. STONE, Lincoln Laboratory, Massachusetts Institute of Technology, Lexington, Mass.

2.2. — *Planetary Scattering and Satellite Communication*

2.2.1. Depolarization and Surface Roughness, H. S. HAYRE, Electrical Engineering Department, Kansas State University, Manhattan, Kan.

2.2.2. Communication Experiments with Echo II, S. L. ZOLNAY and J. W. EBERLE, Electrical Engineering Department, Ohio State University, Columbus, O.

2.2.3. Radar Observations of Venus At 3.6 Centimeters, David KARP and W. B. SMITH, Lincoln Laboratory, Massachusetts Institute of Technology, Lexington, Mass.

2.2.4. Interpretation of Radar Measurements from the Moon and Earth, L. M. SPETNER and I. KATZ, The Johns Hopkins University, Applied Physics Laboratory, Silver Spring, Md.

2.2.5. A Precision Planetary Range-Tracking Radar, R. C. TITSWORTH, G. A. MORRIS, Jr. and R. L. MOTSCH, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, Calif.

2.2.6. Communication Satellite System Degradation Due to Rain, N. E. FELDMAN, Electronics Department, The Rand Corporation, Santa Monica, Calif.

2.3. — *Antennas in Dissipative Non-Ionized Media*

2.3.1. The Driving-Point Impedance of a Small Prolate Spheroidal Antenna Immersed in a Conducting Medium, W. T. COWAN, R. D. KELLY, and R. H. WILLIAMS, University of New Mexico, Albuquerque, N. M.

2.3.2. Radiation Fields from a Horizontal Electric Dipole in a Stratified Conducting Medium, A. W. BIGGS and H. M. SWARM, Electrical Engineering Department, University of Washington, Seattle, Wash.

2.3.3. The Circular Loop Antenna near the Interface Between a Dissipative Medium and Air, Keigo IIZUKA, Gordon McKay Laboratory, Harvard University, Cambridge, Mass.

2.3.4. Characteristics of the HF Annular Slot Antenna in Dissipative Media, Essad Tahan, Sylvania Electronic Systems, Waltham, Mass.

2.3.5. Conductivity and Radio Propagation in the Earth's Crust, A. ORANGE, Air Force Cambridge Research Laboratories, P. NELSON, Massachusetts Institute of Technology, and T. CANTWELL, Geoscience Incorporated, Cambridge, Mass.

3. — COMMISSION III

3.1. — *F2-Region Measurements*

3.1.1. Measurements of Electron Content with Syncom II, O. K. GARRIOTT, F. L. SMITH III, A. DA ROSA, Radioscience Laboratory, Stanford University, Stanford, Calif., P. C. YUEN, Department of Electrical Engineering, University of Hawaii, Honolulu, Hawaii.

3.1.2. Determination of the Solar Ionizing Flux From Sunrise Measurements A. A. GRAN, Ionosphere Research Laboratory, Pennsylvania State University, University Park, Pa.

3.1.3. Analysis of Second-Order Corrections Applied to Radio Beacon Satelliites, N. D. FOLTZ, Ionosphere Research Laboratory, Pennsylvania State University, University Park, Pa.

3.1.4. Faraday Rotation Measurements of Decametric Wavelength Radiation from the Planet Jupiter, R. M. STRAKA, A.F.C.R.L. Radio Observatory, Hamilton, Mass.; and D. GAUNT, Lowell Technological Research Institute, Lowell, Mass.

3.1.5. Ionospheric Electron Content Measurements Using Lunar Reflections at 150.6 MC, Harold D. WEBB, University of Illinois, Urbana, Ill.; and Fred B. DANIELS, U. S. Army Electronics Laboratories, Fort Monmouth, N. J.

3.2. — *The Topside Ionosphere*

3.2.1. The Structure of the Topside Equatorial Ionosphere, T. E. VAN ZANDT, R. B. NORTON and H. RISBETH, Ionosphere Research and Propagation Division, National Bureau of Standards, Boulder, Colo.

3.2.2. Statistical Analysis and Discussion of the Electron Density Distributions at the 1000-KM Surface, T. I. DAYHARSH and W. W. FARLEY, Stanford Research Institute, Menlo Park, Calif.

3.2.3. MIDDLE Latitude Changes in Topside Electron Density Through a Magnetic Storm, Patricia L. MILIC, Stanford Research Institute, Menlo Park, Calif.

3.2.4. The Nasa Ames Research Center I.Q.S.Y. Programs for the Reduction of Alouette Topside Ionograms, L. COLIN, Ames Research Center, Moffett Field, Calif.

3.2.5. The Electron Density at the Alouette I Orbit in Mid-Latitudes, Michael RYCROFT, Ames Research Center, Moffett Field, Calif.

3.2.6. Structure and Variation of the Topside Ionosphere Observed from Fort Monmouth Between September 1963 and January 1964, P. R. ARENDT and A. PAPAYOANOU, U. S. Army Electronics Laboratories, Fort Monmouth, N. J.

3.2.7. Some Early Results from Ionosphere Explorer I; W. CALVERT, R. W. KNECHT and T. E. VAN ZANDT, Central Radio Propagation Laboratory, National Bureau of Standards, Boulder, Colorado.

3.3. — *Ionospheric Propagation*

3.3.1. A Frequency-Shift Pulse Backscatter Sounding Technique, R. B. FENWICK, Radioscience Laboratory, Stanford University, Stanford Calif.; and G. JACOBS and S. KESSLER, International Broadcasting Service, U. S. Information Agency, Washington, D. C.

3.3.2. Ionospheric Radio Observations on Two Closely Spaced Frequencies, Kurt TOMAN, Air Force Cambridge Research Laboratories, Bedford Mass.

3.3.3. Sunspot Cycle Dependence of Ionospheric Storms, R. J. CORMIER and K. L. SMALLWOOD, Air Force Cambridge Research Laboratories, Bedford, Mass.

3.3.4. Effects of Rocket Outgassing on RF Experiments, W. PFISTER and J. C. ULWICK, Air Force Cambridge Research Laboratories, Bedford Mass.

3.3.5. Unusual HF Propagation Modes as Implied by Observations of Transmissions from the U. S. S. R. and Red China, Walter F. BAIN, Page Communications Engineers, Inc. Washington, D. C.

3.3.6. Persistent Field-Aligned Ionization Observable at 50 Mc/s Near Hawaii, W. F. BAIN, Page Communications Engineers, Inc., Washington D. C.

3.3.7. Ionospheric Propagation Measurements on a North South Path, L. HUMPHREY, C. ROBERTS and J. PIERLUISSI, General Electric Company, Defense Electronics Division, Cornell University Industry Research Park, Ithaca, N. Y.

3.4. — *Sporadic-E, Turbulence and Drifts*

3.4.1. The Wind Shear Theory of Sporadic E, W. I. AXFORD and D. L. CUNNOLD, Center for Radiophysics and Space Research, Cornell University, Ithaca, N. Y.

3.4.2. Validity of Three-Station Methods of Determining Ionospheric Motions, R. RAGHAVARAO and C. O. HINES, University of Chicago, Chicago, Ill.

3.4.3. Some Evidence of Sporadic E layer Tilt in the Temperate Zone, R. W. HARRIS and C. CLARK, Engineering Experiment Station, Utah State University, Logan, Utah.

3.4.4. Dielectric Permittivity of Turbulent Magneto-Ionic Media, Leonard S. TAYLOR, General Electric Space Sciences Laboratory, King of Prussia, Pa.

3.4.5. Zenith Angle Dependence of Radio Star Scintillations for an Extended Incoherent Source, Don Parker, Wayland, Mass.

3.5. — *D-Region Measurements*

3.5.2. General Method of Solving the Full-Wave Equations With Mode-Coupling and its Application to LF Propagation in the Ionosphere, Y. INOUE, Wentworth Institute, Boston, Mass.; and S. HOROWITZ, Air Force Cambridge Research Laboratories, Bedford, Mass.

3.5.3. A Mathematical Technique for the Conversion of Wave Interaction Data to D-Region Electron Density Profiles, F. V. HELLRICH and A. J. FERRARO, Ionospheric Research Laboratory, Pennsylvania State University, University Park, Pa.

3.5.4. An Integrated Experiment for the Study of the Aeronomy of the D-and E-Regions of the Ionosphere, S. A. BOWHILL and G. G. KLEIMAN, Department of Electrical Engineering, University of Illinois, Urbana, Ill.

3.5.5. Variation of the VLF Conversion Coefficient During the Sunrise Transition, C. F. SECHRIST, Jr. and J. M. MUSSER, HRB-Singer, Inc., State College, Pa.

3.5.6. A Radio Propagation Experiment Using a Rocket-Borne Receiver, H. W. KNOEBEL and D. SKAPERDAS, Coordinated Science Laboratory, University of Illinois, Urbana, Ill.

4. — COMMISSION IV

4.1. — *Whistlers and VLF*

4.1.1. Modes in Columms of Field Aligned Ionization, B. A. LIPPMANN, P. J. WYATT and V. A. ERMA, Defence Research Corporation, Santa Barbara, Calif.

4.1.2. Instabilities in the Whistler Mode Caused by Velocity Anisotropies in Fast-Particle Fluxes, R. I. MILLER, Space Sciences Laboratory, University of California, Berkeley, Calif.

4.1.3. Anisotropic Electron Velocity Distribution for Cyclotron Absorption of Whistlers and VLF Emissions, H. GUTHART, Radioscience Laboratory, Stanford University, Stanford, Calif. and Stanford Research Institute, Menlo Park, Calif.

4.1.4. Cerenkov and Cyclotron Radiation as VLF Emission Sources, Victor MANSFIELD, Radiophysics Laboratory, Dartmouth College, Hanover, N. H.

4.1.5. Generation of Whistler Waves by a Helical Electron Beam, J. NEUFELD and H. WRIGHT, Oak Ridge National Laboratory, Oak Ridge, Tenn.

4.1.6. Lower Hybrid Resonance Emissions, N. M. BRICE, Faculty of Engineering, Carleton University, Ottawa, Ontario, Canada; and R. L. SMITH, Radio-Science Laboratory, Stanford University, Stanford, Calif.

4.1.7. Maximum Duration of Quasi-Constant Frequency Discrete Emissions, by N. BRICE, Faculty of Engineering, Carleton University, Ottawa, Ontario, Canada.

4.2. — *The Topside Ionosphere*

See Commission III, 3.2.

4.3. — *Magnetospheric Properties*

4.3.1. A Study of the Effective Electron Cross-Sections and Temperatures in the High Latitude Ionosphere, L. A. MAYNARD and H. L. WERSTIUK, Prince Albert Radar Laboratory, Defence Research Telecommunications Establishment, Ottawa, Ontario, Canada.

4.3.2. The Effects of the 20 July 1963 Solar Eclipse on the F-Region, J. V. EVANS, Lincoln Laboratory, Massachusetts Institute of Technology, Lexington, Mass.

4.3.3. Ionospheric Temperature at Sunspot Minimum, J. E. GEISLER and S. A. BOWHILL, Department of Electrical Engineering, University of Illinois, Urbana, Ill.

4.3.4. Correlation of Auroral Absorption and Precipitated Electrons, D. H. JELLY, Defence Research Telecommunications Establishment, Ottawa, Ontario, Canada ; and I. B. MCDIARMID, National Research Council, Ottawa, Ontario, Canada.

4.4. — *Magnetospheric Physics*

4.4.1. Refractive Indices for Multicomponent Plasmas, R. L. SMITH and N. BRICE, Radioscience Laboratory, Stanford University, Stanford, Calif.

4.4.2. Electron Precipitation Through VLF and ULF Turbulence, C. F. KENNEL and H. E. PETSCHEK, Avco-Everett Research Laboratory, Everett, Mass.

4.4.4. On the Orientation of the High-Latitude DS Current System, C. O. HINES, University of Chicago, Chicago, Ill., and A. NISHIDA, University of Tokyo, Tokyo, Japan.

4.4.5. Magnetohydrodynamic Waves in a Plasma Slab Bounded by a Neutral Gas, Elisabeth A. COOPER, Space Sciences Laboratory, University of California, Berkeley, Calif.

5. — COMMISSION V

Radar Observations and Measurements

2.2.3. Radar Observations of Venus at 3.6 Centimeters, David KARP, and W. B. SMITH, Lincoln Laboratory, Massachusetts Institute of Technology, Lexington, Mass.

2.2.4. Interpretation of Radar Measurements from the Moon and Earth, L. M. SPETNER and I. KATZ, The Johns Hopkins University, Applied Physics Laboratory, Silver Spring, Md.

2.2.5. A Precision Planetary Range-Tracking Radar, R. C. Titsworth, G. A. Morris, Jr. and R. L. Motsch, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, Calif.

Miscellaneous

3.1.2. Determination of the Solar Ionizing Flux from Sunrise Measurements, A. A. Gran, Ionosphere Research Laboratory, Pennsylvania State University, University Park, Pa.

3.1.2. Faraday Rotation Measurements of Decametric Wavelength Radiation from the Planet Jupiter, R. M. Straka, A.F.C.R.L. Radio Observatory, Hamilton, Mass.; and D. Gaunt, Lowell Technological Research Institute, Lowell, Mass.

3.1.5. Ionospheric Electron Content Measurements Using Lunar Reflections at 150.6 MC, Harold D. Webb, University of Illinois, Urbana, Ill.; and Fred B. Daniels, U. S. Army Electronics Laboratories, Fort Monmouth, N. J.

3.4.5. Zenith Angle Dependence of Radio Star Scintillations for an Extended Incoherent Source, Don Parker, Wayland, Mass.

4.3.2. The Effects of the 20 July 1963 Solar Eclipse on the F-Region, J. V. Evans, Lincoln Laboratory, Massachusetts Institute of Technology, Lexington, Mass.

6. — Commission V

6.1. — *Antennas*

6.1.1. The Driving-Point Impedance of a Symmetrically Driven Satellite Antenna in Isotropic Space, R. H. Williams and T. N. C. Wang, Electrical Engineering Department, University of New Mexico, Albuquerque, N. M.

6.1.2. A Theoretical Treatment of the Yagi Array, I. Larry Morris, Gordon McKay Laboratory, Harvard University, Cambridge, Mass., and Sylvania Electronic Systems, Needham Heights, Mass.

6.1.3. The Theoretical Basis for Approximate Solutions for the Near Fields of Log-Periodic Antennas, Richard B. Kieburtz, Department of Electrical Sciences, State University of New York, Stony Brook, L. I., N. Y.

6.1.4. Complex Wave Analysis of the Backfire Bifilar Helical Antenna, P. W. Klock and R. Mittra, Antenna Laboratory, University of Illinois, Urbana, Ill.

6.1.5. The Traveling Wave V Antenna, Keigo Iizoka, Division of Engineering and Applied Physics, Harvard University, Cambridge, Mass.

6.1.6. Currents, Charges, and Near Fields of Cylindrical Antennas, R. W. P. King and T. T. Wu, Gordon McKay Laboratory, Harvard University, Cambridge, Mass.

6.1.7. The Cylindrical Antenna with Non-Reflecting Load, T. T. Wu and R. W. P. King, Gordon McKay Laboratory, Harvard University, Cambridge, Mass.

6.2. — *Arrays*

6.2.1. On Space-Tapered Aperiodic Arrays, S. W. Lee and Y. T. Lo, Antenna Laboratory, University of Illinois, Urbana, Ill.

6.2.2. Optimumly Spaced Antenna Arrays, S. L. Shih, Electronics Laboratory, General Electric Company, Syracuse, N. Y.

6.2.3. Space-Frequency Equivalence for Correlation Arrays and Linear Additive Arrays, W. G. Jaeckle, The Bendix Corporation, Research Laboratories Division, Southfield, Mich.

6.2.4. Grating Plateaux of Planar Nonuniformly Spaced Arrays, Y. L. Chow and J. L. Yen, Electrical Engineering Department, University of Toronto, Toronto, Canada.

6.2.5. A Semi-Broadband Quadrature Arrays, Alphonse Bush, Los Angeles, Calif.

6.2.6. Modeling Program for Development of a Super-Power Multiplex-Steerable Short-Wave Antenna System, C. E. Smith, C. S. Bidlack, R. H. Sublett and F. D. Bolotin, Smith Electronics, Inc. Brooksville, O.

6.2.7. An Approach for S/N Optimization in Linear Arrays, F. I. Tseng and D. K. Cheng, Electrical Engineering Department, Syracuse University, Syracuse, N. Y.

6.3. — *Reflection Phenomena, Codes and Noise*

6.3.1. On an Integral Formulation of Reflected and Transmitted Waves from One-Dimensional Inhomogeneous Slabs, W. J. Byatt and T. N. C. Wang, Electrical Engineering Department, University of New Mexico, Albuquerque, N. M.

6.3.2. Cyclic Product Codes with Variable Redundancy, R. T. Chien and D. T. Tang, I.B.M. Watson Research Center, Yorktown Heights, N. Y.

6.3.3. Some Results on the Factorization Problem, Thomas Kailath, Department of Electrical Engineering, Stanford University, Stanford, Calif.

6.3.4. Ray Tracing Methods for Analysis of Propagation Through Radomes, G. Tricoles, General Dynamics, San Diego, Calif.

6.3.5. A Study of Dielectric Lenses, P. L. E. Uslenghi, Radiation Laboratory, University of Michigan, Ann Arbor, Mich.

6.3.6. Transient Solutions for a Class of Diffraction Problems, L. B. Felsen, Department of Electrophysics, Polytechnic Institute of Brooklyn, Farmingdale, N. Y.

6.3.7. The Superposition of Selected Waveguide Modes to Achieve Desirable Features in the Aperture Distribution of Dual-Polarized Tracking Radars, by K. J. KEEPING, Lincoln Laboratory, Massachusetts. Institute of Technology, Lexington, Mass.

6.4. — *Electromagnetic Theory*

6.4.1. Integrals of the Second Order Linear Differential Equation, J. KANE, California Institute of Technology, Pasadena, Calif., and E. T. SURYNARAYAN, University of Rhode Island, Kingston, R. I.

6.4.2. Application of Conformal Mapping to Electromagnetic-Waves, F. J. TISCHER, Electrical Engineering Department, University of Alabama, Huntsville, Ala.

6.4.3. Phase-Considerations in the Navy Space Surveillance System, M. G. KAUFMAN, U. S. Naval Research Laboratory, Washington, D. C.

6.4.4. Generalized Distribution-Free Coincidence Detection Procedures, D. G. LAINIOTIS, School of Electrical Engineering, Oklahoma State University, Stillwater, Okla.

6.4.5. Low Frequency Scattering by a Prolate Spheroid, J. S. ASVESTAS, and R. E. KLEINMAN, The Radiation Laboratory, University of Michigan, Ann Arbor, Mich.

6.4.6. Characteristic Values from a New Approach to the Phase Integral Method, K. M. HAGENBUCH, Ionospheric Research Laboratory, Pennsylvania State University, University Park, Pa.

6.5. — *Antennas and Ionized Media*

6.5.1. The Impedance of a Short Dipole in a Compressible Plasma, K. G. BAMMAIN, Department Electrical Engineering, University of Illinois, Urbana, Ill.

6.5.2. Modifications of Theories on the Excitation of Electroacoustic Waves, R. W. LARSON, Radiation Laboratory, University of Michigan, Ann Arbor, Mich.

6.5.3. Radiation from Electromagnetic Sources in a Plasma, S. R. SESHADRI, Applied Research Laboratory, Sylvania Electronic Systems, Waltham Mass.

6.5.4. Propagation in Non-Uniform, Gyrotropic Media, S. H. GROSS, Airborne Instruments Laboratory, Cutler-Hammer, Inc., Deer Park, L. I., N. Y.; and L. B. FELSEN, Department of Electrophysics, Polytechnic Institute of Brooklyn, Farmingdale, N. Y.

6.5.5. Impedance of a Dipole Antenna in a Homogeneous Magnetosphere, W. S. AMENT, Electromagnetic Research Corporation, College Park, Md.

6.5.6. Measurements on a Plasma Sheath, Daniel J. JACAVANCO, Air Force Cambridge Research Laboratories, Bedford, Mass.

6.5.7. Radiation from a Vertical Electrical Dipole in a Warm Plasma Above a Conducting Plane, R. M. LANGELIER, Purdue University, Lafayette, Ind.

6.6. — *Antennas in Dissipative Non-Ionized Media*

See 2-3, p. 2.

7. — COMMISSION VII

On Plasmas

4.4.1. Refractive Indices for Multicomponent Plasmas, R. L. SMITH and N. BRICE, Radioscience Laboratory, Stanford University, Stanford, Calif.

4.4.5. Magnetohydrodynamic Waves in a Plasma Slab Bounded by a Neutral Gas, Elisabeth A. COOPER, Space Sciences Laboratory, University of California, Berkeley, Calif.

8. — SPACE RADIO RESEARCH

2.2.6. Communication Satellite System Degradation Due to Rain, N. E. FELDMAN, Electronics Department, The Rand Corporation, Santa Monica, Calif.

3.1.3. Analysis of Second-Order Corrections Applied to Radio Beacon Satellites, N. D. FOLTZ, Ionosphere Research Laboratory, Pennsylvania State University, University Park, Pa.

3.2.4. The Nasa Ames Research Center I.Q.S.Y. Programs for the Reduction of Alouette Topside Ionograms, L. COLIN, Ames Research Center, Moffett Field, Calif.

3.2.5. The Electron Density at the Alouette I Orbit in Mid-Latitudes, Michael RYCROFT, Ames Research Center, Moffett Field Calif.

3.2.7. Some Early Results from Ionosphere Explorer I, W. CALVERT, R. W. KNECHT and T. E. VAN ZANDT, Central Radio Propagation Laboratory, National Bureau of Standards, Boulder, Colorado.

6.1.1. The Driving-Point Impedance of a Symmetrically Driven Satellite Antenna in Isotropic Space, R. H. WILLIAMS and T. N.-C. WANG, Electrical Engineering Department, University of New Mexico, Albuquerque, N. M.

Summaries of the above mentioned papers are available at the U. S. A. National Committee for U.R.S.I., National Academy of Science, Washington D. C.

COURSE IN ELECTROMAGNETIC MEASUREMENTS AND STANDARDS

A two-week, professional course in Electromagnetic Measurements and Standards will be offered August 9-20, 1965, by the Radio Standards Laboratory of the N.B.S. Institute for Basic Standards, in association with the Bureau of Continuation Edu-

cation of the University of Colorado. This course is intended for the professional staff within industry, university, military, and other government technical facilities whose responsibilities include precision measurements, quality control, standards, etc. Topics will include the theory of measurement and errors, review of basic electromagnetic theory, specification of the fundamental quantities of electromagnetic standards and their operational realization. Emphasis will be placed on the use of standards to obtain the highest precision.

Prerequisites : Education equivalent to a B. S. degree in Electrical Engineering or Engineering Physics, and a year or more of actual working experience.

Tuition : $ 200.00.

Registration Deadline : July 15, 1965.

Registration will be limited and early application should be made to ensure consideration. Registration will be closed July 15, 1965. Further details and registration forms will be available March 15, 1965 from : The Bureau of Continuation Education, University Memorial Center, Room 328, University of Colorado, Boulder Colorado.

This course is part of the mission of the Radio Standards Laboratory in disseminating information concerning electromagnetic standards and measurements.

SPRING MEETING
CALL FOR PAPERS

APRIL 20-23, 1965 ; WASHINGTON, D. C.

Deadline : *January* 15, 1965

The United States National Committee of the International Scientific Radio Union will hold its annual spring meeting this year in close cooperation with the American Geophysical Union (which meets in Washington, C. D. on April 19-22, 1965). There will again be a jointly organized.

Symposium on Solar-Terrestrial Relationships
on Thursday, April 22, 1965

Additional joint U.R.S.I./A.G.U. sessions will be arranged where appropriate. The meeting will be co-sponsored by IEEE Groups.

Instructions :

Submit titles and informative 200-word abstracts in duplicate to Prof. Alan T. WATERMAN, Jr., Secretary U.S.N.C.-U.R.S.I., Stanford Electronics Laboratories, Stanford University, Stanford, California.

* Indicate the U.R.S.I. Commission for which you think the paper is most appropriate.

* If you believe an A.G.U. Section would be interested in the material, indicate which Section.

* If the paper is a candidate for inclusion in the Sol-Ter Symposium, please so indicate.

Note : The early deadline date, Jan. 15, 1965, has been chosen to facilitate cooperation with the A.G.U., to cross check between Commissions and Sections in scheduling papers, and to permit the A.G.U. portions of the program to be printed in their Transactions in advance of the meeting.

U.S.N.C.-U.R.S.I. Commissions :

1. Radio Measurement Methods and Standards.
2. Radio Propagation in Non-Ionized Media.
3. Ionospheric Radio.
4. Magnetospheric Radio.
5. Radio and Radar Astronomy.
6. Radio Waves and Transmission of Information.
7. Radio Electronics.

Possible joint U.R.S.I./A.G.U. sessions :

1. U.R.S.I. Commissions 3, 4 — with A.G.U. Section on Geomagnetism and Aeronomy.
2. U.R.S.I. Commission 2 — with A.G.U. Sections on Meteorology and Oceanography.
3. U.R.S.I. Commissions 2, 3, 4, 5 — with A.G.U. Section on Planetary Sciences.

COMMISSIONS AND COMMITTEES

Commission I on Radio Standards and Measurements

PROCEEDINGS OF THE XIVth GENERAL ASSEMBLY

(Abstract published in *International Aerospace Abstracts*)

Radio Standards and Measurements (*Mesures et Etalons radioélectriques*).

Union Radio Scientifique Internationale (U.R.S.I.), General Assembly, 14th, Tokyo, Japan, September 9-20, 1963. Volume XIII-I.

Commission I : Radio Standards and Measurements.
Brussels, U.R.S.I., 1963. 153 p.

Review of the various stages of development of the work of Commission I. The member nations' reports are given, together with the minutes of the sessions, the final report of the chairman, and resolutions. Most reports include extensive bibliographies. The Commission reviewed the work done toward the establishment of standards for atomic time scales, electromagnetic quantities, and power, and recommended an international intercomparison of these standards. Atomic and molecular standards of frequency and time transmission, radioelectric measurements and standards, quartz clocks, radio-frequency and microwave power measurements, radio noise measurement methods and standards, and precise measurements of distance and of the velocity of light using lasers are the subjects primarily considered. It is stated that a U. S. Q-switched solid state laser is reported to have 50 mw output in a narrow beam at 10 nanosec. It is noted that some hydrogen masers operate at a spectral line width of 1 c/s. Laser techniques are considered as offering good possibilities in laboratory research and in the fields of measurements, control, and tracking near or far from

the Earth. Atomic time is available for time interval determination. The accuracy of setting clocks with satellite methods could be improved to approximately 1 μ/s. Therefore, frequency comparisons by transmissions show better results in short periods of time. The progress in developing atomic standards is marked by advanced performance in precision, accuracy, and resettability. Methods of sampling and a number of comparison techniques are discussed in relation to precise microwave measurement and investigation. It is noted that progress has been made in determining frequency time interval and phase by digital procedures and, by the use of semi-conductor techniques, in automation and control.

THE TRANSIT OF DELICATE PHYSICAL STANDARDS (see p. 56)

TEMPORARY IMPORTATION OF SCIENTIFIC EQUIPMENT FREE OF IMPORT DUTIES (see p. 59).

THE THIRD INTERNATIONAL MEASUREMENT CONFERENCE (IMEKO III) and the SIXTH INTERNATIONAL INSTRUMENTS AND MEASUREMENTS CONFERENCE (I and M VI)

U.R.S.I. was represented by Prof. P. O. Lundbom, Director of Research, Head of Measurement and Standard Groups and Chairman of Commission I of the U.R.S.I. Swedish National Committee.

I.C.S.U. was represented by Prof. Dr. G. Borelius, who presented the greetings of the International Scientific Unions.

Hereunder are mentioned papers submitted to some of the sessions and being of more direct interest to U.R.S.I.

— Sessions on instruments and methods for measuring electrical and magnetic quantities (*Co-chairmen* : V. O. Arutjunov and D. Lundqvist).

— Y. L. Yousef and H. Mikhail, U. R. A. : Measurement of small magnetic fields by a vibrating coil magnetometer (in English).

— H. Capptuller, Federal Republic of Germany : Analog-digital converter for precision magnetic measurements (in German).

— R. Lukianov and P. Semienko, U. S. A. : Sensitive plotters of static O-H curves (in English).
— I. Masslaroff and V. Miteva, Bulgaria : The measurement of the Hall-effect and of the magnetic resistive effect in semiconductors by the help of current pulses (in Russian).
— Cy. Almassy and T. Sterk, Hungary : Rapid recording method by the help of electrets (in German).
— W. Fulinski, Poland : New circuits for differential testing of the potential transformers using potentiometer principle (in Russian).
— Th. L. Zapf, U. S. A. : The accurate measurements of voltage ratios of inductive voltage dividers (in English).
— C. Penescu, Roumania : A new non-linear measuring device of impedance using transistors (in English).
— B. Ichijo, T. Arai and A. Kakitomo, Japan : Study on high stabilized sensitive R-C meter and its application (in English).
— L. Ripper, Czechoslovakia : Precision measuring system for very high resistances (in German).
— D. T. Jovanovic, R. P. Ilic and B. M. Stojanovic, Yugoslavia : Small direct current measurement by the method of integration and differentiation (in English).
— V. O. Arutjunov, U. S. S. R. : Phase-constant a.c.-measuring and application (in Russian).
— D. Muster and H. Weinbaum, U. S. A. : A digital phase-angle meter (in English).
— K. Hara and T. Hoshino, Japan : Self-balancing earthing device for precise bridge (in English).
— A. Millea, A. Stoica and N. Cruia, Roumania : The use of inductive current- comparators for precise measurements (in English).
— Y. Aida, Japan : Research on the short-circuited ring type absolute standard of current for high frequencies (in English).
— R. Drechsler, Czechoslovakia : Contribution to the measurement of the power and work of the electric current in an unsymmetrical three-phase system (in German).

— Sessions on instruments and methods for measurements in radio engineering (*Co-Chairmen* : A. Carrelli and P. O. Lundbom).

— A. Sowinski, Poland : Frequency choice of automatic digital measurement with a given accuracy (in German).
— A. Ambrozy, Hungary : A new method for measuring very low frequency sinusoidal voltages (in English).
— R. E. Larson, U. S. A. : Microwave calibration techniques at the National Bureau of Standards (in English).
— E. Campbell, W. C. Daywitt and C. K. S. Miller, U. S. A. : Development of a versatile noisetube mount for use as an interlaboratory standard of microwave noise (in English).
— B. O. Weinschel and G. U. Sorger, U. S. A. : Waveguide below cutoff attenuation standard (in English).

— G. P. Bava and G. Zito, Italy : Measurement of the phase difference between the resonant cavities of an atomic frequency standard (in English).

Abstracts of papers.

Abstracts of papers have been edited by Dr. Ing. S. Kovacs and Mrs J. Solt (Budapest) (Publishers : Royal Swedish Academy of Engineering Sciences, Stockholm, and Hungarian Scientific Society for Measurement and Automation, Budapest.)

Commission III. — Ionosphère

PRÉVISIONS DES CARACTÉRISTIQUES IONOSPHÉRIQUES

Nous attirons l'attention des lecteurs sur l'article « Méthodes utilisées par le C.R.P.L. pour la prévision des caractéristiques intéressant la propagation de l'onde d'espace dans les bandes d'ondes décamétriques » par K. Davies.

Cet article a paru dans le *Journal des Télécommunications*, Vol. 31, nº 12, décembre 1964, pp. 339-350.

IONOSPHERIC PREDICTIONS

We draw the attention of the readers to the paper « Prediction of ionospheric characteristics at C.R.P.L. for sky-wave radio propagation at high frequencies » by K. Davies.

This paper was published in *Telecommunication Journal*, Vol. 31, nº 12, December 1964, pp. 339-350.

REPRÉSENTATION DES VARIATIONS DES DONNÉES IONOSPHÉRIQUES

Dans un article intitulé « La représentation des méthodes numériques des variations journalières et géographiques des données ionosphériques (*Journal des Télécommunications*, Vol. 32, nº 1, 15 janvier), les auteurs, W. B. Jones et R. M. Gallet du N. B. S.

Boulder, donnent une solution du problème de l'élimination des instabilités qui tendent à se développer dans les représentations numériques des caractéristiques de l'ionosphère dans les vastes zones du globe actuellement dénuées de stations de sondage.

REPRESENTATION OF IONOSPHERIC DATA VARIATIONS

In a paper entitled « Representation of diurnal and geographic variations of ionospheric data by numerical methods » (*Telecommunication Journal*, Vol. 32, n° 1, Jan. 15, 1965), the authors, W. B. Jones and R. M. Gallet, N.B.S., Boulder, give a solution to the problem of controlling instabilities which tend to develop in numerical representations of ionospheric characteristics in large areas where no stations are present.

INDICES D'ACTIVITÉ SOLAIRE POUR LA PROPAGATION IONOSPHÉRIQUE

(Extrait du *Journal des Télécommunications*, Vol. 31, n° 12, décembre 1964)

Conformément à la Résolution 4 du Comité consultatif international des radiocommunications (C.C.I.R.), le secrétariat spécialisé du C.C.I.R. a préparé les tableaux suivants concernant les indices fondamentaux de la propagation ionosphérique (Avis 371 et Rapport 246 du C.C.I.R.).

VALEURS OBSERVÉES

— R_{12} (moyenne glissante sur douze mois du nombre de taches solaires) :

Année \ Mois	1	2	3	4	5	6	7	8	9	10	11	12
1963	29	30	30	29	29	28	28	27	27	26	23	21
1964	19											

— I_{F_2} (indice ionosphérique) :

Année \ Mois	1	2	3	4	5	6	7	8	9	10
1964	0(2)*	6(2)*	20(2)*	14(2)*	1(2)*	—3(1)*	1(1)*	—3(1)*	4(1)*	2(4

(*) Les chiffres entre parenthèses indiquent le nombre de valeurs de fo qui ne sont pas encore parvenues au secrétariat du C.C.I.R. et dont on i

donc pas tenu compte dans le calcul de l'indice I_{F_2}. Pour plus de détails, voir le numéro du *Journal des télécommunications* (avril 1964), page 119.

Par rapport aux données contenues dans le Rapport 246 du C.C.I.R., une station de sondages ionosphériques a cessé de fonctionner — celle de Porto Rico (en juin 1963). Les valeurs de I_{F_2}, contenant entre parenthèses le chiffre (1) sont donc depuis le mois de juin 1963 les valeurs définitives de l'indice I_{F_2}. En outre, la station de Fairbanks n'a pas fonctionné pendant la période août-octobre 1963. Pour cette période les valeurs définitives de l'indice I_{F_2} sont celles contenant le chiffre (2) entre parenthèses.

— Φ (flux du bruit solaire moyen mensuel) (**) :

Année \ Mois	1	2	3	4	5	6	7	8	9	10
1964	74	76	75	73	69	69	67	69	70	73

(**) Renseignements obligeamment fournis par le « National Research Council », Ottawa.

PREVISIONS POUR LES MOIS A VENIR (1er DÉCEMBRE 1964) (***) :

— R_{12}

Année \ Mois	11	12	1	2	3	4
1964	6	6				
1965			7	7	8	8

(***) Renseignements obligeamment fournis par le professeur WALDMEIER, Observatoire fédéral de Zurich.

Estimation de l'erreur sur les prévisions de R_{12} : ± 5

— I_{F_2} (****)

Année \ Mois	10	11	12	1	2	3	4
1964	—0	—2	—3				
1965				—4	—4	—4	(—3)

(****) Renseignements obligeamment fournis par le « Department of Scientific and Industrial Research, Radio Research Station », Slough.

La valeur prévue six mois à l'avance est donnée entre parenthèses.

Estimation de l'erreur sur les prévisions de I_{F_2} :

Mois (1964)	10	11	12
Max.	+4,5	+4,5	+4,5
Min.	—7,5	—9	—9,5

Mois (1965)	1	2	3	4
Max.	+3,5	+3	+2,5	+2,5
Min.	—10	—10	—10,5	—10,5

SOLAR INDICES FOR IONOSPHERIC PROPAGATION

(Reprint from the *Telecommunication Journal*, Vol. 31, n° 12, December 1964)

In accordance with Resolution 4 of the International Radio Consultative Committee (C.C.I.R.), the Secretariat of this body has produced the following tables, showing the basic indices of ionospheric propagation (C.C.I.R. Recommendation 371 and Report 246).

PARAMETERS

R_{12} (smoothed mean, over twelve months of sunspots observed) :

Year \ Month	1	2	3	4	5	6	7	8	9	10	11	12
1963	29	30	30	29	29	28	28	27	27	26	23	21
1964	19											

— I_{F_2} (ionospheric index) :

Year \ Month	1	2	3	4	5	6	7	8	9	10
1964	0(2)*	6(2)*	20(2)*	14(2)*	1(2)*	—3(1)*	1(1)*	—3(1)*	4(1)*	2(4)*

(*) The figures in brackets represent the number of figures for foF_2 which have not yet reached the C.C.I.R. Secretariat, and have been overlooked in calculation of I_{F_2}. For further detail, see the *Telecommunication Journal*, April 1964, page 119.

With regard to the data contained in C.C.I.R. Report 246 one ionospheric sounding station has ceased to operate — Puerto Rico (in June 1963) The values of I_{F_2} that include the figure (1) in brackets are therefore as

from the month of June, 1963, the definitive value for I_{F_2}. Furthermore the Fairbanks sounding station did not operate during the period August-October 1963. Fo that period the definitive values of I_{F_2} are those including the figure (2) in brackets.

— Φ (mean monthly solar noise flux) (**) :

Month / Year	1	2	3	4	5	6	7	8	9	10
1964	74	76	75	73	69	69	67	69	70	73

(**) Data kindly supplied by the National Research Council, Ottawa.

FORECAST FOR THE NEXT FEW MONTHS (1 DECEMBER, 1964) (***) :

— R_{12}

Month / Year	11	12	1	2	3	4
1964	6	6				
1965			7	7	8	8

(***) Data kindly supplied by Professor WALDMEIER, Federal Observatory, Zurich.

Estimated error in forecasts of R_{12} : $\pm$ 5

— I_{F_2} (****)

Month / Year	10	11	12	1	2	3	4
1964	—0	—2	—3				
1965				—4	—4	—4	(—3)

(****) Data kindly supplied by the Department of Scientific and Industrial Research, Radio Research Station, Slough.

The figure in brackets is the figure forecast six months in advance.

Estimate of the error in I_{F_2} predictions :

Month (1964)	10	11	12
Max.	+4,5	+4,5	+4,5
Min.	—7,5	—9	—9,5

Month (1965)	1	2	3	4
Max.	+3,5	+3	+2,5	+2,5
Min.	—10	—10	—10,5	—10,5

BIBLIOGRAPHIE

Physique de la Haute Atmosphère

Le Groupe de Recherches Ionosphériques Français, formé avec la participation du Centre National d'Etudes des Télécommunications (C.N.E.T.), du Centre National de la Recherche Scientifique (C.N.R.S.) et de l'Institut de Physique du Globe, a publié deux volumes contenant les « Notes prises au cours du Prof. K. Rawer à la Faculté des Sciences de Paris sur la Physique de la Haute Atmosphère/Ionosphère ».

Les principaux sujets traités sont :

I. Généralités : Aéronomie de la haute atmosphère, équilibre photochimique, ionisation, équilibre d'ionisation, propagation des ondes radioélectriques dans un plasma, méthodes d'observation.

II. La Région E et la Région D : la couche E, théories sur l'origine de la couche E, la couche E sporadique, théories concernant E sporadique, l'absorption ionosphérique, les vents ionosphériques, expériences concernant la région D, théories de l'origine de la région D, absorption et perturbations dans la région D.

III. La Région F : Base de la région F, la couche F1, maximum d'ionisation de F2 et hauteur de ce maximum, origine de la région F, perturbations dans la région F, aéronomie de l'ionosphère supérieure, l'exosphère, l'ionosphère extérieure.

Commission V. — Radio Astronomy

The present solar minimum, by C. M. Minnis (see p. 54).

Commission VI. — Ondes et Circuits Radioélectriques

LETTRE DU PRÉSIDENT DE LA COMMISSION

La lettre reproduite ci-après a été envoyée par le Président aux Membres Officiels de la Commission.

Eindhoven, le 10 décembre 1965.

Cher Collègue

Cette lettre traitera trois sujets :

1. Le programme des réunions de la Commission VI à l'Assemblée plénière de Munich 1966.
2. Le Symposium sur la théorie électromagnétique de Delft, Septembre 1965.
3. Le titre et le mandat des Commissions VI et VII.

Comme une réunion du Comité de Coordination est envisagée vers Avril 1965, j'apprécierai d'avoir vos commentaires avant le 15 Mars, 1965.

Il est possible que vous ne soyez pas membre officiel à ce moment, parce qu'on a oublié d'informer le secrétaire-général ou moi d'un changement. Veuillez transmettre la lettre, au nouveau membre et m'informer de la modification. En tous cas même si vous n'avez pas de commentaire, écrivez-moi une petite note confirmant la réception de cette lettre. Je vous en serai très reconnaissant.

1. — Le programme des réunions de la Commission VI a Munich.

Dans ma lettre du 27 octobre 1963, sur la répartition des sujets entre les Commissions VI et VII je vous ai donné les propositions d'un petit comité (Loeb, Marcuvitz, Shepherd, Silver). J'ai eu des réponses de 13 pays : le Canada, la France, les Pays-Bas, le Royaume Uni, les Etats-Unis et l'U. R. S. S. étaient contre les changements proposés. L'Autriche, le Danemark, la Finlande, l'Italie et la Suède étaient en faveur de ces changements. La Grèce et l'Australie ont confirmé la réception de ma lettre sans prendre position sur le sujet. Les objections concernent surtout la suppression de la théorie électromagnétique du programme de notre Commission.

Après consultation des vice-présidents de notre Commission, du colonel Herbays, et du Dr. Smith-Rose, il nous semble qu'il n'est pas nécessaire de changer le programme de notre Commission à ce moment. Nous pouvons maintenir encore une fois un programme analogue à ceux de Tokyo, Londres, Boulder. Dans des cas spéciaux nous voulons proposer, avec l'approbation du président de la Commission VII, l'organisation de réunions communes des deux

commissions. On a étudié les plasmas dans la Commission VII, mais la propagation des ondes, le rayonnement et la diffusion des ondes dans ces milieux ionisés sont étudiés aussi dans notre Commission.

Pour mémoire nous vous rappelons les sujets, proposés par le petit comité Loeb « Transmission et traitement des informations, télécommunications spatiales et par satellites, circuits, systèmes et commande, télémesure, mesures des objectifs et identification de ceux-ci ». De ces sujets le deuxième intéresse aussi le comité de l'U.R.S.I. sur les recherches spatiales. Probablement ce comité s'intéresse plutôt aux résultats des mesures, qu'à la méthode de les communiquer.

Pour la prochaine assemblée nous ajoutons aux sujets mentionnés les problèmes de la théorie électromagnétique que notre Commission a traitée traditionnellement.

Je voudrais demander aux membres officiels des suggestions de sujets à traiter par la Commission VI à l'Assemblée Générale de Munich. Quelques-uns de vous m'ont déjà écrit à ce sujet, il n'est pas nécessaire de me le rappeler. Il sera peut-être impossible de suivre chaque suggestion à cause du temps limité, mais les vice-présidents et moi considéront sérieusement toutes vos propositions.

2. — Symposium de Delft de la Théorie électromagnétique.

Ce Symposium, qui est tenu sous les auspices de notre Commission, a été annoncé par circulaire en juin 1964. Ce mois-ci une seconde annonce suivra. Tous ceux qui ont participé au Symposium de Copenhague et nombre d'autres ont reçu la première annonce. Si vous connaissez quelqu'un qui pourrait présenter une contribution, ou voudrait participer mais n'a pas reçu cette annonce, veuillez écrire au Secrétaire de la Commission d'Organisation, le professeur R. Timman, Université technique, Julianalaan 132, Delft, Pays-Bas.

Je serai très reconnaissant de votre aide pour le succès de ce Symposium.

3. — Titre et mandat de notre Commission.

Le Bureau m'a demandé de préparer un rapport provisoire sur ce sujet avant la réunion du Comité de Coordination d'avril 1965. Le professeur Grivet fera le même pour la Commission VII.

Par les bons soins du Colonel Lochard le comité national français m'a donné le projet suivant.

Titre de la commission : Radioélectricité théorique et transmission des informations.

Mandat : La Commission VI est chargée d'étudier l'application des théories mathématiques à la solution des problèmes qui intéressent les Radioélectriciens, particulièrement dans les domaines suivants :

1° *Theorie de la transmission des informations* :

— Codage des informations.
— Traitement des informations.
— Représentation des signaux et des bruits en temps et en fréquence et problèmes liés tels que : signal analytique, spectre instantané, transformation des signaux et bruits dans les réseaux linéaires et non linéaires.
— Transmission des signaux porteurs d'informations dans les voies à propriétés fixes ou variables dans le temps, à propriétés certaines ou aléatoires.
— Processus de détection, de décision et de décodage à la réception des signaux. Les signaux à considérer peuvent être porteurs des informations désirées dès leur émission (signaux dits de trafic) ou apporter au récepteur des informations sur l'emplacement, la forme, la nature ou l'identité d'un objet (signaux de radiorepérage).

2° *Propriétés des réseaux électriques* :

— Propriétés et fonctionnement, linéaire ou non linéaire, des réseaux électriques, transducteurs ou dispositifs de commande utilisés en radioélectricité.
— Théorie statistique de la fiabilité des réseaux ou ensembles construits à l'aide de composants de fiabilité donnée.

3° *Théorie électromagnétique (Macroscopique)* :

— Théorie du rayonnement électromagnétique et des sources de rayonnement ; théorie des antennes classiques ou associées à des éléments non linéaires ou à des dispositifs de traitement des informations.
— Propagation et guidage des ondes électromagnétiques dans les milieux idéaux, homogènes ou inhomogènes, isotropes ou ani-

sotropes, illimités ou limités, à propriétés fixes ou variables dans le temps, à propriétés certaines ou aléatoires.

Le professeur Zadeh m'a envoyé un projet moins détaillé, qui n'a pas encore été accepté par son Comité National (Etats-Unis) : La Commission VI traitera principalement la transmission des informations par ondes radioélectriques, et les aspects reliés de la théorie des communications et de l'information, de la théorie électromagnétique, de la théorie des réseaux électriques, de la théorie des dispositifs de commande, de l'analyse numérique, des programmes mathématiques pour calculateurs électroniques, etc. La Commission VII traitera surtout la propagation des ondes électromagnétiques, leur rayonnement, diffusion, etc et les dispositifs électroniques qui émettent ou reçoivent ces ondes.

Pour mon rapport au Bureau j'aimerais connaître votre opinion — si possible après consultation de votre comité national — avant le 15 mars 1965. Après la réunion je vous enverrai un rapport, et je demanderai votre avis sur le meilleur chemin a suivre. Avant le 31 janvier 1966 je dois donner mon rapport final au Secrétaire-général. Ce rapport doit contenir un projet de titre et de mandat de la Commission, il sera distribué aux membres du Bureau et aux présidents des Commissions et des comités. Avec leurs commentaires il sera inclus dans le rapport du Secrétaire-général au Comité Exécutif.

Avec votre aide la réunion du Comité Exécutif sera bien informée, et elle traitera un projet bien préparé.

Dr. F. L. Stumpers,
Président de la Commission VI
Laboratoire de Recherches
Philips-*Eindhoven*
Pays-Bas

LETTER FROM THE COMMISSION CHAIRMAN

The letter hereunder published has been circulated to the Official Members of the Commission.

Dear Sir,

This letter will deal with three subjects :

1. The programme of the Commission VI meetings at the Plenary Assembly of Munich 1966.

2. The Delft Symposium on Electromagnetic Theory in September 1965.

3. The terms of reference of Commissions VI and VII.

As a meeting of the Coordinating Committee of U.R.S.I. is envisaged for the beginning of April 1965, I would appreciate your comments before March 15, 1965. It may sometimes occur that a change in the membership of Commission VI is not brought to the attention of the Secretary-General or the Chairman. Please let us know if this has happened in your case. Send me a short note acknowledging the reception of this letter, even if you have no comments at the moment.

1. — The programme of the Commission VI meetings in Munich.

In my last circular letter of October 27, 1963 on the proposals of the Loeb, Marcuvitz, Shepherd, Silver committee on the programme of Commission VI and VII, I received answers from 13 countries. Canada, France, the Netherlands, the United Kingdom, U. S. A., and U. S. S. R. were against the proposed changes.

Austria, Denmark, Finland, Italy and Sweden were for it. Greece and Australia acknowledged the letter but did not express an opinion. Objections mainly concerned the removal of electromagnetic theory from the programme of Commission VI.

After consultation of the vice-chairmen, colonel Herbays, and Dr. Smith-Rose we feel that the programme of Commission VI need not be changed at once, and that we still can use the informal terms of reference previously used. Where this is a suitable solution we will, with the agreement of the chairman of Commission VII propose joint sessions of the two Commissions. Plasmas e.g. have been on the programme of Commission VII, but several of our members do research on wave propagation, radiation and scattering in plasmas.

We may remind you that apart from electromagnetic theory, the following subjects were provided for Commission VI by the Loeb Committee : Transmission and processing of information. Satellite and space communication circuits, systems and control. Telemetering. Target measurements and identification.

Of these subjects the second one is also interesting for the U.R.S.I. Space Research Committee, though its interest may well be more in the results communicated than in the method of communicating those results.

I would like to receive from the official delegates suggestions for subjects to be considered for Commission VI at the General Assembly. Some of you have already sent their suggestions, and they need not repeat them. It may not be possible to follow up every suggestion in view of the limited time available, but the vice-chairmen and I will seriously consider every proposal.

2. — The Delft Symposium on Electromagnetic Theory.

A first announcement for this Symposium, that is to be held under the auspices of this Commission was sent out last June. This month a second announcement will be sent. All those who participated in the Copenhagen Symposium and many others have received the first announcement. If you know of anyone who could give a contribution or would like to participate but has not received an invitation please send the address to the Secretary of the Organizing Committee, professor R. Timman, Technological University, Delft, Julianalaan 132, the Netherlands.

3. — The terms of reference of Commissions VI and VII.

The Board has asked me to provide a provisional report at the Spring meeting of 1965 concerning the terms of reference of Commission VI. Professor Grivet will do the same for Commission VII.

The French National Committee has through Colonel Lochard given the following proposal :

Title of the Commission : Theoretical radioelectricity and information transmission.

Terms of reference : Commission VI is asked to study the application of mathematical theories to the solution of problems, that interest radio scientists, in particular in the following domains :

1° *Theory of the transmission of information* :

— Coding of information.
— Information processing.
— Representation of signals and noise in time and in frequency and related problems, such as : Analytical signal, instantaneous

spectrum, transformation of signals and noise in linear and nonlinear circuits.
— Transmission of information carrying signals through fixed or variable channels with fixed or random parameters.
— Detection, Decision and Decoding of received signals.
— These signals can carry information superimposed on them at the transmitter (communication), or bring information on the place, the form, the nature or the identity of an object (radiolocation signals).

2° *Properties of electrical circuits* :

— Properties and function, of linear and nonlinear electrical networks, transducers, or systems for remote control (« dispositifs de commande ») used in radio communication.
— Statistical theory of the reliability of networks and systems constructed from units of a given reliability.

3° *Electromagnetic Theory (macroscopic)* :

— Theory of electromagnetic radiation and radiation sources ; theory of classical antennae or of antennae associated with non-linear elements or with information processing devices.
— Propagation and guidance of electromagnetic waves in ideal, homogeneous or non-homogeneous, isotropic or anisotropic, limited or unlimited media, with fixed or variable properties, and fixed or random parameters.

Professor Zadeh has sent me a less detailed proposal, which has not yet been approved by the U. S. National Committee. In his opinion Commission VI should be concerned in the main with the transmission of information by means of radio waves, and with the relevant aspects of communication and information theory, electromagnetic theory, system theory, circuit theory, control theory, computer sciences, mathematical programming etc. — Commission VII would be concerned in the main with the study of electromagnetic waves, their radiation, propagation, scattering etc. and with electronic devices which are used to generate or receive them.

For my report to the Board I would like to have your opinion — where this is possible after consultation of your National Committee — before March 15, 1965. After that meeting I will

report to you, and ask your advice on further steps to be taken. Before January 31st, 1966 I have to provide the Secretary — General with a final report, containing proposals for terms of reference and title of the Commission. This report will be circulated to the members of the Board and the Chairmen of U.R.S.I. Commissions and Committees. It will then be included in the Report of the Secretary-General to the Executive Committee.

With your help I hope we can arrive at a well informed meeting of the Executive Committee, dealing with a well organized proposal.

Dr. F. L. STUMPERS,
Philips Research Laboratories
Eindhoven
The Netherlands

Committee on Space Radio Research

LETTER FROM THE CHAIRMAN

To : Members of the Space Radio Research Committee.

Subject : Program of the S.R.R.C. at the 1966 General Assembly of U.R.S.I.

Dear Colleagues :

The Board of Officers and the Coordinating Committee will meet in Brussels around the end of March to develop the plans and program for the 1966 General Assembly. It is quite likely that the Space Radio Research Committee will be assigned, at least, one general session such as it conducted in Tokyo and I am now soliciting suggestions from you for the content of our program.

It has been proposed by Commission 6 of the U. S. A. National Committee that the S.R.R.C. shall treat the following subjects :

A. Communication Satellite Systems (already launched or currently being studied).

B. Study of Space Physics by Passive Radio, by Radar, and by Space Probes.

The plans for the C.O.S.P.A.R.-U.R.S.I. Symposium on *Optimization of Instrumentation for Space Experiments from the Stand-*

point of Data Processing, which will be held as part of the scientific program of C.O.S.P.A.R. at its General Assembly in Buenos Aires, May 13-19, are well under way. I shall, of course, give at least, a brief report of this symposium at our 1966 General Assembly, but I believe that the discussions in Buenos Aires will generate many ideas and it may be worthwhile for the S.R.R.C. to plan to consider this subject also in Munich in 1966.

Some of you undoubtedly will be attending the C.O.S.P.A.R. meeting in Buenos Aires this spring. I wish to call a meeting of our Committee during the course of the C.O.S.P.A.R. Assembly. Will you please let me know whether or not you shall be attending.

And, please do give some thought to the program of the 1966 U.R.S.I. Assembly and let me hear from you no later than March 15. We do need your help in setting up the program.

With best regards,

Sincerely yours,
Samuel SILVER,
Chairman, Space Radio Research
Committee, U. R. S. I.

Send replies to : Space Sciences Laboratory, University of California, Berkeley, California 94720, U. S. A.

CALENDAR ON SPACE CONFERENCES AND SYMPOSIA compiled by the Outer Space Affairs Group, United Nations

NOTE BY THE SECRETARIAT

The attached quarterly calendar of space conferences and symposia has been prepared in response to the decision of the Committee on the Peaceful Uses of Outer Space at its sixth session (October-November 1964) requesting the Secretary-General « to compile useful information on space conferences and symposia open to the scientists of Member States and inform Member States periodically of such opportunities ».

Additional information regarding the meetings listed should be obtained from the sponsoring organization concerned.

The subsequent quarterly issues of the Calendar for 1965 will list newly scheduled meetings not included in the present calendar together with additional information on and changes related to the entries in this issue.

January 1965.

ABBREVIATIONS AND ADDRESSES OF ORGANIZATIONS

A.A.S.	American Astronautical Society and American Astronomical Society, 516 Fifth Avenue, New York 36, N. Y.
A.F.I.T.A.E.	Association française des ingénieurs et techniciens de l'aéronautique, 4, rue de Cimarosa, Paris 16e, France.
A.F.L.C.	(United States) Air Force Logistics Command.
A.F.O.S.R.	(United States) Air Force Office of Scientific Research.
A.G.U.	American Geophysical Union, 1515 Massachussets Avenue, N. W., Washington, D. C.
A.I.A.A.	American Institute of Aeronautics and Astronautics, 1290 Avenue of the Americas, N. Y. 20, N. Y.
A.I.B.S.	American Institute of Biological Sciences, 200 P. Street N. Y., Washington 6, D. C.
A.I.P.	American Institute of Physics, 335 East 45th Street, New York, N. Y.
A.U.I.S.	Associazione Internazionale Uomo nello Spazio, Viale dell'Universita, 25, Rome, Italy.
A.N.S.	American Nuclear Society, 244 E. Ogden Avenue, Hinsdale, Illinois 60521.
A.R.O.	(United States) Army Research Office.
A.S.M.E.	American Society of Mechanical Engineers, United Engineering Centre, Aviation and Space Division, 345 E. 47th Street, New York 17, N. Y.
A.S.T.M.	American Society for Testing and Materials, 1916 Race Street, Philadelphia 3, Penna.
A.S.T.M.E.	American Society of Tool Manufacturing Engineers, 10700 Puritan Street, Detroit 38, Mich.
C.A.S.I.	Canadian Aeronautics and Space Institute, Commonwealth Building, 77 Metcalf St., Ottawa 4, Ontario.
C.C.I.R.	International Radio Consultative Committee (of I.T.U.).
C.O.S.P.A.R.	Committee on Space Research (of I.C.S.U.), 55, Boulevard Malesherbes, Paris 8e, France.
E.S.R.O.	European Space Research Organization, 36, rue de la Pérouse, Paris 16e, France.
I.A.A.M.	International Academy of Aviation Medicine, 53, rue Cardinal Mercier, Brussels 1, Belgium.
I.A.E.A.	International Atomic Energy Agency, Vienna, Austria.
I.A.F.	International Astronautical Federation, 5, rue du 4 Septembre, Paris 2e, France.
I.A.M.A.P.	International Association of Meteorology and Atmospheric Physics, 315, Bloor Street West, Toronto 5, Ontario, Canada.
I.A.G.	International Association of Geodesy, 19, rue Auber, Paris 9e, France.
I.A.U.	International Astronomical Union, c/o Royal Greenwich Observatory, Hertsmonceaux Castle, Hailsham, Sussex, England.

I.C.A.S.M.	International Congress of Aviation and Space Medicine, 53, rue Cardinal Mercier, Brussels, 1, Belgium.
I.C.S.U.	International Council of Scientific Unions, 2 vie Sebenico, Rome, Italy.
I.E.E.E.	Institute of Electrical and Electronic Engineers, 345 East 47th Street, N. Y. 17, N. Y.
I.F.A.C.	International Federation of Automatic Control, Prinz-Georg Strasse 79, Düsseldorf, Federal Republic of Germany.
I.N.C.O.S.P.A.R.	Indian National Committee for Space Research, Physical Research Laboratory, Navrangpura, Ahmedabad 9, India.
I.O.N.	Institute of Navigation, 711 14th Street, N. W., Washington 5, D. C.
I.Q.S.Y.	International Year of the Quiet Sun.
I.S.A.	Instrument Society of America, Penn-Sheraton Hotel, 530 William Penn Place, Pittsburgh 19, Penn.
U.R.S.I.	International Scientific Radio Union, 7, Place Emile Danco, Brussels 18, Belgium.
I.T.U.	International Telecommunication Union, Geneva, Switzerland.
I.U.T.A.M.	International Union of Theoretical and Applied Mechanics, 29, Avenue de la Division Leclerc, Châtillon-sous-Bagneux, Seine, France.
N.A.A.	National Aeronautic Association, 1025 Connecticut Avenue N. W., Washington D. C. 20036.
N.A.S.A.	(U. S.) National Aeronautics and Space Administration.
N.A.T.O.	North Atlantic Treaty Organization, Porte Dauphine, Paris 16e, France.
O.N.R.	(U. S.) Office of Naval Research.
R.A.S.	Royal Aeronautical Society, 4 Hamilton Place, London, W.1., England.
R.C.A.	Radio Corporation of America, R.C.A. Communications Systems Division, Bldg. 1-3-1, Camden, N. J.
S.A.E.	Society of Automotive Engineers, 485 Lexington Avenue, New York, N. Y. 10017.
S.I.A.M.	Society for Industrial and Applied Mathematics, P. O. Box 7541, Philadelphia, Penna.
S.P.A.R.M.O.	Solar Particles and Radiation Monitoring Organization.
U.N.	United Nations.
U.N.E.S.C.O.	United Nations Educational, Scientific and Cultural Organization, Paris, France.
U.S.A.E.C.	United States Atomic Energy Commission.
U.S.A.F.	United States Air Force.
W.M.O.	World Meteorological Organization, Geneva, Switzerland.
W.W.W.	World Weather Watch.

CALENDAR OF SPACE CONFERENCES AND SYMPOSIA FOR 1965

Date	Meeting, Subject and Sponsor	Place
January		
5-8	Second Annual Conference on Solid State Physics University of Bristol	Bristol
12	Engineering Design in Satellite Vehicles R.A.S.	London
18-25	International Symposium on Solar Ray Simulation A.S.T.M.	
20-21	Scientific and Technical Committee E.S.R.O.	Paris
25-27	Second Aerospace Sciences Meeting A.I.A.A.	New York Hilton Hotel, N. Y.
?	Seminar on Sounding Rockets I.N.C.O.S.P.A.R./U.N.E.S.C.O.	Kodaikanal, India
February		
1-21	Fourth Session of Regional Association I (Africa) W.M.O. [Among the agenda items are : Regional distribution of meteorological information obtained by satellites ; Regional aspects of the World Weather Watch.]	Lagos
1-3	Sixth Conference on Solid Propellant Rockets A.I.A.A.	Washington, D. C.
8-10	Symposium on Unmanned Exploration of the Solar System A.A.S., A.G.U., A.I.B.S., A.I.A.A., A.A.S. and I.E.E.E.	Denver Hilton Hotel, Denver, Colo.
9	Communication Satellites R.A.S.	London
10-2/3	Study Group IV, Space Systems and Radio-astronomy C.C.I.R.	Monte Carlo
15-17	Flight Testing Conference A.I.A.A. and N.A.S.A.	Huntsville, Alabama

Date	Meeting, Subject and Sponsor	Place
February (cont'd)		
17-19	International Solid State Circuits Conference I.E.E.E. [Agenda items include : Regional distribution of meteorological information obtained by satellites; Regional aspects of W.W.W.]	University of Pennsylvania, Philadelphia
March		
1-4	Unmanned Spacecraft Meeting A.I.A.A.	Los Angeles, Calif.
14-18	Aviation and Space Conference A.S.M.E.	Statler Hotel, Los Angeles, Calif.
82-26	Third Symposium on Thermophysical Properties Committee K-7 A.S.M.E., Tranfer Division	Purdue University Lafayette, Indiana
24-25	Fifth Session of E.S.R.O. Council E.S.R.O.	Paris
31-9/4	Advisory Committee on Science and Technology U.N.	New York, N. Y.
Mar.-Apr.	Commission for Synoptic Meteorology, Working Group on Codes W.M.O.	Geneva
Spring	Advisory Group for Aeronautical Research and Development (Combustion and Propulsion Panel) N.A.T.O.	U. S. A.
?	Working Group 4 for Space Science and Radio Astronomy C.C.I.R.	?
April		
6-8	Executive Committee Meeting I.C.S.U.	Munich
5-8	Symposium on High Energy Physics Inst. of Physics and the Physical Society [Information : 47 Belgrave Sq., London, S.W.1.]	Birmingham

Date	Meeting, Subject and Sponsor	Place
April (cont'd)		
12-18/5	Administrative Council, 20th Session I.T.U.	Geneva
13-15	National Telemetering Conference A.I.A.A./I.E.E.E.	Houston, Texas
20-22	Symposium on System Theory Polytechnic Inst. of Brooklyn I.E.E.E., S.I.A.M., A.F.O.S.R., O.N.R. and A.R.O.	New York, N. Y.
21-23	Fourth International Congress on Man and Technology in the Space and Nuclear Age A.I.U.S.	Milan
21-23	Conference on Support for Manned Flight A.I..A., A.F.L.C. : Aeronautical Systems Division	Dayton, Ohio
?	Symposium on the Interpretation of Orbits of Artificial Satellites I.A.U., I.U.T.A.M., C.O.S.P.A.R.	Paris
May		
10-21	Annual Meeting — C.O.S.P.A.R.	Buenos Aires
24-5/6	International Conference on Cloud Physics I.A.M.A.P., *Ad Hoc* Committee on Cloud Physics and Cloud Modification	Tokyo
25-26	Scientific and Technical Committee E.S.R.O.	Paris
27-11/6	Executive Committee, 17th Session W.M.O. [Among agenda items : Meteorological aspects of artificial satellites.]	Geneva
June		
7-9	International Symposium on Global Communications R.C.A.	Boulder, Colorado
9-16	Advisory Group for Aeronautical Research and Development N.A.T.O.	Munich

Date	Meeting, Subject and Sponsor	Place
June (cont'd)		
9-22	International Radio Consultative Committee (Propagation over the surface of the earth and through the nonionized regions of the atmosphere) C.C.I.R.	Geneva
11-20	Seventh International Aeronautical Congress A.F.I.T.A.E.	Paris
14-18	Second International Symposium on Basic Environmental Problems of Man in Space I.A.F./U.N.E.S.C.O.	Paris
14-18	Conference of Aerospace Propulsion Specialists A.I.A.A.	Colorado Springs, Colorado
21-24	Symposium on Automatic Control in the Peaceful Uses of Outer Space I.F.A.C.; Norwegian Committee on Automatic Control; Royal Norwegian Committee for Scientific and Industrial Research	Stavangar
23-9/7	Study Group VI (Ionospheric Propagation) C.C.I.R.	Geneva
23-24	Scientific and Technical Committee E.S.R.O.	Paris
Summer	International Symposium on Large-Scale Atmospheric Dynamics I.A.M.A.P.	Europe
July		
early	International Astrophysical Symposium, 13th University of Liège	Liège
July/Aug.	Symposium on the Moon University of Manchester	Paris
3-11	Aeronautical and Space Exhibition	Toulouse
28-30	Fourth Annual Conference on Reliability and Maintainability of Space Materials A.I.A.A., A.S.M.E., S.A.E., A.S.T.M.E.	Los Angeles, California

Date	Meeting, Subject and Sponsor	Place
July (cont'd)		
?	Conference on the Application of Science and Technology for the benefit of the less developed areas of Latin America U.N.E.S.C.O.	Santiago
August		
last half	International Commission on Atmospheric Chemistry and Radioactivity Meeting I.A.M.A.P.	Stockholm
16-18	Conference on Guidance and Control A.I.A.A., I.O.N.	Minneapolis, Minnesota
25-27	Sixth Biennial Symposiumon Gas Dynamics A.I.A.A.	Evanston, Ill.
30-1/9	Conference on Structural Dynamics and Aerology A.I.A.A., N.A.S.A.	Boston, Mass.
September		
8-15	XVI Congress of International Astronautical Federation I.A.F.	Athens
8-9	Scientific and Technical Committee E.S.R.O.	Paris
14-12/11	Conference of Plenipotentiaries I.T.U.	Geneva
16-17	Astrodynamics Specialist Conference I.A.A.A.	Monterey, California
Autumn	Advisory Group for Aeronautical Research and Development, Combustion and Propulsion Panel Meeting N.A.T.O.	Europe
?	International Academy of Aviation Medicine In conjunction with I.C.A.S.M.	Munich
October		
11-13	Fourth Manned Space Flight Meeting A.I.A.A., N.A.S.A.	St. Louis, Missouri

Date	Meeting, Subject and Sponsor	Place
October (cont'd)		
14-17	International Meeting on Balloon Launchings S.P.A.R.M.O.	Bagnères de Bigorre, France
?	International Aeronautic Federation, General Conference N.A.A.	Munich
November		
24-25	Sixth Session of E.S.R.O. Council E.S.R.O.	Paris

No date has been set for the following meetings scheduled for 1965 :

	Symposium of the Interpretation of Orbits of Artificial Satellites I.A.U.	The Netherlands
	European Aeronautical Congress A.F.I.T.A.E.	Germany
	Eleventh General Assembly I.C.S.U.	Warsaw, Munich or Tokyo
	Seminar on Aeronautical Meteorology W.M.O. (Regional Associations for Central, North and South Ameriea)	Costa Rica

I. U. W. D. S.

Letter from the Secretary

Utrecht, 4 December 1965.

Dear Colleague,

In my circular of July 10, 1964, I have mentioned the plans to organize a meeting of the Steering Committee for I.U.W.D.S., along with the general assembly of I.Q.S.Y. which was then scheduled somewhere in Europe. It has now been decided by the Special Committee for the I.Q.S.Y., that this general assembly will be held in Madrid from March 27 until April 2, 1965. Since not only quite a few of our members are involved in the I.Q.S.Y.-work but also a number of experts in fields relating to ours will be there, it seems that this general assembly will be a very good opportunity to hold a full meeting of our Steering Committee.

It is very likely that our committee will be asked to join the I.Q.S.Y.-Committee for part of its sessions on Saturday afternoon, March 27. In order to be prepared for this joint session, I propose that the first session of the I.U.W.D.S. Steering Committee meeting already begins on March 26. Several other sessions of the steering committee, among them a discussion on organisational matters on the afternoon of Sunday, March 28, will be held during the course of the I.Q.S.Y.-Assembly. The detailed agenda will be issued in due course.

To my circular letter of July 10, 1964, a tentative agenda for the 1965 meeting of the Steering Committee and Regional Committees of I.U.W.D.S. was added. In order to make this coming meeting successful, I would like to urge all members, who are involved in regional matters, to discuss these items with their colleagues, and bring the opinions from them to the meeting in Madrid. In this respect I especially would like to draw your attention to items 3 and 4 of this tentative agenda.

Since the post-I.Q.S.Y. plans for world days will be an important subject for the I.Q.S.Y.-Assembly to be discussed, our chairman and Dr. Minnis, secretary of the Special Committee for I.Q.S.Y. have considered the possibility to issue a circular and a questionnaire on this subject well before the assembly. Any suggestion about this subject should reach Mr. Shapley as soon as possible.

I hope that we will have the benefit of all members of the Steering Committee to be present at this very important meeting.

L. D. DE FEITER,
(Secretary)
Sterrewacht der R.-U.
Servaasbolwerk 13
Utrecht
Netherlands

C. I. G

VI Meeting of C.I.G. — Madrid — 2-3 April 1965

A meeting of C.I.G. will be held in Madrid beginning at 16.00 hours on Friday, 2 April. The proposed Agenda is as follows :

1. Approval of the Agenda.
2. Minutes of the last meeting and matters arising.
3. Publications.
4. World Data Centres and C.I.G. Guide to data exchange.
5. Finances.
6. Election of Officers.
7. Any other business.

I. Q. S. Y.

IIIrd I.Q.S.Y. Assembly: Madrid 1965

17th December 1964.

The Assembly and associated meetings of committees and working groups will be held at the Consejo Superior de Investigaciones Cientificas, Serrano 117, Madrid. Registration of delegates will take place in the entrance hall of the Main Building on the west side of the central plaza.

Closed meetings of several committees of I.C.S.U. will be held on 26th, 27th, 28th March and on the afternoon of 3rd April. Members of these committees will receive separate notification from the respective Secretaries.

PROVISIONAL PROGRAMME (*Revision No.* 1)

March

Sunday 28th	
Afternoon	Registration of Delegates
Monday 29th	
Morning	Registration of Delegates
	Opening Ceremony
	Interval
	First Plenary Meeting
Afternoon	Review of Present and Future Arrangements for International Cooperation in the I.Q.S.Y. Disciplines
	Interval

	Council for the I.Q.S.Y.* (1st Meeting)
Tuesday 30th	
Morning	Meetings of I.Q.S.Y. Discipline Working Groups**
Afternoon	Scientific Papers and discussion***
Wednesday 31st	
Morning	Scientific Papers and discussion
Afternoon	Scientific Papers and discussion
April	
Thursday 1st	
Morning	Meetings of I.Q.S.Y. Discipline Working Groups (continued from 30th March)
Afternoon	Not yet allocated.
Friday 2nd	
All Day	Excursion organized by the Spanish Committee
Saturday 3rd	
Morning	Council for the I.Q.S.Y. (2nd Meeting)
	Interval
	Final Plenary Meeting
	End of Assembly

NOTES.

* *Council for the I.Q.S.Y.*

Attendance at meetings of the Council for the I.Q.S.Y. will be restricted to the Chief Delegate from each I.Q.S.Y. Participating Committee represented at the Assembly, together with the members of the Special Committee for the I.Q.S.Y.

** *Working Groups.*

(*a*) It is expected that Working Groups in all the I.Q.S.Y. disciplines will be formed and will be presided over by the I.Q.S.Y. Discipline Reporters :

Meteorology : Dr. GODSON	Solar Activity : Dr. MICHARD
Geomagnetism : Father CARDUS	Cosmic Rays and Geomagnetically
Aurora : Mr. PATON	Trapped Particles : Prof. VERNOV
Airglow : Prof. BARBIER	Space Research : Dr. FRIEDMAN
Ionosphere : Prof. DIEMINGER	Aeronomy : Dr. NICOLET

(*b*) In addition, Working Groups will be formed to discuss :
International Data Exchange and the World Data Centres : Dr. ODISHAW ;
The World Days Programme and Geoalerts, etc. : Mr. SHAPLEY.

Delegates will be invited to attend meetings of the informal Working Groups in which they are most interested and to take part in the discussions.

*** *Scientific Papers* :

It is expected that the Scientific Papers on 30th and 31st March will deal with three main topics :

1. The dynamics of the stratosphere, ozone, stratospheric warmings and relations between the stratosphere and the lower ionosphere.
2. The ionosphere, with special reference to the new results obtained at the higher levels, and relations between the lower atmosphere and the ionosphere.
3. Solar activity and solar terrestrial relations, with particular reference to the characteristics of solar radiation under present minimum conditions.

I.Q.S.Y. Notes

We note in the contents of *I.Q.S.Y. Notes*, n° 10 (December 1964) the following items :

FOREWORD

It is in the tradition of many maritime countries to organize expeditions in which scientific measurements of some kind are made on ships at sea. Geomagnetic and ionospheric observations, for example, have been made over the oceans in order to provide the complementary information which is necessary for the full interpretation of similar measurements made at land-based stations. This issue of *I.Q.S.Y. Notes* contains articles about two specially-equipped research ships that are contributing in this way to the achievements of the I.Q.S.Y. : these are the Soviet ship ZARYA and the German ship METEOR.

The sole object of the expeditions being undertaken by these ships is to make scientific observations, but it must not be forgotten that ships en route from one port to another have quite frequently carried scientific equipment which was used to make observations at sea. The varied types of measurements made in space vehicles are well known, but it is worth remembering also that aircraft still have a useful role to play in making geophysical measurements ; typical examples are the French project in which North-South cross sections of the characteristics of the ionosphere will be made across the geomagnetic equator in West Africa, and the ambitious airborne survey of the geomagnetic field which is being carried out by the U. S. A. An interesting scheme has recently been successfully arranged by the I.Q.S.Y. Reporter for Aurora, Mr. Paton, who has made arrangements for the crews of civil aircraft flying across the North Atlantic to make auroral observations at night ; by using these observations, synoptic auroral maps for the Northern Hemisphere can be made which contain much more information than they would do without the willing cooperation of the airline crews.

This tenth issue of *I.Q.S.Y. Notes* can be regarded as a minor landmark in the series of I.Q.S.Y. publications and provides an appropriate occasion for the issue of a new cumulative index which will permit easier reference to information and articles published earlier. This index is now being prepared by Miss Gillian Campbell and Miss Carol McAteer of the I.Q.S.Y. Secretariat who, over the past two years, have also been responsible for typing

the material for *I.Q.S.Y. Notes* and for preparing it for the printer.

November 1964.

C. M. MINNIS,
Secretary, I.Q.S.Y. Committee

NEW YEAR MESSAGE FROM THE PRESIDENT OF THE I.Q.S.Y. COMMITTEE

During 1964, those of us who have been concerned with the I.Q.S.Y. have watched the slow decline in the number of sunspots belonging to the old cycle and the gradual development of the high-latitude spots which mark the first phase of the new cycle. In recent months, there has been an increase in the number of spotless days, but it seems probable that the level of solar activity during the 1964 minimum will not be as low as it was during the minimum of 1954. This time last year, I referred to the comment made two centuries ago by the Austrian astronomer Wernischek : « Seldom does it happen that the sun is completely free from spots » ; it would appear that the period of the I.Q.S.Y. will be no exception.

I am happy to record that the number of committees participating in the I.Q.S.Y. programme has increased from 63 at the end of 1963 to 70 at present, and that the number of stations in the vast I.Q.S.Y. network, extending from 82° N to 90° S, now exceeds 2000.

Recently the I.Q.S.Y. Committee has again emphasized the importance of assembling I.Q.S.Y. data in the World Data Centres, and I would like to take this opportunity of bringing this to your notice. Our task cannot be considered to be complete until the most important data have been made generally available to all who wish to study them.

Once again, on behalf of my colleagues on the I.Q.S.Y. Committee, I send warm greetings to the thousands of scientific workers who are ensuring the success of the I.Q.S.Y. We have now reached the half-way point in our programme and I am confident that the enthusiasm that has so clearly marked the first half of our two-year programme will be fully maintained throughout 1965.

W. J. G. BEYNON,
President, I.Q.S.Y. Committe

SOME REMARKS CONCERNING THE SELECTION OF SUITABLE LOCATIONS FOR IONOSONDE STATIONS

by H. U. Widdel,

It is well known that the sensitivity of modern ionosondes can rarely be fully utilized. Reception of short-wave transmissions from other stations through the side-lobes of the ionosonde antenna, whose main beam is vertical, results in a noise level which is normally far in excess of receiver noise or of that generated by natural sources. Consequently the observation and recording of weak echoes from the ionsophere is severely hampered or may even become impossible. In principle, an increase of the transmitter power and a decrease in the antenna beam width should improve the situation but, in practice, the improvement that can be obtained by these means is limited by economic factors, since the technical efforts necessary are large and involve rather high costs.

For many years it has been suggested that these difficulties could be avoided by using topographic peculiarities of the terrain to screen off the low-angle radiation produced by short-wave communication transmitters (1) ; to the knowledge of the author, however, no quantitative data have yet been given concerning the actual improvement of ionosonde records achieved by operation of the equipment at the bottom of a valley.

During the course of other investigations, therefore, a mobile ionospheric station was initially operated in a valley about 200 metres deep extending from north to south. The cross-section of the valley was nearly triangular and the slope of the surrounding wooded mountains was between 20° and 25°. After completion of the measurements inside the valley, the station was operated in open and level terrain, using the same antenna system and orientation (North-South). The two locations were 15 km apart and were respectively 25 and 12 km from the main station at Lindau, which is situated in flat, open country and has the same antenna orientation as in the mobile station ; thus ionograms taken at Lindau could be used as references. The relevant ionograms were then compared and checked against those produced at the main station at Lindau.

A comparison of the ionograms taken at the above two stations shows that those produced at the valley location were of higher quality. Since reliable amplitude measurements are difficult to obtain with an ionosonde, the number of traces produced on the ionograms by interfering transmitters over corresponding frequency ranges was taken as a measure of the quality. On average, only half as many of these interference traces were counted in the valley location as compared with the number detectable in the ionograms produced in open terrain under similar ionospheric conditions and over the total frequency range of the ionosonde.

The reduction in noise level was particularly pronounced in the frequency range 1 to 4 Mc/s and it is difficult to explain the reduction in the lower part of this range by screening only. Since most of the transmitting stations in this frequency band use ground-wave propagation with vertically-polarized waves, it is probable that the screening effect is enhanced by absorption effects in the mountain and valley vegetation as has been shown by Gerber and Werthmüller (2).

The reduction of noise level was dependent upon the time of day, being greatest during the daytime but still observable during the night. Some relative fieldstrength measurements taken at both locations in the man-made noise level, ranging from 3 to 15 dB, depending upon the time and frequency range considered. The observation that the maximum reduction in the noise level occurs during day-time at relatively low frequencies suggests that the waves propagated at low angles of incidence during daytime by the E-layer are preferentially attenuated, as would be expected from the geometry of the valley. Comparison with the ionograms taken at Lindau showed that the much smaller antenna system used at the mobile station (vertical rhombics about 30 m in height) could give very nearly the same quality ionograms as a much higher rhombic antenna (70 metres) in flat, open terrain. Over some limited frequency ranges, moreover, an improvement in the noise level over the Lindau ionogram was observed. On days with high absorption, the better radiation efficiency of the larger rhombic resulted in more detail in the reflected echoes, especially on the lower frequencies. Nevertheless, the selection of a suitable site for an ionosonde in a valley will, according to

the results of this experiment, always improve the quality of ionograms and, in many cases, remove certain technical problems which may have to be overcome if the equipment is to be operated in flat and open terrain.

The author would like to thank Prof. Dr. W. Dieminger, Director of the Max-Planck-Institut für Aeronomie, Institut für Ionosphärenphysik, for his interest, discussions and the facilities for performing these experiments. Sincere thanks are also due to Mr. W. R. Piggott for his valuable suggestions and encouragement.

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Lindau, October, 1964.

THE PRESENT SOLAR MINIMUM

by C. M. MINNIS

In 1963 two articles were published in *I.Q.S.Y. Notes* under the title « The Approaching Solar Minimum » (1, 2). The present article can be regarded as a continuation of the series, but it would probably be incorrect to use the same title on this occasion since it appears that we may at present be very close to the minimum or, indeed, may have passed it.

In April 1963 (1) it was suggested that the minimum would occur about the middle of 1964. In October 1963 (2), following the appearance of the first sunspots of the new cycle, the minimum was expected to occur near the end of 1964. In another article (3), the suggestion was made that the marked resurgence of solar activity in September and October 1963 might result in a minimum during which solar activity remained fairly high in comparison with the immediately preceding minima of 1954 and 1944. Finally, in February 1964 (4), it was predicted that the minimum would occur about October 1964 plus or minus three months, that the residual activity would be distinctly higher than in 1954 and that intervals of perfectly quiet sun would be scarce and of short duration.

The predictions referred to above were based partly on a review published in January 1964 (5), in which the trend of solar activity during 1963 was very carefully examined and compared with that of the corresponding years near previous minima. This review has recently been extended to include the first six months of 1964 (6) and the I.S.Q.Y. Reporter for Solar Activity has kindly provided provisional data for July to October 1964. The principal data are summarized in Table 1.

TABLE 1

Summary of Data on Solar Activity

1964

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
(1) Sunspot number .	14.6	16.3	14.5	7.7	9.4	9.3	3.4	8.9	4.4	5.6
(2) Spotless days	1	9	6	7	4	9	19	11	19	16
(3) Old cycle spots ..	11	5	12	7	6	4	2	3	1	3
(4) New cycle spots ..	0	0	1	2	1	4	2	1	2	5
(5) 2800 Mc/s flux										
a) measured	74.4	76.2	75.5	72.7	69.1	69.0	67.2	69.0	70.0	72.8
b) Idjusted 1 AU ..	72.0	74.4	74.7	73.2	70.7	71.2	69.2	70.4	70.1	73.5

It can be seen from the Table that there has been a fairly rapid decrease in the number of old cycle sunspots during 1964. On the other hand, up to September 1964 there had been no very pronounced upward trend in the number of new cycle spots. The first of the new cycle spots appeared in August 1963 and the evidence of the previous two cycles suggests that there will probably be a fairly rapid increase in the number of new cycle spots during the early months of 1965, or even before the end of 1964. If this is correct, it seems possible that the level of solar activity, as measured by the unsmoothed monthly mean sunspot number, may already have reached the minimum values for this cycle in July and September 1964 when, in each of these months, the sunspot number fell to about 4 and there were 19 spotless days.

The mean sunspot number for the months April to September 1964 is 7.2. If the expected rise in the numbers of new cycle spots materializes between now and March 1965, it seems likely that the minimum value of the 12-month smoothed sunspot

number will probably not fall below the minimum value attained in 1944 (7.7) ; it will thus be considerably higher than the minimum value of 3.4 at both the 1933 and 1954 minima.

It is also worth noting that the number of spotless days during the present minimum has not, so far, exceeded 19 in any month, whereas in both 1944 and 1954 there were many months in which the number of spotless days exceeded 20. On the evidence so far available it seems reasonable to conclude that the prediction made by Dr. Michard and referred to in the second paragraph (4) will probably prove to be accurate. The probability of the occurrence of long quiet periods seems likely to decrease rapidly as 1965 progresses. It is very important, therefore, that every effort should be made during the early months of 1965 to give priority to those types of experiment and observation for which it is necessary to have quiet solar and magnetic conditions.

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October 1964.

C. M. Minnis.

THE TRANSIT OF DELICATE PHYSICAL STANDARDS

Research laboratories making scientific measurements often need, for purposes of comparison, to exchange with similar laboratories in other countries the material with which they are working. If this extremely fragile material is to reach its destination in good condition, it must be handled with the greatest care by the Customs in both exporting and the importing countries.

An arrangement has been made to ensure, by simple administrative agreement, that the desired precautions are taken. It is based on the use of a standard label and is designed to permit

Customs examination of physical standards, both on despatch and arrival, to be carried out in the laboratories concerned. The terms of this arrangement are given in full in a U.N.E.S.C.O. document dated 20th April 1964, reference U.N.E.S.C.O./MC/49.

The benefits of this arrangement are available in 34 countries and a complete list of the laboratories concerned is included in the above document.

INSTRUCTION MANUALS FOR THE I.Q.S.Y.

Abstract

Various Instruction Manuals and Handbooks are being used during the I.Q.S.Y. to ensure uniformity of techniques of observation and of data reduction. Some of these Manuals have been produced by the I.Q.S.Y. Committee while others have been issued by, for example, I.A.G.A., U.R.S.I. and W.M.O.

The list of Manuals which follows has been prepared by the I.Q.S.Y. Publications Sub-Committee in consultation wih the I.Q.S.Y. Reporters and others. It supersedes the previous list given in *I.Q.S.Y. Notes*, No. 7.

I.Q.S.Y. Instruction Manuals are obtainable from the I.Q.S.Y. Secretariat and *Annals of the I.G.Y.* are published by Pergamon Press Ltd., Headington Hill Hall, Oxford,England.

World Days.

1. I.Q.S.Y. Instruction Manual No. 1 — World Days Programme.

2. Synoptic Codes for Solar and Geophysical Data.

(Source : I.U.W.D.S. Secretariat, Sterrewacht, 13 Servaasbolwerk, Utrecht, Netherlands.)

V. — Ionosphere.

1. U.R.S.I. Handbook of Ionogram Interpretation and Reduction (Ed. Piggott and Rawer).

(Source : Elsevier Publishing Co., Amsterdam).

2. *Annals of the I.G.Y.*, III (part I, II and III), 1-287 (for vertical incidence soundings, absorption and drift measurements.)

3. I.Q.S.Y. Instruction Manual No. 4 — Ionosphere.
   Part I — Vertical Incidence Soundings.
   Part II — Absorption Measurements.
   Part III — Drift Measurements.

4. *Annals of the I.G.Y.*, III (part IV), 291-381 (for observations of atmospheric radio noise, whistlers, radio-aurora, radio meteors, forward scatter and back scatter).

5. *C.O.S.P.A.R. Information Bulletin* No. 17 ; Technique Manual on Electron Density and Temperature Measurements in the Ionosphere.
(Source : C.O.S.P.A.R. Secretariat, 55, Boulevard Malesherbes, Paris 8e, France.)

6. See XI.1.

VI. Solar activity.

1. *Annals of the I.G.Y.*, V (part IV), 247-283.

2. *I.Q.S.Y. Instruction Manual*, No. 2 — Solar Activity.
   Part I — Solar Activity for the I.Q.S.Y.
   Part II — Recording of solar radio emission during the I.Q.S.Y.

3. *I.Q.S.Y. Instruction Manual*, No. 2 (Supplement) — Reporting of Sudden Ionospheric Disturbances.

4. *I.Q.S.Y. Instruction Manual*, No. 8 — Comets.
   Part I — Scientific Observations and Observational Programmes.
   Part II — Guide to International Data Exchange (for the I.Q.S.Y.).

XI. Space Research.

1. *I.Q.S.Y. Instruction Manual*, No. 9 (Sounding Rocket Research Techniques) has been produced using material prepared for the I.Q.S.Y. by C.O.S.P.A.R. Working Group II and will appear in November 1964. It consists of seven parts :

(*a*) A Manual describing the Rocket-Grenade Experiment ;

(*b*) A Guide to the Literature on the Falling Sphere Method for Measuring Upper-Air Density, Temperature and Wind ;

(*c*) A Guide to Rocket Luminous Vapor Trail Experiments ;

(*d*) A Manual on Night Airglow Photometry ;

(*e*) A Manual on Molecular Oxygen Determination ;

(*f*) A Manual on Ionospheric Current Measurements ;

(*g*) Technique Manual on Electron Density and Temperature Measurements in the Ionosphere.

2. See V.5.

3. Meteorological Soundings in the Upper Atmosphere by G. W. W. KELLOG (*W. M. O. Technical Notes*, No. 60).

TEMPORARY IMPORTATION OF SCIENTIFIC EQUIPMENT FREE OF IMPORT DUTIES

From time to time, laboratories responsible for geophysical research may require to send scientific equipment to other countries for temporary use in connection with a research project or a special series of measurements. Normally this equipment would be subject to import charges by the Customs authorities of the country to which it was sent.

In order to avoid the need for the payment of heavy import charges, certain states have signed Customs Conventions which make provision for the waiving of the Customs charges providing certain conditions are fulfilled. The Conventions which deal with the temporary importation of goods are as follows :

(*a*) Customs Convention on the A.T.A. carnet for the temporary admission of goods (A.T.A. Convention).

(*b*) Customs Convention on the temporary importation of professional equipment.

(*c*) Customs Convention concerning facilities for the importation of goods for displays or use at exhibitions, fairs, meetings or similar events.

Convention (*b*) covers, for example, equipment necessary for scientists and for use in geophysical surveys, specially equipped vehicles, travelling workshops and laboratories. Such equipment and vehicles can be temporarily imported free of import duties and free of import prohibitions and restrictions subject to re-

exportation within 6 months from the date of importation. For valid reasons, the Customs authorities may either grant a longer period or extend the initial period. Provision is also made for the import of component parts required to repair temporarily imported equipment.

These Conventions are the results of agreements reached by the signatory states meeting under the auspices of the Customs Cooperation Council and the Contracting Parties to the General Agreement on Tariffs and Trade in consultation with the United Nations Educational, Scientific and Cultural Organization (U.N.E.S.C.O.).

I.Q.S.Y. ADVISORY GROUPS

(November, 1964)

Abstract

The I.Q.S.Y. Committee includes among its members a number of Reporters who are responsible for advising on the general direction of the programme of work in the I.Q.S.Y. disciplines. Since each discipline falls within the sphere of interest of one of the Scientific Unions of I.C.S.U., the Reporters are appointed by the appropriate Unions. In addition, each Reporter is supported by an expert Advisory Group, the members of which are nominated by the Unions or by one of their Associations.

Questions relating to space research are referred to C.O.S.P.A.R. Working Group II, and the various S.C.A.R. Working Groups advise on matters concerned with the I.Q.S.Y. programme in the Antarctic. It is worth noting that I.A.M.A.P. and W.M.O. have many common interests in the I.Q.S.Y. meteorological programme, and the necessary close cooperation between the Groups nominated by these two organizations is assured by the fact that the I.Q.S.Y. Reporter for Meteorology is Chairman of both. The I.U.W.D.S., one of the Permanent Services of the Federation of Astronomical and Geophysical Permanent Services, is responsible for the international geophysical calendars and the organization of geophysical alerts.

The membership of the various Advisory Groups is given below.

II. Meteorology (W.M.O.).

Chairman : W. L. Godson (Canada).

II. Meteorology (I.A.M.A.P.).

Chairman : W. L. Godson (Canada).

III. Geomagnetism (I.A.G.A.).

Chairman : J. O. Cardus (Spain).

IV*a*. Aurora (I.A.G.A.).

Chairman : J. Paton (U. K.).

IV*b*. Airglow (I.A.G.A.).

Chairman : D. Barbier (France).

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VI. Solar Activity (I.A.U.).

Chairman : R. Michard (France).

VII. Cosmic Radiation and Geomagnetically Trapped particles (I.U.P.A.P.).

Chairman : S. N. Vernov (U. S. S. R.).

XI. Space research (C.O.S.P.A.R. Working Group II for the I.Q.S.Y.).

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XV. Aeronomy (I.A.G.A.).

Chairman : M. Nicolet (Belgium).

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C. O. S. P. A. R.

Report on Space Research Activities in the U.S.S.R.

C.O.S.P.A.R. Information Bulletin, No. 21 (December 1964) is a special issue devoted to the Report on Space Research Activities in the U. S. S. R. presented at the Seventh Plenary Meeting of C.O.S.P.A.R., Florence, Italy, May 1964.

We are publishing some parts of the report which are more particularly connected to U.R.S.I. activities.

1. — *Rocket investigations of the upper atmosphere.*

In 1963 in the Soviet Union 110 meteorological and 4 geophysical rockets were launched.

2. — *Investigations by means of geophysical rockets.*

During launchings of geophysical rockets complex investigations of the upper atmosphere were carried out up to heights of 400-500 km.

(*a*) Measurements of atmospheric density by means of manometers confirmed data on the significant decrease of density in 1963 as compared to the years of the solar cycle maximum.

Atmospheric density at heights of 80-90 km was estimated also from absorption of solar radiation in the region of the Lyman-alpha hydrogen line. On 6 and 18 June 1963 the density during sunrise differed by more than two times.

(*b*) Vertical distributions of electron density in the ionosphere were measured by a dispersion radiointerferometer method with the use of coherent waves with frequencies 48 and 144 megacycles per second. The results obtained confirm the considerable difference discovered in experiments of recent years between electron density profiles in years close to the solar activity minimum and those obtained in years close to the solar activity maximum,

which consists in a more rapid fall of electron density with height above the F region maximum.

Measurements of the electrostatic field strength in the ionosphere by an electrostatic fluxmeter method confirm the conclusions of the previous experiments on the existence at some portions of rocket flights in the ionosphere of outer electrical fields with the strength of 10^{-4}-10^{-3} v cm^{-1} varying from one experiment to another.

(*c*) By means of instrumentation mounted on a geophysical rocket which on 6 June 1963 reached a height of 500 km a photograph of the Sun in the spectral region 170-400 Å was obtained. The main contribution to the obtained image is made by lines and continuum of He II. Regions of enhanced radiation intensity are situated above plage fields.

Measurements of solar radiation in the region 1200-1300 Å were conducted by means of ionization chambers. Atmospheric density at heights of 80-90 km was evaluated by measuring the absorption of the Lyman-alpha hydrogen line. Substantial variations of the density have been revealed which on 6 June was approximately 1.5 times more and on 18 June 1.5 times less than according to the standard atmosphere CIRA.

(*d*) Total energy flux of the electrons in the atmosphere was measured by means of an instrument on the basis of thermoluminescent phosphor with special tube filters. According to preliminary data, the energy of the electron flux on 6 June, 1963, at sunrise at heights of 200-500 km was equal to 0.3-1 erg cm^{-2} sec^{-1} which is in accord with the results of similar measurements on October 18, 1962. At daytime by means of an instrument on the basis of a secondary electron multiplier of an open type the total electron flux has been measured which at heights of 200-500 km was isotropic and on the average was equal to approximately 5.10^7 cm^{-2} sec^{-1} $ster^{-1}$. The electron flux with the energy $\geqslant$ 30-35 kev ($\sim 2.10^5$ cm^{-2} sec^{-1} $ster^{-1}$) and the spectrum ($\gamma = 4.5$) was evaluated with the use of absorbers. It has been established that the soft boundary of the spectrum is $\leqslant$ 8 kev (but maybe $\sim$ 1 kev or softer) which gives an estimate of the energy flux at daytime $\leqslant$0.6-0.1 erg cm^{-2} sec^{-1} $ster^{-1}$. Irregular intensity variations by several times have been recorded during the time intervals of $\sim$ 1 sec.

Measurements of the intensity of solar X-ray radiation in the spectral region of about 3 Å were conducted by means of a similar instrument. Irregular outbursts of X-ray radiation of approximately 1 sec. duration have been observed.

II. — Investigations of the Upper atmosphere and circumterrestrial outer space by means of satellites

From 16 March 1962 in the Soviet Union the program of investigation of the upper atmosphere and outer space has been accomplished by means of artificial Earth satellites of the Cosmos series.

Satellites of the Cosmos series represent space vehicles equipped with diversified instrumentation and aimed at performing various investigations in circumterrestrial outer space.

The scientific program of investigations by means of satellites of the Cosmos series envisages :

the study of charged particle density in the ionosphere with the aim to investigate radio wave propagation ;

the study of corpuscular streams and low-energy particles ;

the study of the energy composition of the Earth's radiation belts with the aim of estimating radiation danger during prolonged space flights ;

the study of primary composition of cosmic rays and their intensity variations ;

the study of the Earth's magnetic field ;

the study of shortwave radiation of the Sun and other space bodies ;

the study of structural parameters of the upper atmosphere ;

the study of the effect of meteoric matter on the elements of the design of space vehicles ;

the study of distribution and formation of cloud systems in the Earth's atmosphere.

In addition, on satellites of the Cosmos series different elements of the design of space vehicles are tested.

In 1963 and at the beginning of 1964 sixteen satellites of this series were launched. Some results obtained from the data processing are outlined below.

2. — *Ionospheric Investigations.*

(*a*) During 1962-1963 ionospheric investigations were conducted by means of the radio transmitter Mayak (Beacon) mounted on artificial Earth satellites of the Cosmos series which emitted radio waves at coherent frequencies 20.005 and 90.0225 megacycles per second. After the launching of the « Electron » space system similar experiments are carried out on the frequencies 20.005, 30.0075 and 90.0225 megacycles per second. The gist of these experiments in a nutshell is as follows : At a number of observational points the reduced difference of Doppler frequencies $\delta\Phi$ of coherent radio waves emitted from artificial Earth satellites is recorded by means of a precision receiving noise immune installation with the phase photorecorder.

The accuracy of measurements of $\delta\Phi$ reaches small portions of the cycle. Besides, at amplitude records the « rotational » Doppler effect $\delta\Phi_H$ is registrated due to the difference of Doppler shifts of frequencies of ordinary and extraordinary waves arising in the ionosphere (the Faraday effect).

Values of $\delta\Phi$ and $\delta\Phi_H$ depend on local properties of plasma in the vicinity of the emitter and on integral properties of the medium along the trajectory of wave propagation from the source to the point of observation. The theory of the method of measurements has shown that in a number of cases the measured value $\delta\Phi$ is described by means of a linear equation whose analysis permits one to determine the properties of the ionosphere.

For the cycle of observations performed extensive experimental material has been acquired. At present an analysis has been completed only of some part of records of the $\delta\Phi$ value in Moscow, Sverdlovsk and the Crimea during passes of satellites Cosmos I, II and XI. The results of this analysis boil down to the following. Dependence of electron density on height has been obtained in the outer ionosphere, above the height Z_m of the ionospheric main maximum N_mF_2. In the lower half of the ionosphere values of N determined by means of artificial Earth satellites coincide well with control measurements by means of panoramic ionospheric stations. For the considered observational period electron density falls on the average by the exponent $e^{-\chi Z}$ where $\chi \sim 5.10^{-3}$ km^{-1}. Besides, a new maximum is revealed by 120-140 km above

the main maximum N_mF_2. The N value in this maximum amounts to (0.9-0.95) N_mF_2.

New data on gradients of electron density horizontal inhomogeneity along the artificial Earth satellite orbit have been obtained. Their average values exceed values known earlier by approximately 10 times.

The linear dimensions spectrum W (ρ) of ionospheric inhomogeneous formations has been determined in the wide range of values of ρ from a few to several hundreds of kilometers apparently in the main along the artificial Earth satellite orbit. Alongside with the maximum known earlier at $\rho_M \sim$ 4-5 km, the characteristic dimensions of inhomogeneities of $\rho_M \sim$ 16-18 km, 28-32 km and 100-120 km have been obtained.

(*b*) In 1963 processing was continued of results of the ionospheric experiments carried out in 1962 on the Cosmos 2 satellite by means of planar and spherical ion traps. It has been established that during daytime hours of April 1962 the height of the region in which the density of He^+ ions was equal to the density of 0^+ ions was of approximately 780 km (as compared to the height of about 580 km during the night-time hours).

Measurements of the electron temperature Te during day-time hours carried out by means of Langmuir probes at heights from about 250 km to about 550 km gave the value of Te within the interval from about 1800° K to 3000° K.

Estimates of the positive ions' temperature carried out in the same height interval from the measurements performed by means of ion traps of honeycomb type gave values

$$Ti \approx 1300^\circ \pm 200^\circ \text{ K}$$

(*c*) A cycle of theoretical investigations has been performed of some effects appearing in the neighbourhood of a body moving in a plasma. Effects near a moving radiating antenna have also been considered. In particular these investigations are aimed at developing the detailed theory of phenomena produced in the neighbourhood of artificial Earth satellites necessary for analysis of results of diverse measurements conducted on artificial Earth satellites and space rockets by means of probes.

In 1963 the description of the following effects have been developed, in particular the disturbance of plasma by a high-frequency

field, the influence of collisions and of the electric field on the perturbation of electron density, perturbation of the magnetic field, distribution of particles performing « finite » motions, the concentration and the flux of particles in the neighbourhood of the probe for a number of particular cases. It has been shown that due to the influence of the electric field at distances from the body of the order and more than (8-10) Ro (Ro is the linear size of the body), maximum rarefaction of electrons and ions behind the body is achieved not along the path of the body's motion but at the conic surface which forms with this path the angle $\theta \sim$ (8-10)° ($\sin\theta \approx \frac{Vo}{Vi}$, Vi is thermal velocity of ions, Vo is the body's velocity).

Perturbation of particle density in the neighbourhood of the antenna mounted on the artificial Earth satellite is caused by pressure of the high-frequency field on charged particles. It has been shown that due to this the field's amplitude experiences spatial oscillations.

In the region of resonance frequency ($w_o = \sqrt{\frac{4\pi Ne^2}{m}}$) calculation of the structure of the field and perturbation of charged particles requires nonlinear effects to be taken into account. It turns out that at $w = w_o$ the period of oscillations is about $(Eo)^{-1/3}$ where Eo is the intensity of the field at the surface of the antenna. Disturbance of the Earth's magnetic field caused by the body's motion reaches in the lower ionosphere only several gammas. Calculations of the flux and density of particles in the neighbourhood of the artificial Earth satellite have shown that formulas of the Langmuir probe used conventionally in many cases are inapplicable to determining current on a probe placed near an artificial Earth satellite. Corresponding formulas have been obtained which are partly tabulated.

IV. — Investigations of deep space and planets of the solar system

In 1963-64 the development of space vehicles designed for prolonged interplanetary flights has been carried out. Processing and studies of scientific data obtained from Mars 1 probe launched in 1962 have been performed.

Information is also given on :

1. The automatic station Lunik 4,
2. The Mars 1 automatic interplanetary station,
3. The automatic interplanetary station Sonde 1,
4. The Electron Space System, with the scientific instrumentation of the Electron 1 and 2 satellites.

VIII. — Some results of space investigations by ground-based stations

1. — *Radar investigations of planets.*

At previous C.O.S.P.A.R. Meeting in 1963 in Warsaw the results of radar observation of the planet Mars and a Venus secondary radar bounce were reported.

In September-October 1963 in the Soviet Union a Jupiter radar bounce was accomplished. This experiment was aimed at studying reflective properties of the Jovian surface and radio wave propagation at extremely large distances.

During the observations radio signals at a frequency of about 700 Mc/s were sent to Jupiter. Only 13 watts of the power emitted by the transmitter fell for the entire visible surface of the planet. It took for radio signals on the average 1 h. 6 min. to pass the entire path from the Earth to Jupiter and back to the Earth.

The results of the analysis of the spectrum of signals reflected from Jupiter and accumulated during 22 hours have shown that Jupiter causes a stronger broadening of the spectrum of reflected signals than it was observed, for instance, during radar observations of planets Venus and Mars. Measurements of the energy of the reflected signals permitted us to evaluate the coefficient of radio wave reflection which amounts to 10 per cent (according to measurements in the spectrum of frequencies with the bandwidth of 72 cycles per second).

2. — *The Experiment on Radio Communication Through the Echo II Satellite and Through the Moon at a Frequency of* 162.4 *Mc/s Between the Observatories Jodrell Bank (Great Britain) and Zimenki (U. S. S. R.).*

In accordance with the agreement between the U. S. S. R. Academy of Sciences and N.A.S.A. (U. S. A.) and between repre-

sentatives of the Gorky State University, the leaders of the Observatory at Jodrell Bank (Great Britain) and representatives of the Communications Administration of Great Britain in a period from February 21 to March 8, 1964, a radio communication experiment was conducted at a frequency of 162.4 Megacycles per second between Observatories at Jodrell Bank (Great Britain) and Zimenki (U. S. S. R.) with the use of the American satellite Echo II as a passive relay (a radio wave reflector). The experiment was of exploratory nature. In this connection a relatively low carrier frequency (162.4 Mc/s) and limited power of the transmitter (1 kwt) were selected. Because of the experiment's exploratory nature and due to the absence of radio-transmitting equipment at the Zimenki Observatory only a one-way transmission from Jodrell Bank to Zimenki was envisaged.

The selected scheme of the experiment ensured good conditions for studying possible ionospheric and tropospheric effects since they increase with the decrease of frequency at which transmission is maintained. Experimenters realized that at chosen characteristics of the radiochannel the bandwidth of the communication line will be sufficiently narrow, and therefore this work cannot be an immediate prototype of the experimental working communication line for which a higher operating frequency and increased power of the transmitter are required.

According to additional agreement between the leaders of Observatories at Jodrell Bank and Zimenki radio communication sessions were conducted with the use of reflection from the Moon.

34 communication sessions through Echo II and 10 communication sessions through the Moon were conducted. The following types of experimental transmissions were performed :

transmission of an unmodulated radio signal of carrier frequency ;

transmission of telegraph signals ;

broadcasting slowed down by 4 and 8 times ;

transmission of phototelegrams.

The experiments conducted gave important scientific results. In particular, it has been shown that the power level on the receiving side differs on the average from the theoretical value by 3-5 decibels and slow and rapid fluctuations of the signal apparently connected with deviations of the shape of the Echo II satellite from a spherical shape are recorded.

Valuable practical experience has been accumulated which may be used for developing communication lines with the utilization of passive space retranslators. A Technical report on the results of tests was sent to N.A.S.A., to the Jodrell Bank Observatory and to Communications Administration of Great Britain.

The experiment conducted is the first international cooperation experiment in the field of space investigations between the U. S. S. R., the U. S. A. and Great Britain. This experiment has given successful results and has shown the value and fruitfulness of international cooperation in space exploration.

3. — *Investigations in physics of planets and interplanetary medium by astronomical methods.*

Infrared spectra of Mars, Venus and Mercury were obtained. The presence of CO_2 was discovered in the atmosphere of Mercury. From measurements of CO_2 band intensity in the Martian spectrum an estimate of pressure in the planetary atmosphere of about 0.02 atm was obtained. The presence of an absorbing agent in the Venus spectrum was revealed in the region $\lambda > 2.9$ microns.

As a result of a great deal of observational data it has been found that each corpuscular stream from the Sun contains two components : (1) a conglomeration of gas condensations (with frozen-in magnetic fields) moving from the Sun radially, (2) a conglomeration of elastic coronal rays of the type of magnetic force tubes. The properties of the solar wind were investigated in days without magnetic storms (by inspection of magnetic activity on polar caps) for a period from 1957 to 1962. It was found that during this entire period the solar wind acted on the Earth continuously, moved from the Earth radially and was not connected with active formations on the Sun. The dependence of the solar wind intensity on the solar activity phase is small or is absent.

Successful experiments in the light location of the Moon were performed by means of ruby lasers.

4. — *Investigations of outer space from the data of ground-based observations.*

Some investigations of the upper atmosphere and circumterrestrial space were made from the results of ground-based ionospheric observations. By ionograms of some ionospheric

stations calculation of vertical electron density distributions (N/h profiles) is carried out.

Interesting results were obtained during studies of N/h profiles during the eclipse. Variations connected with the appearance of movements and the redistribution of ionization in the F_2 region were obtained.

The network of regularly operating ionospheric stations makes it possible to analyse comprehensively the data on the upper atmosphere obtained by means of satellites and rockets and to connect the data on the outer part of the ionosphere with the parameters of the ionosphere situated below the F_2 layer maximum. In particular, in plotting the dependence of ionization on height by the data of receiving signals of the Mayak coherent frequency transmitter mounted on the satellites N/h profiles obtained from measurements of a number of ionospheric stations of the Soviet Union were used as control ones.

Besides the vertical ionospheric sounding the study of the upper atmosphere is conducted also by other methods. Measurements of cosmic radio noise at the Earth's surface permit us to judge radio wave absorption in the entire thickness of the ionosphere and motions and inhomogeneities of the ionosphere. The inhomogeneous structure of the ionosphere, the velocity and directions of motions are investigated also by a spaced radio reception. An analysis of whistlers is used for investigations of the properties of the Earth's magnetosphere.

In the Soviet Union at present a network of ionospheric stations (19 stations) operates at a regular schedule. All the stations are equipped with automatic ionosondes; the frequency range of the stations is from 0.5-1.0 Mc/s to 18-25 Mc/s, the time of passage of the range is from 20 to 30 sec. At many stations there is instrumentation for measuring absorption in the low ionosphere by a pulse method, for recording the absorption of cosmic radio noise. Some stations are equipped with devices for measuring winds in the ionosphere. The stations work according to the program of observations of the International Year of the Quiet Sun. All the materials of measurements are concentrated by the World Data Centre B_2 and are published in Space Data, A Monthly Review (The Nauka Publishing House) and in Materials of Ionospheric Investigations (issued by the Interdepartmental Geophysical Committee).

IX. — The program of scientific investigations in the period of the International Year of the Quiet Sun by means of satellites and rockets

The main tasks of scientific investigations mapped out for a period of the International Year of the Quiet Sun are as follows :

to obtain information about the structure of outer shells of the Sun and about physical processes taking place in them ;

to study the state of interplanetary space and its changes depending on variations of solar activity ;

to study the Earth's upper atmosphere and dependence of its changes on processes taking place on the Sun.

Investigations of the Sun in the period of low activity will enable us to study its radiation in a quiet state and also to obtain more definite dependences of some phenomena connected with solar activity.

To ensure the solution of the above-mentioned problems the maintenance of the following program of investigations is planned :

1. — *Investigation of Solar Electromagnetic Radiation.*

During the International Year of the Quiet Sun (1964-1965) which will fall for a period of the solar activity minimum not only the repetition of measurements and experiments aimed at studying solar geoactive electromagnetic radiation conducted during the International Geophysical Year — International Geophysical Cooperation which was the period of high activity is envisaged but also substantial development of the program of investigations.

During the International Year of the Quiet Sun there will be periods of absolute absence (for several days) of active formations on the solar disc and periods during which only one active region will be on the solar disc. Due to this in the solar activity minimum period an exceptional possibility is opened up to study how the absolutely undisturbed Sun and also solar active formations influence terrestrial phenomena.

At the same time significant data should be obtained for studying the Sun itself, for studying the cyclic solar activity, for analysis of the nature of solar active regions.

In the period of the International Geophysical Year it was established that the transitional region between the chromosphere

and the corona giving up to 90 per cent of radiation is the main source of solar shortwave radiation. Therefore of special interest are studies of this transitional region.

Thus complex investigations during the International Year of the Quiet Sun will enable us to ascertain the nature of solar-terrestrial relationships and basic mechanisms of the influence of the Sun on the Earth. The most important task in this system of investigations is the determination of the major characteristics of geoactive shortwave radiation and establishment of patrol observation on its changes at least in some specified periods. This can be achieved only on satellites and rockets beyond the main mass of the atmosphere absorbing these radiations. In this connection investigations are planned according to the following program :

1. Studies of the intensity and intensity variations of shortwave (X-ray and vacuum ultraviolet) solar radiation. It is planned to carry out measurements on rockets and patrol observations on satellites in some narrow spectral intervals in the region of the spectrum shorter than 1300 Å. It is planned also to measure the total flux of radiation in this part of the spectrum. Newly designed instrumentation will be used for recording such radiation.

While carrying out the program of investigations during the International Year of the Quiet Sun it is supposed to verify and make more precise the results of investigations carried out during the International Geophysical Year and in subsequent years. The following major tasks of investigations can be formulated :

(*a*) The dependence of the intensity of shortwave radiation on the relative area and power of active regions at the visible solar disc.

(*b*) The solution of the general problem on variations of intensities and the spectrum of solar shortwave radiation as a function of the solar cycle phase.

(*c*) The more precise determination of the type of a change in the spectrum of the extreme shortwave portion of solar X-ray radiation in a period of solar flares.

2. Obtaining images of the Sun in ultraviolet rays and X-rays. The main task here is to study the distribution of the intensity

of solar shortwave radiation at the Sun's surface and in active regions.

It is planned to obtain the images in different parts of the spectrum which will allow us to follow both a change in ultraviolet radiation affecting the upper ionosphere (regions F_1 and F_2), a change in X-rays determining the state of the lower part of the ionosphere and conditions during sudden ionospheric perturbations.

3. Studies of the emission of the solar corona at large distances from the Sun in the visible and ultraviolet regions of the spectrum. The solar corona is a region on the Sun in which radiation of the extreme shortwave (X-ray) part of the spectrum appears.

In the period of the International Geophysical Year it was established that outer parts of the corona extend deeply into the interplanetary medium and that streams of particles from the corona reach the regions of the Earth's orbit. Besides, the study of the outer solar corona having the temperature of about 1000000 degrees essentially influences the physical state of the upper atmosphere and the Earth's magnetosphere. However, a ground-based investigation of the corona at large distances from the Sun is impossible due to strong scattered light in the Earth's lower atmosphere. Therefore here only investigations beyond the main part of the atmosphere can be of help.

5. — *A study of the earth's upper atmosphere and its variations depending on solar processes.*

1. A study of variations of the density, the ion and neutral composition of the Earth's upper atmosphere and interrelations of processes taking place in the upper atmosphere with processes in the stratosphere and troposphere is a further development of works carried out during the International Geophysical Year.

One of the main features of this section of the program is to reveal variations of basic thermobaric dynamic parameters of the upper atmosphere (the density, the composition of the atmosphere, wind and flows) depending on seasons and geophysical regions.

Investigations of spatial and temporal variations of density, ionic and neutral composition of the upper atmosphere in combination with investigations of solar shortwave radiation will enable

us to define more precisely the processes determining the state of the Earth's upper atmosphere.

To find physical relations of the state of the Earth's upper atmosphere with the processes taking place on the Sun is the main task of investigations of this section.

To fulfil the program of investigations research rockets and artificial Earth satellites will be used as carriers of instrumentation.

A combination of simultaneous measurements by means of research rockets and artificial Earth satellites which due to some specific features complement well each other will make it possible to fulfil the program of investigations most fully. Research rockets will be launched in two regions of the U. S. S. R. territory (Heiss Island, middle latitudes) and in various geographic regions from sea research ships.

2. Investigations of the Effect of the Solar Ionizing Radiation and of Corpuscular streams on the Earth's Upper Atmosphere.

Investigations performed over recent years have shown that not only the degree of ionization but also heating of the upper atmosphere are directly influenced by solar shortwave radiation. The composition of the atmosphere, the intensity of corpuscular fluxes of electrons in the upper atmosphere and other physical phenomena depend on the level and type of solar shortwave radiation. It was also ascertained that previous estimates of the intensity of the first ionizing agent — solar shortwave radiation made before the beginning of rocket investigations are too low and during ionospheric investigations the ionizing role of the electron flux in the ionosphere (which in night-time conditions may maintain the state of ionization and high temperature of the upper atmosphere) was not taken into account. Sporadic intensifications of such electron fluxes cause ionospheric disturbances, increased radiowave absorption, auroras, etc.

Ionizing electron fluxes are as yet investigated little. Therefore a study of their display, their specific features and nature becomes one of the main tasks alongside investigations of the influence of solar shortwave radiation on the upper atmosphere.

Obtaining the data on solar ionizing radiation and on electron fluxes in conjunction with the direct data on the density, ion and neutral composition, electron concentration and other parameters

of the upper atmosphere by means of rockets and satellites enables us to understand the nature and mechanism of processes taking place in the ionosphere, to make more precise the ionospheric model instead of existing schematized theoretical models. This gives prerequisites for creating the single physical theory of the upper atmosphere which will give a coherent picture of all basic processes and phenomena taking place in the upper atmosphere.

A system of complex measurements of various geophysical parameters will be used in conjunction with measurements of shortwave radiation which opens up new possibilities in direct studies of the influence of shortwave radiation on the state of ionization, on heating, on corpuscular streams in the upper atmosphere and on other geophysical phenomena. All this is necessary for obtaining new experimental facts and for testing existing theories.

Scientific data will be exchanged by publications as it was during the International Geophysical Year.

International Satellite: Ariel II

The December issue of the *C.O.S.P.A.R. Information Bulletin* contains also some technical information on the international satellite Ariel II together with the description of experiments carried out.

Information Bulletin

We quote from *C.O.S.P.A.R. Information Bulletin*, No. 20, November 1964, the following abstracts which seem to be of some interest to U.R.S.I.

C.O.S.P.A.R. — Executive Committee

Union Representatives.

International Astronomical Union : Professor H. C. VAN DE HULST.
International Union of Biochemistry : Professor M. FLORKIN.
International Union of Biological Sciences : Professor N. D. IERUSALIMSKY.

International Union of Pure and Applied Chemistry : Professor E. MIESCHER.
International Unions of Geodesy and Geophysics : Professor J. KAPLAN.
International Mathematical Union : Professor A. V. WIJNGAARDEN.
International Union of Theoretical and Applied Mechanics : Professor M. ROY.
International Union of Pure and Applied Physics : Professor N. NEEL (pro tem).
International Union of Physiological Sciences : Professor Dr. J. WALAWSKI.
International Scientific Radio Union : Professor Samuel SILVER.

Secretarial.

Since July 1, 1964, The Executive Secretary of C.O.S.P.A.R. is Mr. J. GAZIN.

C.O.S.P.A.R. Working Groups and other Bodies

Working group 2 for the I.Q.S.Y.

Chairman : Dr. H. FRIEDMAN.

Correspondent for :

Aeronomy and Aurora : G. A. SKURIDIN.
Ionosphere : W. J. G. BEYNON.
Meteorology : R. FRITH.
Geomagnetism and Cosmic Rays : J. D. KALININ.
Solar Activity and the Interplanetary Medium : H. FRIEDMAN.
Alerts and World Days : L. D. FEITER.

Preparatory Group on Probes through Comets :

Chairman : R. A. LYTTLETON.

Preparatory Group for Conjugate Points :

Chairman : J. C. ROEDERER.

Panel on Polar Cap Experiments :

Chairman : B. LANDMARK.

Panel on Real Time Telemetry :

Chairman : V. A. SARABHAI.

Panel on Synoptic Rocket Soundings :

Chairman : J. BLAMONT.

Working group 3 *on data and publications* :

Chairman : Prof. A. P. MITRA.

Correspondent for :

SPACEWARN : A. H. SHAPLEY.
Data Interchange and W.D.C's : H. ODISHAW.
C.O.S.P.A.R. Publications : J. W. KING.

Sub-Group on Codes (*joint between* W. G. I and W. G. 3).

Convenor : A. SHAPLEY.

Temporary Panel on the Need for an International Multilingual Glossary of Space Science.

Convenor : J. W. KING.

The C.O.S.P.A.R. Meeting in Florence

MAY 1964

During the C.O.S.P.A.R. Meeting a Fifth International Space Science Symposium was held in Florence. This Symposium was made up of the three following sections :

I. Interaction of Energetic Particles with the Atmosphere.

II. Latest results of Space Research.

III. Life Sciences and Space Research.

The scientific papers which were presented, or their abstracts, will appear in two volumes published by the North-Holland Publishing Company (Amsterdam) under the titles :

Space Research, volume V.

Life Sciences and Space Research, volume III.

In addition, the reports of the National Institutions adhering to C.O.S.P.A.R. have been published in the *C.O.S.P.A.R. Information Bulletin*, number 19.

The report summarized in *C.O.S.P.A.R. Information Bulletin* is not concerned with the results to be found in these publications but only with the work of the different C.O.S.P.A.R. groups : Working Groups, Consultative Group on potentially harmful effects of Space Experiments, and General Assembly.

Consequently, the following are briefly presented hereafter :

Reports of A.I.U., U.R.S.I. and I.U.C.A.F.

Work of W.G.2 on the I.Q.S.Y.

Reports of I.A.U., U.R.S.I. and I.U.C.A.F.

I.A.U. took a considerable interest in two questions : the allocation of frequencies for scientific purposes and the interference with optical radio astronomy which can be brought about by certain space experiments. I.A.U. considered that the conferences held to allocate frequencies had not yet had the expected results and that these endeavours should be carried on by I.U.C.A.F. Furthermore I.A.U. attached great importance to the Consultative Group's first report, which is the subject of part 8.

U.R.S.I. recalled that various problems concerned with Space were studied in the course of its 14th General Assembly held at Tokyo in September 1963.

Satellite and rocket borne experiments for studying the ionosphere and the exosphere were discussed in a number of sessions. Three points are to be noted, namely :

1. The top-sounding experiments have yielded far reaching results on the structure of the ionosphere and solar terrestrial interactions ; however this is only a beginning, many results are as yet to be considered as tentative, and more data must be gathered over extended periods of the solar cycle.

2. The structure and dynamics of the D- and E-regions need considerably more study and the importance of synoptic rocket soundings during the I.Q.S.Y. was underscored.

3. Many instrumentation problems, such as the properties of an antenna in a plasma, require more study and research before the data obtained can be interpreted properly.

Moreover, the information to be gained about the structure of the surface of a planet from the characteristics of the polarization of the infrared and millimeter wave radiation emitted by the planet must be given serious consideration in planning future studies of the planets.

Finally U.R.S.I. recalled that the topic of « Basic Relations Between Space Experiment Design and Telemetry and Data Reduc-

tion Requirements » was on the list of proposed symposia and suggested arrangements between U.R.S.I. and C.O.S.P.A.R. with this aim.

I.U.C.A.F. reported that at the extraordinary Administrative Radio Conference of the I.T.U. held in Geneva in November 1963, the work of I.U.C.A.F. bore the first fruits of its successful activities. The need to provide all possible protection for radio astronomy was fully recognised ; and some 13 specific bands of frequencies were allocated on an exlusive or shared basis. In addition, some 22 bands of frequencies were allocated to research in space science as distinct from communications and satellite tracking.

It was recognised therefore that serious progress had been made. However, the fact was mentioned that altough the situation for space research might now be all right, deep space tracking and telemetry may be caught in the same difficult situation as radio astronomy unless some foresight were exercised.

Working Group 2

Just before the C.O.S.P.A.R. Meeting, the Committee for the I.Q.S.Y. held an important meeting in Florence.

W.G.2 brought up to date a certain number of questions summarized below :

At the Warsaw meeting in 1963 a recommendation was adopted concerning technical manuals on rocket probes. The position with regard to these manuals is as follows :

(*e*) Electron Density and Temperature, K. Maeda : this manual has been published as *C.O.S.P.A.R. Bulletin*, No. 17.

(*g*) Measurement of Electric Currents in the Ionosphere, L. J. Cahill : this manual will be available shortly from the C.O.S.P.A.R. Secretariat.

— *Ionosphere* : Two methods of investigations and collection of facts were mentioned : on the one hand the top-side satellite Alouette which has functioned without incident for more than a year ; and on the other an extensive programme of bottom side soundings from about 170 earth stations. The full benefits of both the top and bottom side soundings will only be felt if the data from two sides can be married.

— *World days service* : The 1966 Geophysical Calendar will be ready for publication by the end of 1965.

Resolutions adopted by the General Assembly

Resolution 13 : Consideration of Real Time Transmission Design of Experiments.

C.O.S.P.A.R. notes that the report of the Panel on Real Time Telemetry finds that there are scientific advantages in providing real time signals (for example, telemetry and radio beacon) for general scientific use and recommends that wherever practical real time transmission be considered in the design of such experiments.

Resolution 15 : International Designations for Satellites and Space Probes.

C.O.S.P.A.R. confirms the scheme for international designation of satellites and space probes described in Section 2.3 of the C.O.S.P.A.R. Guide, but for practical reasons requests the International Ursigram and World Days Service (I.U.W.D.S.) to assign on behalf of C.O.S.P.A.R. the tentative designations within a few days of launch and to distribute the information in timely bulletins which equate international designations with national names prior to ultimate publication of the final designations in the *C.O.S.P.A.R. Information Bulletin*.

Resolution 16 : Prompt Distribution of Information on Satellites with Broad International Participation.

C.O.S.P.A.R. recognizing that certain satellites are especially suitable for broad international participation in scientific studies, and recalling the effectiveness of the cooperation of the W.M.O. in making their worldwide communications channels available for the distribution of solar and geophysical alerts during the I.G.Y. and I.Q.S.Y. to a similar group of scientific stations throughout the world requests the W.M.O. to consider the distribution through the same channels of brief launching announcements and if possible, a first orbital prediction for the limited number of satellites of this type.

Resolution 17 : List of Satellites with continuous Transmissions of Radio Signals.

C.O.S.P.A.R. recommends that the exchange of information through the SPACEWARN system include a timely bulletin distributed by mail with a resume of those satellites which are continuously emitting radio signals (e. g. ionospheric beacon or real time telemetry) together with radio frequencies being used, and invites launching authorities to provide the necessary information.

Resolution 21 : *I.Q.S.Y. Guide.*

C.O.S.P.A.R. notes that the I.Q.S.Y. Guide to international data exchange through the WDC's (and the new C.I.G. Guide) propose certain specific suggestions in the area of rocket and satellite data interchange in several I.Q.S.Y. disciplines, accepts these suggestions as part of the C.O.S.P.A.R. Guide for the two-year period of the I.Q.S.Y. (1964-65), requests adherents to C.O.S.P.A.R. to respond to these I.Q.S.Y. suggestions, and also urges that all such data, in accordance with the C.O.S.P.A.R. Guide, be submitted to the WDC's.

Resolution 22 : Bibliographies of Space Science Papers.

C.O.S.P.A.R. welcomes the fact that an increasing number of national reports have an appendix containing a bibliography of papers and reports relating to space science, but calls again attention to the fact that such bibliographies are valuable to scientists and, in accord with Section 3.2 of the Guide, should be included in all national reports.

Resolution 23 : International Multilingual Glossary of Space Science.

C.O.S.P.A.R. believing that the need for international multilingual glossaries of space science terminology (excluding vehicle terminology) requires further study, establishes a temporary panel under Working Group 3 for this purpose consisting of Dr. M. Kroshkin and Dr. J. W. King (convenor), Prof. M. Nicolet, Dr. J. Roesch and Dr. P. H. A. Sneath ; and invites National Committees and the various Unions to cooperate with the Panel in an attempt to determine the need for a multilingual glossary.

Resolution 24 : Simultaneous Rocket Experiments using different Techniques.

C.O.S.P.A.R. recognizing the fact that very accurate knowledge of the atmosphere parameters in the height range from 80-200 km is necessary in order to improve our physical understanding of the entire thermosphere, recommends that rocket experiments using different techniques be undertaken simultaneously. Of particular importance is the simultaneous investigation of the chemical composition by mass-spectrometers and by radiation absorption techniques.

Future C.O.S.P.A.R. Meeting and Symposium

C.O.S.P.A.R. accepted unanimously the invitation to hold the Eighth C.O.S.P.A.R. Meeting and Sixth International Symposium of Space Science at Buenos Aires, during May 1965.

The tentative programme of this Symposium appears to be made up of the following parts :

1. Galactic and extragalactic astronomy. This subject would form the specialized part of the Symposium in the field of physical sciences and the corresponding Program Committee would consist of Prof. H. C. van de Hulst, Dr. H. Friedman, a Soviet Scientist, a Latin American Scientist and the President of I.A.U Commission 44 on Astronomical Observations from outside the Terrestrial Atmosphere, ex officio.

2. Problems of the Atmospheric Circulation. One day would be probably devoted to this special subject with emphasis on topics of special interest to the Southern Hemisphere.

3. Latest Results in Space Research. This usual part of the C.O.S.P.A.R. Symposium would be reserved for contributed papers which would be selected very strictly. It was suggested that instead of detailed papers presenting data on individual experiments, summaries of several different related experiments should be encouraged. It was also suggested that papers on results of I.Q.S.Y. experiments be stressed in these sessions : Space Biosciences and Panel discussion on Optimization of Instrumentation of Space Experiments from the standpoint of Data Processing.

A first circular will be edited in the nearest future by the C.O.S.P.A.R. Secretariat giving more details on the above programme, taking account of the decisions of the next meeting of C.O.S.P.A.R. Bureau.

INTERNATIONAL COUNCIL OF SCIENTIFIC UNIONS

I.C.S.U. Progress Report

December, 1964.

In progress reports last January and March I listed the main actions of the Officers and progress with other matters prior to the June meeting of the Executive Committee. It may be helpful if I summarize now our activities since that meeting, and indicate recent progress with some of I.C.S.U.'s projects.

(1) Relations with U.N.E.S.C.O.

The Secretary-General, Treasurer and I met representatives of U.N.E.S.C.O. in Paris on July 24. A minute of this meeting is attached to this report.

I represented I.C.S.U. at the U.N.E.S.C.O. General Conference in Paris, 4-9 November, for the discussion of the natural sciences chapter of the U.N.E.S.C.O. 1965/6 budget. Ing. Gen. Laclavere accompanied me in most of the sessions, and four other members of our Executive Committee (Blaskovic, Malecki, Wilson, Florkin) were present as delegates of their own countries. Many others who were present as national delegates are taking an active part in I.C.S.U.'s affairs.

In all essentials the allocation of funds proposed in the final draft budget of U.N.E.S.C.O. was accepted, including the I.C.S.U. subvention of 185 000 $ for each of the years 1965/6, 10 000 $ for each of these years for the International Biological Programme, and a number of other grants for specific projects of the scientific Unions. It had been suggested that the increase of 10 000 $ in the subvention to I.C.S.U. for 1965 and 1966 was in respect of the new consultative services to be provided by I.C.S.U., but how far this will be applied, or is adequate, will be discovered later. The repeated reference to I.C.S.U. throughout the whole

meeting was noteworthy, and there was strong pressure for the allocation of larger sums for I.C.S.U.'s own work and that of the Unions. Some of the U.N.E.S.C.O. officials appeared to be unsettled by this strong expression of opinion, although Dr. Kovda himself suggested that in planning the budget U.N.E.S.C.O. had been guided by the views expressed at the General Conference two years earlier, since when there seemed to have been a change of attitude.

At the closing session, after I had spoken privately with him, the Director General made a special statement emphasizing his appreciation of the fundamental importance of the non-governmental organisations and of I.C.S.U. in particular. and his intention to give every possible help and cooperation. After the meeting I received a letter from him affirming his attitude, to which I replied appropriately.

I am sure that I.C.S.U. should make every effort to comply with its newly established consultative relationship with U.N.E.S.C.O. At the same time, the meeting made me more than ever conscious of the need to have some top-level independent non-governmental scientific organisation such as I.C.S.U., capable of objective judgment on matters which may be important for everybody.

During the U.N.E.S.C.O. Conference, Blaskovic, Laclavere and I, with Florkin, Malecki and Wilson, entertained at dinner Drs Kovda, Tha Hla and Matveyev and Dr. Mueller Dacher who is arranging our meeting in Munich. Here we were able to express to Dr. Kovda our thanks, and good wishes upon his retirement at the end of this years.

I was also able, during the meeting, to have a short discussion with Prof. Sissakian, Secretary of the U. S. S. R. Academy of Sciences, about I.C.S.U. and its affairs.

In accordance with a previous decision, we have made arrangements for Dr. W. Gleason to spend two or three months at U.N.E.S.C.O. House, starting next January, to examine on our behalf the ways in which I.C.S.U. and its Unions can function more effectively in giving advice to U.N.E.S.C.O., and getting support from it. Dr. Gleason has been seconded temporarily from his work in the U. S. Academy of Sciences by the generosity of the authorities and the assistance of Prof. Harrison Brown.

I hope to see him on January 4/5 for a discussion of plans before he starts in Paris, and he will be able to meet the other Officers on January 6th .

(2) Relations with the United Nations.

Early this year, the Economic and Social Council (E.C.O.S.O.C.) of the U.N. set up an Advisory Committee on the application of Science and Technology to development, and invited I.C.S.U. to send a representative to its first meeting, held in New York last February. Owing to a series of errors, the invitations came too late for us to be represented. We were again invited to the second meeting in New York early in November. Unfortunately the chief Officers of I.C.S.U. were, at exactly the same time attending the U.N.E.S.C.O. General Conference, with other scientists listed above, and none of our I.C.S.U. Vice Presidents were able to attend in New York at that time. The U. S. Academy of Sciences made arrangements for Dr. Gleason to attend, and he has provided us with a valuable summary of the main discussion and decisions.

We are now advised that the third meeting of the E.C.O.S.O.C. Committee has been arranged for April 4-8 at the identical time as the I.C.S.U. Executive Committee meeting. The possibility of sending a representative is being considered.

(3) Staff and administration.

There have been further changes in the staff at the Rome office. Miss Cowan resigned (to get married), and has been replaced by, Miss Davies, who has had several years experience at the I.A.E.A. Vienna, and is competent in three languages. Unfortunately, Miss Patten has now resigned and is leaving this month. These frequent changes are undesirable, and every possible effort is being made to obtain a more stable secretariat.

The chief Officers received during October a request from Mr. Decae to take six weeks leave of absence from Rome, at short notice, in order to act as a consultant on a accelerator project in California. After careful consideration they agreed to this, and Mr. Decae will be away from November 13 to December 24, during which time Mr. Baker is acting in his place.

The chief Officers have also had to deal with several problems raised by the staff, and with the approval of the Finance Committee

are revising the staff rules and arrangements for sickness and accident insurance.

(4) Appeal.

Members will be glad to know that some preliminary step have been taken with regard to an appeal to build up reserves in our working capital fund. I was fortunate to obtain 56 000 $ from the Nuffield Foundation (U. K.), and we have also received 5000 $ from the German Federal Republic. Discussions have also taken place between Prof. Harrison Brown and myself and another large Foundation in the U. S. A. I intend in the immediate future to issue a more widespread appeal for general funds and as soon as possible to reinforce it with a pamphlet about I.C.S.U. and its work. I very much hope that our National Members may make substantial donations, and that in advising the authorities concerned, our scientists may stress the point that an appeal of this sort is not intended to recur often.

(5) International Biological Programme.

At the Paris meeting of the interim I.B.P. Committee last July, the new committees for S.C.I.B.P. were formally established, with Prof. M. Baer as President. More recently, the various subcommittees and national committees have been making progress with financial planning, and the general organisation of specific programmes. I understand that there seems to be an increasing response from National Members, and talks have been held with other interested organisations such as F.A.O. It is hoped that sufficient funds can be obtained quickly to facilitate the work. The I.C.S.U. Finance Committee has just decided to recommend the provision of a substantial sum from I.C.S.U.'s available funds, to which more may be added early next year.

(6) New Committees and Working Groups.

(*a*) *I.C.S.U. Abstracting Board.*

The working group recommended by the Executive Committee has been set up (Malecki, Ulrich, van der Heide, and a member from the U. S. A. to be named later). This group is expected to meet in Paris on January 7 next, with Prof. Boutry and Mme Poyen. It may also be convenient at that time for the chief

Officers and Prof. H. Brown to attend, since they expect to be in Paris for other discussions.

(*b*) *International Critical Tables.*

The working group met in Washington on December 5/6. (H. Brown, Rossini, Kirillin, Sutherland, Vodar). Valuable surveys of current work in different countries have been prepared for this meeting, and a preliminary report is expected soon.

(*c*) « *Future Structure* ».

The terms of reference of this committee were, « to examine how far the structure of the Council and of its governing committees should be modified in order to deal adequately with the possible increase in the number of Unions and the rapid growth and diversification of Science ».

I have taken the views, by correspondence, of the chief Officers and Vice-Presidents on the composition of this Committee, and have received opinions from others. For a first meeting, in Paris on January 8 next, the following have been invited : Boesch, H. Brown, Lindor Brown, Chandrasekharan, Harrison, Heden, Malecki, Roy, Thompson.

The Sec.-Gen. and Treasurer will also be present for consultation. I have recently circulated a memorandum to all members of the Executive Committee asking for views in writing, so that these can be considered by the Committee. I have already received some useful comments and suggestions.

(*d*) *Hydrology, Atmospheric Sciences, Solar and Terrestrial Physics.*

I regret that it has not yet been possible to constitute the appropriate commissions on these subjects, in spite of much valuable discussion and correspondence with Prof. Kaplan, Prof. Roy, Dr. Garland, Dr. Volker and others. From I.C.S.U.'s standpoint, it is desirable, (i) to carry out the intention of the Executive Committee and the terms laid down by it, (ii) to ensure that any Committee is not so large that it becomes unwieldy or that I.C.S.U. shall not be in a position to finance it properly, and (iii) that Unions, Committees or other organisations shall suggest the names of their representatives without having to wait for the next meetings of their next Executive Committee or Assembly a very long time ahead. These matters have illustrated the

enormous scope and range of the I.U.G.G., and the complexity of the inter-relationships in this particular field. I hope that we shall soon be able to coordinate the wishes of the different parties and establish at any rate interim committees very soon, so that they can make proposals to the Executive Committee next April.

As regards the commission on the atmospheric sciences, it is hoped that it can be appointed and able to meet at the time of the W. M. O. meeting next February.

It is hoped that the Commission on hydrology may meet after the meeting of the U.N.E.S.C.O. Coordinating Council for the Hydrological Decade next April. I would like to feel however, as I think our Executive Committee intended, that our commission will not be merely a consultant panel to the U.N.E.S.C.O. work, but also attempt to look at wider aspects of the problem, including the biological. Long delays in correspondence on this matter have made progress difficult.

Prof. Kaplan has taken much trouble to discuss the questions of solar and terrestrial physics with those concerned. A constructive proposal appears to be in sight, which will cover all legitimate interests.

(7) Inter-Union Commission on Teaching of Science.

I recently enquired of the President of this Commission for any information on progress with the task assigned to it by the Executive Committee. I am informed that there is nothing to report until after the Dakar Conference. I.C.S.U. has appointed a representative who will send a short report.

(8) Lakes in Africa.

In August, Harrison Brown and I visited officials of the U. N. Special Fund in New York to discuss this matter, and felt that our talk had been both interesting and productive. Subsequently, at their request, I supplied the U. N. Special Fund with a list of experts from different countries who might be invited to visit Africa and analyse the problem. I am informed that a team is now being formed to visit Africa early in 1965. Based upon their findings, action will be taken later.

(9) Developing Countries.

It has been suggested to me that the Committee on the developing countries, set up at the Vienna Assembly, might accelerate

its work. Following talks which I was able to have with Prof. Malecki during the visit of the Royal Society delegation to Poland last September, and adopting many of his suggestions, I circulated letters to many countries, copies of which have been sent to all Presidents of Unions. These aimed to collect suggestions about useful help which I.C.S.U. might give, so that a programme can be considered by our Committee and discussed later by the Executive Committee.

In my opinion, I.C.S.U. cannot and should not attempt to do the same kind of work that is being planned by U.N.ES.C.O., except in so far as it may be possible for I.C.S.U. to supply U.N.E.S.C.O. with specific technical advice. There may, however, be some matters on which I.C.S.U. is more fitted to help.

(10) Publications.

The 1965 Year Book is in proof stage and should be available very shortly.

The second issue of the Bulletin is being printed, and will contain mainly factual reports from Unions and Committees. It is planned to have a third issue ready before April next year, including more varied material.

The chief Officers have been discussing with Dr. Minnis the possibility of publishing some I.Q.S.Y. reports in a form which might be a pattern for reports on other I.C.S.U. projects.

(11) Meetings of Finance Committee and Officers.

The Finance Committee (Harrison, Boesch, Wilson and Laclavere) met in Rome on December 9 and considered the present financial position, the 1965 budget, and other matters. It is gratifying that the expenditure for 1964 is almost exactly equal to that planned in the budget prepared by the Officers last January. The sums carried forward from 1963 and 1964 establish a more satisfactory state of I.C.S.U.'s finances, which should be further consolidated during 1965 if the planned budget is followed.

Provision has been made for a reserve sum which will be available for general secretariat expenses at a period when the annual subscriptions are not coming in, and also for the extra cost of the Bombay Assembly 1966. A draft of the terms of reference of the Finance Committee was prepared. The allocation of grants for

1965 to the Unions, Committees and other I.C.S.U. projects, from I.C.S.U.'s own funds and the U.N.E.S.C.O. subvention, was considered. Recommendations will be circulated by the Treasurer.

The Secretary-General and I were present at this meeting and on December 10 we were able, with the Treasurer, to settle other items of general business.

(12) Representation.

Representatives have been appointed for recent and future meetings as listed below. The practice of asking for short reports has been successful, and enables the chief Officers to learn quickly about any matters of particular importance.

I.C.R.O. (Blaskovic)
I.B.R.O. (Peters)
S.C.A.R., Paris, Aug. 64 (Laclavere)
Natural Resources, Lagos, July 64 (Worthington)
Exploration of sea, Copenhagen, Sept. 64 (Braand)
International Measurements, Stockholm, Sept. 64 (Borelius)
W.M.O. Hydrometeorology, Warsaw, Oct. 64 (Tison)
N.G.O's/U.N.E.S.C.O., Aug. 64, Paris (Laclavere)
S.C.O.R., Hamburg, Dec. 64 (Deacon)
I.A.E.A. Assembly, Vienna (Salam)
U. Int. Associations, Brussels (Herbays)
Arid Zone Conference, Johdpur, Dec. 64 (Ramdas)
I.U.C.T.S., Dakar, 65 (Thwaites)
W.M.O./Hydrology, Ottawa 65 (Harrison)
Vienna University, 600th Anniversary, May 65 (Thompson, Blaskovic)
I.Q.S.Y. Bureau, Madrid, April 65 (Laclavere)
Congress on History of Science, Warsaw, Aug. 65 (Malecki).

I have also attended part-time the I.A.U. Hamburg meeting, the I.G.U. London meeting, the I.Q.S.Y. Bureau meeting, and delivered a message from I.C.S.U. at the Madrid celebration of the anniversary of the Spanish Council of Scientific Research.

Delegates to other meetings will be appointed at the Officers meeting next January.

(13) FUTURE MEETINGS.

The Executive Committee will meet in Munich April 3-8 next. Arrangements are at present being made by our German colleagues, but it is expected that the main meeting will begin on Monday morning, April 5, and finish on Wednesday evening April 7, or at latest on the morning of April 8. Meetings of the Officers, committees or working groups may be arranged for April 3-4 and on the morning of April 8.

As already announced the next Assembly will be held in Bombay, 4-11 January, 1966, by the kind invitation of our Indian colleagues.

St. John's College, Oxford — H. W. THOMPSON
President.

16th December, 1964

MINUTES OF A MEETING AT U.N.E.S.C.O. HOUSE
Paris, July 24, 1964

Present :

U.N.E.S.C.O. : Dr. KOVDA, Dr. THA HLA, Dr. Perez VITORIA.

I.C.S.U. : Prof. THOMPSON, Ing. Gen. LACLAVERE, Prof. BLASKOVIC.

1. Regrets were expressed that it had not proved possible to arrange a meeting of the U.N.E.S.C.O./I.C.S.U. Coordinating Committee since January 1964, when an agreement had been reached formally for I.C.S.U. to become the principal scientific adviser to U.N.E.S.C.O.

2. It was now agreed that as a general rule, there should be two meetings in each year, in the periods June-July, and December-January. It was further agreed that although the representatives of I.C.S.U. might, in the immediate future, be the President, Treasurer and Secretary General, alternates or co-opted members might attend as seemed appropriate for discussion of special items. The meetings would not be regulated or restricted by rigid formality. Dr. Kovda suggested that in certain circumstances U.N.E.S.C.O. might be able to find funds to enable I.C.S.U. to bring experts to the meetings for discussion of particular subjects.

3. It was suggested that at the next meeting in December 1964 or January 1965, matters for discussion might include the results of the U.N.E.S.C.O. General Conference, and the approved programme in Natural Science for 1965-6. At the June 1965 meeting, matters concerned with the next U.N.E.S.C.O. Conference could be discussed. In general, topics for consideration by the joint Committee might include (*a*) preliminary discussions, several years ahead, of the U.N.E.S.C.O. programme, and (*b*) current problems in the programmes of U.N.E.S.C.O. and I.C.S.U., and means of implementing decisions about them.

It was agreed that at any time I.C.S.U. would attempt to assist U.N.E.S.C.O. in the recruitment of experts. To this effect, U.N.E.S.C.O. should lodge its requests through the President and Sec.-General of I.C.S.U. with sufficient advance notice to permit the necessary consultations. Professor Thompson pointed out that it is impossible at very short notice to select the most appropriate scientists who can attend meetings of U.N.E.S.C.O. at large distances from their work, due to the very nature of I.C.S.U., its members being so widespread, its organisation being so delocalized, and its administrative secretariat and funds so limited.

Dr. Kovda explained that the increase of 10 000 dollars in the subvention of U.N.E.S.C.O. to I.C.S.U. for 1965 and 1966 had been intended to cover these advisory services, but he thought that this sum might prove insufficient. This matter was left for consideration at a later date. U.N.E.S.C.O. would be prepared to provide facilities for meetings under I.C.S.U's auspices to be held in Paris from time to time.

4. It was stated that in view of the new relationship between U.N.E.S.C.O. and I.C.S.U., a recommendation to dissolve the International Advisory Council of U.N.E.S.C.O. would be put to the forthcoming U.N.E.S.C.O. Conference next October.

5. It was agreed that, as in the past, U.N.E.S.C.O. should be free to send an observer to meetings of the I.C.S.U. Assembly or Executive Committee, and similar arrangements would apply to representatives of I.C.S.U. attending the main meetings of U.N.E.S.C.O.

6. It was understood that the science section of the U.N.E.S.C.O. programme for 1965/6 would probably be discussed at the

U.N.E.S.C.O. General Conference during the first ten days of November. I.C.S.U. would be invited to send an observer to this Conference.

Dr. Kovda suggested that comments on the 1965/6 programme and budget would, even at this late stage, be welcome. It was thought that I.C.S.U. might consider circularising its national members regarding matters which might be raised by their delegates to the U.N.E.S.C.O. Conference.

7. It was agreed that U.N.E.S.C.O. could approach the Unions directly on matters lying specifically within their respective fields of interest. I.C.S.U. should be informed immediately if contracts are made between U.N.E.S.C.O. and any Unions, committee, or other part of I.C.S.U., so that the Officers of I.C.S.U. may be able to consider, at intervals, the distribution of such funds among different projects.

8. Dr. Perez Vitoria complained about the late arrival and the sketchy applications made by I.C.S.U. for U.N.E.S.C.O. subventions and the estimates for the overall breakdown of the U.N.E.S.C.O. subvention. The Treasurer of I.C.S.U. said that in the future he would prepare the statement himself and that he would submit in the near future a new application for the year 1965.

It was agreed that efforts should be made to simplify the reports from I.C.S.U. and I.C.S.U. component bodies to U.N.E.S.C.O., and to eliminate unnecessary work.

9. The proposal made to U.N.E.S.C.O. representatives at the London Executive Committee meeting, that I.C.S.U. might send somebody to spend two or three months at U.N.E.S.C.O. House, was mentioned again. U.N.E.S.C.O. expressed willingness to accommodate such a person so as to enable him to advice I.C.S.U. on the best ways of obtaining better coordination with the different sections of the U.N.E.S.C.O. department of Natural Sciences. It was felt that the best time for such a visit might be towards the end of 1964 after the U.N.E.S.C.O. General Conference.

The function of such a man designated by I.C.S.U. should not be confused with the function of the I.C.S.U./U.N.E.S.C.O. liaison Officer, an office which had existed from 1947 to 1953.

ANNEX.

Extract from an « Aide-Mémoire » submitted by U.N.E.S.C.O. to the Meeting on July 24, 1964

It is felt that advisory services could be provided through the following channels :

(i) by regular consultations with the President and the Secretary-General of I.C.S.U.

(ii) through meetings of the I.C.S.U.-U.N.E.S.C.O. Coordinating Committee. It is expected that all new general questions for examination by the two organisations will be referred in principle to this committee.

(iii) through the attendance of U.N.E.S.C.O. representatives at the discussion of scientific items, both specific and general, of common interest during the sessions of the Executive Committee of I.C.S.U. ; a decision of the I.C.S.U. Executive to hold its sessions from time to time in U.N.E.S.C.O. House would be welcomed.

(iv) on specialised matters, through direct relations with the Unions and sub-committees concerned, the President and Sec.-General of I.C.S.U. would be kept fully informed of the establishment and development of such contracts.

(v) the attendance of both I.C.S.U. and U.N.E.S.C.O. at the sessions of the « Advisory Committee on the application of science and technology to development to the Economic and Social Council » of the United Nations, thus providing further opportunities for mutual consultations.

I.C.S.U. Review of World Science

No. 4 of Volume 6 (October 1964) of the review is mostly devoted to the modern teaching of mathematics developed in the following papers :

— The modern spirit in applied mathematics, C. TRUESDELL (U. S. A.).

— The role of geometrical intruition in modern mathematics, H. FREUDENTHAL (Netherlands).

— Sujets futurs et nouvelles méthodes de l'enseignement mathématique, W. SERVAIS (Belgium).

— Between logic and mathematics, A. ROBINSON (U. S. A.).

INTERNATIONAL ASTRONAUTICAL FEDERATION

XVth International Astronautical Congress General Assembly of I.A.F.

WARSAW, POLAND, 7-12 SEPTEMBER 1964

We quote the following from the proceedings of the Plenary Session :

Relations with international organizations.

As representative of U.R.S.I., Professor Groszkowski stressed the usefulness of space vehicles in studying complex and complicated problems such as wave propagation and radioelectricity, which are important for terrestrial physics. International cooperation in the field of space and close collaboration between the different organizations concerned with studies of the magnetosphere and interplanetary regions is necessary. The I.A.F. Congress was important in this respect and demonstrated the possibility of such cooperation which Professor Groszkowski hoped would expand rapidly in the near future.

The President expressed appreciation of the interest of U.R.S.I. in the work of the I.A.F., and thanked Professor Groszkowski for his comments.

U.N.E.S.C.O.

La nouvelle structure administrative du Secrétariat de l'U.N.E.S.C.O.

Extrait d'un article publié sous le même titre dans la *Chronique de l'U.N.E.S.C.O.*, Vol. X, nº 11, nov. 1964.

Structure du secrétariat au siège

La structure du Secrétariat de l'U.N.E.S.C.O. a été élaborée dans ses grandes lignes il y a une quinzaine d'années et elle est demeurée à peu près inchangée jusqu'en 1963. Elle reflétait une tendance générale à étaler l'expansion du programme de façon à maintenir l'équilibre existant entre les divers domaines de compétence de l'Organisation. Plus récemment, lorsque la priorité dans le cadre du programme a été accordée d'abord à l'éducation, puis aussi aux sciences, et que le volume des opérations s'est accru en même temps qu'augmentait leur complexité, il est devenu urgent de reviser la structure du Secrétariat. Le Directeur général a estimé que ce devait être sa première tâche. Immédiatement après la douzième session de la Conférence générale, au cours de laquelle il venait d'être élu, il a exposé au Conseil exécutif en sa 64e session (décembre 1962) un plan d'ensemble pour une réforme radicale de la structure des services du siège, en exprimant son intention d'appliquer ce plan graduellement, à mesure que le programme de travail l'exigerait et que les ressources en personnel qualifié le permettraient.

Le Directeur général estime que l'application intégrale de cette réforme de structure, avec un modeste accroissement d'effectifs et un nouvel effort d'amélioration des méthodes de travail, mettra le Secrétariat en mesure d'assurer l'exécution du programme élargi proposé pour 1965-1966. Les paragraphes qui suivent décrivent les principales modifications de structure déjà effectuées. Les autres seront progressivement réalisées, de sorte que le plan de réforme

sera intégralement appliqué d'ici 1966. Il restera à examiner les résultats de ces modifications à la lumière de l'expérience de 1967-1968, afin d'apporter au mécanisme et à son mode de fonctionnement les corrections et ajustements de détail qui pourront se révéler nécessaires.

Pour renforcer la direction intellectuelle à l'intérieur du Secrétariat et permettre les délégations de pouvoirs appropriées, en vue de l'exécution du programme, il est procédé à la nomination de sous-directeurs généraux pour les quatre grands secteurs du programme : *a*) éducation ; *b*) sciences exactes et naturelles et leur application au développement ; *c*) sciences sociales, sciences humaines et activités culturelles ; *d*) communications (information et échanges internationaux). Ces sous-directeurs généraux dirigeront la planification et l'exécution du programme dans leurs secteurs respectifs et formeront avec le Directeur général, le directeur général adjoint et le sous-directeur général chargé de l'administration la Haute Direction. La Haute Direction a pour tâche de conseiller et d'aider le Directeur général dans l'exercice des nombreuses et lourdes responsabilités qui lui incombent en ce qui concerne les questions d'intérêt général ; c'est pourquoi il est indispensable que tous les domaines de compétence de l'U.N.E.S.C.O. y soient représentés.

Le sous-directeur général chargé de l'éducation est entré au Secrétariat en septembre 1963. Le sous-directeur général chargé des sciences exactes et naturelles a été désigné en septembre 1964. Il est proposé de désigner un troisième sous-directeur général en 1965, et un quatrième en 1966. Chaque sous-directeur général aura la charge de deux départements du programme, ce qui porte le nombre de ces départements à huit, au lieu de cinq en 1962. Les trois nouveaux départements résultent du dédoublement des anciens départements de l'éducation et des sciences exactes et naturelles et de la transformation en département du Service des échanges internationaux.

Dans le domaine des sciences exactes et naturelles, deux départements ont été créés — l'un pour l'avancement des sciences, l'autre pour l'application de la science et de la technologie au développement — et placés sous l'autorité du sous-directeur général chargé des sciences, qui assure la coordination générale des travaux et le contrôle direct des activités ayant trait à l'organisation et à la

planification du développement scientifique dans les Etats membres. A côté des divisions fonctionnelles, le Directeur général propose de créer des divisions opérationnelles, spécialisées par région et chargées de diriger les projets opérationnels hors siège. Ces divisions opérationnelles serviront à la fois les deux départements des sciences, d'une façon analogue à celles qui existent maintenant dans le secteur de l'éducation.

Ainsi le Directeur général s'efforce-t-il de mettre en place dans l'un et l'autre secteur un système qui doit permettre de combiner l'approche fonctionnelle requise pour les activités intellectuelles avec l'approche géographique indispensable pour les activités opérationnelles.

Nouvelles du Secrétariat

Extraits de la *Chronique de l'U.N.E.S.C.O.*, Vol. X, n° 11, nov. 1964

Nomination du professeur Matveyev au poste de sous-directeur général pour les sciences exactes et naturelles.

Le Directeur général a décidé la création d'un poste de sous-directeur général pour les sciences exactes et naturelles. Ce sous-directeur général est chargé en premier lieu de la direction supérieure des activités incombant aux deux départements, de l'avancement des sciences exactes et naturelles, d'une part, et de l'application de ces sciences au développement, d'autre part. A ce titre, les directeurs de ces départements, qui sont actuellement le professeur Victor Kovda (U. R. S. S.) pour le premier et le Dr. Ralph Krause (Etats-Unis) pour le second, sont placés sous son autorité.

Après avoir consulté le Conseil exécutif, le Directeur général a nommé à ce nouveau poste, pour une durée initiale de trois ans, M. Alexey N. Matveyev (U. R. S. S.), professeur de physique théorique à l'Université de Moscou. M. Matveyev a servi en 1962 et 1963 comme expert de l'U.N.E.S.C.O. en République arabe unie, en qualité de conseiller auprès du directeur du département de physique du Centre national de la recherche au Caire. Il est âgé de quarante-deux ans.

Treizième Session de la Conférence Générale

PARIS, 20 OCTOBRE — 20 NOVEMBRE 1964

Résolutions

Nous publions ci-après quelques résolutions adoptées par la Conférence Générale et intéressant les activités de l'U.R.S.I.

2. — SCIENCES EXACTES ET NATURELLES ET APPLICATIONS DE CES SCIENCES AU DÉVELOPPMENT.

2.0. — *Sous-Direction Générale.*

2.01. — *La Conférence Générale.*

Considérant que la science et ses applications sont l'un des traits caractéristiques de notre époque,

Estimant que les conditions indispensables au développement intellectuel social et économique d'un pays sont notamment : le progrès de la connaissance scientifique,
l'application immédiate de cette connaissance à des fins pacifiques,
l'existence d'une infrastructure convenable d'institutions scientifiques qui se consacrent à ces tâches,

Considérant en outre que les Etats membres sont de plus en plus conscients de la nécessité d'une politique nationale et internationale en matière de science,

Rappelant la résolution 4.3.1 adoptée par le Conseil exécutif de l'U.N.E.S.C.O. à sa 65e session (avril-mai 1963), laquelle approuvait en principe les propositions du Directeur général tendant à donner aux questions scientifiques, dans le programme de l'U.N.E.S.C.O., une importance du même ordre que celle accordée à l'éducation,

Invite les Etats membres à encourager et à soutenir, par tous les moyens appropriés, le progrès de la science et de la technique ainsi que leur application au développement ;

Décide d'accorder aux sciences exactes et naturelles et à la technique, dans les programmes de l'U.N.E.S.C.O. pour 1965-1966 et 1967-1968, une importance du même ordre que celle accordée aux questions d'éducation ;

Autorise le Directeur général, en vertu de cette décision,

a) à poursuivre au cours du prochain exercice biennal la réorientation et l'intensification des activités de l'U.N.E.S.C.O. dans le domaine des sciences exactes et naturelles et de la technique et à établir un plan à long terme en tenant compte des suggestions et des recommandations du Comité consultatif du Conseil économique et social de l'Organisation des Nations Unies, sur l'application de la science et de la technique aux fins du développement, et celles qui figurent dans les rapports présentés à la Conférence générale et au Directeur général ;

b) à assurer au Secrétariat de l'U.N.E.S.C.O., au cours du prochain exercice biennal, une organisation, un personnel et des mécanismes consultatifs adéquats dans le domaine des sciences exactes et naturelles et de la technique, de façon que les programmes de l'Organisation financés par des crédits d'origine budgétaire et extrabudgétaire puissent être exécutés efficacement ;

c) à communiquer la présente résolution au Directeur général du Fonds spécial et au Président-directeur du Bureau de l'assistance technique ainsi qu'au Président de la Banque internationale pour la reconstruction et le développement, en les invitant à prêter une attention particulière à l'inestimable contribution qu'ils peuvent apporter aux efforts des Etats membres et de l'U.N.E.S.C.O. en vue de faire progresser la science et la technique ainsi que leur application au développement, en donnant à leurs programmes dans ce domaine l'importance qui leur revient.

2.1. — *Développement de l'infrastructure scientifique des Etats membres.*

2.11. — *Aide aux Etats membres pour l'organisation et la planification du développement scientifique.*

I. Aide aux Etats membres.

2.111. — Les Etats membres sont invités à formuler et à mettre en œuvre une politique scientifique nationale en vue d'accroître leur potentiel scientifique et technique et d'orienter la recherche scientifique vers le développeent social et économique.

2.112. — Le Directeur général est autorisé, en collaboration avec les Etats membres intéressés et avec les organisations internationales, régionales et nationales compétentes tant gouvernementales que non gouvernementales, notamment les institutions des pays en voie de développement,

a) à rassembler, analyser et diffuser des informations sur le potentiel scientifique et technique des Etats membres, et en particulier sur l'organisation institutionnelle de la recherche ;

b) à effectuer des études comparatives et des études-pilotes sur la politique scientifique nationale et l'organisation de la recherche ;

c) à encourager la coopération régionale en matière de mise au point des politiques scientifiques nationales ;

d) à aider les Etats membres, sur leur demande, à entreprendre ou à améliorer la planification de leur politique scientifique nationale et l'organisation de la recherche, par l'envoi de missions consultatives, l'exécution d'enquêtes sur le potentiel scientifique et technique, notamment les ressources humaines et les budgets, ou l'organisation de stages de formation, et, à cette fin, à participer à leur activités dans ce domaine.

2.113.

I

Les Etats membres associés d'Afrique sont invités à prendre toutes les mesures nécessaires pour mettre en œuvre, aux échelons national et régional, les recommandations contenues dans le Plan pour la recherche scientifique et la formation en Afrique, adopté à la Conférence de Lagos en août 1964, et notamment :

a) à créer un organisme national de recherche et un budget national de la recherche pour planifier, coordonner et diriger la recherche scientifique dans le pays ;

b) à établir des registres nationaux du personnel de recherche ainsi qu'un cadre national de chercheurs de carrière ;

c) à arrêter le projet et décider la création d'instituts nationaux et sous-régionaux des ressources naturelles ;

d) à assurer l'expansion de l'enseignement scientifique et la prise de conscience des valeurs scientifiques par la Société ; .

e) à coopérer à l'établissement d'un comité africain des ressources naturelles, à la révision de la convention sur la protection de la flore et de la faune africaine, et au développement d'un réseau d'instituts de recherches africains.

II

Les Etats membres et Membres associés non africains, l'Organisation des Nations Unies et les Institutions spécialisées, et les organisations internationales non gouvernementales sont invités à coopérer avec les pays d'Afrique à l'application du Plan en leur fournissant une assistance technique et financière.

III

Le Directeur général, agissant en coopération avec l'Organisation des Nations Unies et sa Commission économique pour l'Afrique, les Institutions spécialisées et l'Organisation de l'Unité africaine, le Fonds spécial et le Programme élargi d'assistance technique, est autorisé à aider sur leur demande les Etats membres et Membres associés d'Afrique à mettre en œuvre le Plan, dans le cadre des ressources prévues au présent chapitre et avec l'aide de ressources extrabudgétaires, notamment :

a) en étudiant les besoins et les ressources en personnel scientifique et de recherche, les budgets de recherche et les rapports entre la recherche et le développement économique en Afrique ;

b) en aidant, sur le plan national, à la planification et à l'organisation de l'activité scientifique, d'organismes de recherche et de budgets de recherche ;

c) en contribuant à la planification et au fonctionnement d'instituts nationaux et sous-régionaux des ressources naturelles et d'autres centres de recherche scientifique ;

d) en orientant le programme du Centre africain pour la science et la technologie de façon à contribuer à la mise en œuvre active du Plan.

2.2. — *Coopération internationale pour le progrès de la recherche et de la documentation scientifiques.*

2.21. — Sciences fondamentales.

2.211. — Coopération avec les organisations scientifiques non gouvernementales.

2.2111. — Les Etats membres sont invités à encourager la création et le développement d'associations nationales spécialisées dans les diverses branches des sciences exactes et naturelles, et à aider ces associations à s'affilier aux organisations scientifiques internationales non gouvernementales ainsi qu'à coopérer activement avec elles.

2.2112. — Le Directeur général est autorisé à collaborer avec les organisations scientifiques internationales non gouvernementales, à faciliter la coordination de leurs activités respectives, et à leur fournir des subventions et des services appropriés en vue de développer l'action de l'U.N.E.S.C.O. dans le domaine des sciences exactes et naturelles.

2.2113. — Le Directeur général est autorisé à accorder en 1965-1966 des subventions jusqu'à concurrence de 444.000 dollars aux organisations internationales non gouvernementales du domaine des sciences exactes et naturelles.

2.212. — Amélioration de la documentation et de l'information scientifiques et techniques.

2.2121. — Les Etats membres sont invités :

a) à créer des services nationaux et régionaux de documentation scientifique et technique, ou à faciliter la création et le développement de tels services ;

b) à coordonner les activités de ces services et à développer les échanges de matériel, d'informations, etc.

c) à encourager l'application à l'échelon national des mesures recommandées et des suggestions formulées dans le plan à long terme d'action concertée établi par l'U.N.E.S.C.O. en vue de l'amélioration de la documentation scientifique et technique.

2.2122. — Le Directeur général est autorisé, avec l'aide du Comité consultatif international de bibliographie, de documentation et de terminologie :

a) à appliquer et à développer, avec la collaboration des organisations internationales, régionales et nationales compétentes, tant gouvernementales que non gouvernementales, le plan à long terme d'action concertée dans le domaine de la documen-

tation scientifique dont la mise en œuvre a commencé en 1963-1964, en vue d'assurer la coordination et la normalisation, à l'échelon international ou régional, des travaux effectués dans ce domaine ;

b) à aider les Etats membres à assurer la création ou l'amélioration de services de documentation scientifique et technique, ainsi qu'à entreprendre des recherches en matière de documentation scientifique.

2.2123 — La conférence générale,

Ayant examiné le document 13 C/PRG/30 intitulé « Etude sur la possibilité de publier un annuaire scientifique international », et notamment la section 2 de ce document (Grandes lignes et coût des mesures initiales proposées),

Tenant compte du personnel et des crédits disponibles dans le cadre du programme et du budget pour 1965-1966,

Invite le Directeur général à prendre les mesures nécessaires pour la réalisation des travaux suivants pendant la période biennale 1965-1966 :

a) fournir des services d'information sur les annuaires et autres publications existantes rendant compte des progrès de la science et de la technique ;

b) dans le cadre du Programme de participation aux activités des Etats membres, aider à développer et à internationaliser les annuaires scientifiques actuellement publiés à l'échelon national, en utilisant les fonds de la réserve du Programme de participation mentionnée dans le document 13 C/5, II, 5.2 (6000 dollars) ;

c) procéder à une étude des renseignements dont les hommes de science ont besoin sur les progrès récents de la science et de la technologie, et des moyens de répondre le plus efficacement à ces besoins ;

d) tenir compte des résultats de cette étude expérimentale dans les propositions concernant le programme de 1967-1968.

2.22. — *Sciences de la terre.*

2.221. — Astronomie et géophysique générales.

2.2211. — Le Directeur général est autorisé, en collaboration avec les organisations compétentes du système des Nations Unies

et avec les organisations internationales non gouvernementales appropriées, notamment les unions scientifiques internationales et les comités scientifiques du Conseil international des unions scientifiques, à promouvoir et à faciliter la collaboration internationale pour l'étude scientifique de la terre, en fournissant une assistance destinée à favoriser :

a) les programmes internationaux de recherche, notamment les Années internationales du soleil calme et le Levé magnétique mondial ;

b) le perfectionnement de spécialistes des sciences et des techniques relevant de l'astronomie et de la géophysique ;

c) l'échange de renseignements sur les progrès des recherches astronomiques et géophysiques ;

d) le développement des activités des Etats membres en matière d'astronomie et de géophysique.

2.3. — *Application de la science et de la technologie au développement.*

2.31. — Evaluation des besoins technologiques des pays en voie de développement.

2.311. — Le Directeur général est autorisé, en coopération avec les Etats membres intéressés et sur leur demande, à évaluer les besoins technologiques de ces Etats dans le domaine de la science et de ses applications, notamment :

a) à solliciter les avis d'un comité consultatif composé de spécialistes éminents dans les domaines des sciences exactes et naturelles, de la technologie et des sciences sociales ;

b) à s'assurer les services d'organisations professionnelles et de spécialistes pour l'examen de problèmes particuliers concernant l'évaluation des besoins des Etats membres dans les domaines de la science et de la technologie ;

c) à organiser des conférences régionales sur l'application de la science et de la technologie dans l'intérêt des régions peu développées ;

d) à fournir, sur demande, aux Etats membres et aux organisations du système des Nations Unies, des services consultatifs sur le développement de l'enseignement technique et technologique et de la recherche technologique.

2.312. — Le Directeur général est autorisé à poursuivre la publication de la revue *Impact, science et société* en accordant une attention spéciale aux problèmes de l'application de la science et de la technologie au développement.

Thirteenth Session of the General Conference

PARIS, 20 OCTOBER — 20 NOVEMBER 1964

We are publishing some resolutions adopted by the General Conference and being connected to U.R.S.I. activities.

2. — NATURAL SCIENCES AND THEIR APPLICATION TO DEVELOPMENT

2.0. — *Office of the Assistant Director-General.*

2.01. — *The General Conference.*

Considering science and its applications as one of the characteristic features of our age,

Believing that among the indispensable conditions for the intellectual social and economic development of a country are :
the advancement of scientific knowledge,
the simultaneous application of such knowledge to peaceful ends, and
the existence of appropriate infrastructures of scientific institutions devoted to these tasks,

Considering further that the need for a coherent national and international science policy is being increasingly felt among Member States,

Recalling resolution 3.4.1 adopted by the Executive Board of U.N.E.S.C.O. at its 65th session (April-May 1963) which approved in principle the Director-General's proposal that scientific questions be accorded an importance in U.N.E.S.C.O.'s programme similar to that given to education,

Invites Member States to promote and sustain by all appropriate means the advancement of science and technology as well as their application to development ;

Decides to accord to natural sciences and technology an importance in U.N.E.S.C.O.'s programmes for 1965-1966 and 1967-1968 similar to that given to educational questions ;

Authorizes the Director-General, in the light of this decision,

(*a*) To pursue in the coming biennium the reorientation and expansion of U.N.E.S.C.O's activities in the field of natural sciences and technology, and to elaborate a long-term plan, taking into account the suggestions and recommendations of the Advisory Committee of the Economic and Social Council of the United Nations on the Application of Science and Technology to Development, and of the Reports submitted to the General Conference and the Director-General ;

(*b*) To ensure for the U.N.E.S.C.O. Secretariat, in the coming biennium, adequate organization, staffing and consultative machinery in the field of natural sciences and technology, so that the programmes of the Organization, supported by budgetary and extra-budgetary resources, can be carried out efficiently ;

(*c*) To communicate the present resolution to the Managing Director of the Special Fund, the Executive Chairman of the Technical Assistance Board, and the President of the International Bank for Reconstruction and Development, inviting their particular attention to the invaluable contribution they can make to the efforts of Member States and U.N.E.S.C.O. in the advancement of science and technology and their application to development, by giving due importance to their programmes in this field.

2.1. — *Development of the basic structure of science in Member States.*

2.11. — Aid to Member States in the organization and planning of scientific development.

I. Aid to Member States.

2.111. — Member States are invited to formulate and implement a national science policy with a view to increasing their scientific and technological potential and to ensuring an adequate orientation of scientific research towards social and economic development.

2.112. — The Director-General is authorized, in collaboration with interested Member States and appropriate international, regional, and national organizations, both governmental and non-governmental, and particularly with institutions in developing countries :

(*a*) To collect, analyse and disseminate information on the scientific and technological potential of Member States and, in particular, on the institutional organization for research ;

(*b*) To undertake comparative and pilot studies on national science policy and research organization ;

(*c*) To promote regional co-operation for the development of national science policy ; and

(*d*) To assist Member States, upon their request, in the establishment or improvement of science policy planning and research organization, through sending advisory missions, conducting scientific and technological potential surveys, with particular regard to human resources and budgets, or organizing training seminars, and, to this end, to participate in their activities in this field.

2.113.

I

Member States and Associate Members in Africa are invited to take all necessary steps to implement, at the national and regional levels, the recommendations set forth in the Plan for Scientific Research and Training in Africa, adopted by the Lagos Conference, in August 1964, and in particular to :

(*a*) Establish a national research organ and national research budget to plan, co-ordinate and direct scientific research in the country ;

(*b*) Establish national research manpower registers and a national research service ;

(*c*) Plan and establish national or sub-regional institutes of natural resources ;

(*d*) Ensure the expansion of science education and of the science consciousness of society ;

(*e*) Co-operate in the establishment of an African Committee on Natural Resources, in revising the African convention on

conservation and in the development of a network of African research institutes.

II

Member States and Associate Members outside Africa, the United Nations, the Specialized Agencies and international non-governmental organizations are invited to co-operate with African countries in the implementation of the Plan by providing them with financial and technical assistance.

III

The Director-General is authorized, in co-operation with the United Nations and the Economic Commission for Africa, the Specialized Agencies and the Organization of African Unity, the Special Fund and the Expanded Programme of Technical Assistance, to assist, at their request, Member States and Associate Members in Africa in the implementation of the Plan, within the framework of the resources provided in this chapter, and with the help of extrabudgetary resources, in particular :

(*a*) By undertaking studies on scientific and research manpower needs and resources, research budgets and the relation between research and economic development in Africa ;

(*b*) By aiding in the planning and organization at the national level of scientific activity, of research organs and of research budgets ;

(*c*) By assisting in the planning and operation of the national and sub-regional institutes of natural resources and other centres of scientific research ;

(*d*) By orienting the programme of the African Centre of Science and Technology so as to aid in the active implementation of the Plan.

2.2. — *International co-operation for the advancement of scientific research and documentation.*

2.21. — Basic sciences.

2.211. — Co-operation with scientific non-governmental organizations.

2.2111. — Member States are invited to encourage the creation and development of national associations specialized in the various fields of the natural sciences, and to facilitate their affiliation and active co-operation with existing international non-governmental scientific organizations.

2.2112. — The Director-General is authorized to collaborate with international non-governmental scientific organizations, to foster the co-ordination of their respective activities and to provide them with subventions and services, as appropriate, for the promotion of the work of U.N.E.S.C.O. in the field of the natural sciences.

2.113. — The Director-General is authorized to grant in 1965-1966 subventions not exceeding $ 444 000 to international non-governmental organizations in the field of the natural sciences.

2.212. — Improvement of scientific and technical documentation and information.

2.2121. — Member States are invited :

(*a*) To establish or to facilitate the establishment and development of national and regional scientific and technical documentation services ;

(*b*) To co-ordinate the activities of these services and to develop the exchange of materials, information and other facilities ; and

(*c*) To encourage the application at the national level of the measures and suggestions recommended by U.N.E.S.C.O's long-range plan of common action for the improvement of scientific and technical documentation.

2.2122. — The Director-General is authorized, with the assistance of the International Advisory Committee on Bibliography, Documentation and Terminology :

(*a*) To implement and develop, with the collaboration of appropriate international, regional and national organizations, both governmental and non-governmental, the long-range plan of common action in scientific documentation initiated in 1963-1964, with a view to achieving international or regional co-ordination and standardization in this field ; and

(*b*) To assist Member States in establishing and improving their scientific and technical documentation services, and in undertaking research in scientific documentation.

2.22. — *Earth sciences.*

2.221. — Astronomy and geophysics : General.

2.2211. — The Director-General is authorized, in co-operation with the competent organization of the United Nations system and appropriate international non-governmental organizations, especially the international scientific unions and the scientific committees of the International Council of Scientific Unions, to promote and facilitate international collaboration in the scientific study of the earth, by providing assistance for :

(*a*) International research programmes, including the International Years of the Quiet Sun and the World Magnetic Survey ;

(*b*) The advanced training of scientific and technical specialists in the fields of astronomy and geophysics ;

(*c*) The exchange of information on the progress of research in astronomy and geophysics ; and

(*d*) The development of astronomical and geophysical activities in Member States.

2.3. — *Application of science and technology to development.*

2.31. — Assessment of technological needs of developing countries.

2.311. — The Director-General is authorized, in co-operation with and upon the request of Member States concerned, to assess their technological needs in the field of science and its application, and in particular :

(*a*) To seek the advice of an advisory committee composed of qualified specialists in the fields of natural sciences, technology and social sciences ;

(*b*) To secure services from professionnal organizations and individuals for dealing with specific problems concerning the assessment of the needs of Member States in the fields of science and technology ;

(*c*) To organize regional conferences on the application of science and technology for the benefit of less developed areas ; and

(*d*) To provide advisory services on the development of technical and technological education and technological research to Member States and organizations of the United Nations system at their request.

2.312. — The Director-General is authorized to continue the publication of *Impact of Science on Society* with special attention to the problems of the application of science and technology to development.

Message de M. René Maheu

Directeur général de l'U.N.E.S.C.O. pour le nouvel an 1965

A tous les jeunes du monde

Voici 1965. Les institutions du système des Nations Unies ont décidé de placer cette année sous l'invocation de la coopération internationale, qu'elles entendent non seulement célébrer par des manifestations, mais aussi démontrer par des actes. Que tel soit donc le thème de mon message et des vœux que, de tout cœur, je vous adresse, mes jeunes amis du monde entier.

La coopération internationale est à la fois une nécessité et un idéal.

C'est une nécessité de la civilisation moderne parce que les possibilités et les problèmes de développement que cette civilisation fait apparaître, ne peuvent être, les premières exploitées, les seconds résolus qu'en organisant la communication des connaissances, la confrontation des idées, la mobilisation des ressources et la conjonction des efforts dans des ensembles de plus en plus étendus et complexes qui dépassent désormais les frontières des nations, fussent-elles les plus vastes et les plus puissantes.

C'est aussi un idéal — et par là je ne veux pas dire un rêve de l'imagination, mais une exigence de la conscience — parce que les hommes se sentent, moralement aussi bien que maté-

riellement, de plus en plus solidaires les uns des autres. Chacun comprend de mieux en mieux qu'il ne peut être pleinement heureux si d'autres sont dans la misère ou la servitude, qu'il ne peut être vraiment en paix avec lui-même si d'autres se font la guerre, bref qu'il ne peut être tout à fait un homme si l'injustice et le malheur empêchent les autres hommes de l'être, tous, comme lui et avec lui. Je dis bien tous : dès l'instant que nous acceptons, dons nos pensées ou dans nos actions, que certains soient rejetés de l'universelle humanité, c'est d'une partie de notre propre humanité personnelle que nous nous privons.

Telle est la double justification de la coopération internationale que les institutions comme l'U.N.E.S.C.O. ont pour but de servir et à laquelle je vous invite à vous dédier dès maintenant, avec toute la générosité de votre âge.

Car, bien que la coopération internationale, pour être efficace, exige une organisation et une technique solides, elle ne saurait être réalisée par ces seuls moyens. Elle requiert, plus encore, une certaine ouverture d'esprit, un certain élan du cœur, bref une disponibilité, voire une vocation de l'être tout entier : la vocation de la fraternité humaine.

C'est à cette vocation que je vous appelle, vous qui êtes notre promesse.

Entendez-moi bien. Il ne s'agit pas de vous détourner vers d'autres tâches que celles auxquelles vous vous destinez dans le cadre de votre famille, de votre métier, de votre pays. Il s'agit que vous apportiez à l'exécution de ces tâches la claire conscience que vous appartenez aussi à une autre famille, une autre entreprise, une autre communauté, plus large et plus profonde, qui est l'humanité. Il s'agit, par suite, que vous compreniez que le sens et la valeur de votre vie ne s'arrêtent pas aux horizons immédiats de votre sort, mais que vous faites partie d'une grandiose aventure commune à l'humanité entière, dont l'accomplissement nécessite l'entente et l'effort de tous. Il s'agit, enfin, que vous sachiez reconnaître en chaque homme que vous rencontrerez votre frère, c'est-à-dire votre égal en dignité, votre semblable en besoins et en espérances, quels que soient sa race, son pays et sa langue, sa condition sociale et ses croyances.

Vous grandissez au milieu des prodiges. Votre génération atteindra les astres. Mais c'est l'Homme que je vous souhaite, avant

toutes choses, d'atteindre, de respecter et de cultiver, en vous et chez autrui.

Puisse 1965 vous y conduire par la coopération et la concorde, la justice et la paix !

Bon courage, mes amis ! Bon courage et bonne année !

René MAHEU.

Message from Mr. René Maheu

Director-General of U.N.E.S.C.O. for the New Year 1965

To the Young People of the World

The New Year opens. The institutions of the United Nations have decided to dedicate it to the cause of international cooperation, which they intend not only to celebrate with words, but also to demonstrate with deeds. May this then be the theme of my message, which carries with it my very best wishes to you, my young friends throughout the world.

International co-operation is both a necessity and an ideal.

It is a necessity for modern civilization, because the opportunities for development which this civilization offers can only be exploited, the problems of development which it presents can only be resolved, by organizing the communication of knowledge, the confrontation of ideas, the pooling of resources and the conjunction of efforts within increasingly extensive and complex systems which transcend the boundaries of nations, however vast and powerful these may be.

It is also an ideal — and by that I do not mean a dream, but a moral imperative — for men are coming to realize more and more that they are morally as well as physically interdependent. Each of us is increasingly aware that he cannot be completely happy if others are destitute or live under bondage, that he cannot be really at peace with himself if others are waging war against one another — in short, that he cannot attain his full stature as a man if injustice and want are preventing other men — all of them —

from attaining that stature, like him and with him. I say all of them, for, once we admit in our thoughts or in our deeds, that some shall be excluded from humanity's family, we lose a part of our own individual humanity.

Such is the twofold justification for this international cooperation, which institutions like U.N.E.S.C.O. are designed to serve, and I call upon you to dedicate yourselves to it from now onwards, with all the enthusiasm and generosity of your young years.

For, although international co-operation needs sound organization and technique if it is to be effective, it cannot be achieved by those means alone. Even more, it needs a certain openness of mind, a certain warmth of heart, in short a readiness to serve, which itself implies a conversion to human brotherhood.

It is to this great cause that I call upon you to dedicate yourselves.

Please do not misunderstand me. I do not ask you to abandon those tasks which you are to undertake within the context of your family, your career, your country. I only ask you to remember, when carrying out these tasks, that you also belong to a larger family, a broader life and a vaster community, which is mankind. I ask you to realize that the meaning and value of your existence go beyond the immediate confines of your own personal destiny and that you are taking part in the same splendid adventure as the rest of mankind, an adventure which calls for understanding and effort from all. Lastly I ask you to regard every man you meet as a brother, that is, as your equal in dignity, with the same needs and the same hopes, regardless of his race, country, language, social status or beliefs.

You are growing up in a period of technological miracles. Your generation will reach the stars, but it is Man that I should like you, above all, to reach, to respect and cherish, in yourselves and in others.

May 1965 allow you to progress towards this goal through co-operation and concord, justice and peace !

Good luck to you, my friends ! Be of good cheer and a Happy New Year to you !

René Maheu.

1965, Année de la coopération internationale

Nous reproduisons ci-après une lettre envoyée par le Directeur Général de l'U.N.E.S.C.O. aux organisations internationales non gouvernementales entretenant avec l'U.N.E.S.C.O. des relations de consultation (ce qui est le cas pour l'U.R.S.I.).

« J'ai l'honneur d'attirer votre attention sur la résolution 1907 (XVIII) adoptée par l'Assemblée générale des Nations Unies à sa XVIII[e] session et aux termes de laquelle l'année 1965, vingtième anniversaire de l'Organisation des Nations Unies, a été désignée comme Année de la coopération internationale. Par cette résolution, l'Assemblée générale demande notamment aux organisations non gouvernementales intéressées « de donner la plus grande publicité possible aux activités qu'elles ont entreprises et entreprennent actuellement dans le domaine de la coopération internationale et aux efforts qu'elles déploient pour renforcer et étendre ces activités » et « d'élaborer les plans et programmes qui leur paraîtront convenir le mieux pour servir les fins de l'Année de la coopération internationale ». Elle décide, en outre, de créer un Comité pour l'Année de la coopération internationale composé de douze membres au plus, qui seront désignés par le Président de l'Assemblée générale.

En vue de mettre en œuvre cette résolution, le Secrétaire général de l'Organisation des Nations Unies m'a demandé de lui communiquer, à l'intention du Comité, toutes indications concernant les plans et programmes concrets que les organisations non gouvernementales qui collaborent avec l'U.N.E.S.C.O. formuleraient en vue de participer à l'Année de la coopération internationale.

Je me permets, d'autre part, d'attirer votre attention sur le fait que l'année 1966 marquera le vingtième anniversaire de l'U.N.E.S.C.O., et que les activités envisagées dans le cadre de l'Année de la coopération internationale pourraient être conçues de manière à contribuer également à la célébration de cet anniversaire.

Le Conseil exécutif de l'U.N.E.S.C.O., lors de sa 67[e] session, a décidé d'inviter la Conférence générale à établir, à sa prochaine session, un groupe de travail qui aura notamment pour but de mettre au point, pour la célébration du vingtième anniversaire de

l'U.N.E.S.C.O., des plans et des suggestions dont certains seront destinés aux organisations non gouvernementales. Nous serons en mesure de vous les communiquer en temps utile et de mettre à votre disposition une documentation et du matériel d'information préparés dans le cadre du programme de l'U.N.E.S.C.O. pour 1965-1966.

Je suis persuadé que vous comprendrez toute l'importance qu'il convient d'attribuer à l'Année de la coopération internationale, et j'espère que vous voudrez bien me faire connaître, dans les meilleurs délais, les plans que vous envisagez de mettre en œuvre pour que soient entreprises ou intensifiées, dans le cadre de l'Année de la coopération internationale, les activités destinées à développar une meilleure compréhension internationale. »

Nous attirons tout particulièrement l'attention des organisateurs de réunions organisées en 1965 sous les auspices de l'U.R.S.I. sur la demande contenue dans cette lettre, de donner la plus grande publicité possible aux activités entreprises dans le domaine de la coopération internationale et aux efforts déployés pour renforcer et étendre ces activités.

D'autre part, il conviendrait qu'au cours des réunions organisées en 1966 l'on mentionne que cette année marquera le vingtième anniversaire de l'U.N.E.S.C.O. et l'on souligne l'aide que cette organisation a apportée à la Sciences au cours des dernières 20 années.

1965, International Cooperation Year

We are publishing hereunder a letter sent by the Director General of U.N.E.S.C.O. to international non-governmental organizations in consultative relationship with U.N.E.S.C.O. (which is the case for U.R.S.I.).

« I have pleasure in drawing your attention to Resolution 1907 (XVIII) adopted by the General Assembly of the United Nations at its eighteenth session, and under the terms of which the year 1965, the twentieth anniversary of the founding of the United Nations, was designated International Co-operation Year.

In this resolution, the General Assembly particularly requests the non-governmental organisations concerned « to publicize to the widest extent feasible the activities of international co-operation in which they have been and are at present engaged and their efforts to strengthen and expand these activities », and « to formulate such plans and programmes as seem to them appropriate to promote the purposes of the International Co-operation Year. » It also decides to establish a Committee for the International Co-operation Year, which would be composed of not more than twelve members to be appointed by the President of the General Assembly.

In order to implement this resolution, the Secretary-General of the United Nations has requested me to communicate to him, for the guidance of the Committee, all relevant information concerning such practical plans and programmes as the non-governmental organizations which collaborate with U.N.E.S.C.O. may draw up with a view to participating in the International Co-operation Year.

I would also draw your attention to the fact that the year 1966 will mark the twentieth anniversary of U.N.E.S.C.O., and that the activities envisaged within the framework of the International Co-operation Year might be so conceived as to contribute to the celebration of this anniversary as well.

At its 67th session, the Executive Board of U.N.E.S.C.O. decided to invite the General Conference at its next session to appoint a small working committee to formulate plans and proposals — some of which will be for transmission to non-governmental organizations — for the commemoration of U.N.E.S.C.O's twentieth anniversary. We shall be able to communicate them to you in due course and put at your disposal documentation and information material prepared under U.N.E.S.C.O's programme for 1965-1966.

You will, I feel sure, realize the importance that should be accorded to the International Co-operation Year and I hope that you will be so good as to give me, as soon as possible, information regarding the plans that you intend putting into practice so that activities designed to build up better international understanding may be undertaken or intensified within the framework of International Co-operation Year. »

We call the attention of organizers of meetings organized in 1965 under the auspices of U.R.S.I. to the request contained in the above letter to publicize to the widest extent feasible the activities of international co-operation engaged and the efforts made to strengthen and expand these activities.

On the other hand, it is desirable that at meetings organized in 1966 it be mentioned that 1966 will mark the twentieth anniversary of U.N.E.S.C.O. and that the help U.N.E.S.C.O. brought to Science during the last 20 years be also mentioned.

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