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COMMISSION V on Radio=Astronomy

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Membership of the Commission and Sub-Commissions

COMMISSION

President	;	Dr.	М.	LAFFINE	UR,	Institut	d'As	trophysique,	98bis,
Boule	eva	ard 1	Arage	o, Paris,	$\mathbf{X}\mathbf{\Gamma}$	Ve.			

- Secretaries : Mr. R. HANBURY-BROWN, Jodrell Bank Experimental Station, Little Withington, Macclesfield, Cheshire, England.
 - Mr. M. NICOLET, Chef du Service du Rayonnement à l'Institut Royal Météorologique, 3, Avenue Circulaire, Uccle 1, Belgique.

Official Members :

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Canada : Mr. A. E. COVINGTON, National Research Council, Ottawa, Ont.

Denmark : Prof. Bengt STROMGREN, Astronomiske Observatorium, Universitets oster Voldgade 3, Copenhagen K.

Finland : Prof. J. TUOMINEN, Station for Radio-Astronomy Siltavuozenpenger, 20, Helsinki.

France : Dr. M. LAFFINEUR.

Germany : Prof. Dr. H. SIEDENTOPF, Brunsstasse, 35, Tübingen.

Great Britain : Dr. A. C. B. LOVELL, The Quinta, Swetenham near Congleton, Cheshire.

Vice-President : Dr. J. P. HAGEN, Naval Research Laboratory, Washington, 15, D.C.

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- India: Dr. M. N. SAHA, F.R.S., Hony. Director, Institute of Nuclear Physics, University College of Science, 92, Upper Circular Road, Calcutta 9.
- Italy : Prof. Giorgio Abetti, Direttore dell' Osservatorio Astrofisico d'Arcetri, Via S. Leonardo, 75, Firenze.
- Japan : Prof. Yusuke HAGIHARA, University of Tokyo, Director, Tokyo Astronomical Observatory, Mitaka near Tokyo.
- Morocco : Prof. E. VASSY, Faculté des Sciences de Paris, Physique de l'Atmosphère, 1, Quai Branly, Paris, 7^e.
- Netherlands : Prof. Dr. G. MINNAERT, Sterrewacht, Utrecht.
- Norway : Mr. G. ERIKSEN, Radio Astronomy Group Astrofysisk Institutt, Blindern n/Oslo.
- Spain : R. P. ROMANA PUJO, S.J., Directeur de l'Observatoire de l'Ebre, Tortosa.
- Sweden : Prof. O. RYDBECK, Research Laboratory of Electronics, Chalmers Institute of Technology, Gothenburg.
- Swilzerland : Prof. Dr. WALDMEIER, Directeur de l'Observatoire Astronomique Fédéral, Schmelzbergstrasse, 25, Zurich 6.
- Union of South Africa : Mr. P. J. HEWITT, Officer-in-Charge, Telecommunications Research Laboratory of the C.S.I.R., c/o Department of Electrical Engineering University of the Witwatersrand, Johannesburg, Tvl.
- United States : Dr. J. P. HAGEN, Naval Research Laboratory, Washington 25, D. C.
- Yugoslavia : Prof. Al. DAMIANOVITCH, Faculté d'Electrotechnique, 6, Stevana Sremca, Belgrade 2.

SUB-COMMISSION Va. — ON CONTINUOUS MEASUREMENTS OF SOLAR RADIO EMISSION

- Chairman : Dr. Ir. A. H. de Voogt, Chief, Section on Ionosphere Astronomy, General Direction of P. T. T., 11-12, Kortenaerkade, The Hagen, Nederlands.
- Members : Mr. S. F. SMERD, Editor «Solar Radio Noise», Radiophysics Laboratory, University Grounds, City Road, Chippendale, N.S.W. (Australia).

Mr. A. E. COVINGTON, Microwave Section, National Research Council, Ottawa, 2, Ontario (Canada).

Dr. M. LAFFINEUR, Institut d'Astrophysique, 98bis, Boulevard Arago, Paris XIV^e (France).

- Dr. J. L. STEINBERG, Centre National des Recherches Scientifiques, Laboratoire de Physique, 24, Rue Lhomond, Paris, XVe (France).
- Dipl. Ing. W. MENZEL, Geschäftsführer der Arbeitsgemeinschaft Ionosphäre der deutschen geophysikalischen Institute Rheinstrasse, 110, Darmstadt (Allemagne).
- Prof. Jaakko TUOMINEN, Station for Radio-Astronomie, Siltavuozenpenger, 20, Helsinki (Finlande).
- Dr. A. K. DAS, Director of the Solar Physics Observatory Kodaikanal (South India).
- Prof. G. RIGHINI, Osservatorio Astrofisico di Arcetri Via S. Leonardo, 75 Firenze (Italie).

.

- Prof. Dr. Y. HAGIHARA, Director, Tokyo Astronomical Observatory Mitaka near Tokyo (Japan).
- Mr. G. ERIKSEN, Radio-Astronomy Group, Institutt Astrofysik, Blindern n. Oslo (Norvège).
- Dr. M. Ryle, Cavendish Laboratory, Free School Lane, Cambridge (England).
- Mr. Willard H. Eller, Chairman, Department of Physics, Honolulu 14 (Territory of Hawaii) U. S. A.
- Dr. Chas. R. BURROWS, Director, School of Electrical Engineering Cornell University, Ithaca, N. Y. (U. S. A.).
- Mr. H. Vernon H. GOERKE, Project Leader, Radio Astronomy Project Central Radio Propagation Laboratory National Bureau of Standards, Boulder (Colorado) (U. S. A.).
- Mr. Edward R. SCHIFFMACHER, Engineer in charge, Cornell University Solar Radio Observatory, Osaf Upper Air Research Observatory, Sunpot (New Mexico) (U. S. A.).
- Prof. M. N. SAHA, F.R.S., Hony Director, Institute of Nuclear Physics University College of Science, 92, Upper Circular Road, Calcutta 9 (India).

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SUB-COMMISSION Vb ON TERMINOLOGY AND UNITS

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This Sub-Commission has been disbanded.

SUB-COMMISSION VC ON BASIC SOLAR INDEX

- Chairman : Prof. S. CHAPMAN, c/o The Royal Society, Burlington House, London W. 1, England.
- Secretaries : A. E. COVINGTON, Radio and Electrical Engineering Division, National Research Council, Ottawa (Ont.), Canada.
 - J. F. DENISSE, Observatoire de Meudon, Meudon (Seine et Oise), France.
- Members : Prof. Dr. J. Bartels, Direktor Geophysikalisches Institut, Universität Göttingen, Göttingen, Germany.
 - Dr. W. N. Christiansen, Radiophysics Laboratory, C.S.I.O.R., Sydney, Australia.
 - M. NICOLET, Chef du Service du Rayonnement, Institut Royal Météorologique, 3, avenue Circulaire, Uccle 1, Belgium.
 - Prof. M. WALDMEIER, Director of the Swiss Federal Observatory, Zurich, Switzerland.

SUB-COMMISSION Vd. — ON STANDARDIZATION OF EQUIPMENT AND MEASUREMENTS

Chairman : C. L. SEEGER, Sterrewacht, Leyden, Netherlands.

- Members : A. E. COVINGTON, Radio and Electrical Engineering Division, National Research Council, Ottawa (Ont.) Canada.
 - F. T. HADDOCK, Naval Research Laboratory, Washington 15, D. C. U. S. A.
 - H. HVATUM, Research Laboratory of Electronics, Chalmers University of Technology, Göteborg, Sweden.
 - F. J. KERR, Radiophysics Laboratory, University Grounds, City Road, Chippendale, N. S. W., Australia.

L.OWREN, Institute of Theoretical Astrophysics, Oslo, Norway.

Dr. J. L. PAWSEY, Radiophysics Laboratory, C.S.I.R.O. Sydney,

Dr. F. G. SMITH, Cavendish Laboratory, Cambridge University, Cambridge, U.K.

J. L. STEINBERG, Centre National des Recherches Scientifiques, Laboratoire de Physique, 24, rue Lhomond, Paris, XV^e,

Prof. H. WALLMAN, Chalmers University of Technology, Göteborg, Sweden.

Address by the President of the Commission at the Closing Session

Mr. President, Ladies and Gentlemen,

At the opening of this Assembly, a study of the reports from the National Committees enabled me to give you an outline of our working programme; the agenda of our meetings have been heavy and in consequence contributions have been reduced to their essentials, but some fruitful discussions have been held to our great profit.

Why is the programme so heavily loaded? It is because Radio-Astronomy, a young science, grows steadily richer. A consideration of the work of the past two years shows that we are far from saturation and that other great fundamental discoveries may be expected. I will mention some of the new results of radio-astronomy, chapter headings which will speak for themselves and thereby make my task easier.

At Sydney we talked of one hundred and fifty radio sources, those celestial objects which send their radio waves to the earth. Now we know at least seventeen hundred; most of them observed at the Cavendish Laboratory. One of them has recently been identified with the brilliant supernova, which Kepler and his contemporaries observed in broad daylight in the early days of Astronomy. It is the third object of this type to be identified with a radio source.

The increasingly refined observations of neutral interstellar hydrogen now enable us to determine the shape of the spiral nebula in which we live : a complex structure is slowly being revealed by the work in Holland and America, and symmetrically, the Australian observers are filling in the outline of our island

For the first time, this hydrogen line has been observed inverted, For the first time, as been observed inverted, in absorption, in the spectra of radio sources, thereby allowing in absorption, their distance in terms of the depth of the line. Our two satellite galaxies, the Clouds of Magellan, have disclosed Our two satisfies colleagues the secrets of their structure and to our data by observations of the hydrogen line and its

The spectrum of the radio sources has been extended into Doppler-Fizeau shift. the centimetre wave region in the United States; a few of these distant sources have even been observed at a wavelength of

At the other end of the spectrum, the galactic radiation has been measured at a wavelength of 30 m by C.S.I.R.O. The new discoveries about the physics of the solar atmosphere are no less important : observations carried out with interferometers and also during total eclipses are in agreement and show that the phenomenon of a bright ring occurs at wavelengths of several decimetres; the diameter of this ring being smaller than that

of the photospheric disk. Large instruments are under construction or test; we have been greatly impressed by the enormous metal structures which have been built at Manchester in the course of constructing the giant radio-telescope. The large Australian aerial in the form of a cross, with dimensions of the order of a kilometre, is exploring the sky with its narrow beam, locating accurately the positions of the radio sources in the southern hemisphere.

The technique of receivers has benefited from the stringent

requirements of radio astronomers : the difference in temperature which can now be measured with a modern radiometer is about one degree or even a fraction of a degree. Receivers which are extremely stable for several hundred hours have been studied at Leiden. It is, however, in the study of radio-source spectra that we found problems which remain to be solved, in particular the measurement of absolute brightness or flux density.

In conclusion I must give you a summary of the work and recommendations of our four sub-commissions; but first I would ask you to join me in thanking Mr. Hanbury Brown, Secretary of our Commission. I should also like to propose that we ask Dr. Hagen to accept the office of Vice-President of Commission V, and Mr. Nicolet to undertake the task of French-speaking Secretary.

Resolutions

1. The name of Sub-Commission Va should be changed to « Sub-Commission Va for continuous measurements of solar radio emission ».

2. Sub-Commission Vb on Terminology and Units should be discontinued.

3. It is proposed to establish a new Sub-Commission Vd for the Standardization of Equipment and Measurement with the following membership :

Chairman : C. L. SEEGER, Netherlands.

F. J. KERR, Australia.

A. E. COVINGTON, Canada.

J. L. STEINBERG, France.

F. G. SMITH, Great Britain.

J. L. PAWSEY, International Astronomical Union.

H. HVATUM, Sweden.

H. WALLMAN, Sweden.

L. OWREN, Norway.

F. T. HADDOCK, United States.

4. The Commission wishes to emphasize the importance of making adequate frequency allocations for radio-astronomy. It recommanded that both the C.C.I.R. and the National Committees should make and take every possible step to obtain the necessary reservations. It is envisaged that at least one frequency per octave will be required with a bandwidth of between 1 and 2 %. It is recommended that the National Committees should coordinate their frequency allocation programmes through the medium of Sub-Commission Vd.

5. Referring to Resolution 2 of Commission V at the Xth General Assembly, the Commission wishes to emphasize again the importance of reserving internationally a frequency band around the spectral line of neutral hydrogen. It is recommended that a frequency band extending from 1400 to 1425 Mc/s should be reserved for observations of this line.