

n^o 65. July - Oct.
1950

EDITORIAL NOTICE

During the IXth. General Assembly, the Executive Committee decided to extend the interest of the U. R. S. I. Information Bulletin.

National Committees and Commissions were invited to co-operate in the drafting of the Bulletin which shall be published in accordance with the rules drafted in Zurich and given on page 8.

IXth GENERAL ASSEMBLY

Resolutions voted by the General Assembly on proposals of the Executive Committee

1. *Modifications to the Statutes and the Rules for Commissions.* —
A Drafting Committee composed of

Sir EDWARD V. APPLETON, *Président* ;
Dr. L. V. BERKNER,
Father P. LEJAY,
Dr. H. STERKY ;
Eng. E. HERBAYS, *Secretary* ;

was appointed by the General Assembly.

This Committee shall have for aims to consider, according to General lines emitted by the Executive Committee, modifications to be brought to the Statutes and to the Rules for Commissions, in order to put in action, at the next General Assembly, the following rules :

i. The President, the Vice-Presidents and the Presidents of Commissions may not serve, normally, more than two consecutive terms office.

ii. Delegates of National Committees to General Assemblies may be individuals not necessarily belonging to the National Committees.

iii. The Vice-Presidents of U. R. S. I. may attend, as observers, the meetings of the Executive Committee.

iv. From 1954 onwards, General Assemblies shall be held every three years.

v. The Commissions will be constituted by Official Members, designated by the National Committees, and by Ordinary Members.

2. *Finances* :

2.1. The accounts for 1948 and 1949 submitted to the Finance Sub-Committee by the Secretariat, are adopted. (These accounts will be published in the Proceedings of the General Assembly.).

2.2 The budget drafted for 1950 and the following years by the Finance Sub-Committee was adopted. (This budget will be published in the Proceedings of the General Assembly).

2.3. The rate of the contributory unit shall continue to be 450 gold francs.

2.4. A small Finance Committee, constituted by the President of the Union, one Vice-President and the Treasurer is appointed; the first Vice-President to serve shall be Father P. LEJAY.

This Committee shall have powers to decide about any financial matters occurring until the next General Assembly and which have not been considered during the present meeting.

3. *Nominations*. — The following nominations were made :

3.1 *Officers* :

President : Sir EDWARD V. APPLETON ;

Vice-Presidents : { Dr. J. H. DELLINGER,
R. P. LEJAY,
Dr. D. F. MARTYN ;

Treasurer : Prof. Ch. MANNEBACK ;

Secretary : E. HERBAYS.

3.2. *Presidents of Commissions* :

I. Dr. J. H. DELLINGER,

II. Dr. Chas. R. BURROWS,

III. Sir Edward V. APPLETON,

IV. Prof. H. NORINDER,

V. Dr. D. F. MARTYN,

VI. Prof. Dr. B. VAN DER POL,

VII. Dr. G. LEHMANN.

3.3. *Delegale of the U. R. S. I. to the International Council of Scientific Unions* :

Sir EDWARD V. APPLETON.

3.4. *Delegates of the U. R. S. I. to the Joint Commission on the Ionosphere :*

Sir EDWARD V. APPLETON,
Father P. LEJAY,
Dr. D. F. MARTYN,
Dr. NEWBERN SMITH,
Dr. W. J. G. BEYNON, Secretary.

3.5. *Delegates of the U. R. S. I. to the Joint Commission on Radio Meteorology :*

Dr. Chas. R. BURROWS,
Dr. G. H. BOOKER,
Dr. H. BREMMER,
Prof. J. LUGEON.

3.6. *Delegates of the U. R. S. I. to the Joint Commission on Study of Relationships between Solar and Terrestrial Phenomena :*

Dr. C. W. ALLEN,
Mr. R. BUREAU,
M. J. S. HEY,
Dr. J. H. MENZEL.

3.7. *Delegate of the U. R. S. I. to the Joint Commission on Physics Abstracting :*

Mr. E. HERBAYS.

3.8. *Delegates of the U. R. S. I. to C. C. I. R. :*

Study Group nr. 4 : Dr. H. BREMMER,
Study Group nr. 5 : Dr. R. L. SMITH-ROSE,
Study Group nr. 6 : Dr. H. G. WELLS,
Study Group nr. 7 : Mr. B. DECAUX.

4. *Admission of new National Committees.* — The adhesion of the Indian, Japanese and Yugoslavian National Committees was accepted.

5. *XIth. General Assembly.* — The invitation of the Australian National Committee was accepted and the Xth. General Assembly shall be held in 1952, in Australia; the Assembly thanked Dr. MARTYN for this invitation.

6. *Recommendations* :

6.1. *to National Committees*. — The National Committees were invited :

1° to give their assistance to the Drafting Committee entrusted with the revision of the Statutes and Rules for Commissions ;

2° to send delegations, as large as possible, to attend the Xth. General Assembly ;

3° to co-operate to the drafting of the Information Bulletin.

6.2. *to Presidents of Commissions*. — The Presidents of Commissions were invited to give their assistance in the drafting of the Proceedings ; instructions drafted by the Executive Committee will be sent to the Presidents of Commissions and to the National Committees.

**Resolutions on publications
decided by the Executive Committee**

1. *Proceedings of the General Assembly*. — The following shall be published :

Part I F, in French }
Part I E, in English } Administrative

to contain minutes of sessions, Report of Secretary, other administrative matter and the Reports of National Committees and Commissions.

Part II. — To contain the papers accepted by the Commissions.

The papers in Part II are to be limited in length and to be in three classes, as follows :

1) Not over 1500 words and 3 line drawings. Papers relating to fundamental advance in radio science or major projects in international cooperation.

2) Not over 250 words summaries. All other papers except :

3) Only title and reference. Papers which have or soon will appear in a periodical of wide distribution.

The Chairman of the appropriate Commission shall make final determination in which class each paper is put.

The papers, summaries, titles and references are to be published in either English or French as submitted, with an abstract of not over 50 words, in the other language, following each paper and summary.

The abstract is, as far as possible, to be prepared by the author.

2. *Information Bulletin.* — The bi-monthly Information Bulletin shall continue to be published in separate English and French editions.

It should publish news of research programs and tests submitted by the C. C. I. R. It should publish similar information from other sources and news of scientific radio activity. The « Ursigrams » and « Documentation » sections should be discontinued. A notice is to be published telling how the data given in the Ursigrams can be obtained by interested parties. It is strongly recommended that National Committees and Commissions submit material for the Information Bulletin and that each National Committee should appoint an Associate Editor for the Information Bulletin, to have responsibility in improving the Bulletin and to secure and submit material.

3. *Number of copies of publications distributed.* — The method of dispatch is satisfactory.

The Secretary should distribute regularly 5 copies per subscription unit, of the Information Bulletin and other publications. Upon request of any National Committee, this number might be increased, not to exceed 12 copies per subscription unit. Additional copies should be obtained by purchase.

4. *Scope of papers for General Assemblies.* — The U. R. S. I. deals not only with international cooperation involving action but also the promotion of international cooperation in creative thinking. However, effort towards the international encouragement of creative thinking should be concentrated on fundamental advances in radio science; the responsibility of effecting this is upon the Chairmen of Commissions.

In order to conform to the aims of U. R. S. I., it is recommended that the following classes of documents be prepared for General Assemblies :

a) Reports of Commissions and Sub-Commissions.

b) Reports of National Committees and of appropriate bodies appointed by them.

c) Documents of international interest, either as defined by a General Assembly (e. g. Special Reports) or on the cooperation of U. R. S. I. with other international organizations (e. g. C. C. I. R.).

d) Papers of fundamental interest, selected by the Chairman of Commissions.

It is desirable to organize colloquia, for discussion of a Special Report, a question of international cooperation, or a subject of fundamental radio advances.

Proceedings of the General Assembly

We beg National Committees to inform us, as soon as possible, of the references concerning documents submitted to the General Assembly which have been published or are to be published in a scientific journal.

We shall be grateful to authors of such communications who will send those references either to their National Committee or to the Central Office in Brussel.

The Secretary.

SWISS NATIONAL COMMITTEE

Membership. — Modification

The name of Prof. Dr. M. J. STRUTT has to be deleted from the memberships published in no. 58 of the Bulletin, p. 3-4.

RADIO OBSERVATION OF SOLAR ECLIPSE OF FEBRUARY 25, 1952

National Committees are requested to inform before December 1st., 1950, either the Chairman of the Special Committee or the Secretary of U. R. S. I. of their possibilities to cooperate to the observations.

First Report of the Special Committee of the Joint Commission on Ionosphere

Theory of formation of ionosphere layers is now under debate. The extent to which the several layers are formed from radiation emitted uniformly from the sun's surface, as contrasted with radiation arising from discrete and active regions in the chromosphere or corona can provide critically needed information to the discussion.

Adequate observation during solar eclipse promises to provide this essential information. A network of radio observing stations is required. Each station of the network must be assigned on appropriate geographic location to provide observation of a specific exposed area of the sun's disc and corona at each instant of time. Thus, stations of the network must be located in areas of both total and partial eclipse.

With such a network, properly disposed, the sun's surface and corona can be subdivided into a grid. From combined observations of the network, the effect of radiation from each grid-element (or sector) of the sun's surface on each layer of the ionosphere can be measured. To provide adequate information, the grid-elements must be reasonably uniform in their subdivision

of the solar disc and inner corona. Therefore, careful selection of location of each station of the network is required.

The measurements at each station involve careful determination of ionospheric characteristics during the eclipse, and during the control periods containing it. In addition, separate measurement of solar radio noise is highly desirable, so that discrete noise sources may be analysed in conjunction with corresponding effects from the same grid-element on the sun, on the ionospheric layers. The Committee will inquire into the need for magnetic observation.

The solar eclipse of Feb. 25, 1952, offers an exceptional opportunity for such observation. The geographic situation of the eclipse path across Africa and Asia makes possible a reasonably complete network of stations on land areas. The altitude of the sun is high (above 50°) throughout the major portion of the eclipse track, so that F1 and F2 layers will be fully separated over the affected area. The sunspot minimum will occur about 3 years after the eclipse, so that the activity of the sun will be characterized by the stability of the declining cycle, without the disadvantage of low F2-layer electron-densities that occur at sunspot minimum. Since these favorable conditions are combined only infrequently each century, it seems wise to exploit this opportunity fully.

Not less than 12 stations, and preferably as many as 20 stations should be established to form the network. Such effort is clearly beyond the capacity of any single nation to provide. Therefore the combined effort of the nations adhering to the Unions will be needed for success.

In addition regularly established stations in Europe, in South Africa, and in India, outside the eclipse zone and in the same sunlit hemisphere, should observe accelerated schedules throughout the eclipse and control periods to provide adequate and complete control data.

A control period of Feb. 1, 1952, to April 1, 1952, is designated to provide information on steady state upon which subsequent analysis can be based. Two full months are required to provide

an adequate basis for comparison of each expeditionary station with the long established stations. In addition, it is highly desirable that the more permanent stations already planned for the African area be commissioned as quickly as possible to improve the longer term control of the eclipse data.

The observations required are tentatively specified as :

a) Multifrequency ionospheric observations on E, F1 and F2 layers (and of sufficient sweep to disclose more complex structures) at intervals of not less than 5 minutes throughout the eclipse, and at intervals of not less than 10 minutes for the period from 5 days preceding and to 5 days following in daylight hours.

b) Control multifrequency ionospheric observations at hourly intervals throughout the control period.

c) Measurement of reflection coefficient wherever possible over the widest possible frequency range during the eclipse and the control period.

d) Accurate measurement of h' (± 1 km or better) wherever possible, over the widest possible frequency range during the eclipse and the control period.

e) Continuous measurement of solar noise levels with equipment of appropriate stability during the eclipse and throughout the control period.

f) Measurement during the eclipse interval at any locality in the simultaneously lighted hemisphere of the discrete areas of origin of solar noise on the sun's disc or in the corona.

The formation of this network over the control period will provide highly important auxiliary information relating to motions of the ionosphere, ionospheric storms, and the like. These data will be unique, and their contribution to understanding of the general theory of the ionosphere cannot be underestimated.

To arrange the necessary cooperative effect, the Joint Commission on Ionosphere has designated a Special Committee on Solar Eclipse of Feb. 25, 1952. This Committee has been instructed to :

- a) draw detailed plans for the network.
- b) communicate with the several National Committees of the parent Unions to secure the necessary action to establish the network.
- c) unify methods for obtaining, reducing and presenting the data, as necessary and feasible, for the most thorough analysis.
- d) plan for adequate analysis and treatment of the data derived from the operation.
- e) report its progress periodically to the Joint Commission.
- f) ensure publication of the basic data for further consideration by any concerned.

The membership of the Special Committee is

L. V. BERKNER, Chairman, Carnegie Institution of Washington,
5241 Broad Branch Road, NN.W., Washington 15, D. C.,
U. S. A.

Father P. LEJAY, 196 Rue de Paris, Bagneux, Seine, France.

D. F. MARTYN, Mt. Stromlo Observatory, Canberra, Australia.

D. H. MENZEL, ex-officio, (Chairman, Commission 13, Solar
eclipses, IAU), Harvard College Observatory, Cambridge,
Mass. U. S. A.

Certain highly preliminary data is attached to this report to provide a tentative basis upon which the several adhering National Committees of the parent Unions can formulate the extent and form of their possible cooperation. Since the U. R. S. I. has been designated as the mother Union of the Mixed Commission by the I. C. S. U., the National Committees of U. R. S. I. are requested to assume responsibility for formulation of the national position wherever possible, and to advise the Chairman of the Eclipse Committee of :

- a) The number of sites that can be occupied with any type of facility.
- b) Its preference of sites, or of alternative sites proposed.

c) Any error of information in the preliminary data attached.

d) Any information bearing on the general plan that may be of aid to the Committee.

In the interest of perfecting the network, and of avoiding duplication, the Committee will undertake to propose rearrangements where two or more nations express preference for the same site. In this connection, sites in the area of the partial eclipse are believed to have an importance that is, perhaps, in all respects equal to sites in the path of totality. The sites in the partial area must be occupied for the success of the network.

The success of the plan makes necessary the completion of basic planning for the network in January 1951. It is therefore requested that proposals from all cooperating nations, or their designated agencies, be made available to the Chairman of the Committee at the address above, before Dec. 1, 1950.

Preliminary Plans

1. A very rough sketch of the eclipse area is attached. This will be supplemented in the January report of the Committee by accurate maps and detailed information.

Appendix A indicates planning now being initiated with the I. A. U., and certain cooperating nations to provide complete astronomical data and to lay the basis for cooperation with astronomical groups.

Appendix B indicates planning for cooperation with the I. G. G. U.

It is desirable that each station be equipped with a small (10 cm) telescope with dark glass, for recording the passage of the moon over spot groups and faculae patches. This will provide an extra control of astronomical data.

2. A tentative table of stations existant and proposed for occupation by the Committee is attached in Appendix C. This data includes :

- a) Stations of the area already occupied.
- b) Stations proposed for permanent occupation before Jan. 1, 1952.
- c) Expeditionary stations now tentatively planned for occupation during the eclipse and control period.
- d) Stations that should be occupied during the eclipse and control period.

Attention of all nations is drawn to the eleven stations in category *d*) above. Nations are urged to plan expeditions to one or more of these localities and to advise the Committee promptly of their intention. It is the hope of the Committee that all stations will be occupied. The Committee has not yet examined the detailed logistic and geographic conditions of the stations proposed, and some modifications of locality may be necessary upon completion of this study by the nations desiring to cooperate.

APPENDIX A

Requests for cooperation from the International Astronomical Union

For detailed planning of the Ionospheric research program of the solar eclipse Feb. 1, 1952, more data are required than those readily obtainable from existing publications. It is requested that the Eclipse Commission of the I. A. U. take steps to secure such of the following basic data as are not now immediately available.

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|------------------------------|--|--|
| a) Paths of totality | $\left\{ \begin{array}{l} \text{ground} \\ 100 \text{ km} \\ 250 \text{ km} \end{array} \right.$ | |
| b) Areas of partiality | $\left\{ \begin{array}{l} 10 \% \\ 50 \% \\ 90 \% \end{array} \right.$ | $\left\{ \begin{array}{l} \text{ground} \\ 100 \text{ km} \\ 250 \text{ km} \end{array} \right.$ |

c) Times and altitudes of total and partial eclipse	$\left\{ \begin{array}{l} 10 \% \\ 50 \% \\ 90 \% \\ \text{total} \end{array} \right\}$	$\left\{ \begin{array}{l} \text{ground} \\ 100 \text{ km} \\ 250 \text{ km} \end{array} \right\}$
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d) Illustrative charts of above.

e) Formulae or detailed references for computation of exact data for a given latitude and longitude.

It is also requested that the I. A. U. Eclipse Commission call attention of solar observers to the needs of ionospheric workers for special observations. In particular during the two months control period, Feb. 1-April 1, 1952, an intense effort should be made to provide improved indices of solar activity, especially those related to corona, prominences and flares. One requirement for reduction of data will be maps of the sun, spots, faculae, flocculi, and various coronal radiations especially on eclipse day.

Astronomers in Europe, Africa and Asia, especially those who can observe sun during the period of eclipse are asked to check for flares and other transient solar phenomena. As far as possible studies should be made during all daylight hours for the two months of the control period, as well as during the time of actual eclipse.

As much information as possible should be collected concerning winds in the upper atmosphere. It is suggested that the Commission on Meteors be asked to look into the possibility of disseminating special instructions for studies of bright meteor trains. If interest can be developed in Africa, for example, important data may be obtained.

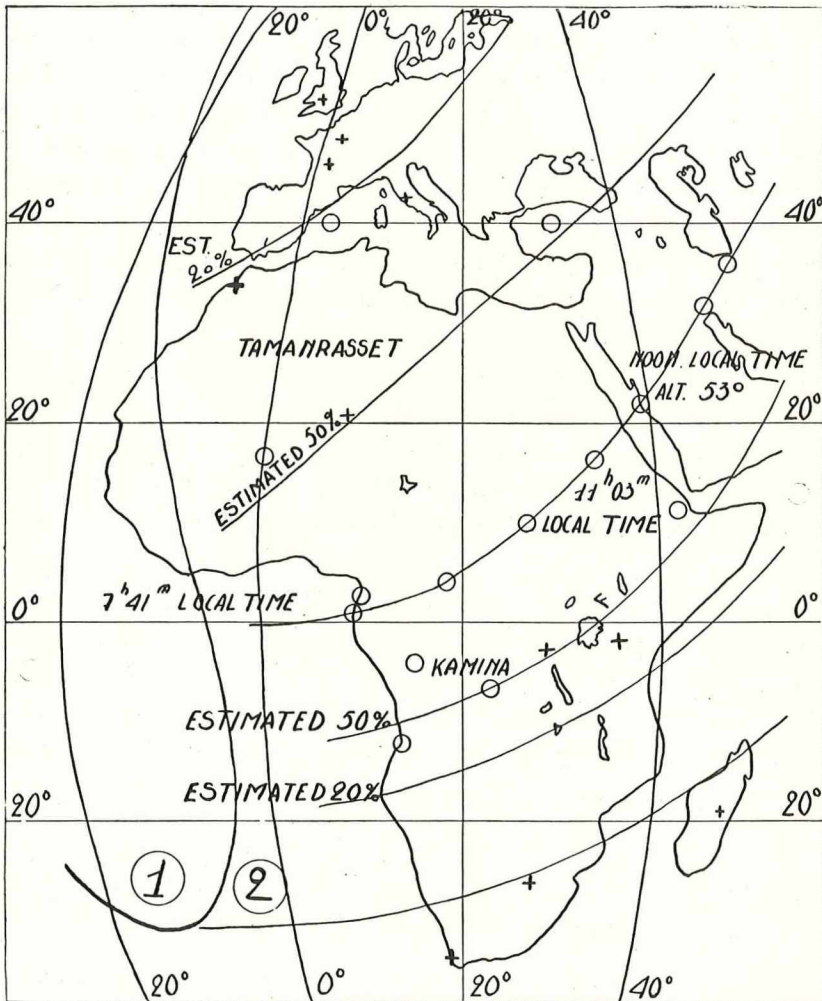
APPENDIX B

Request for Cooperation of I.U.G.G.

a) Directly and also through I. U. G. G. the workers on night-sky and auroral phenomena should be notified to keep a careful and complete study during two control months. This information

may provide useful data concerning ionospheric storms and related disturbances.

b) The Association of Terrestrial magnetism should advise concerning the desirability of geomagnetic recording at selected stations of the network, and of the availability of equipment for such purpose.



- + Existing or planned permanent stations.
- O Proposed expeditionary sites.

APPENDIX C

Table of stations (Existant and proposed)

1	2	3	4	5	6
Locality	Lat	Long	Nature of station	Nation supervising operation	Approximate Extent of Eclipse
Bata, Spanish Guinea	1° N	10° E	Expeditionary	Spain	95 %
Bangui, French Eq. Africa (or vicinity)	4° N	18° E	»	*	95 %
(Unnamed) Anglo Egyptian Sudan	10° N	27° E	»	*	95 %
Khartoum, Anglo Egyptian Sudan	15° N	33° E	»	Great Britain (ionospheric) France (radioastronomy)	100 %
Mecca, Saudi Arabia.....	22° N	39° E	»	*	95 %
Basra, Irak	31° N	47° E	»	*	95 %
Tehran, Iran	34° N	51° E	»	*	95 %
Lobito, Portugese Angola	12° S	13° E	Expeditionary	*	50 %
Brazzaville, French Eq. Africa or Leopoldville, Belgian Congo ...	5° S	15° E	Permanent before January 1, 1952	France or Belgium	70 %
Kamina, Belgian Congo	7° S	23° E	Expeditionary	Belgium	50 %
Uvira, Belgian Congo	3° S	29° E	Permanent before January 1, 1952	Belgium	50 %
Nairobi, Kenya	2° S	36° E	Permanent before January 1, 1952	Union of South Africa	30 %
Djibouti, French Somaliland or Aden, British Aden	12° N	43° E	Expeditionary	*	60 %
Quishm, Iran	26° N	57° E	Expeditionary	*	40 %

1 Locality	2 Lat	3 Long	4 Nature of station	5 Nation supervising operation	6 Approximate Extent of Eclipse
Dakar, Senegal	15° N	17° W	Permanent	France	30 %
Gao, French West Africa	17° N	0°	Expeditionary	*	50 %
Tamanrasset, French West Africa	20° N	8° E	Permanent before January 1, 1952	France	50 %
Tobruk, Libya	32° N	23° E	Expeditionary	*	50 %
Helwan, Egypt	29° 51' N	31° 15' W	Expeditionary	Egypt	60 %
Ankara, Turkey	39° N	32° E	Expeditionary	*	50 %
Fedala, Morocco	34° N	8° W	Permanent	France	25 %
Rome, Italy	42° N	12° W	Permanent	Italy	30 %
Control Stations near eclipse boundary					
Capetown, South Africa	34° S	18° E	Permanent	Union of South Africa	0
Johannesburg, South Africa	26° S	28° E	Permanent	Union of South Africa	0
Tananarive, Madagascar	20° S	47° E	Permanent by Jan. 1, 1952	France	0
Slough, England	52° N	1° W	Permanent	Great Britain	Small
Paris, France	49° N	2° E	Permanent	France	Small
Portieres, France	45° N	1° E	Permanent	France	Small

* No nation has yet signified their intention to occupy sites so marked.

URSIGRAMS

France

Some modifications have been brought to the codes used; copies of the codes and modifications are available either at the General Secretariat of U. R. S. I. or at the Laboratoire National de Radio-électricité, Bureau Ionosphérique Français, 196, rue de Paris, Bagneux (Seine), France.

IONOSPHERIC DATA

Argentina

The Naval Head-Quarters (Communication Department) of Argentina publishes since the beginning of this year results of ionospheric observations carried out in Buenos-Aires. National Committees wishing to receive these data may apply to the General Secretariat of U. R. S. I.

Germany

Results of ionospheric measurements made at the Meteorological Observatory of Warnemünde are being periodically published by the Meteorological Service of the German Democratic Republic. Members of National Committees wishing to receive those informations may apply to the General Secretariat.

DOCUMENTATION

The following documents have been sent to National Committees, either by the General Secretariat or by the publishing organizations.

List of scientific papers published in the Middle-East, received by Middle-East Science Cooperation Office of Unesco between 1-10-1949 and 1-3-50.

The distribution of light from optical systems, by W. H. STEEL, reprinted from the *Australian Jour. Scient. Res.*, Series A, Phys. Sc., Vol. 2, n° 3, p. 335-359, 1949.

Improving the accuracy of growth indices by the use of ratings, by G. A. McINTYRE and R. F. WILLIAMS, reprinted from the *Australian Jour. Scient. Res.*, Series B, Biological Sc., Vol. 2, n° 4, p. 319-345, 1949.

Acoustical analysis by variable density sound film, by D. BROWN, Auckland Univ. Coll., reprinted from the New Zealand Sc. Congress, 1947.

A radiosonde method of potential-gradient measurements in the atmosphere, by K. KREIESHEIMER, Auckland Univ. Coll., reprinted from the New Zealand Sc. Congress, 1947.

Some aspects of the experimental nuclear physics, by the Chairman Prof. P. W. BURBRIDGE, Auckland Univ. Coll., reprinted from the New Zealand Sc. Congress, 1947.

Dielectric properties of crystal quartz of high frequencies, by B. N. HARDEN, Auckland Univ. Coll., reprinted from the New Zealand Sc. Congress, 1947.

Synchronized feed-back in scale-of-2 electronic counters, by C. H. VINCENT, Auckland Univ. Coll., reprinted from the New Zealand Sc. Congress, 1947.

Abstract of published papers on radio research in Australia, 1948-1950.

