

# SCAR

SCIENTIFIC COMMITTEE ON ANTARCTIC RESEARCH

# BULLETIN

ARGENTINA   AUSTRALIA   BELGIUM  
CHILE   FRANCE   JAPAN   NEW ZEALAND  
NORWAY   SOUTH AFRICA   UNITED KINGDOM  
UNION OF SOVIET SOCIALIST REPUBLICS  
UNITED STATES OF AMERICA

PUBLISHED BY

SCOTT POLAR RESEARCH INSTITUTE, CAMBRIDGE, ENGLAND  
INSTITUTO ANTARTICO ARGENTINO, BUENOS AIRES, ARGENTINA

Reprinted from *Polar Record*, Vol. 11, No. 74, 1963, pp. 614–628.

# SCAR BULLETIN

No. 14, MAY 1963

## OCEANOGRAPHIC DATA DISTRIBUTION AROUND ANTARCTICA

BY FEODOR OSTAPOFF\*

After the periods of intense oceanographic work in the Southern Ocean represented by the Discovery Investigations in the thirties and IGY-IGC activities of the fifties, it may be appropriate to review achievements in this field. Such an evaluation will certainly aid future planning of oceanographic work, especially in connexion with the forthcoming IIOE (International Indian Ocean Expedition).

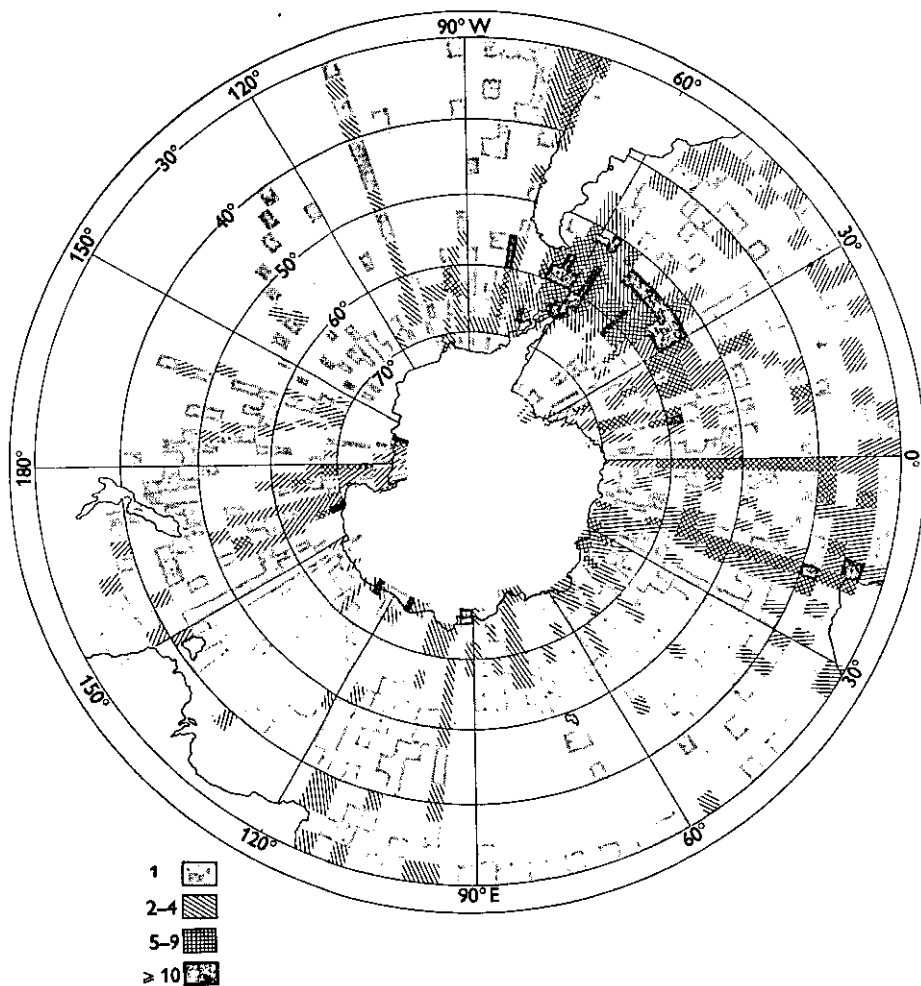
Salinity observations can be used as an index of data distribution. In this discussion we chose salinity values at 200 m. depth which offer several advantages over values taken at the surface. The samples are obtained from a level sufficiently deep to indicate the distribution of deep hydrographic casts. Furthermore, until recently, chlorine determinations (on which the salinity values are based) were made by chemical analysis, and might also indicate other chemical constituents of sea water. For example, the distribution of oxygen observations does not differ greatly in its spatial distribution from that of salinity, although the total number of oxygen samples is less (about 2000 oxygen observations compared with 2850 salinity observations at 200 m.). Naturally, this is not the case for temperature observations, which in the Southern Ocean are more numerous than any other type. The figure (page 615) shows the distribution of salinity observations at 200 m.; the data sources are listed at the end of the paper. About 2850 observations were available; there may be others, but not sufficient to affect the general distribution of the data significantly. Of these 2850 observations between lat. 30° S. and the coast of Antarctica, almost two-thirds were obtained during the pre-IGY period, and about one-half of the total falls geographically into the Atlantic sector. A breakdown according to seasonal distribution of the data shows an expected frequency maximum of 46 per cent of the total falling into the summer months December, January and February. The following table summarizes the seasonal data distribution:

*Data grouped according to seasons (oceanographic parameters at 200 m.)*

	December, January, February	March, April, May	June, July, August	September, October, November,
No. of observations	1810	825	215	500
Percentage of total	46.0	29.0	7.5	17.5

\* United States Weather Bureau, Washington.

Since 1961 more data has been collected, increasing the total to about 3000, or a little more. A survey of deeper levels shows that the total number of hydrographic stations reaching or penetrating the 2000 m. level is slightly more than 1400. At 4000 m. about 500 observations have been made. These numbers all apply to the ocean south of lat.  $30^{\circ}$  S.



Distribution of salinity observations at 200 m. Different shading indicates number of observations per unit area

The available observations were combined in squares of  $2.5^{\circ}$  of latitude by  $2.5^{\circ}$  of longitude. Different shading was used to indicate 1, 2-4, 5-9, and 10 or more observations per unit area (see key to figure). The data distribution chart reveals several important points. In general, the region of the Westerlies between lats.  $40^{\circ}$  and  $50^{\circ}$  S. (in the Pacific sector between lats.  $40^{\circ}$  and  $60^{\circ}$  S.)

is relatively poorly covered. In the Indian and Pacific Ocean sectors between this belt and lat. 30° S., the limit of our investigation, hardly any data seem to exist. Surprisingly, near Antarctica (with the exception of the Amundsen Sea, the eastern Ross Sea and western Weddell Sea) the data coverage is adequate, reflecting the activities, mostly in recent years, of expeditionary vessels of numerous nations participating in Antarctic research. This finding gains in significance if one remembers that our unit area at lat. 70° S. is only about half the size of that at lat. 40° S. Good data coverage also exists along the meridians which were recommended by SCAR (4/SCAR/Recommendations of Working Group on Oceanography (c), 5/SCAR/0-3) for future concentrated oceanographic work: long. 20° E., long. 165° E. and Drake Passage.

In addition to the SCAR-recommended hydrographic sections, emphasis might be placed on the investigation of the vast, yet unsurveyed, areas—in particular those of the Indian and Pacific Ocean sectors. This task could be accomplished on the return voyages of the supply ships from Antarctica after their basic mission has been completed.

The figure also gives some indication of the minimum number of temperature observations, in so far as there exist more of these than of salinity observations. As temperature is a less conservative property than salinity, more temperature observations are required for adequate mapping of its distribution. Also a large number of closely spaced vertical soundings taken at different seasons are needed to determine the mean vertical temperature structure in the upper layers and its variation in time and space. It is regrettable that the bathythermograph has not been used widely in the Southern Ocean; United States, New Zealand and Japanese vessels have obtained bathythermograph cross-sections, but almost exclusively only in the New Zealand or South African sector. At present, USNS *Eltanin* is, among other geophysical activities, engaged in an extensive bathythermograph observational programme in the Pacific sector which will undoubtedly contribute significantly to our knowledge of the thermal fine structure of the top layer in the ocean. It is urged that all vessels going to Antarctica should carry out a bathythermograph programme with a sampling frequency of at least one per hour.

#### *Data source of salinity observations at 200 m.*

BRENECKE, W. (1921). Die ozeanographischen Arbeiten der Deutschen Antarktischen Expedition, 1911–1912. *Aus dem Archiv der Deutschen Seewarte*, No. 1

CAPURRO, L. R. A. (1961). Hydrological observations in the southern oceans. *IGY Oceanography Report*, No. 2. IGY World Data Center A, Oceanography Discovery Committee. *Discovery Reports*, Vols. 1, 3, 4, 21, 22, 24, 25

FRIEDMAN, S. (1960). Oceanographic data obtained in the Indian Ocean, Gulf of Aden and the Red Sea during Cruise *Vema* 14 and *Vema* 16. *Lamont Geological Observatory, Columbia University. Technical Report, CU-10-60-AT (30-1) 1808*

KLEPIKOV, V. V. Ed. (1961). Tret'ya morskaya ekspeditsiya na d/e Ob, 1957–58. Materialy nablyudenyi [Third marine expedition in the diesel-electric ship *Ob*, 1957–58. Observations.] *Trudy Sovetskoy Antarkticheskoy Ekspeditsii* [Transactions of the Soviet Antarctic Expedition], Vol. 22

MAKEROV, YU. V. (1954). Gidrologicheskiye usloviya promyslovogo sezona 1949–50. g. v rayone plavaniya kitobaynay flotilii *Slava* [Hydrological conditions of the whaling season 1949–50 in the area of activity of the *Slava* whaling fleet] *Trudy Gosudarstvennogo Okeanograficheskogo Instituta* [Transactions of the State Oceanographical Institute], Vol. 24, No. 36, p. 21–4

TAUBER, G. M. (1954). Meteorologicheskiye usloviya promyslovogo sezona 1949-50 g. v rayonakh plavanaya K/S *Slava-15* [Meteorological conditions of the whaling season 1949-50 in the area of activity of the catcher *Slava-15*] *Trudy Gosudarstvennogo Okeanograficheskogo Instituta* [Transactions of the State Oceanographical Institute], Vol. 24, No. 30, p. 13-20

UNITED STATES NAVY-HYDROGRAPHIC OFFICE. (1956). *Field report Oceanographic observations. United States Navy Antarctic Expedition, 1954-55, USS Atka. HO Misc. 16331*, Washington

UNITED STATES NAVY-HYDROGRAPHIC OFFICE. (1956). *Report on Operation "Deep Freeze 1", HO Misc. 16331-1*, Washington

UNITED STATES NAVY-HYDROGRAPHIC OFFICE. (1957). *Operation "Deep Freeze 11", 1956-57, Oceanographic survey results. Technical Report-29*, Washington

UNITED STATES NAVY-HYDROGRAPHIC OFFICE. (1961). *Operation "Deep Freeze 60", 1959-60, Oceanographic Survey Results. Technical Report-32*, Washington

WÜST, G. (1932). Bericht über die ozeanographischen Untersuchungen. *Die Deutsche Atlantische Expedition Meteor, 1925-27*, Vol. 4, No. 2, p. 274-86

ZVEREV, A. A. Ed. (1959). *Vtoraya morskaya ekspeditsiya na d/e Ob, 1956-57. Materialy nablyudeniya* [Second marine expedition in the Ob, 1956-57. Vol. 6. Observations]

## INFORMATION ON RESEARCH ACTIVITIES IN THE ANTARCTIC: NATIONAL REPORTS

The exchange of information on scientific programmes between the various nations and individual scientists interested in Antarctic research is essential in order to minimize duplication of effort, and to ensure that specialists are aware of all investigations being made in the Antarctic in their particular discipline. Although information becomes available in due course through publication, exchange of data, and by personal contacts between scientists these processes take time. In order to provide information at an earlier stage, the Third Meeting of SCAR (1959) called on National Committees on Antarctic Research to present annual reports by 30 June each year which would set out clearly:

- (1) A list of stations occupied during the previous year.
- (2) A statement of the programme of work accomplished during the previous calendar year which would enable a scientist to learn whether or not observations directly related to a particular research interest had been made at a particular Antarctic station. The reports, therefore, include lists of observations made, types of instruments used, characteristics of instruments used for certain studies, frequency of observations and periods during which observations were made.
- (3) The name of the Institute(s) or authority(ies) responsible for processing Antarctic data in each field is included in the National Report in order to put research workers in touch with sources of information with the minimum delay.
- (4) A bibliography of publications on Antarctic research published by, or in, each reporting country since the previous annual report.
- (5) A statement of activities planned for the calendar year following that in which the report is presented. This report is given in less detail, since it is a statement of intention rather than accomplishment, and it is usually possible to shorten it by indicating sections which will be continued as in

(2) above. It is useful to include in this section a tabulated summary of investigations to be carried out at each station, with co-ordinates of stations and number of wintering personnel.

In drawing up this list of contents for National Reports, the risk of introducing unnecessary paper work was borne in mind. The list was limited to the minimum amount of information necessary to enable the reader to assess what was being accomplished by any station.

It will be seen from the following table of publications that most SCAR nations are now producing these reports. It is likely that from 1963 all twelve SCAR countries will do so. In view of the usefulness of the material presented, the nature and availability of the reports should be more widely known. On the opposite page is shown a facsimile of a typical page of the reports: in this case from report No. 4 of the Soviet Committee on Antarctic Research.

The uses of the reports to scientific research workers are numerous. For example, if a scientist making a geomagnetic survey in a particular region of the Antarctic finds that the continuous magnetometer record from his controlling station ceased for a few hours, he can, by consulting national reports, see where to apply for a copy of a magnetogram from the permanent observatory nearest to his observations. Such a request would normally be dealt with quickly, compared with the period which would elapse before hourly values of magnetic data were published and/or deposited in the appropriate World Data Centres. Another scientist, not closely associated with Antarctic research although perhaps taking an active part in space research, may wish to know whether some perturbation of particle radiation observed on a satellite was also present in high latitude records of cosmic radiation. National Reports provide the information on the types of cosmic ray instruments functioning at Antarctic stations at the relevant time. Yet another case is that of an oceanographer studying waves in the Northern Hemisphere which he believes must have originated from a storm near a particular Antarctic station. The National Report will indicate which national organization to contact, although in this case he may also be able to obtain the information from the International Antarctic Analysis Centre in Melbourne, Australia, or from microfilm records of their weather analyses held by certain institutions in all SCAR countries.

Report No. 1 was intended to cover the years 1957 and 1958, but few nations actually produced a special report as summaries of IGY activities had already appeared elsewhere.

Report No. 2 covers activities completed during	1959
and programme proposed for	1961
Report No. 3 covers activities completed during	1960
and programme proposed for	1962
Report No. 4 covers activities completed during	1961
and programme proposed for	1963

- 21 -

IONOSPHERE1961

Station	Type of Equipment	Power	Frequency Range	Schedule of operation	Data Reduced
Mirny	Automatic Ionosphere Station	2 kw	1 = 16 mc	Routine at 55, 00, 05, 15, 30 and 45 past each hour. On world days every 5 min.	Ionogrammes
Vostok	Automatic Ionosphere Station	2,5 kw	1) 1=10 mc 2) 1=18 mc	Routine at every 15 min. On world days 5 min.	High plots and frequency plots.

Data

The direction of observing program and reduction of data are the responsibility of the Arctic and Antarctic Research Institute, Leningrad, U.S.S.R.

Facsimile of specimen page from Soviet National Report.

[ 619 ]

SCAR BULLETIN



*Publication of National Reports*

	No. 1	No. 2	No. 3	No. 4
Argentina	x	x	x	x
Australia	x	x	x	x
Belgium	—	x	x	x
Chile	—	—	—	—
France	—	x	x	x
Japan	—	x	x	x
New Zealand	x	x	x	x
Norway	—	x	x	x
South Africa	—	x	x	x
UK	—	x	x	x
USA	x	x	x	x
USSR	—	x	x	x

Any research worker wishing to consult these reports should communicate with his National Committee. The national member of the relevant SCAR working group (see list on p. 623–28) should hold No. 4 and subsequent reports.

**ANNEX***Notes for national committees on production of national reports to SCAR*

1. Contents should comply with details given on p. 617.
2. Reports should be of standard format to facilitate ease of reference or binding: 27 cm. wide, 21 cm. high (printed horizontally).
3. National Reports should be distributed not later than 30 June in each year.

Reports should be circulated as follows:

- a. National Committees 18 copies (agreed at VI SCAR)
- b. Antarctic wintering stations (through appropriate National Committee) 1
- c. Working Group Secretaries (through appropriate National Committee) 1
- d. Secretary of SCAR 2
- e. SCAR delegate of International Unions 1
- f. WMO General Secretary 1
- g. Secretary of SCOR 1
- h. Secretary of COSPAR 3

In order to facilitate distribution, National Committees should receive a bulk supply covering the first three sections above and arrange distribution within their own country. Number of Report No. 5 required in this connexion will be:

	National Committee	Bases	Working Group Secretaries	Total
Argentina	18	7	—	25
Australia	18	4	4 or 5	26 or 27
Belgium	18	—	—	18
Chile	18	4	—	22

	National Committee	Bases	Working Group Secretaries	Total
France	18	8	1	22
Japan	18	—	1	19
New Zealand	18	2	2	22
Norway	18	—	—	18
South Africa	18	8	—	21
UK	18	9	1	28
USA	18	8	1	22
USSR	18	2	1	21

Provided reports are despatched before 30 June it is suggested that the two copies for the Secretary of SCAR and two copies for each National Committee should be sent by airmail, the remainder could be sent by surface mail.

The co-operation of all SCAR nations in complying with these suggestions will considerably increase the already evident value of these reports. Many nations are to be congratulated on the excellent reports they produce, but all are requested to examine the details given above to ensure they are not omitting any useful factor.

## WORKING GROUP ON GLACIOLOGY

The Working Group on Glaciology met in Obergurgl on 14 to 21 September after the Commission of Snow and Ice Symposium on the variations of the régime of existing glaciers. On the 19th and 20th a number of glaciologists who had attended the symposium joined members of the Working Group in discussions covering the following points:

(a) Techniques of the measurement of ice thickness in polar regions, the assessment of existing methods and possible new developments; (b) measurement of accumulation and ablation; (c) Measurement of glacier discharge; (d) chemistry of ice; (e) the utilization of isotopes in glaciological investigations; (f) techniques of deep drilling; (g) a general glaciological discussion.

The Working Group itself met on 21 September; the following were present: G. de Q. Robin, chairman; C. Lorius, secretary; A. Bauer, C. R. Bentley, W. de Breuck, W. O. Field, J. Jacka, O. Liestøl, E. Picciotto, O. Schauer, P. A. Shumsky.

The Working Group made the following recommendations to SCAR; these will be discussed at the Seventh Meeting in September 1963:

Bearing in mind the glaciological programmes of the National Committees, the Working Group on Glaciology feels that more attention should be given to the following:

### *Locations of measurements*

1. Determination of the direction of flow lines and position of ice divides. The use of surface strain networks for determination of flow lines and study of surface topography for the location of ice divides is recommended.

2. Measurements in strips along flow lines or ice divides in all fields of glaciological study.

*Accumulation studies*

3. (a) The need for further determination of the 1952-53 layer by detecting the presence of radioactive debris from the first thermonuclear test. These determinations should be carried out at locations where the stratigraphy is known in order to test the method and annual samples of at least 1 kg. down to about the 1945 level are required.

(b) The establishment of reference horizons at the present level (wires, strings, etc.).

(c) Studies of the microparticle content of ice cores to determine earlier reference horizons.

*Nuclear and chemical methods*

4. Application of nuclear methods (mainly stable isotope variations and radioactive decay) to glaciological problems.

For this purpose more well-equipped laboratories and trained scientists are required in view of the great number of Antarctic samples already available and likely to be collected in the near future.

5. The need for studies of the geographical distribution of chemical and isotopic content of Antarctic ice. The opportunities for collection by traverse parties should be borne in mind.

*Ice thickness determinations\**

6. Comparative trials of different methods of ice thickness determinations. In particular comparative trials between seismic, electrical, radio, and gravity methods would be welcomed.

*Deep drilling applications*

7. Development of methods of deep drilling and coring.

8. Development of methods of measurement of strain rate in deep bore holes.

*Ice discharge†*

9. The methods employed by Soviet glaciologists in Antarctica, in which morphological features shown on air photographs have been used to determine ice velocities.

Early publication of details of these methods would be welcomed.

*Complementary zones of studies*

10. The need for studies of the changing characteristics of glaciers along the islands of the Scotia Arc in relation to conditions in the Southern Andes of South America to determine glacial-meteorological relationships, present and past behaviour, and other glaciological characteristics.

*Distribution of information*

11. The continuing need for the exchange of publications and data. Summarized information on results of tests mentioned in *Resolutions VI G16—3a, 3c, 6, 7, 8, 9, 10*, should be distributed as soon as possible.

National Committees are asked to draw the attention of organizations interested in Antarctic research to the possibility of publishing short notes or new results and techniques in the *SCAR Bulletin*.

12. Individuals or organizations holding translations into western languages of Russian or Japanese papers on Antarctic glaciology which they are prepared to make available to other users are requested to inform the Secretary of SCAR, who will notify National Committees.

\* See also *Recommendation V. G1-4 (SCAR Bulletin, No. 10, p. 145)*.

† See also report to working group on Geodesy and Cartography (*SCAR Bulletin, No. 10, p. 144*).

## PERMANENT WORKING GROUPS OF SCAR

## BIOLOGY

- Argentina:* A. Corte, Instituto Antártico, Argentino, Cerrito 1248, Buenos Aires
- Australia:* Dr R. Carrick (Secretary), Wildlife Survey Section, CSIRO, P.O. Box 109 City, Canberra, ACT
- Belgium:* J. P. Gosse,<sup>†</sup> Centre National de [Recherches Polaires de Belgique, 29 rue Vautier, Bruxelles 4
- Chile:* N. Bahamonde, Museo Nacional de Historia Natural, Casilla 787, Santiago
- France:* Dr J. Prévost, Laboratoire d'Histologie, Faculté de Médecine, 45 rue des Saints Pères, Paris 6e
- Japan:* Professor J. Shimoizumi, Faculty of Science, Tokyo University of Education, Otsuka-Kubomachi, Bunkyo-ku, Tokyo
- New Zealand:* Dr R. A. Falla, Dominion Museum, Wellington
- Norway:* Dr J. T. Ruud, Universitet i Oslo, Karl Johansgt, 47, Oslo
- South Africa:* Dr R. A. Dyer, Division of Botany, 590 Vermeulen Street, Pretoria
- United Kingdom:* Dr F. C. Fraser, Department of Zoology, British Museum (Natural History), Cromwell Road, London, SW 7
- USA:* Dr Kaare Rodahl, Lankenau Hospital, Lancaster and City Line Avenues, Philadelphia 31, Pennsylvania
- USSR:* Professor A. P. Andriyashev (Zoological Institute, Academy of Sciences of the USSR), Soviet Committee on Antarctic Research, 1-y Akademicheskyy pr., 30A, Moscow B-333

## COMMUNICATIONS

- Argentina:* Captain A. J. Oliver, Instituto Antártico Argentino, Cerrito 1248, Buenos Aires
- Australia:* W. R. Baird, Overseas Telecommunications Commission, 12 Spring Street, Sydney, NSW
- Belgium:* H. Vandevelde, Centre National de Recherches Polaires de Belgique, 29 rue Vautier, Bruxelles 4
- Chile:* Not appointed
- France:* R. Bost, Terres Australes et Antarctiques Françaises, 27 rue Oudinot, Paris 7e
- Japan:* Dr Y. Aono, Radio Research Laboratories, Ministry of Posts and Telecommunication, Kokubunji P.O. Kitatama-gun, Tokyo
- New Zealand:* T. R. Clarkson, Engineer-in-Chief's Office, Post Office, Wellington
- Norway:* Not appointed
- South Africa:* G. E. Haupt, Department of Transport, Fountain Lane, Pretoria

*United Kingdom:* A. H. Sheffield (Chairman), Commonwealth Telecommunications Board, 28 Pall Mall, London, S.W. 1

*USA:* J. M. Jones, Committee on Polar Research, National Academy of Sciences, 2101 Constitution Avenue, Washington 25, D.C.

*USSR:* A. M. Driatsky, Arkticheskiy i Antarkticheskiy Nauchno-Issledovatel'skiy Institut [Arctic and Antarctic Research Institute], Soviet Committee on Antarctic Research, 1-y Akademichesky pr. 30A, Moscow B-833

#### GEODESY AND CARTOGRAPHY

*Argentina:* L. Picard, Servicio de Hidrografía Naval, Avda. Montes de Oca 2124, Buenos Aires

*Australia:* B. P. Lambert (Secretary), Director of National Mapping, 22 University Avenue, Canberra City

*Belgium:* J. Loodts, Centre National de Recherches Polaires de Belgique, 29 rue Vautier, Bruxelles 4

*Chile:* Comandante C. Labbé, Departamento de Navegación y Señalización de la Armada, Casilla 324, Valparaíso

*France:* Ing. Gen. G. Laclavère, 140 rue de Grenelle, Paris 7e

*Japan:* Dr T. Okuda, Geographical Survey Institute, Ministry of Construction, Meguro-ku, Tokyo

*New Zealand:* R. P. Gough, Lands and Survey Department, Wellington

*Norway:* S. Helle, Norsk Polarinstitut, Observatorieg. 1, Oslo

*South Africa:* F. W. Marsh, Trigonometrical Survey, Rhodes Avenue, Mowbray, CP

*United Kingdom:* Brigadier M. Hotine, Directorate of Overseas Surveys, Kingston Road, Tolworth, Surrey

*USA:* G. D. Whitmore, US Geological Survey, Department of Interior, Washington 25, D.C.

*USSR:* Not appointed

#### GEOLOGY

*Argentina:* O. Schauer, Instituto Antártico Argentino, Cerrito 1248, Buenos Aires

*Australia:* Dr N. H. Fisher, Bureau of Mineral Resources, P.O. Box 378, Canberra City, ACT

*Belgium:* E. Picciotto, Centre National de Recherches Polaires de Belgique, 29 rue Vautier, Bruxelles 4

*Chile:* Ing. C. R. Fuller, Instituto de Investigaciones Geológicas, Casilla 10465, Santiago

*France:* M. J. P. Bloch, Laboratoire de Géologie de l'E.N.S., 24 rue Lhomond, Paris 5e

*Japan:* Professor H. Kuno, Department of Geology, University of Tokyo, Tokyo

*New Zealand:* R. W. Willett (Chairman), Geological Survey, P.O. Box 368, Lower Hutt

*Norway:* Dr T. Gjelsvik, Norsk Polarinstitut, Observatorieg. 1, Oslo

*South Africa:* Dr F. C. Truter, Geological Survey, P.O. Box 401, Pretoria

*United Kingdom:* Dr R. J. Adie, Department of Geology, University of Birmingham, Edgbaston, Birmingham 15

*USA:* Dr L. M. Gould, Department of Geology, University of Arizona, Tucson, Arizona,

*USSR:* Professor M. G. Ravich, Nauchno-Issledovatel'skiy Institut Geologii Arktiki [Arctic Geological Research Institute], Soviet Committee on Antarctic Research, 1-y Akademicheskyy pr., 30A, Moscow B-333

#### GEOMAGNETISM

*Argentina:* R. P. J. Hernández, Servicio Meteorológico Nacional, Paseo Colón 317, Buenos Aires

*Australia:* J. M. Rayner, Bureau of Mineral Resources, Box 378, Canberra ACT

*Belgium:* M. Focroulle, Centre National de Recherches Polaires de Belgique, 29 rue Vautier, Bruxelles 4

*Chile:* P. Perelman, Instituto de Sismología y Geofísica, Universidad de Chile, Casilla 2777, Santiago

*France:* M. R. Schlich, Institut de Physique du Globe, 191 rue Saint Jacques, Paris, 5e

*Japan:* T. Nagata (Chairman/Secretary), Geophysical Institute, Tokyo University, Tokyo

*New Zealand:* A. L. Cullington, Magnetic Survey, Botanic Gardens, Christchurch

*Norway:* Dr L. Harang, Institutt for Teoretisk Astrofysikk, Blindern, Norway

*South Africa:* A. M. van Wijk, Magnetic Observatory, Hermanus, CP

*United Kingdom:* Dr J. M. Stagg, 84 King's Road, Richmond, Surrey

*USA:* D. K. Bailey, Central Radio Propagation Laboratory, National Bureau of Standards, Boulder, Colorado

*USSR:* Mrs V. A. Troitskaya, Akademiya Nauk SSR. Institut Fiziki Zemli [Institute of Physics of Earth, Academy of Sciences of the U.S.S.R.], Soviet Committee on Antarctic Research, 1-y Akademicheskyy pr., 30A, Moscow B-333

#### GLACIOLOGY

*Argentina:* C. A. Lisignoli, Instituto Antártico Argentino, Cerrito 1248, Buenos Aires

*Australia:* Dr U. Radok, Department of Meteorology, University of Melbourne, Parkville, 2N, Victoria

*Belgium:* W. de Breuck, Centre National de Recherches National de Belgique, 29 rue Vautier, Bruxelles 4

*Chile:* L. Ponce, Instituto de Sismología y Geofísica, Universidad de Chile, Casilla 2777, Santiago

*France:* C. Lorius (Secretary), Laboratoire de Géologie, Collège de France, Place Marcelin Berthelot, Paris V

*Japan:* Professor T. Yoshikawa, Department of Geography, University of Tokyo, Tokyo

*New Zealand:* I. C. McKellar, Geological Survey, P.O. Box 79, Dunedin

*Norway:* O. Liestøl, Norsk Polarinstitutt, Observatorieg. 1, Oslo

- South Africa:* Professor E. S. W. Simpson, Department of Geology, University of Cape Town, Rondebosch, CP
- United Kingdom:* Dr G. de Q. Robin, Scott Polar Research Institute, Cambridge
- USA:* Dr A. P. Crary, U.S. Antarctic Research Program, National Science Foundation, Washington 25, D.C.
- USSR:* Dr P. A. Shumsky, Akademiya Nauk SSSR. Institut Merzlotovedeniya im. V. A. Obrucheva [Institute of Permafrost Studies, Academy of Sciences of the U.S.S.R.], Soviet Committee on Antarctic Research, 1-y Akademichesky pr., 30A, Moscow B-333

### LOGISTICS

- Argentina:* Lt.-Cdr. E. J. Pierrou, Instituto Antártico Argentino, Cerrito 1248, Buenos Aires
- Australia:* Dr P. G. Law, Antarctic Division, Department of External Affairs, 187 Collins Street, Melbourne, Victoria
- Belgium:* F. Bastin, Centre National de Recherches Polaires de Belgique, 29 rue Vautier, Bruxelles 4
- Chile:* Comandante D. J. Vega., Sección Antártica del Estado Mayor de la Defensa Nacional, Ministiro de Defensa Nacional, Santiago
- France:* M. J. Vaugelade, Expéditions Polaires Françaises, 47 Avenue du Maréchal Fayolle, Paris 16e
- Japan:* Professor K. Kinoshita, Department of Physics and Chemistry, Gakushuin University, Mejiro, Toshima-ku, Tokyo
- New Zealand:* G. W. Markham (Secretary), Antarctic Division, D.S.I.R., Box 6022, Wellington
- Norway:* S. Helle, Norsk Polarinstitut, Observatoriegt. 1, Oslo
- South Africa:* S. A. Englebrecht, Weather Bureau, Private Bag 97, Pretoria
- United Kingdom:* Sir V. E. Fuchs, British Antarctic Survey, 4 Millbank, London, S.W. 1
- USA:* Admiral J. R. Reedy, USN, 6th and Independence Avenue, SW, Washington 25, D.C.
- USSR:* E. I. Tolstikov (Deputy Head of Glavsevmorput', Ministry of Marine), Soviet Committee on Antarctic Research, 1-y Akademichesky pr., 30A, Moscow B-333
- At the 6th SCAR Meeting P.-E. Victor, Expéditions Polaires Françaises was elected Chairman

### METEOROLOGY

- Argentina:* Commander L. M. de la Canal, Servicio de Meteorología Marítima, Secretaría de Marina, Cangallo 55, Buenos Aires
- Australia:* H.R. Philpott, Commonwealth Bureau of Meteorology, Rox 1289 K, Melbourne, Victoria
- Belgium:* X. de Maere, Centre National de Recherches Polaires de Belgique, 29 rue Vautier, Bruxelles 4
- Chile:* Dr M. Puigcerver, Instituto de Sismología y Geofísica, Universidad de Chile, Casilla 2777, Santiago

*France*: M. J. Alt, Météorologie Nationale, 2 quai Branly, Paris 7e

*Japan*: Dr Y. Kawahata, Japan Meteorological Agency, Otemachi, Chiyoda-ku, Tokyo

*New Zealand*: Dr R. G. Simmers, Meteorological Office, Box 722, Wellington

*Norway*: V. Hisdal, Norsk Polarinstitutt, Observatoriegte. 1, Oslo.

*South Africa*: Dr J. J. Taljaard, Weather Bureau, Private Bag 97, Pretoria

*United Kingdom*: H. H. Lamb, Meteorological Office, London Road, Bracknell, Berks.

*USA*: M. J. Rubin, US Weather Bureau, Washington 25, DC

*USSR*: G. M. Tauber Head, Gidrometeorologicheskaya Sluzhba pri Sovetskom Ministrov [Office of Hydromet Service, Council of Ministers], Soviet Committee on Antarctic Research, 1-y Akademicheskyy pr., 30A, Moscow B-333  
New Chairman/Secretary to be appointed.

#### OCEANOGRAPHY

*Argentina*: Contraalmirante R. N. Panzarini, Instituto Antártico Argentino, Cerrito 1248, Buenos Aires

*Australia*: Dr G. F. Humphrey, Division of Fisheries and Oceanography, CSIRO, Cronulla, NSW

*Belgium*: M. Steyaert, Centre National de Recherches Polaires de Belgique, 29 rue Vautier, Bruxelles 4

*Chile*: Comandante Custodio L. Labbé, Departamento de Navegación y Señalización de la Armada, Casilla 324, Valparaíso

*France*: P. Tchernia, Laboratoire d'Océanographie Physique, 43 rue Cuvier, Paris, 5e

*Japan*: Professor K. Hidaka, Department of Geophysics, University of Tokyo, Tokyo

*New Zealand*: J. Brodie, NZ Oceanographic Institute, DSIR, Wellington

*Norway*: Dr H. Mosby, Universitet i Bergen, Bergen

*South Africa*: Professor J. H. Day, Department of Zoology, University of Cape Town, Rondebosch, CP

*United Kingdom*: G. E. R. Deacon, National Institute of Oceanography, Wormley, nr. Godalming, Surrey, England

*USA*: Dr W. L. Tressler, U.S. Navy Hydrographic Office, Washington 25, DC

*USSR*: M. M. Somov (Chairman), Arkticheskiy i Antarkticheskiy Nauchno-Issledovatel'skiy Institut [Arctic and Antarctic Research Institute], Leningrad., Soviet Committee on Antarctic Research, 1-y Akademicheskyy pr., 30A, Moscow B-333

#### SOLID EARTH GEOPHYSICS

*Argentina*: S. Gershanik, Observatorio Astronómico de la Plata, Paseo del Bosque, La Plata

*Australia*: Professor K. E. Bullen, Department of Applied Mathematics, University of Sydney, NSW

*Belgium*: Not appointed



- Chile:* (Seismology) P. Welkner, Instituto de Sismología y Geofísica, Universidad de Chile, Casilla 2777, Santiago
- France:* M. G. Jobert, Institut de Physique du Globe, 191 rue Saint Jacques, Paris 5e
- Japan:* Professor T. Hagiwara, Earthquake Research Institute, University of Tokyo, Tokyo
- New Zealand:* E. I. Robertson (Secretary), Geophysics Division, DSIR, 156 The Terrace, Wellington
- Norway:* M. Sellevoll, Universitet i Bergen, Bergen
- South Africa:* Professor A. L. Hales, Bernard Price Institute for Geophysical Research, University of Witwatersrand, Milner Park, Johannesburg
- United Kingdom:* Dr R. Stoneley, Department of Geodesy and Geophysics, University of Cambridge, Cambridge
- USA:* G. P. Woollard, Department of Geology, University of Wisconsin, Wisconsin
- USSR:* Y. D. Bulanzhe, Akademiya Nauk SSSR. Institut Fiziki Zemli [Institute of Physics of Earth, Academy of Sciences of the U.S.S.R.], Soviet Committee on Antarctic Research, 1-y Akademichesky pr., 30A, Moscow B-333

## UPPER ATMOSPHERE PHYSICS

- Argentina:* Dr O. Schneider, Instituto Antártico Argentino, Cerrito 1248, Buenos Aires
- Australia:* F. Jacka (Chairman/Secretary), Physics Section, Antarctic Division, Department of External Affairs, 187 Collins Street, Melbourne
- Belgium:* J. Verheye, Centre National de Recherches Polaires de Belgique, 29 rue Vautier, Bruxelles 4
- Chile:* Profesor E. P. Hellmaier, Instituto de Física y Astronomía de la Universidad Católica, Santiago
- France:* M. A. Lebeau, Institut de Physique du Globe, 191 rue Saint Jacques, Paris, 5e
- Japan:* Dr H. Ueda, Radio Research Laboratories, Ministry of Postal Services, Kokubunji, PO, Kitatama-gun, Tokyo
- New Zealand:* W. H. Ward, Dominion Physical Laboratory, Gracefield Road, Lower Hutt
- Norway:* Dr L. Harang, Institutt for Teoretisk Astrofysikk, Blindern, Oslo
- South Africa:* Professor P. H. Stoker, University of Potchefstroom, Potchefstroom
- United Kingdom:* Dr S. Evans, Scott Polar Research Institute, Cambridge
- USA:* D. K. Bailey, Central Radio Propagation Laboratory, National Bureau of Standards, Boulder, Colorado
- USSR:* Dr Y. D. Kalinin, Komitet po Antarkticheskim Issledovaniyam [Soviet Committee on Antarctic Research], 1-y Akademichesky pr., 30A, Moscow B-333

All correspondence should be addressed to the person listed as Chairman or Secretary.

## NOTICE

The SCAR Bulletin is published in England in January, May and September each year as part of the *Polar Record*, the journal of the Scott Polar Research Institute.

Contributions are invited, and should consist of factual notes on the membership, equipment and activities of Antarctic parties; articles on matters of particular interest in connection with these activities are also welcome. Contributions should be sent to the Editor, Scott Polar Research Institute, Lensfield Road, Cambridge, England.

## THE POLAR RECORD

This is the journal of the Scott Polar Research Institute. It is published in January, May and September each year and may be obtained direct from the Scott Polar Research Institute, Lensfield Road, Cambridge, England, or through any bookseller. The subscription is thirty-one shillings and sixpence a year, or ten shillings and sixpence a copy.