ISSN 0083-7903, 64 (Print)
ISSN 2538-1016; 64 (Online)

Bibliography of New Zealand Submarine Geology 1866—1969

by

VALERIE J. LEWIS

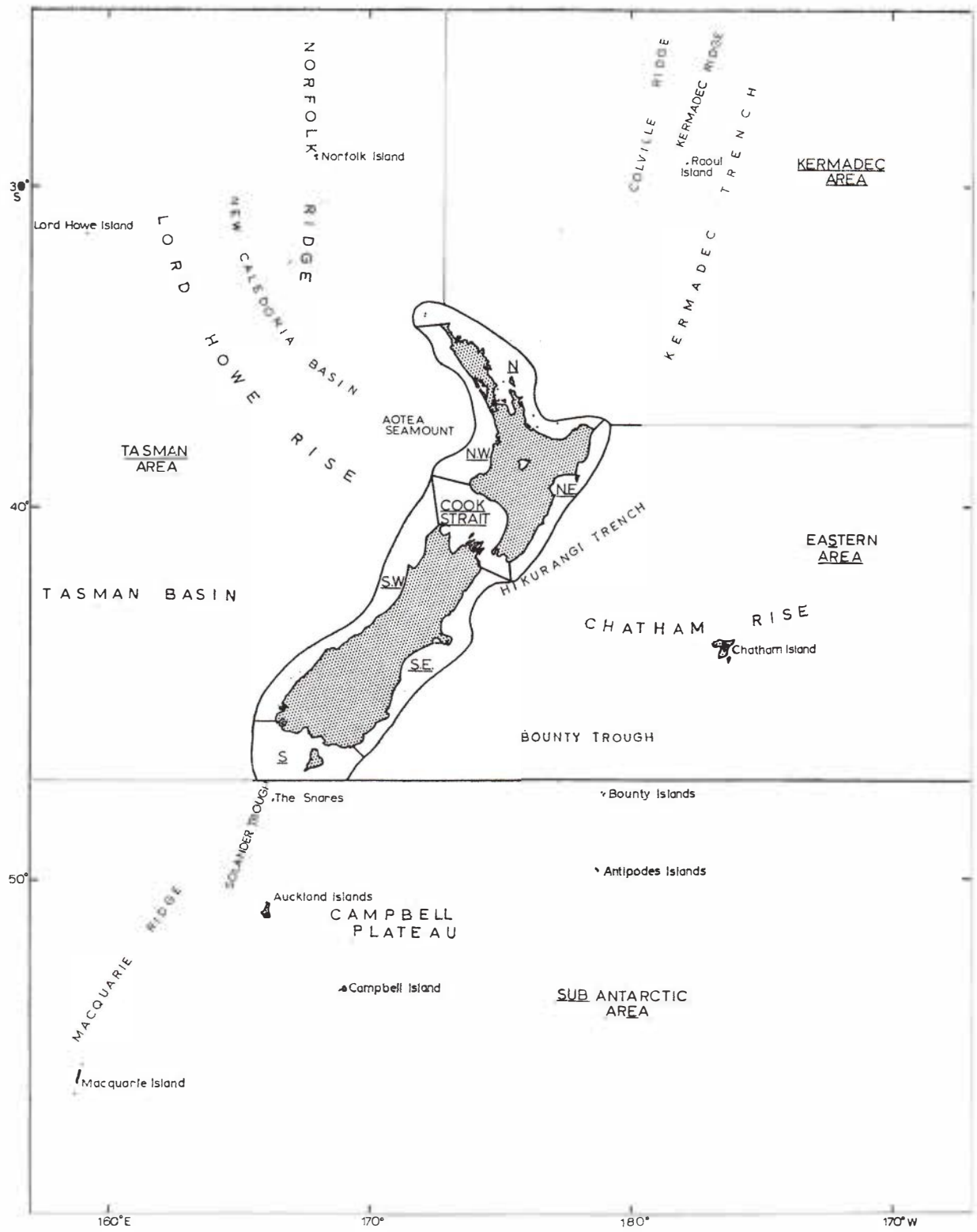
New Zealand Oceanographic Institute Memoir No. 64

1977

BIBLIOGRAPHY OF NEW ZEALAND

SUBMARINE GEOLOGY

1866–1969



The New Zealand region showing the coastal and oceanic areas defined in the geographic index

NEW ZEALAND

DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH

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VALERIE J. LEWIS

4 Akautangi Way, Hataitai, Wellington

New Zealand Oceanographic Institute Memoir 64, 1977. 32 p.
ISSN 0083–7903

Abstract

An annotated bibliography of 453 entries is presented, with geographical and subject indexes. "Submarine geology" is here defined as the geology of the area of seabed below low water mark, and the "New Zealand region" extends from 24°S to 57° 30′S. and 157°E to 167°W. Maps and charts, and material on foraminifera, have been excluded from the bibliography.

Citation according to
World List of Scientific Periodicals (4th edn.).
Mem. N.Z. oceanogr. Inst. 64

Received for publication October 1972

FOREWORD

This bibliography of New Zealand submarine geology covers papers written between 1866 and the end of 1969. Four hundred and fifty-four papers are recorded here together with abstracts, and the work as a whole provides a most useful reference to activities in submarine geology in the New Zealand region.

Preparation of the bibliography was commenced by Mrs Lewis as part of the work for a diploma of the New Zealand Library School.

J. W. BRODIE, Director,
New Zealand Oceanographic Institute, Wellington.

ACKNOWLEDGMENTS

I am grateful for the assistance provided by my husband Dr Keith Lewis and by Mr J. W. Brodie, Dr D. J. Cullen, New Zealand Oceanographic Institute; Dr R. Falconer, Physics Department, Victoria University of Wellington; Dr C. A. Fleming, New Zealand Geological Survey, and Mr T. Hunt, Geophysics Division, DSIR.

My thanks are also due to the librarians and staff of the following Wellington libraries for access to their collections and assistance when necessary: Alexander Turnbull Library; General Assembly Library; National Library of New Zealand; New Zealand Geological Survey; New Zealand Meteorological Office; New Zealand Oceanographic Institute; New Zealand Seismological Observatory; Royal Society of New Zealand; Victoria University of Wellington.

This bibliography was commenced as part of the diploma of the New Zealand Library School, and I am grateful to my supervisor, Mr J. H. Podstolski, and to the Director of the National Library School, Mr R. N. O'Reilly, for permission to use this material.

The manuscript has been prepared for publication by Misses L. Bailey and E. Bardsley.

INTRODUCTION

Scope of Bibliography

For the purposes of this bibliography submarine geology has been defined as the geology of that area of the seabed below low water mark. The earliest item located was dated 1866 although one item was originally published in 1847, and the cut-off date for publication of material was 31 December 1969. Items can usually be located by consulting the Union List of Serials in New Zealand libraries. The bibliography also includes items on equipment and techniques of submarine geology relevant to New Zealand work.

Maps and Charts

Maps and charts have been omitted although items describing charts are included. The most comprehensive charts in this field are those published by the New Zealand Oceanographic Institute and other relevant charts and maps are held by the library of this institution. Most material on foraminifera has been excluded, as this has already been documented **(see** Eade, 1967).

Sources of References

The following journals were searched completely:

New Zealand Journal of Science and Technology, 1918–57.
New Zealand Journal of Science, 1958–69.
New Zealand Journal of Geology and Geophysics, 1958–69.
Transactions of the Royal Society of New Zealand, 1868–1969.
Tuatara, 1947–69.
Deep-Sea Research, 1953–69.
Marine Geology, 1964–69.
Tectonophysics, 1964–69.

Other items were located using the reference lists given by authors in papers from the above journals.

The Lists of Publications and Charts of the New Zealand Oceanographic Institute were searched for geological items and the following bibliographies were consulted:

Krebs, B.N. 1964: Bibliography of the Oceanography of the Tasman and Coral Seas. **Mem. N.Z. oceanogr. Inst 24:** 27pp. **(Bull. N.Z. Dep. scient. ind. Res. 156).**

New Zealand Oceanographic Committee 1955: Bibliography of New Zealand Oceanography 1949–1953. **Mem. N.Z. oceanogr. Inst. 1:** 18 pp. **(Geophys. Mem. N.Z. Dep scient. ind. Res. 4).**

Indexes

Because of the large number of items involved, often covering several subjects and geographic areas, the main bibliography is arranged in alphabetical order by author. Two indexes are provided, by subject and by geographical area (both on p.32), references in each case being to item numbers, not pages. To provide full geographical coverage the New Zealand area has been divided into arbitrary regions (Frontis.) and indexed accordingly. It is envisaged that the geographical index will be used in conjunction with the subject index to locate papers precisely, e.g., to find papers on the bathymetry of the Tasman Sea, look up both "Bathymetry" in the subject index and "Tasman Sea" in the geographical index and the items which appear in BOTH lists will be on the required subject.

Abbreviations

Abbreviations used are those given in the World List of Scientific Periodicals, Fourth Edition, Butterworths, London, 1965.

BIBLIOGRAPHY

ADAMS, C.E.; BARNETT, M.A.F.; HAYES, R.C.
1933 Seismological report of the Hawkes Bay earthquake of 3rd February 1931. *N.Z. Jl Sci. Technol. 15(1):* 93–107.
Gives the background of the earthquake by describing the relationship of New Zealand seismology to that of the Pacific, past seismic activity in the Hawkes Bay region and foreshocks. The earthquake is discussed, with reference to the distribution of seismic intensity, the seismograph records, the horizontal movement of the ground, the determination of the epicentre in Hawke Bay, time at origin, focal depth, and the aftershocks. [1]

ADAMS, R.D.
1962 Thickness of the earth's crust beneath the Campbell Plateau. *N.Z. Jl Geol. Geophys. 5 (1):* 74–85.
By the use of records from eight earthquakes, an average value of about 20 km was found. This is intermediate between the values usually found for oceanic and continental regions."—abstr.
see also [96], [204]. [2]

ADAMS, R.D.; CHRISTOFFEL, D.A.
1962 Total magnetic field surveys between New Zealand and the Ross Sea. *J. geophys. Res. 67(2):* 805–13.
"During the summers of 1958/59 and 1959/60, total magnetic field surveys were made with ship-towed nuclear spin magnetometers between New Zealand and the Ross Sea. The total field contours are given for the region between New Zealand and 80°S and for the Ross Sea area. Magnetic anomalies in the different bathymetric regions are discussed and some possible interpretations given."—abstr. [3]

ADAMS, R.D.; DIBBLE, R.R.
1967 Seismological studies of the Raoul Island eruption, 1964. *N.Z. Jl Geol. Geophys. 10(6):* 1348–61.
"An eruption of mud and steam at Raoul Island (largest of the Kermadec Group) on November 20, 1964, was preceded by a swarm of earthquakes which started on November 10. Within four hours of the start of the swarm, the frequency of shocks . . . had risen to a maximum of over 80 per hour."—abstr.
Eruption then occurred and the earthquakes gradually decreased. The earthquakes are analysed in this paper. [4]

ADAMS, R.D.; LeFORT, J.H.
1963 The Westport earthquakes, May 1962. *N.Z. Jl Geol. Geophys. 6(4):* 487–509.
"A sequence of over 80 earthquakes occurred in 1962 off the coast near Westport, New Zealand. . . . Arrival times of phases at overseas stations all show that the foci were shallow. Late arrivals at Australian stations indicate a lower velocity in the upper mantle beneath the Tasman Sea than is implied by the Jeffreys-Bullen tables."—abstr. [5]

ADKIN, G.L.
1921 Porirua Harbour: a study of its shore line and other physiographic features. *Trans. Proc. N.Z. Inst. 53:* 144–56.
Includes a section on the origin of the harbour. [6]

AMIN, B.S.; KHARKAR, D.P.; LAL, D.
1966 Cosmogenic ^{10}Be and ^{26}Al in marine sediments. *Deep Sea Res. 13(5):* 805–24.
"The results of measurements of ^{10}Be and ^{26}Al activities in two wide-diameter (12.7 cm) Pacific sediment cores are reported. The cores were raised from regions of the ocean floor where an undisturbed slow accumulation was expected. Several sections up to about one metre depth were analysed."—abstr.
Includes one core from the New Zealand region (57°35'S, 174°15'W). [7]

ANDREWS, E.C.:
1922 The present structure of the Pacific: presidential address. *J. Proc. R. Soc. N.S.W. 56:* 14–38.
General discussion of the structure of the south-west Pacific with reference to trenches, island arcs and seismicity. [8]
1939 The structure of the Pacific Basin. *Proc. 6th Pacif. Sci. Congr. 1:* 201–4.
General discussion, mentioning a few New Zealand features (e.g. Tonga–Kermandec Trench) in the context of their relation to Pacific structure. [9]

ANDRUSCHENKO, P.F. *see* [374].

ANGENHEISTER, G.A.
1921 A study of Pacific earthquakes. *N.Z. Jl Sci. Technol. 4(5):* 209–31.
Deals with those earthquakes whose epicentres were near the Tonga Deep. Most are out of the New Zealand area, but three near the Kermadec Islands are included. [10]

ARRHENIUS, G.
1966 Sedimentary record of long-period phenomena. Pp 155–74 *in* Hurley, P.M. (ed.) "Advances in Earth Science (Contributions to the International Conference on the Earth Sciences, Massachusetts Institute of Technology, September 1964)". M.I.T. Press, Cambridge, Massachusetts and London. xiv + 502 pp.
A general discussion. One chart illustrates the concentration of mica at the present sediment surface of the Pacific Ocean floor, including the area to the east of New Zealand. *see also* [344]. [11]

BADGLEY, P.C.
1965 "Structural and tectonic principles". Harper & Row, New York. 521 pp.
"Designed to give a broad background in the fields of structural geology and tectonics."—intro.
Includes extensive references (Pp. 408–11). Excellent section on New Zealand, particularly the Tonga and Kermadec Trenches. (Pp. 425–9). [12]

BANGHAR, A.R.; SYKES, L.R.
1969 Focal mechanisms of earthquakes in the Indian Ocean and adjacent regions. *J. geophys. Res. 74(2):* 632–49.
"Focal mechanism solutions are presented for 22 earthquakes that occurred in . . . the Macquarie ridge . . . Earthquakes on the Macquarie ridge are characterized by either thrust faulting, strike-slip faulting, or a combination of the two."—abstr. [13]

BANWELL, C.J. *see* [204].

BARAZANGI, M.; DORMAN, J.
1969 World seismicity maps compiled from ESSA, Coast and Geodetic Survey, epicentre data, 1961–1967. *Bull. seism. Soc. Am. 59 (1):* 369–80.
Seven world maps contain information on earthquakes around the world, particularly of the New Zealand Region. There are also references to the Tonga–Kermadec Trench in the text. [14]

BARKER, P.H.
1967 Bathymetry of the Fiordland continental margin. *N.Z. Jl Sci. 10(1):* 128–37.
"Some recent observations of the bathymetry of the Fiordland continental margin are described. These, together with other data from the area, have enabled the position of the southward extension of the Alpine Fault and its relationship to the Macquarie Ridge to be more precisely assessed. It would appear that the Macquarie Ridge, the Alpine Fault and its North Island extensions, together with the Colville and Kermadec Ridges, form a connected part of the world-wide oceanic rise-ridge system."—abstr.
Includes an appendix entitled "Detailed description of the sea bed along the track GFED in Fig. 1." (from the southwest tip of South Island northwestwards to lat. 43°S., long. 163°E.) [15]
see also [401].

BARKER, P.H.; KIBBLEWHITE, A.C.
1965 Physical oceanographic data from the *Tui* Cruise, 1962. *N.Z. Jl Sci. 8(4):* 604–34.

Includes a description of the measurement of bottom topography, together with a preliminary investigation into the bottom structure. [16]

BARNETT, M.A.F. *see* [1].

BARTRUM, J.A.

1916 Concretions in the recent sediments of the Auckland Harbour, New Zealand. *Trans. Proc. N.Z. Inst. 49:* 425–8.

"During dredging operations recently carried out in St George's Bay, Auckland Harbour, a considerable number of concretions were brought up, along with fine sands and numerous molluscan shells from a depth of about 28 ft to 35 ft below mean high-water level."—abstr.

These concretions are described and suggestions made as to their origin. Photographs are included. [17]

BATH, M. *see* [358].

BELL, D.J.; GOODELL, H.G.

1967 A comparative study of glauconite and the associated clay fraction in modern marine sediments. *Sedimentology 9(3):* 169–202.

The crystallinity and mineralogy of both the glauconite and the clay fraction of samples from six contemporary marine environments were investigated by X-ray diffraction. One of the environments was the Chatham Rise, where the glauconite exhibits poor crystallinity, but the associated clay fraction is well-crystallised. [18]

BELL, J.M.

1909 The physiography of Wellington Harbour. *Trans. Proc. N.Z. Inst. 42:* 534–40.

A description of the Harbour and surrounding area giving its geological history. Includes diagrams, a chart, and photographs. [19]

BENIOFF, H.

1949 Seismic evidence for the fault origin of ocean deeps. *Bull. geol. Soc. Am. 60(12):* 1837–56.

Evidence is offered which indicates that the Tonga–Kermadec sequence of earthquakes (and others) originates on a great fault which dips under the continental masses. This fault is about 2500 km long, 900 km wide and 650 km deep. Associated oceanic deeps are surface expressions of the downwarping of the oceanic blocks, upwarping having produced islands. [20]

1951 Crustal strain characteristics derived from earthquake sequences. *Trans. Am. geophys. Un. 32(4):* 508–14.

"A procedure has been devised for determining the relative size of elastic strain-rebound increments from earthquake magnitudes."—abstr.

One of the examples used is of deep-focus earthquakes of the Tonga–Kermadec sequence. [21]

1954 Orogenesis and deep crustal structure — additional evidence from seismology. *Bull. geol. Soc. Am. 65(5):* 385–400.

A general discussion, including about 200 words on the Tonga–Kermadec region with a slight amendment to the author's conclusions in his earlier paper that there was a single major fault. He now suggests there are two faults activated by a single stress system. [22]

1955 Seismic evidence for crustal structure and tectonic activity. *Spec. Pap. geol. Soc. Am. 62:* 61–74.

Earthquakes of the Tonga–Kermadec region (among others) are analysed, and the fault system in this region termed an oceanic fault. [23]

BENSON, W.N.

1923 Palaeozoic and Mesozoic seas in Australasia. *Trans. Proc. N.Z. Inst. 54:* 1–62.

Discussion of the stratigraphic, structural and tectonic relationships of Australia and New Zealand, and the geological history of Australasia. Includes an extensive bibliography. [24]

1924 The structural features of the margin of Australasia. *Trans. Proc. N.Z. Inst. 55:* 99–137.

Briefly discusses the tectonic features and later geological history of the South Pacific area from the East Indies to New Zealand to see whether any light is thrown on the structure or history of New Zealand. Includes an extensive bibliography. [25]

1950 Meeting of the Geological Division of the Pacific Science Congress in New Zealand, February 1949. *Interim Proc. geol. Soc. Am. 1:* 11–13.

A description of the meeting and its discussions, mentioning those on submarine canyons briefly. [26]

BENSON, W.N.; RAESIDE, J.D.

1963 Tidal colks in Australia and New Zealand. *N.Z. Jl Geol. Geophys. 6(4):* 634–40.

Includes a chart showing the topography of Otago Harbour and some description of it. [27]

BIEHLER, S. *see* [378].

BORDOVSKY, O.K.

1960 K Khimii osadkoy tsentral'noi chasti Tikhogo Okeana. (On the chemistry of sediments of the central Pacific.) *Trudy Inst. Okeanol. 42:* 107–16. (In Russian).

Gives nine stations to the east and northeast of New Zealand and three stations to the west and northwest. Includes a chart. [28]

BRAMLETTE, M. *see* [344].

BRENNAN, J.A. *see* [404], [405].

BRODIE, J. W.

1952 Features of the sea-floor west of New Zealand. *N.Z. Jl Sci. Technol. B (33)5:* 373–84.

"The morphology of the floor of the Tasman Sea is described from contoured maps and echo-sounding data. Structural trends are discussed and the sedimentation pattern in the eastern Tasman Sea outlined."—abstr. [29]

1955 Sedimentation in Lyttelton Harbour, South Island, New Zealand. *N.Z. Jl Sci. Technol. B (36)6:* 603–21.

"Between 1849 and 1951 Lyttelton Harbour has shallowed in parts by as much as a fathom. Dredging has maintained an "over-deepened" channel and basin and has caused a deepening of adjacent areas. It is suggested that the sediments are derived from the Harbour catchment and have been distributed by the tidal streams. Wave base within the Harbour is about 4½ fathoms."—abstr. [30]

1957 Marine geology of the Chatham Islands area. Pp. 28–30 *in* Knox, G.A. "General account of the Chatham Islands 1954 Expedition." *Mem. N.Z. oceanogr. Inst. 2 (Bull. N.Z. Dep. scient. ind. Res. 122).*

Brief description of the morphology and distribution of the sediments, including a diagram showing an echo-sounding record across Pitt Strait and echo-sounding profiles across the shelf edge. [31]

1958a The sea floor around the Solander Islands. Pp. 430–1 *in* Harrington, H.J.; Wood, B.L. "Quaternary andesite volcanism at the Solander Islands." *N.Z. Jl Geol. Geophys. 1 (3):* 419–31.

Mainly a short description of the Solander Trough. Includes a chart. [32]

1958b Structural significance of sea floor features around New Zealand. *Geol. Rdsch. 47(2):* 662–7.

"The oceanic highs and deeps around New Zealand exhibit a marked linearity and fall into three groups whose features trend NW–SE, E–W, and NNE–SSW. These groups are recognised as structural provinces: the Northwestern, Chatham and Kermadec Provinces respectively, with both age and geographic differences."—abstr.

Includes a folded chart. [33]

1964 Bathymetry of the New Zealand region. *Mem. N.Z. oceanogr. Inst. 11:* 55 pp. *(Bull. N.Z. Dep. scient. ind. Res. 161.)*

Recounts the history of bathymetric charting of the New Zealand area, giving names of ocean floor features with profiles and a short description of many of them. Discusses the structural position of New Zealand and sedimentation in the New Zealand region (roughly equal to the area treated in

this bibliography). Contains an index, a bibliography, and is well-illustrated, including two folded charts. [34]

1965a The Fiordland shelf and Milford Sound. Pp. 15–23 *in* Skerman, T.M. (ed.) "Studies of a Southern Fiord." *Mem. N.Z. oceanogr. Inst. 17. (Bull. N.Z. Dep. scient. ind. Res. 157.)*
Description of the slope canyons, cross-shelf furrows and the submarine and subaerial morphology of Milford Sound. [35]

1965b Aotea Seamount, eastern Tasman Sea. *N.Z. Jl Geol. Geophys. 8(3):* 510–17.
"An elongate ENE–trending seamount in the New Caledonia Basin is interpreted as the product of basaltic fissure eruption. The age is unknown, but Pleistocene–Recent shallow-water echinoids have been dredged from the summit, which is 550 fathoms below sea level."—abstr. [36]

1965c The Southern Ocean: Oceanography. Pp 101–27 *in* Hatherton, T. (ed.) "Antarctica". A.H. & A.W. Reed, Wellington.
Describes sediments, morphology, structure and physical oceanography of the area from lat. 52° southwards. [37]

see also [44], [275].

BRODIE, J.W.; DAWSON, E.W.
1965 Morphology of North Macquarie Ridge. *Nature, Lond. 270(4999):* 844–5.
Echo-sounding traverses carried out by the N.Z. Oceanographic Institute illustrate that Macquarie Ridge extends from Macquarie Island to the south-western corner of the South Island. [38]

BRODIE, J.W.; HATHERTON, T.
1958 The morphology of Kermadec and Hikurangi Trenches. *Deep Sea Res. 5(1):* 18–28.
Kermadec Trench, 700 miles long, is steep and deep; Hikurangi Trench is broader and shallower. Both have benched sides, those of the Hikurangi trench being only on a small scale. The origin of these benches is discussed. New names Hikurangi Trench, Colville Ridge, and Havre Trough are proposed for bathymetric features not previously clearly defined. A folded chart is included. [39]

BROWN, D.A.; CAMPBELL, K.S.W.; CROOK, K.A.W.
1968 "The geological evolution of Australia and New Zealand". Pergamon Press, London, 409 pp.
Includes a short (400-word) description of the structure of the "sub-oceanic surroundings" of New Zealand. [40]

BRUNE, J. *see* [108].

BRUNNER, G.J.
1934 The earthquake of September 6th, 1933, and its bearing on the problem of the deep earthquake. *Trans. Am. geophys. Un. 15:* 72.
The epicentre of this earthquake was just at the northern boundary of the New Zealand region. Includes photographs of records at various world stations. [41]

1938 The deep earthquake of May 26, 1932, near the Kermadec Islands. *Beitr. Geophys. 53:* 1–64.
"On May 26, 1932, the seismographs over the earth recorded an earthquake which manifested quite unusual features. Most apparent was its extreme violence and the amazing number of distinct impulses which appear on the records." "The phases were studied in detail, the epicentre was found to be 25°S, 179°E . . . and the depth is 600± km."
—abstr. [42]

BRUUN, A.F.
1957–9 General Introduction to the Reports and List of Deep Sea Stations. *Galathea Rep. 1:* 7–48.
Tabular information is presented on stations in the Tasman Sea, west coast of New Zealand and in the Kermadec and Tonga Trenches. (Pp. 44–6). [43]

BRUUN, A.F.; BRODIE, J.W.; FLEMING, C.A.
1955 Submarine geology of Milford Sound, New Zealand. *N.Z. Jl Sci. Technol. B 36(4):* 397–410.
"The submarine topography of Milford Sound and of the adjacent shelf is described from echo-sounding records and illustrated by profiles and a contoured map."—abstr. [44]

BRUUN, A.F.; LANGER, E.; PAULY, H.
1955 Magnetic particles found by raking the deep sea bottom. *Deep Sea Res. 2(3):* 230–46.
Description of magnetic particles collected by the Challenger Expedition, 1872–76, and by the Galathea Expedition, 1950–52, those from the Galathea Expedition being termed caudaites. Includes two samples from the New Zealand region. [45]

BRYAN, W.H.
1944 The relationship of the Australian continent to the Pacific Ocean—now and in the past. *J. Proc. R. Soc. N.S.W. 78:* 42–62.
A discussion of the structure of the southwest Pacific. [46]

BUCHANAN, J.Y. *see* [411].

BUCKENHAM, M.H.
1968 Chatham Rise Sediments. *Sci. Rec. Univ. Otago 18:* 6–7.
A short article on the sediments of the Chatham Rise likely to contain minerals of economic value to New Zealand, e.g. glauconite, phosphate. Some information is given on present research projects in this field. [47]

BULLEN, K.E.
1936 On near earthquakes in the vicinity of New Zealand. *N.Z. Jl Sci. Technol. 18(6):* 493–507.
Investigation using official seismological reports, with three objects in view: 1. to seek the best possible values for the velocities and pulses and to assign a modulus of precision in each case; 2. to look for relative apparent delays in starting of the different pulses with a view to possible first estimation of crustal thicknesses near New Zealand; 3. for data and methods to assist in future investigations. The conclusion for item 2 was that the granitic layer near New Zealand is thin. [48]

1939 The crustal structure of the New Zealand region as inferred from studies of earthquake waves. *Proc. 6th Pacif. Sci. Congr. 1:* 103–10.
Discussion of the crustal structure, concluding that the lower part of the crustal layers resemble the European region, but that marked differences occur in higher layers. In particular, there is a suggestion that the intermediate layer may have a greater total thickness in the New Zealand region than in Central Europe. [49]

1955 Note on New Zealand crustal structure. *Trans. Proc. R. Soc. N.Z. 82(5):* 995–9.
Description of the structure of the New Zealand region from seismic data, and comparisons with other areas. [50]

CAMPBELL, K.S.W. *see* [40].

CAREY, S.W. (Ed.)
1958 Continental Drift; a symposium. Geology Dept. University of Tasmania, Hobart. 363 pp.
New Zealand is well represented, particularly on pp. 68–74 and 305–10. Other references may be located through the index. [51]

CASSIE, R.M.
1957 Post-war Oceanography. Pp. 262–72 *in* Callaghan, F.R. (ed.) "Science in New Zealand". A.H. & A.W. Reed, Wellington. 272 pp.
A general description of the development of oceanography in New Zealand. Includes references. [52]

CHASE, T.E. *see* [293], [295].

CHRISTIE, J.M. *see* [276].

CHRISTOFFEL, D.A.
1961a A total magnetic field survey conducted between New Zealand and Antarctica and in the Ross Sea. *Sci. Rep. Geophys. Lab. Univ. Brit. Columbia 3:* 1–26.
Description of the survey and its results, plus a

general description of geological structure in the areas studied. [53]

1961b Total magnetic measurements between New Zealand and Antarctica. *Nature, Lond. 190(4778):* 776–8.
Results of a survey of the earth's total magnetic field between New Zealand and Antarctica, measured by a proton magnetometer installed aboard HMNZS *Endeavour*. [54]

1969 Seafloor spreading in the Southwest Pacific and the Cenozoic drifting pattern of southern continents. *Trans. Am. geophys. Un. 50(4):* 185.
"This paper presents the results from interpreting the magnetic stratigraphy south of New Zealand and Antarctica, and applying the concepts of seafloor spreading to tracing the relative positions of Antarctica, Australia and New Zealand from the Upper Crataceous to the present." P. 185. [55]

see also [3]

CHRISTOFFEL, D.A.; ROSS, D.I.

1965 Magnetic anomalies south of the New Zealand Plateau. *J. geophys. Res. 70(12):* 2857–61.
"Four total magnetic field profiles between New Zealand and Antarctica are presented, and an attempt is made to analyse these in terms of the ocean floor structure."—abstr. [56]

COMITE CENTRAL D'OCEANOGRAPHIE ET D'ETUDE DES COTES

1950 Sondages dans la Fosse des Kermadec. *Bull. Inf. Com. cent. Oceanogr. Etude Cotes 2(8):* 302.
Describes and illustrates two sounding traverses. [57]

CONOLLY, J.R.

1969 Western Tasman sea floor. *N.Z. Jl Geol. Geophys. 12(1):* 310–43.
This study covers the area from the eastern Australian coast to longitude 160°E, which includes Lord Howe Island. Most of the paper is therefore considering areas outside the scope of this bibliography, however, the Lord Howe Rise is well-described, and the larger structural features of the whole Tasman Sea are included. [58]

COOKE, R.J.S.

1966 Some seismological features of the North Macquarie ridge. *Nature, Lond. 211(5052):* 953–4.
It is suggested that seismicity is definitely associated with the ridge structure. The Campbell Plateau appears to be aseismic and reflects T waves, which therefore arrive late at Macquarie Island station. [59]

1967 Observations of the seismic T phase at Macquarie Island. *N.Z.Jl Geol. Geophys. 10(5):* 1212–25.
"T phases originating in a number of regions are recorded at Macquarie Island, in particular from near Macquarie itself, and the South Pacific Cordillera shocks from these two regions originate on mid-ocean ridges. . . . The average velocity of all the phases is 1.470 km/s. . . . Reflections of the T phase are observed from the edge of the Campbell Plateau."—abstr. [60]

COPE, R.N.; REED, J.J.

1967 The Cretaceous paleogeology of the Taranaki–Cook Strait area. *Proc. Australas Inst. Min. Metall. 222:* 63–72.
"Cores of pre-Tertiary basement from 10 oil exploration wells are related petrologically to the 'axial', 'marginal' and 'shelf' facies of the New Zealand geosyncline."—abstr.
Includes a folded, coloured map showing sediments, faults, folds, etc. Evidence for a major Cook Strait fault is reviewed. [61]

COTTON, C.A.

1911 Notes on Wellington physiography. *Trans. Proc. N.Z. Inst. 44:* 245–65.
On pp. 251–4 is a description of the geological history of Port Nicholson (i.e. Wellington Harbour), including a bathymetric chart. [62]

1913 The Tuamarina Valley: a note on the Quaternary history of the Marlborough Sounds district. *Trans. Proc. N.Z. Inst. 45:* 316–22.
Contains a section entitled "Amount of subsidence (and submergence)" which includes the results of soundings. [63]

1918 Conditions of deposition on the continental shelf and slope. *J. Geol. 26(2):* 135–60.
Mainly a theoretical dissertation, with a few New Zealand examples. [64]

1921 The warped land-surface on the south-eastern side of the Port Nicholson depression, Wellington, New Zealand. *Trans. Proc. N.Z. Inst. 53:* 131–43.
Includes a history of the development of Wellington Harbour. [65]

1949 Plunging cliffs, Lyttelton Harbour. *N.Z. Geogr. 5(2):* 130–6.
Unlike most other harbours of a similar size and land penetration, Lyttelton Harbour is subject to the effects of powerful ocean swell throughout its length up to its head. The peculiar conditions responsible are shown to be the abrupt margins of the harbour—referred to as plunging cliffs—and the transversely flat profile of the harbour bottom. [66]

1951a Accidents and interruptions in the cycle of marine erosion. *Geogrl. J. 117(3):* 343–9.
Effects of progradation on a drowned coast are seen on the west of the stable North Auckland Peninsula, and on the drowned Bay of Plenty coast. Deals theoretically with continental shelves and sediment movement. [67]

1951b Redeposition theory of sedimentation. *N.Z. Jl Sci. Technol. B 32(5):* 19–25.
A general discussion, with references to the east coast of New Zealand. [68]

1953 Submarine canyon hypothesis. *N.Z. Sci. Rev. 11(9):* 110–13.
Considers the contemporary theories for the origin of submarine canyons, with particular reference to those around New Zealand. Cotton favours the theory that New Zealand submarine canyons particularly have been formed tectonically. [69]

1958 The rim of the Pacific. *Geogrl. J. 124(2):* 223–31.
A discussion of the topography and history of the Pacific with several references to features in the New Zealand region. [70]

1962 Low sea levels in the late Pleistocene. *Trans. R. Soc. N.Z. 1(16):* 249–52.
General discussion with examples, one in New Zealand—off Cape Campbell. One conclusion is the theory that the absence of a submarine bench in the Pacific is probably attributable to the shortness of the time sea level remained at these low stands. [71]

1968 Relation of the continental shelf to rising coasts. *Geogrl. J. 134(3):* 382–9.
Discusses three theories to explain the juxtaposition of an actively rising coast and an apparently stable marginal seafloor. The theories are illustrated by references to the east coasts of the North and South Islands. [72]

COUPER, R.A.

1951 Microflora of a submarine lignite from Toetoes Bay, near Bluff, New Zealand. *N.Z. Jl Sci. Technol. B 33(3):* 179–86.
The lignite is thought to be derived from a submarine outcrop. [73]

COWAN, M.; HATHERTON, T.

1968 Gravity surveys in Wellington and Hutt Valley. *N.Z. Jl Geol. Geophys. 11(1):* 1–15.
"Gravity observations in Wellington, Hutt Valley and Wellington Harbour are reported. Cross-sections are given and alluvium thicknesses estimated. Between 3,000 and 4,000 ft of light sediments overlie greywacke basement in Wellington Harbour off Ngauranga Gorge."—abstr. [74]

CRAWFORD, J.C.

1873 Port Nicholson an ancient freshwater lake. *Trans. Proc. N.Z. Inst. 6:* 290–4.

Discussion of this theory, with evidence (e.g. borings taken from the wharf, which show the remains of land vegetation at a considerable depth). [75]

1874a Did the great Cook Strait River flow to the north-west or to the south-east? *Trans. Proc. N.Z. Inst. 7:* 448–51.
Evidence is provided, including soundings, suggesting that Cook Strait was formed by a river whose tributaries form the Marlborough Sounds, and which was the outlet for the freshwater lake of Port Nicholson. The river is considered to have flowed southeastwards. [76]

1874b Some further proofs as to the ancient Cook Strait river and the harbour of Wellington as a freshwater lake; also a consideration of the date at which the islands were united. *Trans. Proc. N.Z. Inst. 7:* 451–3.
Includes more evidence, such as the presence of moas in both islands, that North and South Island were once joined. [77]

CROOK, K.A.W. *see* [40].

CULLEN, D.J.

1962a The influence of bottom sediments upon the distribution of oysters in Foveaux Strait, New Zealand. *N.Z. Jl Geol. Geophys. 5(2):* 271–5.
"Investigation of sediments in Foveaux Strait has revealed a clear correlation between the distribution of the oyster beds and the occurrence of medium to fine sandy pebble gravel."—abstr. [78]

1962b The significance of a glacial erratic from the Chatham Rise, east of New Zealand. *N.Z. Jl Geol. Geophys. 5(2):* 309–13.
"The recognition of an undoubted glacial erratic within a heterogeneous collection of rock fragments dredged from the Chatham Rise raises the possibility of extensive and long-continued deposition of rock debris by drifting icebergs in this area. The specimen is a red feldspathic sandstone of a type not known in New Zealand but showing some resemblance to rocks of the Beacon sandstone of Antarctica."—abstr. [79]

1965 Autochthonous rocks from the Chatham Rise, east of New Zealand. *N.Z. Jl Geol. Geophys. 8(3):* 465–74.
Rocks obtained from Chatham Rise are considered to occur *in situ,* or to be derived from sources nearby. Their significance with respect to the structure of Chatham Rise is briefly discussed. [80]

1966a Fluviatile run-off as a factor in the primary dispersal of submarine gravels in Foveaux Strait, New Zealand. *Sedimentology 7:* 191–201.
Submarine gravels are thought to have been initially deposited as fluviatile sediments during a former period of low sea level. The size of water catchment and source areas on opposite sides of the Strait is considered to be an important factor, regulating the proportions of the various rock types. [81]

1966b A series of coloured charts of New Zealand coastal sediments. *Inf. Ser. N.Z. Dep. scient. ind. Res. 56:* 1–11.
A description of the coloured charts being issued by the N.Z. Oceanographic Institute, on a scale of 1:200,000, to show the distribution of sediment types in the coastal regions round New Zealand. As the method of presenting data on these charts is in many respects unique, a brief explanation is given of the principles used in compilation and the problems encountered. [82]

1967a The Antipodes Fracture Zone, a major structure of the South-west Pacific. *N.Z. Jl. mar. Freshwat. Res. 1(1):* 16–25.
"The steep Antipodes scarp . . . south-east of New Zealand, is attributable to dextral tear faulting within a north-east/south-west belt, the Antipodes Fracture Zone. . . . The Waipounamu Fracture separates the Campbell Plateau and Chatham Rise from mainland New Zealand. The origin of these fracture zones is linked with that of the parallel Alpine Fault of South Island."—abstr. [83]

1967b Island arc development in the South-west Pacific. *Tectonophysics 4(2):* 163–72.
The main ridges on the South-west Pacific are interpreted as island arcs of geosynclinal or volcanic origin. The structural evolution of the South-west Pacific is discussed. [84]

1967c A note on the regional structure of the South-west Pacific. *N.Z. Jl Sci. 10(3):* 813–15.
"Bathymetric, seismic and volcanic data indicate that the Kermadec and Colville Ridges, north of New Zealand, and the Macquarie Ridge, between New Zealand and Antarctica, are a continuation of the West Pacific island arc system, and not sections of a mid-oceanic ridge."—abstr. [85]

1967d Submarine evidence from New Zealand of a rapid rise in sea level about 11,000 B.P. *Palaeogeogr. Palaeoclim. Palaeoecol. 3(3):* 289–98.
The proximity of a 35-fathom (64m) submerged shoreline, approximately 11,000 years old; an, 8-fathom (14m) submarine peat horizon, dated at 9,300 ± 80 years B.P., in the vicinity of Foveaux Strait; and published radio-carbon analyses of peat and shell from terrestrial sites elsewhere in New Zealand, indicate a rapid rise of sea level between these two dates. A generalised curve depicting sea level fluctuation is constructed. [86]

1967e Mantle convection and sea-floor spreading in the South-west Pacific. *Nature, Lond. 216(5113):* 356–7.
Presents further arguments in favour of transcurrent fault movement on the sub-Antarctic Slope. [87]

1967f The age of glauconite from the Chatham Rise, east of New Zealand. *N.Z. Jl mar. Freshwat. Res. 1(4):* 399–406.
"Radiometric analysis indicates that a granular variety of glauconite, widespread on the Chatham Rise, is derived from late Tertiary sediments. Other forms of glauconite, associated with pumice, phosphorite nodules, and glacially transported erratic blocks, are of Quaternary age. These are quantitatively unimportant, and may have originated as a result of redistribution of components from the older glauconite."—abstr. [88]

1967g The submarine geology of Foveaux Strait. *Mem. N.Z. oceanogr. Inst. 33:* 67 pp. *(Bull. N.Z. Dep. scient. ind. Res. 184).*
Describes geomorphology, sediments and submarine gravels which were deposited from southward flowing rivers during a period of lower sea level. [89]

1968 Movement of sialic blocks oblique to the direction of sea floor spreading. *Earth Planet. Sci. Lett. 5(2):* 123–6.
"Structural studies in the South-west Pacific provide a basis for suggesting the possibility of migration of continental sialic blocks oblique to the direction of sea-floor spreading as indicated by linear magnetic anomaly patterns."—abstr. [90]

1969a Strike-slip displacement of mid-ocean rises and the concept of mid-ocean rise migration. *J. geophys. Res. 74(6):* 1409–12.
"The evidence for multiple strike-slip displacements of the mid-ocean rise system in the South-west Pacific is questioned. The concept of mid-ocean rise migration depending on such evidence is discussed, and it is shown that interpretations involving large-scale lateral migration (as distinct from axial prolongation) of mid-ocean rises require careful scrutiny."—abstr. [91]

1969b Quaternary volcanism at the Antipodes Islands: its bearing on structural interpretation of the South-west Pacific. *J. geophys. Res. 74(17):* 4213–20.
Tear-faulting is preferred to rifting as the dominant movement along the Antipodes Fracture Zone as a result of study of Quaternary volcanism at the Antipodes Islands. This is an important issue in determining the direction of migration of sialic crustal blocks in the South-west Pacific during Cenozoic times. [92]

CULLINGTON, A. L.; HANLEY, A.
1964 Magnetic surveys of the coasts of New Zealand. *N.Z. Jl Geol. Geophys. 7(4):* 766–95.
Includes a brief account of some early magnetic observations in this area, from Cook (1769–70) to 1873, and results of other surveys from 1955 to 1961. [93]

DAVID, T.W.E.
1913 Discovery by the Australasian Antarctic Expedition of important submarine banks. *Geogrl J. 41(5):* 461–3.
A bank was discovered 60 miles to the north of Macquarie Island, rising from depths of 1750 fms to 570 fms. [94]

DAWSON, E.W. *see* [38].

DE JERSEY, N.J.
1946 Seismological evidence bearing on crustal thickness in the South-west Pacific. *Pap. Dep. Geol. Univ. Qd. n.s. 3(2):* 1–18.
Based on a study of seismograms recorded at the University of Queensland Seismological Station. The methods used to determine structure were observations of the amplitude ratio **PP/P** and observations of the velocities and periods of surface waves. Half of the paper is concerned with crustal thickness in the area to the east of Australia, and the conclusion is that a continental structure is indicated, with a crustal thickness of 25 km. [95]

DENHAM, R.N. *see* [255].

DIBBLE, R.R. *see* [4].

DICKENSON, G.E.; ADAMS, R.D.
1967 A statistical survey of earthquakes in the main seismic region of New Zealand. Part 3. Geographical distribution. *N.Z. Jl Geol. Geophys. 10(4):* 1040–50.
"Maps are presented showing contours of frequency of earthquake occurrence in the main seismic region of New Zealand from 1942 to 1961. Shallow, intermediate and deep earthquakes are considered separately; the deeper earthquakes have a more regular and concentrated distribution, and their highest concentration is to the north-west of that of the shallower shocks. Close relationships between the patterns of seismicity and isostatic gravity anomalies are not apparent."—abstr. [96]

DICKINSON, W.R.; HATHERTON, T.
1967 Andesite volcanism and seismicity around the Pacific. *Science, N.Y. 157(3790):* 801–3.
Includes reference to the Tonga–Kermadec arc, with a diagram. [97]

DILL, R.F. *see* [372].

DORMAN, J. *see* [14].

DRAKE, C.L.
1969 Continental margins. *Geophys. Monogr.* 13: 549–56.
Includes 200 words on the Tonga–Kermadec arc. [98]

DUDA, S.J.
1965 Secular seismic energy release in the circum-Pacific belt. *Tectonophysics 2(5):* 409–26.
Includes earthquakes in the New Zealand Region. [99]

DUNCAN, A.R.; PANTIN, H.M.
1969 Evidence for submarine geothermal activity in the Bay of Plenty. *N.Z. Jl mar. Freshwat. Res. 3:* 602–6.
"Gas bubbles rising to the sea surface and unusual scattering zones on echo-sounding records provide evidence for areas of submarine geothermal activity near Whale Island and White Island."—abstr. [100]

DUNCAN, J.K.
1964 Submarine sediment data collection and management at the U.S. Naval Oceanographic Office. *Tech. Rep. oceanogr. Off., Wash. TR–150:* 62 pp.
Contains a folded chart showing sediment samples from the South-west Pacific filed in U.S. Naval Oceanographic Office on 1st January 1963. [101]

EADE, J.V.
1967 A checklist of Recent New Zealand Foraminifera. *Mem. N.Z. oceanogr. Inst. 44:* 70 pp. *(Bull. N.Z. Dep. scient. ind. Res. 182.).*
Lists all Foraminifera recorded from the New Zealand Plateau giving, in each case, the name, original reference, all references to New Zealand Recent occurrences and taxonomic notes. [102]

EIBY, G.A.
1958 The structure of New Zealand from seismic evidence. *Geol. Rdsch. 47:* 647–62.
"The New Zealand region is characterised by a crust of 20–25 kms in thickness, and a sub-crust extending to at least 370 kms. These are separated by a transitional layer extending from the base of the crust to a depth of about 100 kms. The crust is divided into blocks by steeply dipping faults. Some blocks are seismically active and others stable."—abstr. [103]
1964 The New Zealand subcrustal rift. *N.Z. Jl Geol. Geophys. 7(1):* 109–33.
Includes charts and discussion of earthquakes with submarine foci. [104]
1968 An annotated list of New Zealand earthquakes, 1460–1965. *N.Z. Jl Geol. Geophys. 11(3):* 630–47.
"New Zealand earthquakes known to have had a large felt area or to have caused damage are listed chronologically. Brief descriptive notes, including epicentres and magnitudes when known, and maximum reported intensities are given for each earthquake."—abstr.
Includes several submarine earthquakes, particularly in Cook Strait. [105]

ESTCOURT, I.N.
1968 A Note on the fauna of a ripple-marked sandy sediment in western Cook Strait, New Zealand. *N.Z. Jl mar. Freshwat. Res. 2(4):* 654–8.
Includes a description of the sediment at the station, at 40°53.6′S, 174°26.8′E, depth 140m, with photographs of the ripple-marked seabed. [106]

EVISON, F.F.
1968 Active regions of the Southwest Pacific. *Can. J. Earth Sci. 5(4):* 1045–9.
"The south-west quadrant of the Pacific, from southern New Zealand to central New Guinea, contains eight distinct active regions of the asymmetric type (i.e. continental margins and island arcs). These regions vary widely in size, shape, and geodynamic character. Four of them face towards and four away from the Pacific Ocean; hence the concept of circum-Pacific active belt is only partly applicable . . . The South-west Pacific is a severe testing ground for hypotheses concerned with large-scale processes and structures in the upper mantle and crust."—abstr. [107]

see also [168], [409].

EWING, J. *see* [110], [234].

EWING, M. *see* [210], [234], [311].

EWING, M.; BRUNE, J., KUO, J.
1962 Surface-wave studies of the Pacific crust and mantle. *Geophys. Monogr. 6:* 30–40.
A general study of the whole Pacific, including the following statement about the New Zealand region: "Dispersion curves for the Melanesian–New Zealand paths are markedly different from those for the Pacific Basin proper, and suggest a thicker crust and lower velocities in the upper mantle." — p. 37. [108]

EWING, M.; HEEZEN, B.C.
1956 Some problems of Antarctic submarine geology. *Geophys. Monogr. 1:* 74–81.
Includes information on the New Zealand region in two charts as well as briefly in the text, with a short note on the Macquarie Island area. [109]

EWING, M.; HOUTZ, R.; EWING, J.
1969 South Pacific sediment distribution. *J. geophys. Res. 74(10):* 2477–93.
"Seismic profiler data from about 200,000 km of traverse in the South Pacific are used to develop

a sediment isopach map of the area."—abstr. Areas to the north and east of New Zealand are well covered, particularly the Hikurangi Trench. [110]

EWING, W.M. *see* [402].

FAIRBRIDGE, R.W.

1957 Continental margin of the Southwest Pacific. Advancing or retreating? *Proc. 9th Pacif. Sci. Congr. 12:* 69. Abstract only. Attempts to explain the nature of the fairly deep marine basins lying between Australia and the Andesite line. [111]

1962 Basis for submarine nomenclature in the South-west Pacific Ocean. *Dt. hydrogr. Z. 15(1):* 1–15. Gives the history of names of features including a "Table of principal exploring and surveying voyages in the Melanesian region" and an extensive bibliography. [112]

FAIRBRIDGE, R.W.; VAN DER LINDEN, W.J.M.

1966 Tasman Sea. Pp. 898–902 *in* Fairbridge, R.W. (ed.), "Encyclopedia of Oceanography". Reinhold Pub. Corp. New York. xiii and 1021 pp. Defines the Tasman Sea and briefly describes its bathymetry, sediments and structure. [113]

FARQUHAR, H.

1966 The New Zealand Plateau. *Trans. Proc. N.Z. Inst. 39:* 135–7. A description of the New Zealand Plateau from soundings made by HMS *Penguin* and other vessels in connection with the laying of the Pacific telegraph-cable from British Columbia to New Zealand and Australia. [114]

FARQUHAR, O.C.

1966 Seamounts, ancient and modern. *New Scient. 29 (487):* 698–702. Ancient seamounts exist in Northland, New Zealand and these are described, together with brief information on the structural history of the New Zealand region in relation to them. [115]

FERGUSSON, G.J.; RAFTER, T.A.

1959 New Zealand ^{14}C age measurements — 4. *N.Z. Jl Geol. Geophys. 2(1):* 208–41. A list of samples dated in the Nuclear Sciences laboratory. Includes three submarine samples from Cook Strait and Hawke Bay. [116]

FERRAR, H.T.

1925 Soundings in the seas around New Zealand. *N.Z. Jl Sci. Technol. 7(5):* 295–7. A very preliminary description, posing many questions now answered, e.g. "Does the Kermadec Deep extend southwards past the East coast earthquake centre and cut off the Chatham Islands from New Zealand?" Generally provides more questions than information, but does include a map showing soundings taken around New Zealand, and a few submarine contours. [117]

FINLAY, H.J. *see* [315].

FISHER, R.L.

1954 On the soundings of trenches. *Deep Sea Res. 2(1):* 48–58. Results of extensive bathymetric investigations of the Tonga and Japan Trenches made by the Scripps Institution of Oceanography research vessels *Horizon* and *Spencer F. Baird* during 1952–53. [118]

1955 The trenches of the Pacific. *Scient. Am. 193(5):* 36–41. Description, including diagrams and profiles, of the Tonga–Kermadec Trench. Includes theories of its history. No bibliography. [119]

see also [339].

FISHER, R.L.; HESS, H.H.

1963 Trenches. Pp. 411–36 *in* Hill, M.N. (ed.) "The sea. 3." Interscience, New York. Includes material on the Tonga–Kermadec Trench. [120]

FLEMING, C.A.

1949 The geological history of New Zealand (with reference to the origin and history of the fauna and flora). *Tuatara 2(2):* 72–90. A description of the geological history of the New Zealand area. [121]

1950 The geology of the Mokohinau Islands, North Auckland. *Trans. Proc. R. Soc. N.Z. 78 (2 & 3):* 255–68. Includes a description of the morphology of the seafloor surroundings the islands, including a profile. Also relates the islands structurally to the other areas of New Zealand. [122]

1951 Some post-Miocene changes in New Zealand environments. *N.Z. Sci. Rev. 9(10):* 166–71. A paper presented to a symposium on present distribution of New Zealand plants and animals as affected by geological factors, contributing the historical background, from the geological viewpoint. Includes a bathymetric map, giving names of submarine features, some used here for the first time. [123]

1952a A Foveaux Strait Oyster-bed. *N.Z. Jl Sci. Technol. B34(2):* 73–83. "The substratum and animal community of a Foveaux Strait oyster-bed are described on the basis of material obtained during a day's dredging the east bed, north of Ruapuke."—abstr. [124]

1952b The seas between. Pp. 102–26 *in* Simpson, F.A. (ed.) "The Antarctic Today". New Zealand Antarctic Society, Wellington. 389 pp. A description of the morphology, structure, submarine processes and hydrology of the Southern Ocean, including the south part of the New Zealand area. [125]

1952c The White Island Trench: a submarine graben in the Bay of Plenty, New Zealand. *Proc. 7th Pacif. Sci. Congr. 3:* 210–13. White Island Trench is a submarine depression, 3,000 feet deep, traced northeast from the Bay of Plenty to 850 fms near White Island. The Trench is a "back-deep" on the inner side of the East Cape–Kermadec–Tonga welt and foredeep. It is homologous with the Taupo Graben of the North Island, and is marked by a line of recent volcanoes. Includes two charts. [126]

1953 The geology of the Snares Islands, Part 1. General Geology. *Bull N.Z. Dep. scient. ind. Res. 13:* 27 pp. (Cape Expedition Series.) A brief description of the submarine geology of New Zealand sub-antarctic seas, including a chart. [127]

1954 Ecology of the Sub-antarctic Islands: geological history. *Proc. N.Z. ecol. Soc. 2:* 16. A short description of the geological history of Campbell Islands and the Auckland Islands. [128]

1957 Sea lions as geological agents. *J. sedim. Petrol. 21 (1):* 22–5. Numbers of water worn basalt pebbles probably obtained from marine locations around the Auckland Islands and carried in the stomachs of sealions, are found in the surface and embedded in recent peat deposits at the Snares Islands. [129]

1962 New Zealand biogeography; a paleontologist's approach. *Tuatara 10(2):* 53–108. Includes a discussion of the structure of the New Zealand region and its history. [130]

1963 A moa-bone from the sea-floor in Cook Strait. *Rec. Dom. Mus. Wellington 4(16):* 231–3. "An imperfect tibia of *Anomalopteryx oweni* (Haast) (?), trawled from 50 fms off Kapiti Island is thought to be the first fossil record of a terrestrial animal on the New Zealand continental shelf, an area that was probably land in at least some of the glacial stages of the Pleistocene."—abstr. [131]

1967 Biogeographic change related to Mesozoic orogenic history in the South-west Pacific. *Tectonophysics 4(4–6):* 419–27. Though mainly concerned with fossil evidence, includes a discussion of Mesozoic history in New

Zealand and theories concerning it. [132]

1969a The Mesozoic of New Zealand: a chapter in the history of the circum-Pacific mobile belt. *Proc. geol. Soc. 1655:* 101–3.
Abstract of a paper given at a meeting. Mainly a discussion of the New Zealand geosyncline and its relation to Pacific structure. [133]

1969b Venus, Mars and Jupiter the bringer of jollity; presidential address. *Aust. J. Sci. 32(3):* 68–78.
A general discussion of the development of some branches of science in New Zealand, including a description of seafloor spreading in the New Zealand area. [134]

see also [44], [315].

FLEMING, C.A.; HUTTON, C.O.

1949 Notes on the geology of Kapiti Island, Cook Strait, New Zealand. *Trans. Proc. R. Soc. N.Z. 77(4):* 456–68.
"The submarine topography suggests that a ridge at one time extended from Kapiti to the eastern Marlborough Sounds and that a continuous tectonic scarp joined the east coast of Kapiti and the west side of the Wairau Plain."—abstr. [135]

FLEMING, C.A.; REED, J.J.

1951 Mernoo Bank, east of Canterbury, New Zealand. *N.Z. Jl Sci. Technol. B 32(6):* 17–30.
"Mernoo Bank, 90 miles east of the South Island of New Zealand, rises from depths greater than 200 fms to an oval flattish summit occupying 800 square miles of sea-bottom shallower than 100 fms. . . . The bank is interpreted as a tectonic dome on the western end of the Chatham Rise." —abstr.
Includes some sediment analyses. [136]

FRIIS, H.R. (Ed.).

1967 "The Pacific Basin: a history of its geographical exploration". American Geographical Society, New York. 457 pp.
A scholarly work, especially useful in the context of marine geology for its description of the South Pacific expeditions, e.g. the *Challenger* Expedition. Contains extensive bibliographies and charts. [137]

FURKERT, F.W.

1947 Westport Harbour. *Trans. R. Soc. N.Z. 76(3):* 373–402.
Description of depths, silting and dredging operations in Westport Harbour. Between 1913 and 1947, 19,700,000 cubic yards of material have been dredged out of the Harbour and dumped to leeward of the entrance. Includes charts and diagrams. [138]

GALE, A.W. *see* [169], [170].

GASKELL, T.F.

1957 Seismic results in relation to the Andesite line. *Proc. 9th Pacif. Sci. Congr. 12:* 66–8.
A general description, including examples for the northern part of the New Zealand area. [139]

GASKELL, T.F. (Ed.)

1967 "The earth's mantle". Academic Press, New York. 509 pp.
Includes information on the New Zealand region in charts (*see* pp. 79, 81, 128, 165, 188, 191, 484–5). [140]

GEE, R.D. *see* [429]

GERARD, V.B.

1953 Aeromagnetic observations over the Banks Peninsula area and the Mernoo Bank. *N.Z. Jl Sci. Technol. B 35(2):* 152–60.
"Anomalies indicate that Mernoo Bank is predominantly non-magnetic and therefore quite different from Banks Peninsula."—abstr.
Also includes some description of Lyttelton and Akaroa Harbours. [141]

GERARD, V.B.; LAWRIE, J.A.

1955 Aeromagnetic surveys in New Zealand, 1949–1952. *Geophysics Mem. N.Z. Dep. scient. ind. Res. 3:* 19 pp.
The text describes methods and procedure, but accompanying it are nine charts in which the surveys include marine areas adjacent to the coast. [142]

GILL, E.G.

1950 Some unusual shore platforms near Gisborne, North Island, New Zealand. *Trans. R. Soc. N.Z. 78(1):* 64–8.
There is evidence for eustatic level lower than the present sea level in the continuation of the courses of streams across the continental shelf. [143]

1968 Quaternary shore lines research in Australia and New Zealand. *Aust. J. Sci. 31(3):* 106–11.
Contains a reference to Capricorn Seamount (Tonga Trench) in relation to the rise and fall of sea level in the Australian and New Zealand region, and to the Campbell Plateau. The majority of the paper concerns Australia. [144]

GILL, P.J.; MACDONALD, W.J.P.

1967 Large scale earth resistivity experiment in New Zealand. *Nature, Lond. 216:* 1195–7.
Discusses the difference between the patterns around the north electrode (in good contact with the sea) and the Benmore electrode (in the middle of the South Island). [145]

GILMOUR, I.A. *see* [166].

GILMOUR, R.

1953 Submarine investigations and borings, West Tamaki Strait, Motukorea area. *N.Z. Engng 8(6):* 201–4.
This paper deals with investigations to explore the strata below the seabed in the Waitemata Harbour, and in particular the area surrounding Motukorea (Brown's Island) and the east and west Tamaki Straits. Describes in some detail the rigs used by the Drainage Board in these investigations.
Gives the geological background and the results of the survey. [146]

GILPIN-BROWN, J.B. *see* [401].

GIRDLER, R.W.

1968 Statistical analyses of terrestrial heat flow and seismicity of the Pacific Ocean. *Geophys. Monogr. 12:* 35–9.
"Correlations are drawn between depth of seismicity, satellite gravity data, heat flow, and various tectonic features of the Pacific Ocean."—abstr. Includes references to the New Zealand region both in the text and in accompanying charts. [147]

GLAESSNER, M.F.

1952 The geology of the Tasman Sea. *Aust. J. Sci. 14(4):* 111–14.
A summary of theories on the historical geology and topography of the Tasman Sea. Also includes his own speculative theories. Comes to the conclusion "It is clear that only future oceanography and geophysical and geological work in the Tasman Sea area can lead to firm conclusions about its geological history and constitution." p. 114. [148]

1953 Recent advances in the study of mountain building in the South-west Pacific region. *Proc. 8th Pacif. Sci. Congr. 2A:* 700–5.
Includes treatment of submarine structures around New Zealand, and reference to and discussion of items [20], [29], [123]. [149]

GOLDBERG, E.D. *see* [344].

GOODELL, H.G.

1966 Antarctic marine geology. *Geotimes 11(4):* 24–6.
A short description of the *Eltanin* cruises, mostly concerning Antarctica, but with some information on the New Zealand region, including two charts.
see also [18]. [150]

GRANT-TAYLOR, T.L.

1966 Cook Strait. Pp. 394–7 *in* McLintock. A.H. (ed.) "An Encyclopaedia of New Zealand", Vol. 1. Govt. Printer, Wellington. xxxi + 928 pp.
A general account, including a description of the

floor of Cook Strait, its formation, major faults and two charts. [151]

GRANT-TAYLOR, T.L.; HORNIBROOK, N.deB.

1964 The Makara faulted outlier and the age of Cook Strait. *N.Z. Jl Geol. Geophys. 7(2):* 299–313.
Includes discussion and several charts showing the geological history of Cook Strait. [152]

GREAT BRITAIN. HYDROGRAPHIC DEPARTMENT.

1903–1949 List of oceanic depths. London. Admiralty Lists of depths and nature of bottom. Volumes for the following years include stations in the New Zealand area:
1903 (Vol. 194), 1904 (Vol. 196); 1907 (Vol. 212), 1912 (Vol. 245), 1913 (Vol. 248), 1914 (Vol. 251), 1917 (Vol. 259), 1919 (Vol. 265), 1920 (Vol. 269), 1921, 1922, 1923 (Vol. 275), 1924 (Vol. 270), 1926 (Vol. 284), 1927 (Vol. 286), 1928 (Vol. 289), 1929, 1930 (Vol. 299), 1932 (Vol. 317), 1935 (Vol. 324), 1936 (Vol. 327), 1938 (Vol. 331), 1947, 1948 (Vol. 456).
Continues from Great Britain. Hydrographic Office. [153]

1946 "The New Zealand Pilot, comprising the coasts of the North and South Islands of New Zealand, Stewart Island and adjacent islands, Kermadec, Chatham, Bounty, Antipodes, Auckland and Campbell Islands." (11th Ed.) Admiralty, London. 44 pp.
Describes features of the coasts and harbours for navigational purposes including depths, hazards, dangers, etc. [154]

GREAT BRITAIN. HYDROGRAPHIC OFFICE.

1888–1902 List of oceanic depths . . London.
Admiralty lists of depths and nature of the bottom for stations in the New Zealand area. Volumes for the years 1888, 1890, 1892, 1893, 1894, 1895, 1896, 1897, 1898, 1899, 1901 1902.
Continues as Great Britain. Hydrographic Department. [155]

1889 "Search for reported dangers in the South Pacific between New Zealand and the Tonga Islands made by Captain Pelham Aldrich, in H.M. Surveying Ship "Egeria", 1888; with lists of soundings and temperatures . . . remarks on Sunday [Raoul] Island, Kermadec Group, soundings between New Zealand and Tasmania." Admiralty, London. 28 pp.
Several sounding surveys were made to locate specific reported dangers, only one of which (Pelorus Reef) was found. There are remarks on the deepest sounding obtained (4,428 fms), description of the surveys, tables of soundings describing also the nature of the bottom, and tables of temperature observations at various depths. [156]

GREEN, R.

1962 Tasmanian records of earthquake T-phases from New Zealand. *N.Z. Jl Geol. Geophys. 5(2):* 322–30.
"Some 15–20 minutes after the arrival in Tasmania of the P-wave from earthquakes, especially in south-west New Zealand and Macquarie Island, the low velocity (1.47 km/sec.) T-phase arrives. The T-phase travels over the intervening ocean through a very efficient wave-guide as an acoustical wave and at the continental shelf generates a number of transformed waves."—abstr. [157]

see also [347].

GREGG, D.R.

1958 Reports of a submarine eruption off New Zealand in 1877. *N.Z. Jl Geol. Geophys. 1(3):* 459–60.
"Submarine eruptions were reported on 1 Dec. 1877 near East Cape. They were probably not of volcanic origin, and may have been a tsunami." —abstr. [158]

GREVE, Sv.

1938 Echo soundings: an analysis of the results. *Dana Rep. 14:* 1–25.
Short description of the features of each area, and morphological profiles drawn from the soundings. The New Zealand region appears in three sections —14. Noumea to Auckland; 15. Auckland to east coast of New Zealand to Wellington; 16. Wellington via Tasman Sea to Newcastle, Australia. [159]

GREVE, Sv.; SPARCK, R.

1956 "The Galathea Deep Sea Expedition, 1950–52, described by members of the Expedition." Allen and Unwin, London. 296 pp.
Includes material on the New Zealand area. [160]

GRIM, P.J.

1969 Heat flow measurements in the Tasman Sea. *J. geophys. Res. 74(15):* 3933–4.
"In September 1967, 14 ocean bottom heat flow measurements were attempted in the Tasman Sea from the ESSA Coast and Geodetic Survey ship *Oceanographer*. Seven of these are considered successful and are presented in Table 1 and Fig. 1." —abstr. [161]

GRINDLEY, G.W.

1957 Mesozoic orogenies in New Zealand. *Proc. 9th Pacif. Sci. Congr. 12:* 71–5.
Abstract only. History of the New Zealand region in Mesozoic times. Includes four charts. [162]

GRINDLEY, G.W.; HARRINGTON, H.J.

1957 Late Tertiary and Quaternary volcanicity and structure in New Zealand. *Proc. 9th Pacif. Sci. Congr. 12:* 198–203.
Abstract only. Includes discussion of the structure of submarine features, e.g. Tonga–Kermadec area. Five charts. [163]

GUTENBERG, B.; RICHTER, C.F.

1954 "Seismicity of the earth and associated phenomena." Princeton University Press, Princeton, N.J. 310 pp.
Includes a description of the New Zealand area and three useful charts. There are several other references to the New Zealand area under Kermadec and New Zealand. (*see* index, p. 309). [164]

HAAST, J.

1868 On the recent earthquakes on land and sea. *Trans. Proc. N.Z. Inst. 1:* 147.
Description of an earthquake to the northeast of New Zealand in 1868. [165]

HAGYARD, T.; GILMOUR, I.A.; MOTTRAM, W.D.

1969 A proposal to remove sand bars by fluidisation. *N.Z. Jl Sci. 12:* 851–64.
"A method is proposed whereby fluidisation is utilised to intercept coastal movement of sand bars in harbour entrances. The results of preliminary design calculations are given, together with approximate coasts for the harbour of Westport, New Zealand."—abstr. [166]

HAMILTON, R.M.

1968 Reply to R.P. Suggate's letter (1). *N.Z. Jl Geol. Geophys. 11(5):* 1277.

see also [173], [175], [386]. [167]

HAMILTON, R.M.; EVISON, F.F.

1967 Earthquakes at intermediate depths in southwest New Zealand. *N.Z. Jl Geol. Geophys. 10(6):* 1319–29.
Earthquake activity in the southern seismic region of New Zealand extends to intermediate depths of about 103 ± 5 km. The area is classed as an active margin between the New Zealand continental mass and the Tasman Sea. The Tasman margin is fully discussed. [168]

HAMILTON, R.M.; GALE, A.

1968 Seismicity and structure of North Island, New Zealand. *J. geophys. Res. 73(12):* 3859–76.
"The configuration of New Zealand's major seismic zone, which occurs with other geophysical features in the pattern that is typical of active continental margins and island arcs, is explained using computer-determined hypocenters for approximately 500 earthquakes since 1962. . . . The structure of the North Island region is similar in some respects to that of the Tonga–Kermadec region to the northeast, but the two regions are separated by a gap in seismicity, a change in trend and a dis-

continuity in the oceanic trench system."—abstr. Supports Hamilton & Evison's and Summerhayes' interpretation of the structure off the Fiordland coast. [169]

1969 Thickness of the mantle seismic zone beneath the North Island of New Zealand. *J. geophys. Res. 74 (6):* 1608–13.
Includes general discussion of the New Zealand Region and references to Hikurangi Trench. [170]

HANLEY, A. *see* [93].

HARRINGTON, H.J.

1965 Geology and geomorphology of Antarctica. Pp. 1–71 *in* Mieghem, J. Van, Van Oye, P. "Biogeography and ecology in Antarctica". W. Junk, The Hague.
Includes a description of the seafloor around the Subantarctic Islands, and its structure. Discusses palaeogeography of an area including part of the New Zealand region. [171]

see also [163].

HATHERTON, T.

1952 Gravity profiles across the Canterbury Plains. *N.Z. Jl Sci. Technol. B 34(1):* 13–20.
"A reconnaissance gravity survey of the Canterbury Plains has revealed that the Canterbury Plains syncline is modified by the Kermadec Trench to the northeast and the Bounty Basin to the southeast. The axis of the syncline rises to [within] about 3,300ft of the land surface due west of Banks Peninsula".—abstr. [172]

1967a Total magnetic force measurements over the North Macquarie Ridge and Solander Trough. *N.Z. Jl Geol. Geophys. 10(5):* 1204–11.
"Associated with the North Macquarie Ridge is a positive total magnetic force anomaly of 500–600 gammas amplitude and between 5 and 30 kilometres in width. The course of this anomaly is traced from latitude 51°S, long. 163°E, for a distance of 500 km north-north-east to Preservation Inlet, New Zealand where measurements cease. A subsidiary positive anomaly appears to be associated with the Western flank of the Solander Trough. The magnetic anomaly associated with the North Macquarie Ridge is related to other geophysical features of south-west New Zealand."—abstr. [173]

see also [167], [175], [386].

1967b Geophysical study of Nelson–Cook Strait region, New Zealand. *N.Z. Jl Geol. Geophys. 10(6):* 1330–47.
Mainly a description of the magnetics and gravity of the Nelson region, but includes a section on the geophysical anomalies in Cook Strait. [174]

1968 Reply to R.P. Suggate's letter (2). *N.Z. Jl Geol. Geophys. 11(5):* 1278–9.

see also [167], [173], [386]. [175]

1969 Gravity anomalies over the eu- and mio-geosynclinal systems of California and New Zealand. *Bull. geol. Soc. Am. 80:* 213–29.
"The similarity of possible ultramafic and andesite occurrences in the Tasman Basin–Macquarie Ridge–Solander Trough system, at present devoid of sediments, to those of the California and New Zealand systems, leads to the hypothesis that an ultramafic-cored ridge predates sedimentation during the orogenic phase."—abstr. [176]

see also [39], [74], [97], [299].

HAYES, D.E.

1968 Marine geophysical observations aboard *Eltanin,* 1967–1968. *Antarctic Jl U.S. 3(5):* 171–2.
A short description of Eltanin cruises 28 and 29, the former in the Tasman Sea. Describes research in progress on the samples and data obtained on the cruise. [177]

see also [212].

HAYES, D.E.; HEIRTZLER, J.R.; HERRON, E.M.; PITMAN, W.C.

1969 Preliminary Report of Volume 21 U.S.N.S. *Eltanin* Cruises 22–27, January 1966–February 1967. *Tech. Rep. Lamont–Doherty Geol. Obs. Columbia Univ. 2-CU-2-69:* 130 pp.
Bathymetric and geomagnetic measurements for cruises 22–27, which include traverses over much of the New Zealand region. [178]

HAYES, M.O.

1967 Relationship between coastal climate and bottom sediment type on the inner continental shelf. *Mar. Geol. 5:* 111–32.
General discussion of relationships in all areas of the world, with reference to the New Zealand region (type A, young mountain range coast) in a chart and a table. [179]

HAYES, R.C.

1934 The focal depth of the Pacific earthquake of Sept. 6th, 1933. *N.Z. Jl Sci. Technol. 16(3):* 156–7.
This earthquake, originating in the region between the Kermadec and Tonga Islands, is studied, and the conclusion is that its focal depth was 600 km. Includes two diagrams. [180]

1935a Seismic waves and crustal structure in the New Zealand region. *N.Z. Jl Sci. Technol. 17(3):* 519–28.
"Observations of 10 well-recorded New Zealand earthquakes during the period 1931 to 1934 indicate a continental crustal structure in the New Zealand region, resembling that postulated by Jeffreys for the European continent, but with velocities distinctly higher than those found in typically continental regions."—conclusion. [181]

1935b A new phase in deep-focus earthquakes. *N.Z. Jl Sci. Technol. 17(3):* 553–62.
A study of the Wellington records of deep-focus earthquakes in the southwest Pacific. "A prominent phase appearing a few minutes after ScS on the Milne-Shaw seismograms at the Dominion Observatory, Wellington, of seven abnormally deep-focus earthquakes in the south-west Pacific has been identified as a transverse wave reaching the station after having been reflected, first at the earth's surface near the epicentre, and then at the boundary of the core." P. 562. [182]

1935c Earthquake frequency in New Zealand: seasonal and diurnal variations. *N.Z. Jl Sci. Technol. 16(6):* 343–8.
"The present paper deals with seasonal and diurnal variations of frequency from all non-instrumental data from 1848 to 1934, and also from instrumental records as far back as sufficient data are available—that is from 1923."—intro.
Discusses land and submarine earthquakes in the New Zealand region. Includes several tables and diagrams. [183]

1936 Normal and deep earthquakes in the South-west Pacific. *N.Z. Jl Sci. Technol. 17(5)* 691–701.
"Aims at presenting as complete a list as possible of deep earthquakes in the south-west Pacific [defined as 0°–50°S lat. 140°E–160°W long.] during the period 1918 to 1934, also some statistics showing the distribution of these earthquakes in space and time, as compared with the distribution of normal earthquakes." P. 692.
Includes a chart. Approximately 25 deep earthquakes were in the New Zealand area. [184]

1939 The deep-focus earthquakes of the South-west Pacific. *Proc. 6th Pacif. Sci. Congr. 1:* 131–4.
General discussion, mentioning the apparent existence of three regions of deep focus earthquakes in the New Zealand region: 1. Northeast portion of North Island; 2. submarine region east of North Island; 3. Southwest area of South Island. There is also a region around the Kermadec Islands. [185]

1941a Earthquake origins in the New Zealand region. *N.Z. Jl Sci. Technol. B 22(5):* 225–30.
"A map is presented showing revised earthquake origins in the New Zealand region for the years 1931 and 1936 to 1940 inclusive. The methods of determining epicentres and focal depths are briefly outlined. . . . The influence of focal depth on the

surface effects of earthquakes is illustrated by two isoseismal maps."—abstr.
Includes earthquakes of submarine origin, predominantly from Cook Strait and the east coast of North Island. [186]

1941b The seismicity of New Zealand. *N.Z. Jl Sci. Technol. B 23(2):* 49–52.
"New Zealand is divided into four seismic regions on the basis of maximum earthquake intensity and average frequency of shocks."—abstr.
Includes marine areas. [187]

1942 Earthquakes in New Zealand during the year 1941. *N.Z. Jl Sci. Technol. B 23(6):* 210–11.
Comprises a chart showing earthquake epicentres, including many submarine locations, and a table giving dates and times of occurrence. [188]

1943a The sub-crustal structure in the New Zealand region from seismic data. *Bull. seism. Soc. Am. 33(2):* 75–9.
A very short paper with two diagrams, and a chart giving evidence to suggest the existence of a discontinuity from East Cape to the south of Cook Strait, the depth varying from 30 km to 350 km. [189]

1943b Earthquakes in New Zealand during the year 1942. *N.Z. Jl Sci. Technol. B 24(4):* 191–4.
Comprises a chart showing earthquake epicentres, including many submarine locations, and a table giving dates and times of occurrence. [190]

1943c On earthquake distribution in New Zealand. *N.Z. Jl Sci. Technol. B 24(5):* 236–8.
"The distribution of destructive and non-destructive earthquake epicentres in New Zealand is presented on a map. The results . . . provide detail regarding the variation of seismic activity from place to place."—abstr.
Includes marine areas. [191]

1944 Earthquakes in New Zealand during the year 1943. *N.Z. Jl Sci. Technol. B 25(5):* 226–8.
Comprises a chart showing earthquake epicentres, including many submarine locations, and a table giving dates and times of occurrence. [192]

1945 Earthquakes in New Zealand during the year 1944. *N.Z. Jl Sci. Technol. B 27(1):* 33–5.
as [192]. [193]

1946 Earthquakes in New Zealand during the year 1945. *N.Z. Jl Sci. Technol. B 27(6):* 436–8.
as [192]. [194]

1947 Earthquakes in New Zealand during the year 1946. *N.Z. Jl Sci. Technol. B 29(2):* 90–3.
as [192]. [195]

1948 Earthquakes in New Zealand during the year 1947. *N.Z. Jl Sci. Technol. B 30(2):* 102–5.
as [192]. [196]

1949 Some aspects of earthquake activity in the New Zealand region. *Proc. 7th Pacif. Sci. Congr. 2:* 629–36.
Deals briefly with three aspects of earthquake activity (much of it submarine) in the New Zealand region:
1. The distribution of epicentres of normal and intermediate earthquakes and shocks of different magnitudes;
2. The distribution of surface intensity in earthquakes;
3. Correlation of instrumental magnitude of an earthquake with its focal depth, epicentral activity, and radius of felt area. [197]

1951 Earthquake origins in New Zealand during the year 1949. *N.Z. Jl Sci. Technol. B 31(4):* 43–5.
as [192]. [198]

1952a Earthquake origins in New Zealand during the year 1950. *N.Z. Jl Sci. Technol. B 33(4):* 304–8.
as [192]. [199]

1952b The Cook Strait earthquake: 1950 Jan.–Feb. *N.Z. Jl Sci. Technol. B 33(4):* 309–18.
"Some particulars are given of the most prominent earthquakes in the Cook Strait region in January–February 1950; with special consideration of the intensities of the four largest shocks. Maps are included showing the epicentres of all the shocks located, and the isoseismals for three of the largest shocks. . . . The seismic history of the region is discussed briefly."—abstr. [200]

1953 Earthquake origins in New Zealand during the year 1951. *N.Z. Jl Sci. Technol. B 34(4):* 252–6.
as [192]. [201]

1955 Earthquakes in New Zealand during the year 1953. *Bull. seism. Obs. Wellington S-99:* 6 pp.
Comprises tables and a chart of earthquakes including submarine ones, mainly originating in Cook Strait and off the northeast coast of North Island. [202]

1959 Earthquakes in New Zealand during the year 1954. *Bull. seism. Obs. Wellington S-106:* 5 pp.
as [192]. [203]

see also [1].

HEALY, J.; LLOYD, E.F.; BANWELL, C.J.; ADAMS, R.D.
1965 Volcanic eruption on Raoul Island, November 1964. *Nature, Lond. 205(4973):* 743–5.
Includes a history of volcanic eruptions on the island, including those in Denham Bay in 1814 and 1872. After the 1964 eruption soundings made in Denham Bay showed changes in the morphology of the seafloor. [204]

see also [376] and [377].

HECTOR, J.
1866–7 Notes on the coast and harbours from Milford Sound to Hokitika. *Rep. geol. Surv. N.Z. 4:* 42–8.
Contains information on depth in various harbours, mainly from the viewpoint of boat access. [205]

HEDERVARI, P.
1967 Investigations regarding the earth's seismicity. 5. On the earthquake geography of the Pacific Basin and the seismotectonical importance of the andesite line. *Beitr. Geophys 76(5):* 393–405.
An investigation of the seismotectonic and earthquake-geographic relationship between the andesite line and certain structures of the periphery of the Pacific. The place defined by the distribution of hypocenters of earthquakes is discussed as being a gigantic fault or fault system which beds from the oceanic trench toward the territory under the mainland. [206]

HEDLEY, C.
1910 The submarine slope of New South Wales. *Proc. Linn. Soc. N.S.W. 35(1):* 9–21.
Divided into three sections—the Notonectian current, the continental shelf and the continental base, the latter a description of the Tasman Sea as far as New Zealand, including notes on the structural history of the region. [207]

HEEZEN, B.C.
1960 The rift in the ocean floor. *Scient. Am. 203(4):* 98–110.
Mentions that the mid-ocean ridge connects with the Great Alpine Fault of New Zealand, and includes a profile of the Southwest Pacific rift. [208]

1963 The Tonga–Kermadec and Hikurangi Trenches. *Abstr. Pap. int. Ass. phys. Oceanogr. 6:* 70. *(xiii General Assembly, Int. Un. Geod. Geophys.).*
Outlines investigations carried out from R.V. *Verna* in 1962 using piston corer and rock dredge for 50 observations at 25 stations, and seismic reflection profiler, nuclear resonance magnetometer precision depth recorder and Graf sea-gravimeter for 3000 miles of continuous recordings. Gives a brief discussion of the results. [209]

HEEZEN, B.C.; EWING, M.
1963 The mid-oceanic ridge. Pp. 388–410 *in* Hill, M.N. (ed.) "The Sea. 3. The earth beneath the sea, History". Wiley, New York. 963 pp.
A short description of the mid-oceanic ridge in

the New Zealand area, some general remarks (e.g. on origin) being relevant. [210]

see also [109].

HEFFORD, A.E.

1949 Oceanography of New Zealand seas. *Trans. R. Soc. N.Z. 77(5):* 212–21.
General review presented in 1947 at the Sixth Science Congress, covering physical oceanography (soundings), hydrology and biological oceanography. [211]

HEIRTZLER, J.R. *see* [178], [334], [335].

HEIRTZLER, J.R.; HAYES, D.E.; HERRON, E.M.; PITMAN, W.C.

1969 Preliminary report of volume 20, U.S.N.S. *Eltanin* cruises 16–21, January 1965–January 1966. *Tech. Rep. Lamont–Doherty Geol. Obs. Columbia Univ. 3-CU-3-69:* 122 pp.
Bathymetric and geomagnetic measurements for cruises 16–21, including much of the New Zealand region. [212]

HENDERSON, J.

1933 The geological aspects of the Hawkes Bay earthquakes. *N.Z. Jl Sci. Technol. 15(1):* 38–75.
Gives the background geology of New Zealand in relation to the Southwest Pacific, and the geology of part of Hawkes Bay. Includes theories on faults and movements, partly submarine. [213]

1937 Notes on the Wairoa earthquake. *N.Z. Jl Sci. Technol. 18(12):* 854–7.
Includes discussion of the structure of the area in the larger Pacific pattern. Many epicentres of the aftershocks were out at sea. Earthquake occurred 16th September 1932. [214]

HERDMAN, H.F.P.

1957 Recent bathymetric charts and maps of the Southern Ocean and waters around Antarctica. *Deep Sea Res. 4(2):* 130–7.
Includes discussion of the merits of U.S.H.O. chart No. 2562 (3rd Ed.) which includes the New Zealand region. [215]

HERDMAN, H.F.P.; WISEMAN, J.D.H.; OVEY, C.D.

1956 Proposed names of features on the deep-sea floor. 3. Southern or Antarctic Ocean. *Deep Sea Res. 3(4):* 253–61.
"The history of names in the Southern Ocean is discussed, followed by the names of those proposed by the British National Committee on the Nomenclature of Ocean Bottom Features."—abstr.
The northern limit for the ocean in this paper has been taken as 52°S, and the paper therefore includes some features in the New Zealand region, e.g. Macquarie–Balleny Ridge, Pacific–Antarctic Ridge. *see also* [443]. [216]

HERRON, E.M. *see* [178], [212], [334], [335].

HESS, H.H. *see* [120].

HESS, H. H.; MAXWELL, J.C.

1949 Major structural features of the South-west Pacific: a preliminary interpretation of H.O. 5484, bathymetric chart, New Guinea to New Zealand. *Proc. 7th Pacif. Sci. Congr. 2:* 14–17.
"A bathymetric chart of the area from New Guinea to New Zealand is being prepared in the Hydrographic Office, U.S. Navy . . . The present paper is a brief summary and structural interpretation of the main bathymetric features to be found in the chart." P. 14.
Includes Kermadec Islands structure. [217]

HILL, M. N.

1957 Recent geophysical exploration of the ocean floor. *Physics Chem. Earth 2:* 129–63.
Discusses some methods of geophysical exploration and results obtained by various people in different parts of the world. e.g. Officer in the Southwest Pacific. (*see* P. 297). [218]

HILL, M. N. (Ed.)

1963 "The sea: ideas and observations on progress in the study of the seas. Vol. 1. The earth beneath the sea." Interscience, New York. 963 pp.
General references to Kermadec and Tonga Trenches which can be located through the index. [219]

HOBBS, W. H.

1923 The growing mountain ranges of the Pacific region. *Proc. 2nd Pan-Pacif. Sci. Congr. 1:* 746–57.
New Zealand is taken as an example of an island arc to study. The structure of the Tasman Sea and Tonga–Kermadec areas is discussed. [220]

HOCHSTEIN, M.P.

1967 Interpretation of magnetic anomalies across Norfolk Ridge. *N.Z. Jl Geol. Geophys. 10(5):* 1302–8.
"Total magnetic force anomalies across Norfolk Ridge are caused by basaltic extrusions which are normally magnetised with an average magnetisation of 1.4 times 10^{-2}e.m.u. These rocks have a minimum thickness of about 1.5–2.0 km in the central part of the ridge, and are covered by a thin layer of non-magnetic deposits."—abstr. [221]

HOCHSTEIN, M.P.; REILLY, W.I.

1967 Magnetic measurements in the South-west Pacific Ocean. *N.Z. Jl Geol. Geophys. 10(6):* 1527–62.
"Total magnetic force and bathymetric profiles totalling 25,000 km have been measured in the South-west Pacific Ocean between New Zealand, Fiji and the Cook Islands."—abstr.
They exhibit magnetic anomaly patterns which are related to diverse geological and structural features. [222]

HODGSON, J.H.

1955 Direction of faulting in Pacific earthquakes. *Geofis. pura appl. 32:* 31–42.
Analyses of seismograph records by Byerly's method shows that transcurrent faulting is very important. Of ten earthquakes in the Southwest Pacific, all show transcurrent faulting. [223]

1956 Direction of faulting in some of the larger earthquakes of the South-west Pacific, 1950–1954. *Publs Dom. Obs. 18(9):* 169–216.
"The direction of faulting is determined . . . to permit a study of the failure pattern in the area. It is concluded that faulting in the South-west Pacific is principally strike-slip, on steeply dipping planes. The strike direction of the faults is not consistent, nor does it show any systematic variation with latitude, depth of focus, or position on the associated arcuate feature."—abstr.
Twelve of the earthquakes were associated with the Tonga–Kermadec region, and the New Zealand area. [224]

1957 Nature of faulting in large earthquakes. *Bull. geol. Soc. Am. 68(5):* 611–44.
"The Dominion Observatory, Ottawa, has applied Byerly's method to determine the direction of faulting in 65 earthquakes, which makes a total of 75 earthquakes so analysed. To date, ten solutions have received some confirmation by comparison with observed faulting. The method is ambiguous in that two planes, neither of which is indicated as the fault, are defined for each solution. This does not obscure the fact that of the 75 earthquakes all but eight resulted from strike-slip faulting. . . In the South-west Pacific the null vectors lie parallel to vertical planes striking in the direction of the associated geographical features."—abstr.
Includes discussion and diagrams of earthquakes in the New Zealand–Kermadec–Tonga region. [225]

1962 Movements in the earth's crust as indicated by earthquakes. Pp. 67–102 *in* Runcorn, S.K. (ed.) "Continental drift". Academic Press. New York. xii + 338 pp.
This article contains a short discussion of the Kermadec–Tonga Trench, including a diagram showing null direction for this Trench, plotted on

a polar stereographic net. [226]

HODGSON, J.H.; STOREY, R.S.
1954 Direction of faulting in some of the larger earthquakes of 1949. *Bull. seism. Soc. Am. 44(1):* 57–83.
Solutions are obtained for 15 earthquakes, including the Kermadec Islands earthquake of November 22, 1949. No attempt is made to correlate the results with structure. [227]

HOGBEN, G.
1892 The earthquake of the 4th December 1891: notes thereon. *Trans. Proc. N.Z. Inst. 25:* 362–7.
Description of an earthquake having its epicentre in northern Cook Strait. [228]
1904 Notes on the east coast earthquake of 9th August 1904. *Trans. Proc. N.Z. Inst. 37:* 421–4.
The epicentre was 227 miles ESE of Wellington. It is postulated that the earthquake waves passed 2/5 of their path through granite and 3/5 their path through a rock such as limestone. [229]
1912 Earthquake-origins in the South-west Pacific in 1910. *Trans. Proc. N.Z. Inst. 44:* 139–42.
A description of earthquakes of 1910, including several with epicentres in the New Zealand region. includes a chart, table and diagram. [230]
1918 A note on east coast earthquakes (New Zealand), 1914–17. *Trans. Proc. N.Z. Inst. 50:* 280–1.
Discussion and map of several earthquakes with epicentres to the east of North Island. Postulated fault planes appear on a chart. [231]

HOLMES, R.W.
1918–19 Littoral drift as affecting harbour construction in New Zealand. *Proc. N.Z. Soc. civ. Engrs 5:* 74–141.
Description and discussion of the movement of beach and seabed material around the coasts of New Zealand, mainly in connection with harbour maintenance. Includes a specific description of the following harbours at which improvements have been effected: Gisborne, Wairoa, Napier, Waitara, New Plymouth, Patea, Wanganui, Nelson, Westport, Greymouth, Hokitika, Wairau, Timaru, Oamaru, Dunedin. [232]

HORNIBROOK, N.deB. *see* [152].

HOUGH, J.L.
1956 Sediment distribution in the Southern Ocean around Antarctica. *J. sedim. Petrol. 26(4):* 301–6.
Includes almost the whole of the New Zealand region (to 30°S lat.). The main information is given in a folded chart showing sediment distribution. [233]

HOUTZ, R. *see* [110].

HOUTZ, R.; EWING, J.; EWING, M.; LONARDI, A.G.
1967 Seismic reflection profiles of the New Zealand Plateau. *J. geophys. Res. 72 (18):* 4713–29.
The results of 15,000 km of reflection profiler data collected by Lamont Geological Observatory in New Zealand waters up to May 1966. Covers the Chatham Rise, Bounty Basin, Campbell Plateau, northwestern regions and Hikurangi Trench. [234]

HULME, S.G.
1961 Dredgings from Manukau Harbour, Auckland. *Bull. Conch. Sect. Auckland Mus. 16:* 2–5.
Depth and lithology are given for 22 stations, located in an accompanying chart; profiles of Manukau Harbour are given. [235]

HULSTON, J.R. *see* [250].

HUTTON, C.O. *see* [135].

INTERNATIONAL ASSOCIATION OF SEISMOLOGY AND PHYSICS OF THE EARTH'S INTERIOR.
1967 "New Zealand National Report 1963–66." Govt. Printer, Wellington, 33 pp.
Includes information on magnetic surveys south of New Zealand, on earthquake stations at various islands, and a good bibliography. [236]

ISACKS, B. *see* [312], [313], [314], [400].

ISACKS, B.; MOLNAR, P.
1969 Mantle earthquake mechanisms and the sinking of the lithosphere. *Nature, Lond. 223:* 1121–4.
Includes references to the New Zealand region, particularly the Tonga–Kermadec Arc. [237]

ISACKS, B.L.; OLIVER, J.; SYKES, L.R.
1968 Seismology and new global tectonics. *J. geophys. Res. 73(18):* 5855-900.
A general world survey, choosing various areas for particular discussion, e.g. Southwest Pacific. New Zealand well-covered by chart and first motion studies of earthquake data for zones of compression and extension. [238]
1967 Spatial and temporal clustering of deep and shallow earthquakes in the Fiji–Tonga–Kermadec region. *Bull. seism. Soc. Am. 57(5):* 935–58.
"A study of the tendency of deep and shallow earthquakes in this region to cluster in space and time revealed that: 1. In general, deep earthquakes do not form either aftershock sequences of swarms of the types commonly observed in series of shallow shocks throughout the world; 2. A small percentage of the deep earthquakes cluster in the form of multiplets, i.e. small numbers of events closely grouped in space and time; 3. During the seven-year interval studied, clustering of the shallow events in the Kermadec region was markedly greater than that of shallower events in the Tongan region . . . [and that of the latter greater than the Fijian region]. The data provide new constraints for hypotheses of focal mechanism."—abstr. [239]
1969 Focal mechanisms of deep and shallow earthquakes in the Tonga–Kermadec region, and the tectonics of island arcs. *Bull. geol. Soc. Am. 80(8):* 1443-70.
"Well-determined focal mechanisms based on reliable first motions of both compressional and shear waves are presented for 18 shallow, 6 intermediate and 15 deep-focus earthquakes in the Fiji–Tonga–Kermadec region."—abstr. [240]

IVANOV, M.M.
1963 The work of the non-magnetic vessel *Zarya* in the Pacific Ocean. *Deep Sea Res. 10:* 645–7.
Edited translation of: *Okeanologiia, I(5):* 920–22, 1961.
Description of the traverses of the ship *Zarya,* which made a beginning on magnetic observations in the Pacific Ocean in 1959–60, including two traverses in the New Zealand area. [241]

JAGGAR, T.A.
1945 "Volcanoes declare war: logistics and strategy of Pacific volcano science." Paradise of the Pacific, Honolulu. 166 pp.
Chapter 5, entitled 'New Zealand volcanoes tie up with Tonga', discusses volcanology in the New Zealand region. The theory is advanced that a long crack in the bottom of the Pacific Ocean, with interruptions by very deep water, extends from New Zealand to Hawaii. This hypothesis is based on the striking sympathies of eruptive dates between the volcanoes of New Zealand, Tonga, Samoa and Hawaii. [242]

JEROME, J.L. *see* [434].

JESPERSEN, P.; TANING, A.V.; GREVE, S.V.
1934 Introduction to the reports from the Carlsberg Foundation's oceanographical expedition round the world, 1928–30. *Dana Rep. 1:* 7–130.
Consists of charts of the voyage and tables containing station numbers and information about each. Stas 3621–3654 are in the New Zealand area, and soundings for these stations are given. [243]

JOHNSON, G.L. *see* [432]

JONES, W.M.
1944 The use of differences of arrival times of P as an aid to epi-central determinations in the South Pacific. *N.Z. Jl Sci. Technol. B 26 (3):* 146–54.
Curves were drawn for the more important seismic

portions of the South Pacific on Mercator projections (area 0–35°S lat. 160°E–170°W long.). The use of such curves in the determination of epicentres is briefly discussed. [244]

1945a Effects of focal depth on epicentral determinations from S–P intervals in the South Pacific region. *N.Z. Jl Sci. Technol. B 26(4):* 219–26.
"For earthquakes in the more important seismic portion of the South Pacific, the effects of focal depth on the location of epicentres by S–P intervals at Wellington, Brisbane and Suva are investigated, and the displacements of epicentres due to incorrect assumptions of focal depth are illustrated. Methods are considered for obtaining directly good approximations to an epicentre without any assumption of focal depth."—abstr. [245]

1945b The application of P–difference methods of epicentral determination to New Zealand local seismology. *N.Z. Jl Sci. Technol. B 26(6):* 359–65.
"Using the travel times of P-phases given for near earthquakes in the Jeffreys–Bullen 1940 tables, the differences in the times of arrival of the first impulses at the Wellington and New Plymouth; and at the Wellington and Tuai Seismological stations are shown by a series of curves, both for a surface focus and for a focus of depth 160 km. [The curves extend to include marine areas.] The variations with focal depth of the epicentral positions given by the intersections of such curves are discussed, and a method considered of obtaining an epicentre, from the records of four stations, independent of focal depth."—abstr. [246]

1945c Determination of epicentres in the South Pacific from differences in the arrival times of ScS. *N.Z. Jl Sci. Technol. B 26(6):* 366–69.
"The differences in the times of arrival of ScS at the Wellington and Suva, and at the Wellington and Brisbane, Seismological Observatories, for earthquakes in the more important seismic region of the South Pacific, [north of New Zealand] are shown by a series of curves for the case of a surface focus. The positions of epicentres as determined by the intersections of such curves are not greatly affected by focal depth."—abstr. [247]

1948 Geomagnetic latitudes and regional anomalies in New Zealand and the South Pacific. *N.Z. Jl Sci. Technol. B 30:* 118–23.
"For an axis pole at 78.5°S., 111°E., parallels of geomagnetic south latitude are shown at 1° intervals for N.Z. and at 5° intervals for the region 0–15°, 150°E–155°W. Regional anomalies in N.Z. in respect of the theoretical field from the centred dipole, for inclination and horizontal force, are illustrated by a comparison of this field with the actual distribution observed by Farr."—abstr. [248]

KAPLAN, I.R.; RAFTER, T.A.

1965 Transformations of sulphur compounds in the sediments of Milford Sound. Pp 73–6 in Skerman, T.M. (ed.) Studies of a Southern Fiord. *Mem. N.Z. oceanogr. Inst. 17 (Bull. N.Z. Dep. scient. ind. Res. 157.)*
Includes an analysis of sulphur isotopes. [249]

KAPLAN, I.R.; RAFTER, T.A.; HULSTON, J.R.

1960 Sulphur isotopic variations in nature. Part 8. Application to some biogeochemical problems. *N.Z. Jl Sci. Technol. 3(2):* 338–61.
Results obtained from laboratory experiments (using measurements of stable sulphur isotope ratios to explain some biogeochemical problems in nature) were used to interpret measurements from various environments including mud and seawater from Milford Sound. [250]

KHAIN, V.E.; MURATOV, M.V.

1969 Crustal movements and tectonic structure of continents. *Geophys. Monogr. 13:* 523–38.
Includes the structure of the New Zealand Region on a world map and a reference to the Alpine fault. [251]

KHARKAR, D.B. *see* [7].

KIBBLEWHITE, A.C.

1966a The acoustic detection and location of an underwater volcano. *N.Z. Jl Sci. 9(1):* 178–99.
"Study of an unusual component of the sea noise spectrum in the water to the east of the North Island of New Zealand has led to the detection and location of a previously unknown area of underwater volcanic activity in a position some 150 miles ENE of Great Barrier Island. Investigations spread over several years have identified several modes of acoustic activity. These are described and possible interpretations discussed in relation to other known examples of underwater volcanoes." —abstr. [252]

1966b Detection and location of a new underwater volcano. *Nature, Lond. 210(5039):* 938–9.
A short communication, describing the South Kermadec Ridge seamounts. These are thought to be of volcanic origin, and at least one, named Rumble III, is still active. Includes a chart. [253]

1967 Note on another active seamount in the South Kermadec Ridge group. *N.Z. Jl Sci. 10(1):* 68–9.
Short description of the discovery of Rumble III, one of the South Kermadec Ridge Seamounts. Includes a chart. [254]

KIBBLEWHITE, A.C.; DENHAM, R.N.

1967 Bathymetry and total magnetic field of the South Kermadec Ridge Seamounts. *N.Z. Jl Sci. 10(1):* 52–67.
Bathymetry and magnetic surveys have been carried out in the vicinity of the South Kermadec Ridge seamounts. These surveys are described and their significance discussed. The possible existence of a section of the mid-oceanic ridge between New Zealand and Fiji is examined."—abstr.
Includes six small folded charts. [255]

KING, L.C.

1939 The relation between the major islands of New Zealand (with a bibliography). *Trans. Proc. R. Soc. N.Z. 68:* 544–69.
Partly a history of Cook Strait, including various theories as to its origin. Submarine, structural and other evidence is presented. Includes an extensive bibliography. [256]

KINGMA, J.T.

1959 The tectonic history of New Zealand. *N.Z. Jl Geol. Geophys. 2(1):* 1–55.
Includes references to Cook Strait structure and history, especially on charts, and mentions the relation of Mernoo Bank–Chatham Rise to the rest of New Zealand. [257]

KNOX, G.A.

1951 Oceanographic research in New Zealand. *Sci. Congr. Rep .R. Soc. N.Z. 7:* 72–80.
Includes a description of work done on submarine topography and sediments, and projected oceanographic work. [258]

1957 General account of the Chatham Islands 1954 Expedition. *Mem. N.Z. oceanogr. Inst. 2:* 37 pp. *(Bull. N.Z. Dep. scient. ind. Res. 122.)*
Contains a description of the bottom topography of the area between Banks Peninsula and the Chatham Islands, with two folded charts. Appendix: Marine geology of the Chatham Islands area, by J.W. Brodie. Includes an index. [259]

KONING, L.P.G.

1952 Earthquakes in relation to their geographical distribution, depth and magnitude. 3. The South-western Pacific. *Proc. Sect. Sci. k. ned. Akad. Wet. 55:* 194–206.
Evidence is cited to show that there are two large seismic belts in this region—New Guinea to New Caldonia, and New Zealand to Samoa and Fiji, and that a more or less regular distribution of the centres of relatively strong seismicity exists in a horizontal as well as in a vertical sense in the upper 150 km. [260]

KOST, S.
1966 Recent sediments and sedimentary history across the Pacific–Antarctic Ridge. *Contr. sedim. Res. Lab. Dep. Geol. Florida St Univ. 17:* 1–83.
The sediments and paleomagnetism of 23 piston cores from the South Pacific sector of the Southern Ocean are studied in order to interpret their history and that of the Antarctic in late Tertiary and Quaternary times. About six of the cores are in the New Zealand region (along long. 160°W and from lats 50° to 57°S). Contains numerous illustrations and a good bibliography. [261]

KRAUSE, D.C.
1966 Geology and geomagnetism of the Bounty Region east of the South Island, New Zealand. *Mem. N.Z. oceanogr. Inst. 30: 33 pp. (Bull. N.Z. Dep. scient. ind. Res. 170.)*
A description of the magnetic data and seafloor morphology of the area, and correlations between them. Includes two folded coloured charts. [262]
1967 Bathymetry and geologic structure of the Northwestern Tasman Sea–Coral Sea–South Solomon area of the South-western Pacific Ocean. *Mem. N.Z. oceanogr. Inst. 41: 49 pp. (Bull. N.Z. Dep. scient. ind. Res. 183.)*
Most of the area studied in this paper is outside the scope of this bibliography. However, some discussion is included of Lord Howe Rise and Norfolk Rise. [263]

KUO, J. *see* [108].

KUSTANOWICH, S.
1963 Distribution of planktonic Foraminifera in surface sediments of the South-west Pacific Ocean. *N.Z. Jl Geol. Geophys. 6(4):* 534–65.
Includes a description of the sediments at the stations selected—in all parts of the New Zealand area. [264]

LAL, D. *see* [7].

LANGER, E. *see* [45].

LANGFORD, A.; McDOUGALL, J.C.; ROBERTSON, N.
1969 A new large-diameter piston-corer and core-liner cutter. *N.Z. Jl mar. Freshwat. Res. 3(4):* 595–601.
"A newly developed piston sediment corer utilising a neat-fitting piston operating within a 2 7/8-in. diameter plastic liner has successfully cored heavy gravel, coarse shell and sandy sediments. A quick fit and release junction for pipe-lengths and cutter has been devised."—abstr. [265]

LAUDER, W.R.
1962 Port Nicholson and the "plough" mechanism in transcurrent faulting. *N.Z. Jl Geol. Geophys. 5(1):* 189–91.
"The Port Nicholson depression [i.e. Wellington Harbour] may have been formed because the dextral transcurrent Wellington Fault has a skewed surface."—abstr. [266]

LAWRIE, J.A.
1965 Directions of geomagnetic fluctuations near coastlines. *N.Z. Jl Geol. Geophys. 8(5):* 869–84.
"W.D. Parkinson has observed that rapid geomagnetic disturbing vectors tend to be confined to tilted planes near coastlines, and has suggested that the conductivity contrast between land and sea might be the cause. This paper describes further analysis of data . . . and [discusses] Parkinson's theory. Periods at which the effect is to be expected are predicted at each station, in order of magnitude. These periods are consistent with the observations."—abstr.
Includes Amberley Station, Christchurch. [267]
see also [142].

LEAHY, L.R.
1938 The configuration of the bottom of the South Pacific. *C.r. Congr. int. Geogr. 2:* 99–110.
". . . this paper will dwell on, and describe as accurately as possible, the major features of the South Pacific in regard to submarine topography."
—P. 99. Includes a bathymetric chart. [268]

LeFORT, J.H. *see* [5].

LEMASSON, L. *see* [355].

LENSEN, G.J.
1958 Note on fault correlations across Cook Strait. *N.Z. Jl Geol. Geophys. 1(2):* 263–8.
"Two methods are suggested for linking the active transcurrent faults in the North Island and the South Island across Cook Strait. One uses the average lateral displacements along the faults, the other the location of epicentres. Both methods give the same fault pattern."—abstr. [269]
1961 Principal horizontal stress directions as an aid to the study of crustal deformation. *Publs. Dom. Obs. 24 (10):* 389–97. (A symposium on Earthquake Mechanism).
Consideration of the whole of the Pacific, with sections on N.Z. and the Tonga–Kermadec region. [270]

LEOPARD, A.E. *see* [342].

Le PICHON, X.
1968 Sea floor spreading and continental drift. *J. geophys. Res. 73(12):* 3661–97.
A world survey of the topic, N.Z. and its surrounding region are well covered. [271]
A correction to this paper is published in *J. geophys. Res. 75 (14):* 2793, 1970.

LISITZIN, A.P.
1962 Bottom sediments of the Antarctic. *Geophys. Monogr. 7:* 81–8.
A general description of the area. Contains a chart of bottom sediments also showing the location of geological stations of the Soviet Marine Antarctic Expedition, some of which were in the New Zealand region. [272]

LISITZIN, A.P.; ZHIVAGO, A.V.
1960 Marine geological work of the Soviet Antarctic Expedition, 1955–1957. *Deep Sea Res. 6(2):* 77–87.
The ship *Ob* made traverses in the Antarctic and Indian Oceans, and through the south New Zealand area to Wellington, then across the Tasman Sea. No results of the latter part are given, but some features of the New Zealand area are referred to in comparison with ones further south. [273]

LLOYD, E.F. *see* [204].

LONARDI, A.G. *see* [234].

McDONALD, W.J.P. *see* [145].

McDOUGALL, J.C.
1961 Ironsand deposits offshore from the west coast, North Island, New Zealand. *N.Z. Jl Geol. Geophys 4(3):* 283–300.
"Surface sediment samples have been obtained from the near-shore portion of the shelf off the west coast from depths between 5 and 50 fms. The percentage of magnetic ironsand in the sediments has been determined by magnetic separation."—abstr. [274]
see also [265].

McDOUGALL, J.C.; BRODIE, J.W.
1967 Sediments of the western shelf, North Island, New Zealand. *Mem. N.Z. oceanogr. Inst. 40:* 55 pp. *(Bull N.Z. Dep. scient. ind. Res. 179.)*
A preliminary analysis of the nature and distribution of the surface and subsurface sediments of an area extending from Wanganui to Kaipara. [275]

McINTYRE, D.B.; CHRISTIE, J.M.
1957 Nature of faulting in large earthquakes. [Discussion of J.H. Hodgson's paper.] *Bull. geol. Soc. Am. 68:* 645–52.
Includes 200 words plus three diagrams on the Tonga–Kermadec region. [276]

McKNIGHT, D.G.
1969a A recent, possibly catastrophic burial in a marine Molluscan community. *N.Z. Jl mar. Freshwat. Res. 3:* 177–9.

Mainly a description of the fauna contained in a shallow water benthic sample from off the east coast of the Coromandel Peninsula, but includes a description of the sediment content. [277]

1969b An outline distribution of the New Zealand shelf fauna. *Mem. N.Z. oceanogr. Inst. 47:* 90 pp. *(Bull. N.Z. Dep. scient. ind. Res. 195.)*
A general description of 200 words is given of the sediments of the shelf around New Zealand. [278]

MACPHERSON, E.O.

1946 An outline of late Cretaceous and Tertiary diastrophism in New Zealand. *Geol. Mem. N.Z. 6:* 1–32.
Description of New Zealand in relation to Southwestern Pacific structure, plus a description of the structural history of New Zealand. Includes two folded charts and a good bibliography. [279]

MALING, P.B.

1969 "Early charts of New Zealand, 1542–1851". A.H. & A.W. Reed, Wellington. 134 pp.
Reproductions of old charts and information about them. Many of the charts include soundings. [280]

MARSHALL, P.

1910 Ocean contours and earth movements in the Southwest Pacific. *Rep. Australas. Ass. Advmt Sci. 12:* 432–50.
"In this paper an attempt is made to embody the most recently recorded soundings that could be obtained in a general bathymetric map in order to show the most probable land connections that may have existed in the past, on the assumption of the general elevation of the whole range." [Australia–Tasman Sea–New Zealand area.] p. 433. [281]

1911 Address by the President. *Rep. Australas. Ass. Advmt Sci. 13:* 90–9.
The following title is reported: [The Western margin of the Pacific Basin.]
It is suggested from evidence given that the boundary of the Southwest Pacific passes through New Zealand, Kermadec, Tonga, Fiji, Solomon and Admiralty Islands. Includes a folded chart. [282]

1932 Stability of lands in the South-west Pacific. Section P–Geography and oceanography. Presidential address. *Rep. Aust. N.Z. Ass. Advmt. Sci. 21:* 399–411.
A discussion of continental drift in relation to Australia and New Zealand, including plant and animal life. The conclusion is that New Zealand has been separated from Australia since early Mesozoic times. [283]

1933a Effects of earthquake on coastline near Napier. *N.Z. Jl Sci. Technol. 15(1):* 79–92.
Describes slips and slumps along the Napier and district coastline. Includes soundings taken in Hawkes Bay and comments on them. [284]

1933b Recent soundings of sea floors: New Zealand. *Proc. 5th Pacif. Sci. Congr. 2:* 895.
Short description of contemporary soundings undertaken in New Zealand. Soundings were made by the Otago Harbour Board off the east coast of South Island, and by the New Zealand Government steamer *Matai* along the coast of Napier after the earthquake in 1931. [285]

1947 The permanent Pacific. Presidential address. *Rep. Aust. N.Z. Ass. Advmt Sci. 25:* 1–13.
A general discussion of various aspects of the Pacific Ocean (depth, vulcanicity, wildlife) including many references to the New Zealand region. [286]

MASON, R.G. *see* [339].

MAWSON, D. (Ed.)

1939 Soundings. *Rep. B.A.N.Z. Antarct. Res. Exped. A 3 (1):* 1–22.
Includes soundings around Macquarie Island. [287]

MAXWELL, J.C. *see* [217].

MENARD, H.W.

1958 Development of median elevation in ocean basins. *Bull. geol. Soc. Am. 69(9):* 1179–86.
Includes description of the Southwest Pacific. New Zealand is considered a puzzle—whether it is a small continent or a continental island. Menard considers it as the former. [288]

1964 "Marine Geology of the Pacific." McGraw–Hill, New York. 271 pp.
A general description by subject (e.g. vulcanism, manganese nodules, trenches, and island arcs) rather than region. There are many references to the New Zealand region, located by consulting the index or gazetteer. [289]

1965a Sea-floor relief and mantle convection. *Physics Chem. Earth 6:* 315–64.
Includes a few references to New Zealand, and several world maps containing valuable information on New Zealand in relation to the rest of the world. [290]

1965b The world-wide oceanic ridge system. *Phil. Trans. R. Soc. 258A:* 109–22.
Mentions the Melanesian Rise, which is partly in the New Zealand region (Lord Howe Rise). Several world charts include information on New Zealand. [291]

1969 "Anatomy of an expedition." McGraw–Hill, New York. 255 pp.
Describes the general goals and chronicles the researches of the expedition by the Scripps Institution research ships *Argo* and *Horizon* in 1967 to the Melanesian Borderland, which includes the northern part of the New Zealand Region. [292]

MENARD, H.W.; SHOR, G.G. Jr.; SMITH, S.M.; CHASE, T.E.

1968 Distribution of sediment in the Southwestern Pacific. (abstr.) *Trans. Am. geophys. Un. 49(1):* 217.
". . . a sub-bottom reflector on the Lord Howe rise crops out in such a swale and was sampled and identified as lithified Miocene foraminiferal ooze."—abstr. [293]

MENARD, H.W.; SMITH, S.M.

1966 Hypsometry of ocean basin provinces. *J. geophys. Res. 71 (18):* 4305–25.
"The frequency distribution of depths in ocean basins has been determined using the most recent American and Russian oceanographic charts as sources, and a computer for data processing."—abstr.
Coverage of depths of oceans is world-wide, though the New Zealand region appears on two charts. [294]

MENARD, H.W.; SMITH, S.M.; CHASE, T.E.

1964 Guyots in the South-west Pacific Basin. *Bull. geol. Soc. Am. 75(2):* 145–8.
Includes sounding tracks across the New Zealand region. Refers to Tonga–Kermadec structure. [295]

MERO, J.L.

1964 "The mineral resources of the sea." Elsevier, New York. 312 pp.
Includes three brief references to New Zealand, and general references to the Pacific Ocean. [296]

MIYAMURA, S.

1968 Seismicity of island arcs and other arc tectonic regions of the circum-Pacific zone. *Geophys. Monogr. 12:* 60–9.
Includes short references to New Zealand and figures giving the number of earthquakes and relative frequency in relation to focal depth for the Tonga–Kermadec region. [297]

MOLNAR, P. *see* [237].

MOLNAR, P.; OLIVER, J.

1969 Lateral variations of attenuation in the upper mantle and discontinuities in the lithosphere. *J. geophys. Res. 74(10):* 2648–82.
Demonstrates the existence and pattern on a world-wide scale of lateral variations of attenua-

tion in the uppermost mantle. Includes two charts containing relevant information on the New Zealand region, and explanations. [298]

MOONEY, H.M.; HATHERTON, T.
1969 Upper mantle inhomogeneity beneath New Zealand. *Eos Trans. Am. geophys. Un. 50(4):* 246. (abstr.)
Evidence is presented to suggest that the Kermadec island arc structure extends south to include the North Island of New Zealand. [299]

MORGAN, W.J.
1968 Rises, trenches, great faults and crustal blocks. *J. geophys. Res. 73(6):* 1959–72.
Discussion of the rigid crustal block theory, which suggests that the earth's surface is divided into blocks, bounded by rises, trenches or fold mountains and faults. Discusses the movement of these blocks. Includes references to New Zealand features, e.g. Macquarie Ridge. [300]

MOSBY, H.
1940 Nomenclature of the submarine features of the Southern Seas. *Publs scient. Ass. Oceanogr. phys. 8:* 95–9.
Discussion of the best name to use for each feature. Includes the Macquarie Ridge, Tasman Basin, New Zealand swell. A folded chart of the features can be found in the book. [301]

MOSELY, H.N. *see* [411].

MOTTRAM, W.D. *see* [166].

MURATOV, M.V. *see* [251].

MURRAY, J.
1895 A summary of the scientific results obtained at the sounding, dredging, and trawling stations of H.M.S. Challenger. 1st part. *Rep. scient. Results explor. Voyage Challenger.* 796 pp.
Gives results for stations from Sydney to New Zealand (Wellington) and from New Zealand to Tongatapu. Stations 165A to 171A are in the New Zealand region. Results given for each station include water temperature, density, depth, sediment type, some navigational details, and details of animals collected. [302]
1902 Deep-sea deposits and their distribution in the Pacific Ocean with notes on the samples collected by S.S. *Britannia,* 1901. *Geogr. J. 19(6):* 691–711.
Describes some Pacific sediments, with examples, some of which come from the New Zealand area. The samples collected by S.S. *Britannia* include seven in the New Zealand region, which are described in detail. [303]
1905 On the depth temperature of the ocean waters and marine deposits of the South-west Pacific Ocean. *Qd Geogr. J. 21:* 71–134.
The area under consideration contains almost the whole of the New Zealand region, (the southern boundary is 50°S lat.). The topography of the seafloor is described, and also the marine deposits. Includes information on samples collected by several ships (HMS *Challenger,* HMS *Egeria,* HMS *Penguin,* HMS *Waterwitch*) between 1874 and 1895, and from the German ship *Gazelle.*
see also [411]. [304]

MURRAY, J.; RENARD, A.F.
1891 Report on deep-sea deposits based on specimens collected during the voyage of HMS *Challenger* in the years 1872 to 1876. *Rep. scient. Results explor. Voyage. Challenger:* 525pp.
Results given in tabular form for each station (relevant ones 165A–171A), then discussed in voyage order. There are also general discussions. There is an index, several plates, and many charts showing bathymetry, deposits, the route and location of stations and some profiles. [305]

NATIONAL SCIENCE FOUNDATION. OFFICE OF ANTARCTIC PROGRAMMES
1967 Eltanin cruises 23–25. *Antarctic Jl U.S. 2(2):* 41–4.
Description of three cruises made by the U.S. ship *Eltanin,* in all of which the New Zealand region was visited. The paper gives results only incidentally, being mainly a description of traverses, stations, equipment used, and research programmes for which sampling was done. [306]

NEWMAN, L.E. *see* [434], [442].

NINKOVICH, D.
1968 Pleistocene volcanic eruptions in New Zealand recorded in deep sea sediments. *Earth Planet. Sci. Lett. 4(2):* 89–102.
Five layers of rhyolitic ash have been identified in deep sea cores, taken mostly from an area lying between Chatham Islands and the Kermadec and Tonga Trenches. Paleomagnetic stratigraphy has been established in the cores and used for dating of the ash layers, which have the same age range as the New Zealand ignimbrites. This suggests a significant ash fall phase, until now little known, associated with eruptions of ignimbrite. [307]

NORRIS, R.M.
1964 Sediments of Chatham Rise. *Mem. N.Z. oceanogr. Inst 26:* 39 pp. *(Bull. N.Z. Dep. scient. ind. Res. 159.)*
Discusses the Chatham Rise, a broad elongate submarine ridge extending about 500 miles east of South Island, New Zealand. Describes topography history and economic considerations. Includes two folded charts. [308]

OFFICER, C.B.
1955 South-west Pacific crustal structure. *Trans. Am. geophys. Un. 36(3):* 449–59.
"This investigation has been concerned with the determining of the crustal thicknesses of the various features of the South-west Pacific from Love– and Rayleigh–wave dispersion characteristics."—abstr. [309]
1959 On some offshore seismic refraction profiles in the Cook Strait, Tasman Bay and Golden Bay areas of New Zealand. *N.Z. Jl Geol. Geophys. 2(2):* 350–4.
"Marine seismic profiles show that the thickness of unconsolidated sediments varies from a few hundred feet in the Cook Strait and Golden Bay areas to 2,300 feet in the vicinity of the Marlborough Sounds. . . . The maximum recorded velocities are consistent with the basement rock mapped in neighbouring land areas."—abstr. [310]

OLIVER, J. *see* [238], [239], [240], [298], [299].

OLIVER, J.; EWING, M.; PRESS, F.
1955 Crustal structure and surface wave dispersion. Part 4. Atlantic and Pacific Ocean Basins. *Bull. geol. Soc. Am. 66(7):* 913–46.
Includes details of one earthquake in the New Zealand region—NE of North Island. (P. 919). Also includes some general discussion of Pacific earthquakes. [311]

OLIVER, J.; ISACKS, B.
1967 Deep earthquake zones, anomalous structures in the upper mantle and the lithosphere. *J. geophys. Res. 72(16):* 4259–75.
"The principal conclusion of this paper is that regional seismic data for deep and shallow earthquakes associated with the Tonga–Kermadec arc show that there exists in the mantle an anomalous zone whose thickness is of the order of 100 km and whose upper surface is approximately defined by the highly active seismic zone that dips to the west beneath the island arc and extends to depths of about 700 km."—abstr. [312]
1968 Structure and mobility of the crust and mantle in the vicinity of island arcs. *Can. J. Earth Sci. 5(4):* 985–91.
Based on seismic wave propagation in the Fiji–Tonga region. Includes the northernmost part of the New Zealand region. [313]

OLIVER, J.; SYKES, L.; ISACKS, B.
1969 Seismology and the new global tectonics. *Tectonophysics 7:* 527–41.

"A comprehensive study of the observations of seismology provides widely based support for the new global tectonics founded on the hypotheses of continental drift, sea-floor spreading, transform faults, and underthrusting of the lithosphere at island arcs."—abstr. New Zealand is well covered by the 6 charts included in the paper. [314]

OLIVER, R.L.; FINLAY, H.J.; FLEMING, C.A.

1950 The geology of Campbell Island. *Cape Exped. Ser. Bull. 3.* D.S.I.R. Wellington. 62 pp.
Relevant sections: geological history, geological correlation with New Zealand and Macquarie Island, tectonic relationship of Campbell Island. [315]

OSTROUMOV, E.A.; VOLKOV, I.I.

1960 O Forakh Soedineniya Sery Donnykh Otlozhenlyokh Tikhogo Okeana u Novoi Zelandii (Forms of sulphur compounds of bottom deposits in the Pacific Ocean near New Zealand). *Trudy Inst. Okeanol, 42:* 117–24. (In Russian).
Work based on five stations, four to the east and one to the west of North Island. Includes a chart. [316]

OVEY, C.D. *see* [216], [443].

PANTIN, H.M.

1957 Fossiliferous concretions from the shelf southeast of Cape Campbell, New Zealand. *N.Z. Jl Sci. Technol. B 38(7):* 781–91.
Description and significance of calcareous concretions containing abundant fossils dredged from the shelf near Cape Campbell (41° 50′S., 174° 26′E.). The presence of critical species indicates a climate colder than the present. [317]

1958 Rate of formation of a diagenetic–calcareous concretion. *J. sedim. Petrol. 28(3):* 366–71.
"Age determination by the C^{14} method have been made on the matrix and enclosed fauna of a Quaternary calcareous concretion from the shelf southeast of Cape Campbell, New Zealand. The results show that the concretion must have formed within 19,500 years, and probably within 7,500 years. It appears to have grown in a calcareo–argillaceous sediment containing an abundant molluscan fauna. The classification of concretions and the terminology applied to them, are discussed in this paper." —abstr.
Concretion obtained from 70 fms at locality 41° 50′S, 174° 26′E. [318]

1960 Dye-staining technique for examination of sedimentary micro-structures in cores. *J. sedim. Petrol. 30(2):* 314–16.
"A dye-staining technique is described that is capable of producing a high visible contrast between different lithologies in core-samples; this enables microstructures in the sediment to be clearly identified and illustrated."—abstr. [319]

1961 Magnetic concrete as an artificial tracer mineral. *N.Z. Jl Geol. Geophys. 4(4):* 424–33.
"Magnetic concrete, composed of crushed ironsand and cement, was used as an artificial tracer mineral in an experiment designed to estimate the sediment-transporting power of the bottom currents in the central part of Cook Strait, New Zealand. The results show that these currents are capable of transporting sand grains at least 1½mm in diameter."—abstr. [320]

1963 Submarine morphology east of the North Island, New Zealand. *Mem. N.Z. oceanogr. Inst. 14:* 43 pp. *(Bull N.Z. Dep. scient. ind. Res. 149.)*
Description and discussion of the continental shelf and slope between Gable End Foreland, North of Poverty Bay, and the mouth of the Opouawe River near Cape Palliser. Includes three folded charts in pocket. [321]

1965a Sedimentation in Milford Sound. Pp. 35–47 *in* Skerman, T.M. (ed.) Studies of a Southern Fiord. *Mem. N.Z. oceanogr. Inst. 17 (Bull. N.Z. Dep. scient. ind. Res. 157.)*
Includes tables, photographs, and echo-sounding profiles. [322]

1965b The effect of adsorption on the attainment of physical and chemical equilibrium in sediments. *N.Z. Jl Geol. Geophys. 8(3):* 453–64.
The attainment of physical and chemical equilibrium in many sediments must be inhibited by the adsorption of foreign substances on the surface of mineral grains. [323]

1966a Campbell Plateau. P. 292 *in* McLintock, A.H. (ed.) "An Encyclopaedia of New Zealand" Vol. 1. Govt Printer, Wellington, xxxi, 928 pp.
A general description including a chart. [324]

1966b Chatham Rise. Pp. 335–6 *in* McLintock, A.H. (ed.) "An Encyclopaedia of New Zealand" Vol. 1. Govt Printer, Wellington. xxxi, 928 pp.
A general description including a chart. [325]

1966c Hikurangi Trench. P. 23 *in* McLintock, A.H. (ed.) "An Encyclopaedia of New Zealand" Vol. 2. Govt. Printer, Wellington. 894 pp.
A general description including a chart. [326]

1966d Sea Floor. Pp. 193–9 *in* McLintock, A.H. (ed.) "An Encyclopaedia of New Zealand" Vol. 3. Govt Printer, Wellington. 848 pp.
A general description covering shape, rocks and sediment. Seven charts are given. [327]

1966e Sedimentation in Hawke Bay. *Mem. N.Z. oceanogr. Inst. 28:* 69 pp. *(Bull. N.Z. Dep. scient. ind. Res. 179.)*
Hawke Bay is described under the following chapter headings: Topographical and geological setting, bathymetry, distribution and nature of sediments, discussion of sedimentary regime, provenance, authigenic minerals, internal structures in the sediments. [328]

1967 The origin of waterborne diamictons and their relation to turbidites. *N.Z. Jl mar. Freshwat. Res. 1(2):* 118–38.
"The term diamicton has recently been proposed as a non-genetic name for any non-calcareous terrigenous sediment containing a wide variety of grain sizes: the lithified equivalent is a diamictite. The present paper deals with the origin and classification of waterborne diamictons. The latter have been divided into three groups by the writer."—abstr.
Selected examples are taken from the New Zealand area. [329]

1969 The appearance and origin of colours in muddy marine sediments around New Zealand. *N.Z. Jl Geol. Geophys. 12(1):* 61–6.
"Muddy marine sediments in the New Zealand region show a considerable range of colour. Thirty-five representative samples were selected and divided by the writer into seven groups, lettered A to G. Simple chemical tests were applied to these samples in order to obtain information regarding the nature of the chemical compounds which control the colour of these sediments."—abstr. [330]

see also [100].

PARK, A.G.

1955 Otago Harbour—a challenge of nature. *Rec. Proc. N.Z. geogr. Soc. 19:* 15–16.
The geological history of the area is described. The present phase of silting and building of sandbars provides problems for the Harbour Board. [331]

PAULY, H. *see* [45].

PETELIN, V.P.

1960 O donnykh osadkakh zapadnoi chasti Tikhogo Okeana. [Bottom sediments in the western part of the Pacific Ocean.] *Rez. Issled. mezhdunar. geofiz. Proekt 10. Okeanolog. Issled. 2:* 45–60. [In Russian, English abstr.]
"The article presents some preliminary results of the study of bottom sediments in the western part of the Pacific, carried out according to the IGY programme of oceanographic researches on the "Vityaz" from July 1957 till June 1958 (cruises

25th, 26th, 27th). Red clay and globigerina ooze are the main types of the bottom sediments in the region; between them is the zone of sediments belonging to the transitory type, the clayey–limy pelagic mud."—abstr. [332]

see also [375].

PHILLIPS, C.

1898 The volcanoes of the Pacific. *Trans. N.Z. Inst. 31:* 510–51.
Contains brief information on soundings by HMS *Penguin* between Tonga and New Zealand. [333]

PITMAN, W.C. *see* [178], [212].

PITMAN, W.C.; HERRON, E.; HEIRTZLER, J.R.

1967 Magnetic anomalies in the South Pacific Ocean and ocean floor spreading. *Trans. Am. geophys. Un. 48 (1):* 132. (Abstr.)
"By examination of the magnetic data from over 20 crossings of the Pacific–Antarctic ridge and flanking basin areas, the region of linearity and symmetry is extended to include almost all the South Pacific from 40°S to 65°S. and from the base of the New Zealand plateau to very near the coast of South America."—abstr. [334]

1968 Magnetic anomalies in the Pacific and sea floor spreading. *J. geophys. Res. 73(6):* 2069–85.
"The symmetric linear magnetic pattern found over the crest of the Pacific–Antarctic and Juan de Fuca Ridges can now be traced across the flanks and into the basins in the north and south Pacific Ocean. The bilateral symmetry is best shown in the South Pacific, where the western half of the pattern can be traced to the edge of the New Zealand Plateau."—abstr. [335]

POWELL, A.W.B.

1936 Animal communities of the sea-bottom in Auckland and Manukau Harbours. *Trans. Proc. R. Soc. N.Z. 66:* 354–401.
Includes detailed descriptions of the bottom sediments. [336]

PRESS, F. *see* [311].

QUILTY, P.G. *see* [429].

RAESIDE, J.D. *see* [25].

RAFTER, T.A. *see* [116], [249], [250].

RAITT, H.

1957 "Exploring the Deep Pacific". Staples Press, London. 253 pp.
A non-scientific travelogue of Scripps Institution's Capricorn Expedition, 1952–53, to explore the Pacific Ocean.
Includes many photographs and a bibliography. [337]

RAITT, R.W.

1964 Geophysics of the South Pacific. Pp. 223–41 *in* Odishaw H. (ed.) "Research in Geophysics, Vol. 2" M.I.T. Press, Cambridge, Massachusetts. xxi + 595 pp.
A diagram shows distribution of echo-soundings in the Pacific Ocean but most of the paper deals with the Southeast Pacific. [338]

RAITT, R. W.; FISHER, R.L.; MASON, R.G.

1955 Tonga Trench. *Spec. Pap. geol. Soc. Am. 62:* 237–54.
Only the southernmost part of the Trench is in the New Zealand region as here defined, but this part is discussed frequently. Bathymetry, topography, seismicity, magnetics and structure are described. [339]

REED, J.J.

1951 Marine sediments near Sumner, Canterbury, New Zealand. *N.Z. Jl Sci. Technol. B 33(2):* 129–37.
Mechanical and petrographic analyses of 36 bottom samples; the minerals are derived almost entirely from feldspathic sandstones and silt-stones. Factors influencing the sedimentation are discussed. [340]

1952 Sediments from the Chatham Rise. *N.Z. Jl Sci. Technol. B 34(3):* 173–84.
"A sediment sample collected by RRS *Discovery* from the Chatham Rise 80 miles west of the Chatham Islands, and from a depth of 157 to 170 fms is well-sorted gravelly sand consisting of rock fragments, phosphorite nodules, mineral grains and Foraminifera."—abstr. [341]

see also [61], [136].

REED, J.J.; LEOPARD, A.E.

1954 Sediments of Cook Strait. *N.Z. Jl Sci. Technol. B 36 (1):* 14–24.
"A sediment map of Cook Strait has been prepared from the results of a study of 181 bottom samples, mostly collected during the coastal survey by HMNZS *Lachlan* and from the qualitative sediment notations on the Admiralty charts."—abstr. Includes a folded chart, photographs, and tables listing information for each sample. [342]

REILLY, W.I.

1965 The mean height and hypsographic curve for New Zealand. *N.Z. Jl Geol. Geophys. 8(1):* 128–39.
"The mean height of New Zealand is found to be 483m, that of the North Island 298m, and that of the South Island 627m."—abstr.
The New Zealand continental block, bounded by the 2000m isobath has an area of 2,074,000 km². Only 14% of it is land and 12% continental shelf. Thus it has the appearance of a submerged continent with only its mountain ranges above the sea. Tables give the area, volume and other parameters of land above base levels from 2km above to 2km below sea level. [343]

see also [222], [349].

RENARD, A. *see* [305].

REVELLE, R.; BRAMLETTE, M.; ARRHENIUS, G.; GOLDBERG, E.D.

1955 Pelagic sediments of the Pacific. *Spec. Pap. geol. Soc. Am. 62:* 221–35.
A general survey of the Pacific. The New Zealand area is shown in charts. [344]

RICHARD, J.J.

1962 Kermadec, Tonga and Samoa. *Cat. act. Volc. Wld 13:* 1–38.
Includes a submarine volcano near Raoul Island. [345]

RICHTER, C.F.

1958 "Elementary seismology". W.H. Freeman, San Francisco, Calif. 768 pp.
Includes a section (pp. 438–65) on comparisons between stratigraphy and tectonics of the New Zealand Region and California. [346]

see also [164].

RIPPER, I.D.; GREEN, R.

1967 Tasmanian examples of the influence of the bathymetry and crustal structure upon seismic T-wave propagation. *N.Z. Jl Geol. Geophys. 10(5):* 1226–30.
Factors influencing seismic T-wave propagation appear to be 1. the effect of bathymetry on the Sofar Channel; 2. the length of the land path before energy ejection into the Sofar Channel; 3. efficiency of energy ejection into the channel; 4. different ration of T-waves around submarine ridges. All of the T-phases studied originated in the New Zealand region. [347]

ROBERTSON, E.I.

1965 Gravity base stations in the south-west Pacific. *N.Z. Jl Geol. Geophys. 8(3):* 424–39.
Since 1950 gravity stations have been established on various islands in the southwest Pacific, including Kermadec, Macquarie and Auckland Islands. Full details are given for each, including free-air and Bouguer anomalies. [348]

ROBERTSON, E.I.; REILLY, W.I.

1958 Bouguer anomaly map of New Zealand. *N.Z. Jl Geol. Geophys. 1:* 560–4.
Negative anomalies recognized as the gravitational expression on an active tectonic belt related to the Tonga–Kermadec–Hikurangi Trenches and consid-

ered to be "predominantly of deep-seated origin". [349]

ROBERTSON, N. *see* [265].

ROMANKEVICH, Ye.A.

1968 Organic carbon and nitrogen deposits in Recent and Quaternary sediments of the Pacific Ocean. *Oceanology 8(5):* 658–72. [Translated from *Okeanologiya, 8(5):* 825–39.]
The New Zealand area is shown in three charts (two of organic carbon, one of nitrogen). The text is a general treatment of the deposits, referring to the whole Pacific area. [350]

ROOS, S.E.

1937 The submarine topography of the Ross Sea and adjacent waters. *Geog. Rev. 27(4):* 574–83.
Details of cruises in the South Pacific by *Bear of Oakland* in 1933. Includes description of the area south of New Zealand, and diagrams of profiles from Tahiti to New Zealand, and New Zealand to Easter Island. [351]

ROSS, D.I.

1967a Total magnetic field map of the South-west Pacific Ocean between New Zealand and Antarctica. *N.Z. Jl Geol. Geophys. 10(5):* 1231–4.
"A total magnetic field map of the South-West Pacific Ocean between New Zealand and Antarctica for epoch 1964–5 has been drawn from total field measurements made aboard HMNZS *Endeavour*. A comparison is made with earlier results and a value for the westward drift of the field pattern since 1959 is obtained."—abstr. [352]

1967b Magnetic and bathymetric measurements across the Pacific–Antarctic Ridge south of New Zealand. *N.Z. Jl Geol. Geophys. 10(6):* 1452–65.
This paper is complementary to [53] dealing with data obtained on the same cruise, but generally describing areas further south. It does include a chart and traverses up to latitude 45°S. [353]
see also [56].

ROSS, J.C.

1969 "A voyage of discovery and research in the southern and Antarctic regions during the years 1839–43." David & Charles Reprints. Newton Abott, Devon. 2 vols. lii + 366 pp.; x + 447 pp.
First published London, J. Murray 1847.
Journal of a voyage by HMS *Erebus* and HMS *Terror*. Many areas in the New Zealand region are described. Bottom soundings were taken (if the available equipment could reach the bottom) and submarine reefs noted. The main aim of the voyage was observation of the earth's magnetic field, but only one table on this subject contains reference to the New Zealand region (Vol. 1, p. 310). The book unfortunately lacks an index. [354]

ROTSCHI, H.; LEMASSON, L.

1967 Oceanography of the Coral and Tasman Seas. *Oceanogr. mar. Biol. 5:* 49–97.
Mostly a description of the sea itself, but includes one chart showing configuration of the area, and a short description of the bathymetry and topography. [355]

SANTO, T.A.

1961a Rayleigh wave dispersion across the oceanic basin around Japan. Pt 3. On the crust of the south-western Pacific Ocean. *Bull. Earthq. Res. Inst. Tokyo Univ. 39(1):* 1–22.
Includes information on the crustal conditions on the continental side of the Andesite line. [356]

1961b Division of the South-western Pacific area into several regions in each of which Rayleigh waves have the same dispersion characters. *Bull. Earthq. Res. Inst. Tokyo Univ. 39(4):* 603–30.
An attempt is made to divide the complicated oceanic area on the western side of the Andesite line into four regions—1. purely oceanic type: 3. sub-oceanic type; 5. sub-continental type; and 7. purely continental type. Results showed that crustal structure on the western side of the Andesite line is more continental than to the east of it. The Andesite line is shown slightly to the east of New Zealand. [357]

SANTO, T.A.; BATH, M.

1963 Crustal structure of Pacific Ocean area from dispersion of Rayleigh waves. *Bull. seism. Soc. Am. 53(1):* 151–65.
Records of several earthquakes, including ones in and around New Zealand were used to determine Pacific crustal structure. [358]

SAPPER, K.

1927 "Vulkankunde". Stuttgart. 336 pp.
Includes a reference to a submarine volcano in the Kermadec area. [359]

SCHNEIDER, E.D. *see* [432].

SCHOFIELD, J.C.

1967 Sand movement at Mangatawhiri Spit and Little Omaha Bay. *N.Z. Jl Geol. Geophys. 10(3):* 697–731.
Evidence that sea-level fluctuation is probably an important cause of coastal change is presented. Grain size and feldspar/quartz ratios of sand samples, together with malacological evidence, show that sand is transported to Mangatawhiri Spit from depths of 15fms, during periods of progradation, and that effective sand movement probably also occurs down to depths of 20fms. Effects of grain size on feldspar content are given in Appendix 3." —abstr.
Appendix 4 contains mineralogical and grain size analyses. [360]

1968 Prograding shoreline. Pp 894–6 *in* Fairbridge, R.W. (ed.) "Encyclopedia of Geomorphology". Reinhold, New York. 1295 pp.
A definition of prograding shore lines with examples taken from the New Zealand area. [361]

1969 Reconnaissance survey of silica sands, Parengarenga. *Inf. Ser. N.Z. Dep. scient. ind. Res. 63:* 76–92.
"Silica sands are widespread as bare dunes and as beach and seafloor deposits along the east coast of Aupouri Peninsula. . . . The purest deposits occur at the northeastern end of Kokota Sandspit and in nearby offshore positions. Sands in these seafloor positions contain the least amount of chromite and other mafic minerals. . . . The seafloor could be the best locality for future extraction."—abstr. [362]

SCHOTT, G.

1935 "Geographie des Indischen und Stillen Ozeans." Boysen, Hamburg. 413 pp.
Includes information (on routes of exploration, bathymetry, morphology, etc.) in the N.Z. region in extensive coloured folded charts and in the text. [363]

SCRIPPS INSTITUTION OF OCEANOGRAPHY

1953 Shipboard Report, Capricorn Expedition, 28 September 1952–21 February 1953. 60 pp.
Includes a description of the Tonga Trench and a chart of its bathymetry. [364]

SEARLE, E.J.

1958 Pleistocene and Recent Studies of Waitemata Harbour. 1. Main channel. *N.Z. Jl Geol. Geophys. 1(3):* 501–8.
A description of some features of the bed of Waitemata Harbour. Four echosounding profiles across the main stream are presented, and afford evidence of an interval of stillstand about 30ft below modern sea level during the last glaciation. [365]

1959a Pleistocene and Recent Studies of Waitemata Harbour. 2. North Shore and Shoal Bay. *N.Z. Jl Geol. Geophys. 2(1):* 95–107.
Description of the formation of North Shore peninsula, and its subsequent drowning. [366]

1959b Pleistocene and Recent Studies of Waitemata Harbour. 3. Tamaki Head to Mechanics Bay. *N.Z. Jl Geol. Geophys. 2(3):* 479–88.
Mainly a discussion of the coastal features, with some reference to their extension into the Harbour. [367]

1962 The volcanoes of Auckland City. *N.Z. Jl Geol. Geophys. 5(2):* 193–227.
Includes some description of lava flows in Waitemata Harbour. [368]

SEED, D.P.
1968 The analysis of the clay content of some glauconite oceanic sediments. *J. sedim. Petrol. 38(1):* 229–31.
"X-ray diffraction studies of the clay-sized mineral in glauconite oceanic sediments [off the east coast of North Island] do not show the presence of degraded clay lattices suitable as a parent material for glauconite."—abstr. [369]

SHEPARD, F.P.
1949a Sediment distribution on the east Asiatic continental shelves. [Abstract]. *Proc. 7th Pacif. Sci. Congr. 3:* 209–10.
The paper includes a short description of the bottom survey of Waitemata Harbour and Hauraki Gulf by A.W.B. Powell. [370]
1949b Submarine canyons in the Pacific and their bearing on eustatism (with discussion) [Abstract]. *Proc. 7th Pacif. Sci. Congr. 3:* 331–2.
Submarine canyons are considered to be submerged valleys formed by river erosion, pointing to widespread submergence, probably due to eustatic change in sea level. The character of submarine canyons on the New Zealand shelf is discussed. [371]

SHEPARD, F.P.; DILL, R.F.
1966 "Submarine canyons and other sea valleys". Rand McNally, Chicago. 381 pp.
Includes a short description of New Zealand submarine canyons on pp 219–21. [372]

SHOR, G.G. *see* [293].

SKERMAN, T.M. (Ed.)
1965 Studies of a Southern Fiord. *Mem. N.Z. oceanogr. Inst. 17:* 101 pp. *(Bull. N.Z. Dep. scient. ind. Res. 157.)*
Contents include: The Fiordland Shelf and Milford Sound, by J.W. Brodie; Sedimentation in Milford Sound, by H.M. Pantin; Transformations of Sulphur Compounds in the Sediments of Milford Sound, by I.R. Kaplan and T.A. Rafter; Contains a folded chart. [373]

SKORNYAKOVA, N.S.; ANDRUSHCHENKO, P.F.
1968 Iron-manganese nodules from the central part of the South Pacific. *Oceanology 8(5):* 692–701. [Translated from *Okeanologiya 8(5):* 865–78].
Data is reported on the internal structure, distribution and chemical composition of iron-manganese nodules from the central part of the South Pacific, including four stations in the New Zealand area. [374]

SKORNYAKOVA, N.S.; PETELIN, V.P.
1967 Sediments in the central part of the South Pacific. *Oceanology 7(6):* 779–93. [Translated from *Okeanologiya 7(6):* 1005–20.]
Description of the mineral content of sediment cores and bottom samples collected by the Russian research ship *Vityaz* in 1965. Most of the information concerns the area around the Society Islands and Tonga, but four sediment samples were from the northern part of the New Zealand area. Several tables give the concentrations of these minerals at the stations, and the text refers to them. [375]

SMITH, S.M. *see* [293], [294], [295].

SMITH, S.P.
1887 Geological notes on the Kermadec Group. *Trans. N.Z. Inst. 20:* 333–44.
Includes his account of the formation of the islands, and the topography of the surrounding area, plus an account of an earthquake in Denham Bay in 1872 which threw up an island (*see also* [377] which suggests this also happened in 1814). *See also* [204] for another version. [376]
1895 Volcanic activity in Sunday Island (Raoul Island) in 1814. *Trans. N.Z. Inst. 28:* 47–9.
A newspaper account by W.D. Campbell of an eruption in Denham Bay of a partly submerged volcano. Describes the formation of an island in the bay by the earthquake. By 1887 (the year of Smith's visit) the island had disappeared. [377]
see also [204], [376].

SOLOMON, S.; BIEHLER, S.
1969 Crustal structure from gravity anomalies in the southwest Pacific. *J. geophys. Res. 74(27):* 6696–701.
"Crustal thicknesses of about 24km are observed beneath the Lord Howe rise, the Norfolk ridge . . ."—abstr. [378]

SPARCK, R. *see* [160].

SPEDEN, I.G.
1959 The alignment of fold axes in the Jurassic of South-eastern Otago and southern Southland. *N.Z. Jl Geol. Geophys. 2(3):* 448–60.
Mainly a discussion of folding and faulting in the mentioned areas, with some speculative extensions into the South Pacific Ocean. [379]

SPEIGHT, R.
1909 Petrological notes on rocks from the Kermadec Islands, with some evidence for the existence of a sub-tropical Pacific continent. *Trans. N.Z. Inst. 42:* 241–54.
Gives evidence that suggests that the Kermadecs were built up by volcanic action on the remnants of a former continent which stretched southwest from Fiji and Tonga and probably extended to join with northern New Zealand. Also includes discussion of other islands, including Lord Howe and Norfolk. [380]
1943 The geology of Banks Peninsula—a revision. *Trans. N.Z. Inst. 73:* 13–26.
Includes a description of the bathymetry and sediments of the sea bed around Banks Peninsula. [381]
1950 An eroded coastline. *Trans. R. Soc. N.Z. 78:* 3–13.
Includes a section on "Features of the sea-bed in the vicinity [of that section of 90-mile beach, Canterbury, stretching from the outlet of Lake Ellesmere at Taumutu, to the mouth of the Rangitata River] and their bearing on the problem" of the rate of coastal erosion. [382]

SQUIRES, D.E.
1965 Deep-water coral structure on the Campbell Plateau, New Zealand. *Deep Sea Res. 12(6):* 785–8.
"A deep-water coral structure defined by bathymetry and samplings of fauna is recorded from the Campbell Plateau . . . from a depth of 320m. This is the first known occurrence of deep-water coral architecture in the Pacific Ocean."—abstr. Discusses the sediments and topography of the environment. [383]

STANDARD, J.C.
1961 Submarine geology of the Tasman Sea. *Bull. geol. Soc. Am. 72(12):* 1777–88.
Covers the features of the western New Zealand area, including Lord Howe Rise, various seamounts, Kelso Bank, Capel Bank, Middleton and Elizabeth Reefs, and Ball's Pyramid. Includes useful references. [384]

STOREY, R.S. *see* [227].

STRANGE, W.E. *see* [447].

SUGGATE, R.P.
1963 The Alpine Fault of New Zealand. *Trans. R. Soc. N.Z., Geol. 2:* 105–29.
A chart shows a previously unmapped branch fault of the Alpine Fault joining the northern end of the Hope–Kaikoura Fault with the southern end of the Kermadec Trench, reasonably well-defined by bathymetry. [385]
1968 Seismicity and structure in South-west New Zealand and the Macquarie Ridge. *N.Z. Jl Geol. Geophys. 11(5):* 1274–6.

A comment on a paper by Hatherton. [386]

see also [167], [173], [175].

SUMMERHAYES, C.P.

1967a The marine geology of the Auckland Islands area. *Trans. R. Soc. N.Z. Geol. 4(13):* 235–44.
A description of the morphological features of the sea floor around the Auckland Islands and its geological history. [387]

1967b New Zealand region volcanism and structure. *Nature, Lond. 215(5101):* 610–11.
General discussion, mainly about the sea floor south of New Zealand. [388]

1967c Note on Macquarie Ridge and the Tonga–Kermadec complex: are they parts of the mid-ocean ridge system? *N.Z. Jl Sci. 10(3):* 808–12.
"Macquarie Ridge is part of an island arc complex oriented towards the Tasman Basin; the Tonga–Kermadec island arc complex is oriented towards the Pacific; the two are separated in New Zealand by the possibly transform Alpine Fault."—abstr. [389]

1967d Marine environments of economic mineral deposition around New Zealand—a review. *N.Z. Jl mar. Freshwat. Res. 1(3):* 267–82.
"Concentrations of minerals on the sea-floor around New Zealand occur in a manner which makes them economically significant as future mineral resources. . . . The origin, bulk and significance of these deposits are discussed."—abstr. [390]

1967e Manganese nodules from the South-western Pacific. *N.Z. Jl Geol. Geophys. 10(6):* 1372–81.
"Manganese nodules from the Campbell Plateau and Macquarie Ridge have been chemically analysed and their compositions compared with other Pacific nodules. No significant differences in composition are apparent. . . . Nodule formation may be related to late Tertiary or Quaternary submarine volcanism.—abstr. [391]

1969a Recent sedimentation around northernmost New Zealand. *N.Z. Jl Geol. Geophys. 12(1):* 172–207.
A study of relict shallow water sediments formed during the postglacial rise in sea level, covering the continental shelf of northernmost New Zealand. The area considered extends roughly from Pandora Bank and Parengarenga Canyons to Van Dieman Bank. Includes two folded charts. [392]

1969b Submarine geology and geomorphology off northern New Zealand. *N.Z. Jl Geol. Geophys. 12(2–3):* 507–25.
"Results of a reconnaissance geological survey off northernmost New Zealand indicate offshore extension of its rocks and structures for at least 100 miles N.W. Geological samples from the continental shelf suggest carving of that feature by marine erosion relatively early in the Pleistocene."—abstr. [393]

1969c The marine geology of the New Zealand subantarctic sea floor. *Mem. N.Z. oceanogr. Inst. 50:* 92 pp. *(Bull. Dep. scient. ind. Res. 190.)*
The sea floor between New Zealand and the flanks of the Pacific–Antarctic Ridge is described under the following headings: Geology, review of geophysical studies, recent sedimentation, authigenic minerals, geology of major structures, structural synthesis. There are 31 illustrations, 13 tables and 4 folded charts. [394]

SYKES, L.R.

1963 Seismicity of the South Pacific Ocean. *J. geophys. Res. 68(21):* 5999–6006.
"A map of earthquake epicentres is presented for the South Pacific Ocean for the period 1957–1963. For much of this region the accuracy in locating epicentres has been improved by nearly an order of magnitude in comparison with that of previous studies. In several areas of the South Pacific the seismic activity is confined to narrow zones that are less than 50km wide."—abstr.
Includes the Macquarie Island area. [395]

1966a The seismicity and deep structure of island arcs. *J. geophys. Res. 71(12):* 2981–3006.
"The hypocentres of approximately 1500 earthquakes in the Tonga–Fiji, Kermadec, Kuril–Kamchatka, and Caribbean regions were redetermined using a digital computer. Since these computations are more accurate than those used in most previous studies, the spatial distribution of the redetermined hypocentres can be used to resolve structural features with dimensions larger than about 20km. In each of the regions investigated in this paper a zone of intense seismic activity was found beneath the inner (island ward) margin of the oceanic trench."—abstr. [396]

1966b The seismicity of the Tonga–Fiji region. *Geol. Surv. Pap. Can. 66–15:* 278–9. (Continental Margins and Island Arcs. Report on Symposium.)
A summary of this paper is given. Comparisons are made between the Tonga–Fiji region and the Kermadec area. Also includes the discussion of the paper, in which the following statement occurs —"An aseismic corridor occurs just north of New Zealand where the Kermadec and Hikurangi Trenches meet." (D.C. Krause P.279.) [397]

1967 Mechanism of earthquakes and nature of faulting on the mid-oceanic ridges. *J. geophys. Res. 72(8);* 2131–53.
"The mechanisms of 17 earthquakes on the mid-oceanic ridges and their continental extensions were investigated. . . . The results are in agreement with hypotheses of sea-floor growth at the crest of the mid-oceanic ridge system."—abstr.
Includes discussion and several diagrams on the Macquarie Ridge. [398]

1969 Seismicity of the mid-oceanic ridge system. *Geophys. Monogr. 13:* 148–53.
Includes brief references to Macquarie Ridge [399]

see also [13], [238], [239], [240], [314].

SYKES, L.R.; ISACKS, B.L.; OLIVER, J.

1969 Spatial distribution of deep and shallow earthquakes of small magnitude in the Fiji–Tonga region. *Bull. seism. Soc. Am. 59(3):* 1093–2113.
Includes references to the Tonga–Kermadec area and its structure. Discusses earthquakes and structure of the area mainly just to the north of the New Zealand region. [400]

TAIT, R.I.; BARKER, P.H.; GILPIN-BROWN, J.B.

1965 *Tui* oceanographic cruise (Auckland to Norfolk Island and Raoul Island) 1962: oceanographic station data and preliminary investigation of fauna. *N.Z. Jl Sci. 8(4):* 583–634.
"A general account is given of an oceanographic cruise. . . . A detailed cruise log and station list are included together with a summary of the more important biological discoveries."—abstr.
Includes a folded chart showing the bathymetry of the area. [401]

TALWANI, M.; WORZEL, J.L.; EWING, W.M.

1961 Gravity anomalies and crustal section across the Tonga Trench. *J. geophys. Res. 66(4):* 1265–78.
"In 1956, gravity observations with the Vening Meinesz pendulum apparatus were made aboard HMS *Telemachus* in the South-west Pacific Ocean. For each of several gravity profiles, large free-air anomalies were associated with the Tonga and Kermadec Trenches. . . . A crustal thickness of 36km is derived from gravity and seismic data for between this value and one obtained by Officer [316] from surface wave dispersion data is discussed."—abstr.
A corrigendum to this paper appears in *J. geophys. Res. 66(11):* 3989. [402]

TAMS, E.

1932 "Grundzüge der physikalischen Verhältnisse der festen Erde." Bornträger. Berlin.
Includes a description of seafloor features of the Kermadec Islands area. [403]

TANING, A.V. *see* [243].

TAYLOR, P.T.; BRENNAN, J.A.
1969 Airborne magnetic data across the Tasman Sea. *Nature, Lond. 224:* 1100–2.
The data obtained is used to determine the crustal structure and provide evidence for ocean floor spreading. [404]

TAYLOR, P.T.; BRENNAN, J.A.; VOGT, P.R.
1969 A preliminary analysis of regional airborne magnetic data across the Tasman Sea. *Eos Trans. Am. geophys. Un. 50(4):* 136. (Abstr.)
A description of the survey and a discussion of the results in relation to the crustal structure of the Tasman Sea, with particular reference to the Lord Howe Rise. [405]

TE PUNGA, M.T.
1953a The Paryphantidae and a Cook Strait land bridge. *N.Z. Jl Sci. Technol. B 35(1):* 51–63.
Includes discussion of the formation of Cook Strait. [406]
1953b A late Pleistocene land bridge across Cook Strait, New Zealand. *N.Z. Jl Sci. Technol. B 35(2):* 161–92.
"The geological evidence for postulating a late Pleistocene land connection between the North and South Islands [between the Marlborough Sounds and Paraparaumu–Foxton area] . . . is discussed."—abstr.
Includes a chart showing rocks beneath Cook Strait and concludes with a history of Cook Strait. [407]

THOMPSON, B.N.
1964 Basalt at Anchorite Rock, Hauraki Gulf. *N.Z. Jl Geol. Geophys. 7(3):* 525–8.
"The rock pinnacle struck recently by the submarine HMS *Anchorite* while on exercises in the Hauraki Gulf is composed of a sodic olivine basalt, and is probably Miocene or Pliocene in age."—abstr.
Its relation to the surrounding geology is also discussed. [408]

THOMSON, A.A.; EVISON, F.F.
1962 Thickness of the earth's crust in New Zealand. *N.Z. Jl Geol. Geophys. 5(1):* 29–45.
"Study of dispersive earthquake waves shows that over much of New Zealand the crust has a typical continental thickness of 30–40km, in accordance with the evidence of earthquake body waves and of gravity."—abstr.
Includes information on and discussion of surrounding oceanic areas. [409]

THOMSON, J.A.
1926 Volcanoes of the New Zealand–Tonga volcanic zone; a record of eruptions. *N.Z. Jl Sci. Technol. 8(6):* 354–71.
Gives a general introduction to the structure of the zone, then discusses each volcano. Describes only one submarine vent in the New Zealand area—Denham Bay, Raoul Island. [410]

TIZARD, T.H.; MOSELEY, H.N.; BUCHANAN, J.Y.; MURRAY, J.
1885 Narrative of the cruise of HMS *Challenger* with a general account of the scientific results of the expedition. *Rep. scient. Results explor. Voyage Challenger 1:* 1110 pp.
Description of the voyage between Sydney and New Zealand, and New Zealand and Tongatapu, the relevant stations being 165A to 171A. Includes soundings and some description of sediments. [411]

UNITED STATES. NAVAL OCEANOGRAPHIC OFFICE. MARINE SURVEYS DIVISION
1965 Operation Deep Freeze 62. 1962–1963. Marine geophysical investigations. *Tech. Rep. oceanogr. Off. Wash. TR–118:* 157 pp.
Includes a description of geomagnetic survey results and profiles south of New Zealand and between Cook Strait and Australia. [412]

UNITED STATES. NAVY. HYDROGRAPHIC OFFICE
1956 Report on Operation Deep Freeze I [1955–56]. *Tech. Rep. hydrogr. Off. Wash. TR-33:* 81 pp.
All ships taking part in this operation went to Antarctica via New Zealand and one sediment sample was collected off Campbell Island. A very preliminary description is given of this sample on page E-21. As noted 'time did not permit extensive observations'. [413]
1957 Operation Deep Freeze II 1956–1957. Oceanographic survey results. *Tech. Rep. hydrog. Off. Wash. TR-29:* 155 pp.
Ships taking part in this operation went to Antarctica via New Zealand, and two sediment samples were taken in the New Zealand area, one in Wellington Harbour. These are tabulated and described (p. 58 and p. 141). [414]

URRY, W.D.
1949 Radioactivity of ocean sediments. 6. Concentration of the radio-elements in marine sediments of the Southern Hemisphere. *Am. J. Sci. 247(4):* 257–75.
Experiments on cores collected by U.S. Navy Antarctic Expedition 1946–47; one core in the New Zealand region at 175°E, long. 44°S lat. is discussed quite extensively. [415]

VACQUIER, V.
1969 Magnetic intensity field in the Pacific. *Geophys. Monogr. 13:* 422–30.
Mainly a study of the Northeast Pacific, but includes a figure with the following caption—"The magnetic anomaly pattern correlated between profiles by Peter [1966] and by Raff [1966] in the north Pacific and Christoffel and Ross [1965] in the south Pacific [after Vine, 1966]. Vine suggests that the only difference between the two is the rate of spreading that formed them." [416]

VAN BEMMELEN, R.W.
1933 Versuch einer geotektonische Analyse Australiens und des Südwest Pazifik nach der Undationstherie. *Proc. Sect. Sci. K. ned. Akad. Wet. 36(7):* 740–9.
Discussion of the geotectonics of an area that includes all the New Zealand region. [417]
1965 The evolution of the Indian Ocean Mega-undation (causing the Indico-fugal spreading of Gondwana fragments). *Tectonophysics 2(1):* 29–57.
Includes some discussion of continental drift in the Southwest Pacific and a folded chart showing an interpretation of structure in the New Zealand area.
A mega-undation is the author's term for a large scale vertical movement of the earth's crust. [418]

VAN DER LINDEN, W.J.M.
1966 South-west Pacific Ocean. Pp. 846–52 *in* Fairbridge, R.W. (ed.) "Encyclopedia of Oceanography". Reinhold, New York. xiii + 1021 pp.
A general description, including boundaries, sediment, structural units, synthesis and regional developments. [419]
1967a A textural analysis of Wellington Harbour sediments. *N.Z. Jl mar. Freshwat. Res. 1(1):* 26–37.
"Grain size and carbonate analyses have been carried out on bottom sediments samples of Wellington Harbour. From grain-size parameters it was possible to establish a number of facies types and to outline sediment sources and directions of transport."—abstr. [420]
1967b Out into inner space. *N.Z. NAC Airline Rev. 6(44):* 12–13.
A general account of the seafloor around New Zealand and its structural history. Includes a bathymetrical chart. [421]
1967c Structural relationships in the Tasman Sea and South-west Pacific Ocean. *N.Z. Jl Geol. Geophys. 10(5):* 1280–301.
"Bathymetric and magnetic data from Lord Howe Rise–New Caledonia Basin–Norfolk Ridge area form the basis of a reinterpretation of the structure and geological history of the Melanesian complex in relation to the South-west Pacific Ocean."—abstr.

Includes four folded charts. [422]

1968 Textural, chemical and mineralogical analyses of marine sediments. *Misc. Publs N.Z. oceanogr. Inst. 39:* 37 pp.
"This manual is a compilation of the analytical methods in sedimentary petrography commonly used by the N.Z. Oceanographic Institute."—intro.
Includes grain size analysis, carbonate analysis, heavy mineral analysis. [423]

1969a Off-shore sediments, North-west Nelson, South Island, New Zealand. *N.Z. Jl Geol. Geophys. 12(1):* 87–103.
Numerous sediment analyses show that sediment is moving northeastwards around Farewell Spit into Golden Bay. Two seismic profiles give an indication of late Quaternary depositional history. [424]

1969b Rotation of the Melanesian complex and of West Antarctica—a key to the configuration of Gondwana. *Palaeogeogr., Palaeoclim. Palaeoecol. 6:* 37–44.
"An anti-clockwise rotation of the Melanesian complex with respect to Australia and an anti-clockwise rotation of West Antarctica with respect to East Antarctica, both caused by active sea-floor spreading emanating from mid-ocean ridges, enables a reconstruction of Gondwanaland without the necessity of accepting sunken land bridges."—abstr.
Discusses many submarine features of the New Zealand region. [425]

[NO ITEM 426]

1969c Extinct mid-ocean ridges in the western Pacific. *Earth Planet. Sci. Lett. 6(6):* 483–90.
A study of the Dampier Ridge from magnetic and seismic evidence suggests that it is an extinct mid-ocean ridge. Adjacent features are also examined.

see also [113]. [427]

VAN DER LINGEN, G.J.

1969 The turbidite problem. *N.Z. Jl Geol. Geophys. 12(1):* 7–50.
Discussion of the turbidity current hypothesis, with a section on recent deep-sea sediments in relation to this theory. [428]

VARNE, R.; GEE, R.D.; QUILTY, P.G.

1969 Macquarie Island and the cause of oceanic linear magnetic anomalies. *Science (N.Y.) 166:* 230–3.
"Macquarie Island is formed of probably Pliocene oceanic crust. Intruded into pillow lavas is a belt of harzburgite and layered gabbro masses cut by dike swarms. Similar belt-like structures may cause the linear magnetic anomalies of the oceans."—abstr. [429]

VESTINE, E.H.

1939 Magnetic secular variation in the Pacific area. *Proc. 6th Pacif. Sci. Congr. 1:* 65–74.
Several charts of isopors of differing sorts. The New Zealand region is included on all maps, as well as in the text. [430]

VINE, F.J.

1966 Spreading of the ocean floor, new evidence. *Science, N.Y 154(3755):* 1405–15.
Magnetic anomalies are used to show the history of the oceans. Includes discussion of the area south of New Zealand, particularly with reference to the East Pacific Rise. [431]

VOGT, P.R. *see* [405].

VOGT, P.R.; SCHNEIDER, E.D.; JOHNSON, G.L.

1969 The crust and upper mantle beneath the sea. *Geophys. Monogr. 13:* 556–617.
Includes discussion of the crustal structure and seismicity of the Tonga–Kermadec Trench. [432]

VOLKOV, I.I. *see* [316].

WAITE, E.A.

1909 Scientific results of the New Zealand Government Trawling Expedition, 1907; Introduction. *Rec. Cant. Mus. 1(2):* 45–64.
Includes particulars of stations at which trawling was done, with the depth in fathoms and the nature of the bottom sediment at each station. [433]

WALLACE, G.M.; NEWMAN, L.E.; JEROME, J.L.

1958 Bacteriological survey of Auckland Harbours. Part V. Vertical distribution of sewage in Waitemata Harbour. *N.Z. Jl Sci. 1(1):* 23–34.
There was no regular stratification of sewage—probably because of vertical eddies caused by tidal movement over an uneven bottom. The question of pollution is considered. [434]

WEEKLY NEWS

1964 Ocean bed search finds phosphate and potash. *Weekly News 5270:* 5.
General description of current research of the N.Z. Oceanographic Institute, and of the minerals found on the Chatham Rise that may be of some economic use. (Superseded by [308].) [435]

WEEKS, L.G.

1959 Geological architecture of the Circum-Pacific. *Bull. Am. Ass. Petrol. Geol. 43(2):* 350–80.
A consideration of the whole Pacific. The Indonesian–Melanesian–New Zealand mobile belt is briefly described and reference made to strike-slip faulting. Includes several charts of the whole Pacific. [436]

WEGENER, A.L.

1966 "The origin of continents and oceans". 4th rev. ed. Dover Publications, New York (first published 1929). 246 pp.
By using the index, information can be discovered on the structural history of the New Zealand region, including specific reference to the Tonga Trench. [437]

WILLIS, R.P.

1961 Mechanical and other aspects of oceanographic research. *Jl N.Z. Inst. Mech. Engrs 1(1):* 9–12.
Description of the type of work done and equipment used by the N.Z. Oceanographic Institute. [438]

1964 A new method of preparing marine sediment cores. *N.Z. Jl Geol. Geophys. 7(4):* 804–10.
"Flame gouging can be used as a means of splitting corer barrels containing sediment samples from the sea-bed."—abstr. [439]

1966 Simple joint for attaching core cutters to corer barrels. *N.Z. Jl Sci. 9(1):* 77–83.
"An inexpensive, quick-operating joint has been evolved as a trouble-free method of attaching core cutters to corer barrels."—abstr. [440]

WILSON, J.T.

1965 Submarine fracture zones, aseismic ridges and the International Council of Scientific Unions Line: proposed western margin of the East Pacific Ridge. *Nature, Lond. 207 (5000):* 907–11.
The western margin of the East Pacific Ridge is postulated to follow the edge of the New Zealand Plateau, but little actual information is possible due to inadequate charting in this area. [441]

1969 Aspects of the different mechanics of ocean floors and continents. *Tectonophysics 8:* 281–4.
Includes a brief mention of three types of mechanical movement related to continental drift around New Zealand. [442]

WISEMAN, J.D.H. *see* [216].

WISEMAN, J.D.H.; OVEY, C.D.

1954 Proposed names of features on the deep sea floor. 1. The Pacific Ocean. *Deep Sea Res. 2(2):* 93–106.
Includes general discussion, and definitions of Kermadec Ridge, Lord Howe Rise, Norfolk Island Ridge, Pacific–Antarctic Ridge, South-western Pacific Basin, Tasman Basin, Kermadec Trench, Tonga Trench. [443]

see also [216].

WOLFF, T.

1964 The Galathea Expedition, 1950–52: list of benthic

stations from 0–400 metres, near-surface stations and land stations. *Videnskab. Meddr. dansk. naturh. Foren. 127:* 192–258.
Includes tabular information on stations in the Tasman Sea, Milford Sound, west coast, around Auckland, Kermadec Trench and surrounding area and Tonga Trench. [444]

WOOD, B.L.
1958 Submarine geology of Bluff Harbour. *N.Z. Jl Geol. Geophys. 1(3):* 461–9.
A study of drill-cores of a small area at the southern end of Bluff Harbour. [445]
1966 Foveaux Strait. Pp. 742–3 *in* McLintock, A.H. (ed.) "An Encyclopaedia of New Zealand. Vol. 1". Govt. Printer, Wellington. xxxi + 928 pp.
A general description, including non-geological aspects. Includes a small chart. [446]

WOOLLARD, G.P.; STRANGE, W.E.
1962 Gravity anomalies and the crust of the earth in the Pacific Basin. *Geophys. Monogr. 6:* 60–80.
A general study with examples. Useful Pacific charts, including the New Zealand region, showing free-air anomalies, Bouguer anomalies and elevation of the mantle. Includes reference to the Tonga Trench. [447]

WORZEL, J.L.
1965a Deep structure of coastal margins and mid-oceanic ridges. *Colston Pap. 17:* 335–9.
Includes discussion and diagrams of the Tonga Trench. [448]
1965b "Pendulum gravity measurements at sea, 1936–1959." Wiley, New York. 422 pp.
Includes gravity observations of the Tonga Trench and their interpretations. [449]
1966 Structure of continental margins and development of ocean trenches. *Geol. Surv. Pap. Can. 66–15:* 357–75 (Continental Margins and Island Arcs. Report of Symposium).
Includes diagrams and a short discussion of the Tonga Trench. [450]
see also [402].

WRIGHT, J.B.
1966 Convection and continental drift in the South-western Pacific. *Tectonophysics 3(2):* 69–81.
Description of the structure of the area, and conclusions drawn regarding continental drift. [451]

ZHIVAGO, A.V.
1962 Outlines of Southern ocean geomorphology. *Geophys. Monogr. 7:* 74–80.
Includes most of the New Zealand region south of latitude 40°S. Includes a folded coloured chart showing geomorphology, and a short description of the South Pacific area. [452]
1965 Geomorfologiya i Tektonika dna Yuzhnogo Okeana. (Geomorphology and tectonics of the floor in the southern ocean). *Rez. Issled. mezhdunar. geofiz, Proekt, 10 Okeanol. Issled, 13:* 148–56. (In Russian, English Abstract).
Discusses ocean floor structures, the difficulties in compiling tectonic maps of the area and the impossibility of applying continental schemes and nomenclatures to submarine features. [453]
1967 Bottom morphology and tectonics of the Southern Ocean. Pp. 124–35 *in* "Proceedings of the Symposium on Pacific–Antarctic Sciences." *Scient. Rep. Jap. Antarct. Res. Exped, Spec. Issue 1.*
Includes the southern part of the New Zealand area. [454]
see also [273].

GEOGRAPHICAL INDEX

For convenience, the New Zealand Region has been subdivided into both coastal and oceanic areas (*see frontispiece*). In each case an item referring to three or more individual areas is listed under general. It is envisaged that the geographical index will be used in conjunction with the subject index to locate papers precisely, e.g., to find papers on the bathymetry of the Tasman Sea, look up both "Bathymetry" in the subject index and "Tasman" in the geographical index and the items which appear in both lists will be on the required subject.

A. COASTAL AREAS

B. OCEANIC AREAS

SUBJECT INDEX

Printed by Universal Printers Ltd., Wellington
under the authority of E. C. Keating, Government Printer, Wellington, New Zealand.