DEPARTMENT OF THE INTERIOR
CANADA

HON. THOMAS G. MURPHY, *Minister* H. H. ROWATT, *Deputy Minister*

PUBLICATIONS

OF THE

Dominion Observatory

OTTAWA

R. MELDRUM STEWART, *Director*

Vol. X

Bibliography of Seismology

No. 11

JULY, AUGUST, SEPTEMBER, 1931

BY

ERNEST A. HODGSON

OTTAWA
F. A. ACLAND
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1931

Price 25 cents.

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BIBLIOGRAPHY OF SEISMOLOGY

JULY, AUGUST, SEPTEMBER, 1931

1001. AGAMENNONE, G.,

(1) "Serions-nous en voie de prévoir les tremblements de terre?" *Matériaux pour l'Étude des Calamités*, No. 23, 260-265, Geneva, 1930.

(2) "Saremmo sulla via della previsione dei terremoti?" *Bollettino della Società Sismologica Italiana*, **29**, Fascicoli 3-4, 36-41, Rome, 1930.

The above paper (French and Italian versions) originally appeared in the newspaper *Il Messaggero*, of Rome, and was reported in these lists as No. 603. The Italian version, last above, presents a bibliographical list of nine items on the subject of earthquake prediction.

1002. AGAMENNONE, G. and CAVASINO, A., "Il terremoto nella Riviera d'occidente del 23 Febbraio 1887," *Memorie del Real Ufficio Centrale di Meteorologia e Geofisica*, Serie III, **3**, 164 pages, 2 plates, 26 tables, Rome, 1931. G.A.

1003. BARAB, J. and ELY, A. R., "Explosives and Their Application in Geophysical Prospecting." Mimeographed and privately distributed publication by the Hercules Powder Company, 12 pages, Wilmington, October 10, 1930.

—— BELLAMY, Ethel F. B. and BELLAMY, F. A., "Herbert Hall Turner, a Notice of his Seismological Work." See No. 1004 of this list.

1004. BELLAMY, F. A. and BELLAMY, Ethel F. B., "Herbert Hall Turner, a Notice of his Seismological Work," *Special Publication of Oxford University*, 23 pages, Oxford, 1931.

This short account of Professor Turner's work in seismology contains also a list of the publications in that science prepared under his direction.

1005. (1) BERLAGE, H. P., "Zur Frage der Phasendifferenz zwischen der Bewegung des Pendels und des Galvanometers bei der elektromagnetischen Registriermethode," *Koninklijk Nederlandsch Meteorologisch Instituut*, No. 108, Seismische Registrierungen in De Bilt, 1921, x-xiv, De Bilt, 1924. H.P.B.

1005. (2) BERLAGE, H. P., "Untersuchung des De Quervain-Piccard'schen Seismographen und einiger allgemeiner seismometrischer Probleme," *Jahresbericht des Schweizerischen Erdbebendienstes, 1923*, Anhang Nr. 1, Zürich, 1925. H.P.B.

—— BODLE, R. R. and HECK, N. H., "United States Earthquakes 1929." See No. 1031 of this list.

1006. BOIS, Charles, "Chronique sismologique: les tremblements de terre destructeurs," *Matériaux pour l'Étude des Calamités*, as follows:—

April 1 to October 1, 1929: No. 21, 87-91,
October 1, 1929 to April 1, 1930: No. 22, 142-144,
April 1 to October 1, 1930: No. 23, 256-260,
October 1, 1930 to January 1, 1931: No. 24, 381-385,
Geneva, 1930.

1007. BORCHERT, H., "Entgegnung auf die Richtigstellungen von Herrn R. Schwinner zu meiner Arbeit 'Über die Bildung der ersten Erstarrungskruste der Erde'," *Gerlands Beiträge zur Geophysik*, **29**, Heft 3-4, 336-338, Leipzig, 1931.
See also No. 908 and No. 1076 of these lists.

1008. BORN, A., "Alter der Erde und geologische Zeitalter," *Handbuch der Geophysik*, **2**, Lieferung 1, Chapters 10-12, 190-439, 110 figures, Berlin, 1931.
For reference to the *Handbuch der Geophysik*, see No. 332 of these lists.

1009. BOWIE, William, "Shaping the Earth," *Journal of the Washington Academy of Sciences*, **21**, No. 6, 103-125, Washington, March 19, 1931.

1010. BOWIE, William, "Geodetic Work Lays the Basis for Study of Earth Movements," *Transactions of the American Geophysical Union, Twelfth Annual Meeting, April 30 and May 1, 1931. Special Publication of the National Research Council, U.S.A.*, 65-66, Washington, 1931.

1011. BRAMMALL, A., "John William Evans, C.B.E., D.Sc., LL.B., F.R.S.," *Geological Magazine*, No. 799, **68**, 47-48, London, January, 1931.
An obituary note on the celebrated British geologist, whose interest in seismology is so well known.
An even more extended outline of his life is given over the initials, A.M.D., in the *Geographical Journal*, **77**, No. 2, 207-208, London, February, 1931.

1012. BÜSS, E., "Beitrag zur Berechnung von Konstanten der Galitzin'schen aperiodischen Seismographen," *Académie des Sciences de l'URSS, Publication de l'Institut Séismologique*, No. 8, 1-11, Leningrad, 1930.
The following abstract by W. Ayvazoglou is given in *Geophysical Abstracts*, No. 25 (see No. 1053 of this list.): "Formulas are derived for working out special tables which may serve for finding the accurate values of the constants during the observations without considerable calculations, so that the necessary adjustments may be made without delay. The tables are added to the article." F.W.L.

—— CAVASINO, A. and AGAMENNONE, G., "Il terremoto nella Riviera d'occidente del 23 Febbraio 1887." See No. 1002 of this list.

1013. CHAPMAN, S. and PRICE, A. T., "The Electric and Magnetic State of the Interior of the Earth, as Inferred from Terrestrial Magnetic Variations," *Philosophical Transactions of the Royal Society of London*, Series A, **229**, 427-460, London, 1930.
In this paper the authors make use of seismological evidence as to certain conditions within the earth and arrive at conclusions which are of interest to seismologists.

1014. COOKE, C. Wythe, "Correlation of Coastal Terraces," *Journal of Geology*, **38**, No. 7, 577-589, Chicago, October-November, 1930.
See also No. 1022 of this list.

1015. CROSBY, Irving B., "Further Evidence of Keystone Faulting," *Journal of Geology*, **38**, No. 2, 184-186, Chicago, February-March, 1930.

1016. CROWTHER, J. G., "More about the Great Siberian Meteorite," *Scientific American*, 314-317, 9 illustrations, New York, May, 1931.
See also No. 247 and No. 387 of these lists.

1017. DAVISON, Charles, "The North Sea Earthquake," *Nature*, No. 3216, **127**, 955, London, June 20, 1931.
The above note gives a brief description of the earthquake of June 7, 1931, in the North sea.

1018. DEMING, W. Edwards, "The Application of Least Squares," *Philosophical Magazine*, Seventh Series, **11**,, No. 68, 146-158, London, January, 1931.

1019. DENNIS, Clifford E., "Experiments on Planetary Deformation of Earth," *Pan-American Geologist*, **55**, No. 4, 241-256, 5 illustrations, Des Moines, May, 1931.

—— ELY, A. R. and BARAB, J., "Explosives and Their Application in Geophysical Prospecting." See No. 1003 of this list.

—— EWING, Maurice and LEET, L. Don, "Velocity of Explosion-generated Longitudinal Waves in a Nepheline Syenite." See No. 1055 of this list.

1020. FENNER, Clarence N., "Mount Katmai and Mount Mageik," *Zeitschrift für Vulkanologie*, **13**, Heft 1, 1 map, 32 illustrations, Berlin, June, 1930.

1021. FLEMING, John A. et al., "Transactions of the American Geophysical Union, Twelfth Annual Meeting, April 30 and May 1, 1931," *Special Publication of the National Research Council, U.S.A.*, 229 pages, Washington, June, 1931.

In addition to longer papers reported by authors: Bowie, Ewing, Hosmer, Leet, McComb, Merritt, Reid, Reynolds, Sohon, and Wenner, the section on seismology presents a short report by the secretary on "A Proposed Establishment of a Seismological Observatory at Huancayo, Peru," another by Dr. Heck on "Observations of Developments in Instruments at the Seismological Research Laboratory in Pasadena," and one by Frank Neumann on "Memorandum on the New York Earthquake of April 20, 1931."

1022. FLINT, Richard Foster, "Cooke's Correlation of Coastal Terraces: a Discussion," *Journal of Geology*, **39**, No. 1, 82-83, Chicago, January-February, 1931.

See also No. 1014 of this list.

1023. FRASER, Donald M., "Geology of San Jacinto Region, California" (abstract only), *Pan-American Geologist*, **55**, No. 4, 318-319, Des Moines, May, 1931.

The paper was presented at the Toronto Meeting of the Geological Society of America (1931).

1024. FUJIWHARA, S. and TAKAYAMA, T., "Note on the Mechanism of the North Izu Earthquake of Nov. 26, 1930 in Japan," *Gerlands Beiträge zur Geophysik*, **29**, Heft 2, 131-137, 4 figures, Leipzig, 1931.

The authors' abstract reads: "This is the preliminary note on the mechanism of a destructive earthquake which occurred on Nov. 26, 1930 over North Izu in Japan. There appeared three or four systems of faults on this occasion as shown in Fig. 1. At first sight they are too much complicated to be explained in any simple way. By a model experiment, however, the authors found that such complicated fault systems can quite naturally be produced by simple horizontal compressive stresses. On assuming such stresses as existing in the actual case, the authors have succeeded in explaining the principal facts actually observed."

1025. GREGORY, J. W., "Raised Beaches and Variations of Sea-level," *Scientia*, **49**, No. 2, 95-104, Bologna, February, 1931.

A French text, prepared by M. Henry de Varigny, Paris, with the title, "Plages surélevées et variations du niveau de la mer," is given in the same issue at pages 41-48 of the appendix.

1026. GREGORY, J. W., "A Deep Trench on the Floor of the North Sea," *Geographical Journal*, **77**, No. 6, 548-551, 1 map, London, June, 1931.

While it seems probable that this trench has long existed even in a sea so well charted (its limited width having caused it to be missed when soundings were being made) the author discusses, as an alternative, the possibility that it was caused by the North sea earthquake of January 24, 1927.

1027. GUTENBERG, Beno,

(1) "Abkühlung und Temperatur der Erde," *Handbuch der Geophysik*, **2**, Lieferung 1, Chapters 1 and 2, 1-35, 15 figures, Berlin, 1931.

(2) "Der physikalische Aufbau der Erde," *Handbuch der Geophysik*, **2**, Lieferung 1, Chapters 13-19, 440-564, 38 figures, Berlin, 1931. B.G.

For reference to the *Handbuch der Geophysik*, see No. 332 of these lists. The two sections of the publication, listed above, present authoritative and detailed outlines of the present knowledge in the field defined by the title. A valuable introduction to the mathematical theory of elasticity, from the viewpoint of the seismologist, is included in the second section.

1028. HAARMANN, Erich, "Die Oszillationstheorie: eine Erklärung der Krustenbewegungen von Erde und Mond," Ferdinand Enke, xii+260 pages, illustrations and maps. Price M 17 (bound M 19). Stuttgart, 1930.

An extended review by Arthur Holmes, under the title "The Mechanism of Earth Movements," is given on pages 164-165 of the *Geographical Journal*, **77**, No. 2, London, February, 1931.

1029. HECK, N. H., "Doing Something about Earthquakes," *Scientific Monthly*, No. 187, **32**, No. 4, 365-367, New York, April, 1931.

The above paper was presented over the Columbia Broadcasting System, as one of the Science Service Radio Talks.

1030. HECK, N. H., "Seismology and Engineering," *Military Engineer*, **23**, No. 128, 131-134, Washington, 1931.

An abstract by W. Ayvazoglou is given in *Geophysical Abstracts*, No. 25, pages 117-118. See No. 1053 of this list. F.W.L.

1031. HECK, N. H. and BODLE, R. R., "United States Earthquakes 1929," *Special Publication of the U.S. Department of Commerce, Coast and Geodetic Survey*, Serial No. 511, 55 pages, Washington, 1931. USCGS.

This paper may be obtained from the Superintendent of Documents, Washington, at the nominal price of 15 cents. In addition to a discussion of the earthquakes by regions, a rather full description is given, on pages 17-34, of the Attica earthquake of August 12, 1929.

1032. HEISE, Dr., "Seismic Methods of Prospecting as Applied in Mining" (in Russian), *Gorny Journal (Mining Journal)*, **106**, No. 6-7, 163-166, Moscow, 1931.

An abstract is given in Geophysical Abstracts, No. 25, at page 117. See No. 1053 of this list. F.W.L.

1033. HODGSON, Ernest A., "Probing the Earth Beneath," *Scientific American*, pages 102-105, 4 figures, New York, August, 1931.

The above paper is copied from the *Journal of the Royal Astronomical Society of Canada* for February, 1930. See previous reference No. 531 of these lists.

—— HOLMES, Arthur, "The Mechanism of Earth Movements." See No. 1028 of this list.

1034. HOPE-JONES, F., "A New Spark Micro-chronograph," *Monthly Notices of the Royal Astronomical Society*, **89**, No. 6, 615-617, London, April, 1929.

The paper describes a chronograph of an entirely new type, devised and made by Mr. A. L. Loomis of Tuxedo Park, New York.

1035. HOSMER, G. L., "Report of Progress on Accelerometer for Recording Earthquake-shocks," *Transactions of the American Geophysical Union, Twelfth Annual Meeting, April 30 and May 1, 1931. Special Publication of the National Research Council, U.S.A.*, 70-71, Washington, 1931.

1036. IMAMURA, Akitune, "Further Studies on the Chronic Block Movements in the Kyoto-Osaka District," *Proceedings of the Imperial Academy*, **7**, No. 3, 92-95, 4 figures, Tokyo, 1931. A.I.

1037. IMAMURA, Akitune, "On the Block Movements That Preceded and Accompanied the Severe Tokyo Earthquake of May 21, 1928—Active Faults across the City of Tokyo," *Japanese Journal of Astronomy and Geophysics*, **8**, No. 3, 177-186, 6 figures, 3 tables, 1 plate, Tokyo, 1931. A.I.

See also No. 939 of these lists.

1038. INOUYE, Win and SUGIYAMA, Tomonori, "On Sound Phenomena of the Idu Earthquake of Nov. 26th, 1930," *Bulletin of the Earthquake Research Institute, Tokyo Imperial University*, **9**, Part 2, 168-176, 4 figures, June, 1931.

1039. ISHIMOTO, Mishio, "Étude préliminaire sur l'accélération des séismes," *Bulletin of the Earthquake Research Institute, Tokyo Imperial University*, **9**, Part 2, 159-167, 4 figures, 1 plate, June, 1931.

1040. ITOO, Tokunosuke, "Über Oberflächenwellen" (Erste Mitteilung), *Gerlands Beiträge zur Geophysik*, **30**, Heft 3-4, 366-407, Leipzig, 1931.

1041. JEFFREYS, Harold, "Thermodynamics of an Elastic Solid," *Proceedings of the Cambridge Philosophical Society*, **26**, 101-106, January, 1930.

1042. JEFFREYS, Harold, "Damping in Bodily Seismic Waves," *Monthly Notices of the Royal Astronomical Society, Geophysical Supplement*, **2**, No. 7, 318-323, London, January, 1931.

1043. JEFFREYS, Harold, "The Formation of Love Waves (Querwellen) in a Two-layer Crust," *Gerlands Beiträge zur Geophysik*, **30**, Heft 3-4, 336-350, Leipzig, 1931.

The author's summary reads: "The generation of SH- and Love-waves from an impulsive source is considered. It is found that the disturbance transmitted through the lower layer consists of a series of overlapping pulses, each starting at an instant corresponding to the time of transmission of a pulse that has undergone an integral number of reflexions in the upper layer. The recovery after each pulse leads to a train of waves, the superposition of which gives the Love-waves."

1044. JOHNSTONE, J. H. L., "The Acadian-Newfoundland Earthquake of November 18, 1929," *Proceedings and Transactions of the Nova Scotian Institute of Science*, **17**, Part 4, 223-237, 3 illustrations, Halifax, 1930.

The author's abstract reads: "Field data obtained by some observers in Nova Scotia and Newfoundland are given. The seismograms of three of the aftershocks recorded at Halifax are discussed. The first part of the P-wave to reach Halifax was a compression. The seismogram obtained at the island of Saint Helena is briefly discussed and a copy of the tide gauge record obtained at Halifax is shown. The damage to cables is briefly discussed and photographs of broken cable ends found at N. Lat. 43° 26′ 54″ and W. Long. 56° 12′ 54″ are given. No exhaustive investigation has been undertaken as this is being carried out by the Dominion Observatory, Ottawa, and by the United States Coast and Geodetic Survey."

1045. KINDLE, Edward M., "Sea-bottom Samples from Cabot Strait Earthquake Zone" (abstract only), *Pan-American Geologist*, **55**, No. 4, 306, Des Moines, May, 1931.
The paper was presented at the Toronto meeting of the Geological Society of America (1931).

1046. KISHINOUYE, Fuyuhiko, "Report of the Strong Earthquake in the Southwestern Part of Kaga Province, Oct. 17, 1930," *Bulletin of the Earthquake Research Institute, Tokyo Imperial University*, **9**, Part 2, 216-223, June, 1931.
The paper is in Japanese with a short abstract in English on page 223.

1047. KRANZ, Walter, "Bodenerschütterungen, Geophysik, und Ingenieurgeologie," *Zeitschrift für praktische Geologie*, **39**, No. 3, 38-40, Halle, 1931.
An abstract by W. Ayvazoglou appears in *Geophysical Abstracts*, No. 26, at page 142. See No. 1053 of this list. F.W.L.

1048. KRAUZ, E., "Die Seismotektonik der Tiroler Alpen," *Gerlands Beiträge zur Geophysik*, **30**, Heft 1-2, 96-135, 2 figures, Leipzig, 1931.

1049. KRUMBACH, G., "Seismogrammformen und Vorgänge in Herdgebiet," *Gerlands Beiträge zur Geophysik*, **30**, Heft 3-4, 351-365, 5 figures, bibliography, Leipzig, 1931.
The author makes use of the Kamtschatka earthquakes of 1904, 1920, and 1929 to illustrate the characteristic records of earthquakes originating at the same epicentre, though recorded at different stations and at different times. He examines the probable causes of this established observation.
An interesting report along this same line is given on pages 297-298 of the paper by Dr. Leet, reported as No. 1054 of this list.

1050. LAMBERT, Walter D., "Note on Prey's Article: 'Zur Frage nach dem isostatischen Massenausgleich in der Erdrinde,' " *Gerlands Beiträge zur Geophysik*, **30**, Heft 1-2, 239-240, Leipzig, 1931.
See No. 1070 of this list.

1051. LARSEN, Palmer, "Index to Geophysical Abstracts No. 1 to No. 20," United States Bureau of Mines, Information Circular, No. 6438, 1-38, Washington, May, 1931. F.W.L.

—— LA RUE, Wilton W. and MCCOLLUM, Burton, "Use of Existent Wells as an Adjunct to Seismograph." See No. 1059 of this list.

1052. LAWSON, Andrew C., "The Isostasy of the Uinta Mountains," *Journal of Geology*, **39**, No. 3, 264-276, Chicago, April-May, 1931.

1053. LEE, Frederick W., "Geophysical Abstracts," United States Bureau of Mines, No. 25 (Circular 6500), pages 112-135, May: No. 26 (Circular 6511), pages 136-159, June: No. 27 (Circular 6528), pages 160-192, July, Washington, 1931.
No. 27 is devoted entirely to listing patents granted in Germany since 1904 to devices or methods for use in geophysical prospecting. In this issue only electrical methods are considered. Abstracts from German patents concerning other methods of geophysical prospecting will be published in special issues of Geophysical Abstracts appearing later. F.W.L.

1054. LEET, L. Don, "Empirical Investigation of Surface-waves Generated by Distant Earthquakes," *Publications of the Dominion Observatory*, **7**, No. 6, 267-322, 25 figures, 6 tables, bibliography, Ottawa, 1931.

The above constitutes the author's Doctorate Dissertation presented to Harvard University. The following are excerpts from the Summary:

"The earth particle during the passage of Rayleigh-waves was found, without exception in the cases studied, to rotate in an elliptical path in a retrograde sense as regards the propagation direction of the disturbance. The same was found to be true for the W_2-waves which, arriving from the opposite direction, exhibit a rotation sense which is the reverse of that in R. It is shown that this is required by the theory of Rayleigh."

"The Z:H ratio of vertical to horizontal displacements differs from the ratio predicted by theory for an isotropic medium."

"It was found that there is a distinct tendency for longer periods to exhibit greater velocities, that is, for the waves to be subject to dispersion."

"There was, further, a definite correlation between the values obtained for northwest and south continental paths, while the values for the Atlantic indicated a markedly higher velocity than for continental paths."

"It seems clear that no part of the horizontal record of a quake whose azimuth was not one of the cardinal instrument directions can be selected with assurance as representative R-wave registration—there is at practically all times a transverse element of unknown magnitude present . . . . . The problem of instrument orientation seems to assume important proportions . . . . For this reason, it is suggested that recording stations, to render optimum service, should orient at least some of their instruments with reference to one or more epicentral regions from which most of their records are obtained, rather than in the traditional NS-EW planes."

1055. Leet, L. Don and Ewing, Maurice, "Velocity of Explosion-generated Longitudinal Waves in a Nepheline Syenite," *Transactions of the American Geophysical Union, Twelfth Annual Meeting, April 30 and May 1, 1931. Special Publication of the National Research Council, U.S.A.*, 61-65, 2 figures, Washington, 1931.

1056. Link, Theodore A., "Individualism of Orogenies Suggested by Experimental Data," *Bulletin of the American Association of Petroleum Geologists*, **15**, No. 4, 385-403, 21 figures, Tulsa, April, 1931. T.A.L.

1057. Mather, Kirtley F., "Plumbing the Depths of the Earth," *Scientific Monthly*, No. 185, **32**, No. 2, 165-168, New York, February, 1931.

The above paper was presented over the Columbia Broadcasting System as one of the Science Service Radio Talks.

1058. McAdie, Alexander, "Terramotum: Quid Bonum?" *Harvard Alumni Bulletin*, Cambridge, June 18, 1931.

An interesting article, with illustrations, descriptive of the San Francisco earthquake, presented by one who experienced that disaster. R.R.B.

1059. McCollum, Burton and La Rue, Wilton W., "Use of Existent Wells as an Adjunct to Seismograph," *Oil Weekly*, **62**, No. 1, 29-34, Houston, June 19, 1931.

The authors state: "The discovery of production in sands beneath the overhanging cap rock and salt at Barbers Hill and the Allen Dome suggests the possibility of similar deposits on other Gulf Coast domes. The making of well locations for the development of such deposits is a difficult procedure in which a deep profile of the mushroomed flank is of great assistance to the geologist. For this reason certain methods of developing such a profile, here described, are thought to be of special interest."

The article is a qualitative description of the method, to be followed by a more complete discussion in a forthcoming issue of the *Bulletin of the American Association of Petroleum Geologists*. L.D.L.

1060. McComb, H. E., "Progress-report on Development of Seismological Instruments," *Transactions of the American Geophysical Union, Twelfth Annual Meeting, April 30 and May 1, 1931. Special Publication of the National Research Council, U.S.A.*, 74-75, 2 figures, Washington, 1931.

—— McComb, H. E. and Wenner, Frank, "Progress-reports on Development of Instruments—the Shaking-table." See No. 1098 of this list.

1061. Meinesz, F. A. Vening,

(1) "Gravity Anomalies in the East Indian Archipelago," *Geographical Journal*, **77**, No. 4, 323-337, 2 figures, London, April, 1931.

(2) "By Submarine through the Netherlands East Indies," *Geographical Journal*, **77**, No. 4, 338-349, 18 illustrations, London, April, 1931.

An account of the discussion of the above papers when they were presented before the Royal Geographical Society is given in each case.

1062. Merritt, George E., "The Development of a Tilt-meter," *Transactions of the American Geophysical Union, Twelfth Annual Meeting, April 30 and May 1, 1931. Special Publication of the National Research Council, U.S.A.*, page 73, Washington, 1931.

1063. Miyabe, Naomi, "On Block Movements of the Earth's Crust," *Proceedings of the Imperial Academy*, **7**, No. 4, 150-152, 2 figures, Tokyo, April, 1931.

—— Miyabe, Naomi and Terada, Torahiko, "On Heterogeneous Distribution of Houses Destroyed by Earthquake." See No. 1089 of this list.

1064. Mourant, A. E., "A Study of the Seismograms of English Channel Earthquakes," *Monthly Notices of the Royal Astronomical Society, Geophysical Supplement*, **2**, No. 7, 374-383, London, January, 1931.

1065. Musya, Kinkiti, "On the Luminous Phenomenon That Attended the Idu Earthquake, November 26th, 1930," *Bulletin of the Earthquake Research Institute, Tokyo Imperial University*, **9**; Part 2, 177-215, numerous illustrations, June, 1931.

This highly interesting paper is given in Japanese but a two-page English abstract appears on pages 214-215. The introductory paragraph may be quoted as follows:

"In the old records of earthquakes in Japan it is often stated that a luminous phenomenon was observed at the time of great seismic disturbances. The writer of this thesis has long been in the belief that those statements are not entirely groundless. Fortunately he was able to observe the phenomenon at the time of the earthquake which occurred in Idu on November 26th, 1930. It has also been found that many people witnessed the same spectacle. So the author asked the teachers and pupils of about 150 intermediate schools in the affected area to furnish him with data concerning the phenomenon. As a result he received about 1,500 replies with some sketches."

1066. Nettleton, L. L., "Graphic Solution of Strike and Dip from Two Angular Components," *Bulletin of the American Association of Petroleum Geologists*, **15**, No. 1, 79-82, 3 figures, Tulsa, January, 1931.

1067. Observatory, The, "Meeting for the Discussion of Geophysical Subjects," *The Observatory*, No. 680, **54**, 15-18, London, January, 1931.

The meeting was devoted to a discussion of the subject of microseisms, and of two papers by Dr. Jeffreys, published in the *Geophysical Supplement*, and reported in these lists as No. 942 and No. 1042, respectively.

1068. Oxford University, "The International Seismological Summary for 1927, July, August, September," Pages 233-364, Oxford, 1931.

This is the continuation of the series issued under the direction of the late Prof. H. H. Turner.

1069. PAULO DE OLIVEIRA, Euzebio, "Methodos geophysicos applicados às fundaçõ̃es de barragens," *Serviço Geologico e Mineralogico do Brasil, Special Publication,* 9 pages, 5 figures, Rio de Janeiro, 1929.

1070. PREY, A., "Zur Frage nach dem isostatischen Massenausgleich in der Erdrinde," *Gerlands Beiträge zur Geophysik,* **29,** Heft 2, 201-225, Leipzig, 1931.

The author's English abstract reads: "To decide the question started by Hopfner, whether the isostasy be nothing but an illusion produced by the methods of reduction, the case of a non-isostatic earth has been completely treated. Based on the author's development of the heights of the earth in spherical harmonics, the level-surface (geoid) and the values of gravity on the surface of the continents and oceans have been computed. It is thereby regarded that the heights are to be counted not from a normal-earth but from the disturbed level-surface. On the values of the gravity gained in this manner the free-air and the Bouguer's reduction are applied, as usual. The result shows that only in a few regions of the earth an ambiguity, isostatic or non-isostatic, is possible. In general the values of gravity on a non-isostatic earth are not consistent with the observations. There is an obvious asymmetry in the North-South and in the East-West direction caused by the terms of the first order in the development. Accordingly the values of the gravity in America and in Europe treated in like manner should differ by about 100.10^{-3} cm/sec^2, not corresponding to the observations. The absence of this difference seems to be a proof of the existence of a compensation of the masses in the earthcrust."

See also No. 1050 of this list.

—— PRICE, A. T. and CHAPMAN, S., "The Electric and Magnetic State of the Interior of the Earth, as Inferred from Terrestrial Magnetic Variations." See No. 1013 of this list.

—— RECK, Hans, "The Geology of Jan Mayen" and "The Petrography of Jan Mayen." See No. 1100 of this list.

1071. REEDS, Chester A., "Seismic Maps of Major Earthquakes" (abstract only), *Pan-American Geologist,* **55,** No. 1, 68, Des Moines, February, 1931.

The above abstract of a paper presented before the American Geological Society at the Toronto meeting, 1931, announces the publication of seismic maps of the world by the American Museum of Natural History, New York.

1072. REID, Harry Fielding, "The Origin of Earthquake-waves," *Transactions of the American Geophysical Union, Twelfth Annual Meeting, April 30 and May 1, 1931. Special Publication of the National Research Council, U.S.A.,* 67-70, 2 figures, Washington, 1931.

1073. REYNOLDS, W. H., "Report on the Construction of a Three-drum Seismograph-recorder," *Transactions of the American Geophysical Union, Twelfth Annual Meeting, April 30 and May 1, 1931. Special Publication of the National Research Council, U.S.A.,* 76-77, 2 figures, Washington, 1931.

1074. ROTHÉ, E. et al., "Annuaire de l'Institut de Physique du Globe, 1928" (Deuxième Partie, Séismologie), *Special Publication, University of Strasbourg, Faculty of Sciences,* 104 pages, Strasbourg, 1929.

1075. RUTTEN L., "Geologische Nomenclator," Compiled under the auspices of the Geologisch-Mijnbouwkundig Genootschap voor Nederland on Koloniën, under the editorship of L. Rutten, Quarto, 338 pages, The Hague (G. Naeff), 1929.

An abstract signed E. S. B. appears on page 187 of *Journal of Geology,* **38** No. 2, Chicago, February-March, 1930. The publication presents in parallel columns the

corresponding technical geologic terms in use in Dutch, German, English, and French. A report on the section devoted to seismology (pages 167-182) was given as No. 691 of these lists.

1076. SCHWINNER, Robert, "Richtigstellungen zu: H. Borchert, 'Über die Bildung der ersten Erstarrungskruste der Erde,' " *Gerlands Beiträge zur Geophysik*, **29**, Heft 2, 239-246, Leipzig, 1931.

See also No. 908 and 1007 of these lists.

1077. SCIENTIFIC AMERICAN, "Preserved for 10,000 Years to Come," *Scientific American*, pages 42-43, 6 illustrations, New York, July, 1931.

This article, copied from *The Digest*, International General Electric Company, describes the efforts made to preserve the statistics of the great earthquake of Japan (1923).

1078. SCRASE, F. J., "Deep Focus Earthquakes," *Nature*, No. 3204, **127**, 486, London, March 28, 1931.

1079. SCRASE, F. J., "The Instrumental Phase-difference of Seismograph Records: an Illustration of the Properties of Damped Oscillatory Systems," *Proceedings of the Physical Society*, **43**, Part 3, No. 238, 259-273, Cambridge, 1931.

The author's abstract reads: "A discussion is given of the method of interpretation of the maxima shown on the records of earthquakes during the surface-wave phase. The usual procedure is to treat the waves (which actually appear as beats) as being truly simply-harmonic and to apply the formulae which are derived on this assumption. It is shown that, in general, this procedure does not necessarily lead to the correct interpretation. In the case of direct registration the true earth-maximum may have occurred one half-period later than the time obtained by the usual correction. With galvanometric registration the maximum may have occurred either one, two, or three half-periods earlier than the time indicated by the usual formula due to Galitzin. Some curves are included to illustrate these points, and an attempt is made to obtain a mathematical explanation.

It is shown that there is no easy method of eliminating an ambiguity of one half-period. For direct registration, therefore, the phase-correction at present in use appears to be as good as the one alternative. In the case of galvanometric registration, although there are altogether four forms of phase-correction, the number of alternatives for any particular period cannot exceed two. The final recommendation in this case is that the correction suggested by Somville and which is one half-period less than Galitzin's, be adopted for general use." F.J.S.

1080. SEZAWA, Katsutada, "On the Transmission of Seismic Waves on the Bottom of an Ocean," *Bulletin of the Earthquake Research Institute, Tokyo Imperial University*, **9**, Part 2, 115-143, 13 figures, June, 1931.

1081. SHEPARD, Francis P., "Glacial Troughs of the Continental Shelves," *Journal of Geology*, **39**, No. 4, 345-360, 12 figures, Chicago, May-June, 1931.

The author's abstract reads: "Submarine valleys may be classified into three groups. One group resembles youthful river valleys, another fault grabens, and a third glacial troughs. There are many reasons for believing that the valleys of this last group have been shaped by glacial excavation. They are found exclusively off glaciated coasts. They contain the deep-rimmed depressions, trough-shape, and relatively straight walls characteristic of glacially excavated valleys. Evidence of the presence of moraines within these shelf-troughs has been discovered. Finally, the continental shelves off glaciated coasts are much deeper on the average than those off unglaciated areas."

Part of the data of the above paper was presented before the Toronto Meeting of the Geological Society of America (1931), with the title "Saint Lawrence (Cabot Strait) Submarine Trough." An abstract of this appears in *Pan-American Geologist*, **55** No. 4, 308, Des Moines, May, 1931.

1082. Sohon, F. W., S.J., "Registration of the Time-signals at Georgetown," *Transactions of the American Geophysical Union, Twelfth Annual Meeting, April 30 and May 1, 1931. Special Publication of the National Research Council, U.S.A.*, 66-67, 1 figure, Washington, 1931. F.W.L.

1083. Sokolov, P. T., "Collection of Articles on the Theory of the Seismic Method of Geological Prospecting" (in Russian), *Transactions of the Geological and Prospecting Service of the U.S.S.R.*, No. 17, 72 pages, Leningrad, 1931.

An abstract by W. Ayvazoglou is given on pages 144-145 of *Geophysical Abstracts*, No. 26. See No. 1053 of this list.

The abstract states, in part, that the following four problems are discussed:—

1. Resolution of the hodograph function into series.
2. The methods for calculating the hodographs of waves caused by explosions.
3. Some suggestions concerning the theory of seismic prospecting.
4. Application of the seismic method to the measurement of the deviation of bore holes. F.W.L.

1084. Somville, O., "A propos d'une onde longue dans la première phase de quelques séismogrammes" (II^{e} Communication), *Gerlands Beiträge zur Geophysik*, **29**, Heft 2, 247-251, 4 figures, Leipzig, 1931.

The first paper was reported as No. 887 of these lists.

1085. Stoneley, R., "Some Near Earthquakes Reported in the International Seismological Summary," *Monthly Notices of the Royal Astronomical Society, Geophysical Supplement*, **2**, No. 7, 349-362, London, January, 1931.

1086. Stoneley, R., "On Deep-focus Earthquakes," *Gerlands Beiträge zur Geophysik*, **29**, Heft 3-4, 417-435, 4 figures, 3 plates, Leipzig, 1931.

The author's English abstract reads: "Prof. Turner has found that the foci of earthquakes may occasionally be situated as low as 0.09 of the earth's radius below normal, that is, they may occur 580 km. below the surface.

"Allowance for the known errors of the Zöppritz-Turner tables would probably reduce these depths considerably.

"According to a general reciprocal theorem in dynamics, since the amplitudes of surface waves fall off rapidly at great depths, the surface waves of deep focus earthquakes should be small or insensible. Yet the International Seismological Summary gives L and M readings even for the deepest foci contemplated.

"It is here shown that in some of the deepest focus earthquakes, the recorded L and M are sparse, and often non-existent at great distances. The recorded observations mostly refer to S, SS, SSS, etc., or else to Gutenberg's early long wave G, for which the almost complete extinction is not to be expected as the period is very long.

"The actual records of these very deep-seated shocks show a very conspicuous P, a large S, SS, and further disturbances, and no L or M. The amplitudes of the general disturbance at the calculated positions of L and M are smaller, often much smaller, than that of P.

"Finally, a tribute must be paid to the pioneer work of the late Prof. Turner. His deep-focus earthquakes, even if not of such great depth as he thought, have at any rate a focus in some cases far below normal."

—— Sugiyama, Tomonori and Inouye, Win, "On Sound Phenomena of the Idu Earthquake of Nov. 26th, 1930." See No. 1038 of this list.

—— Takayama, T. and Fujiwhara, S., "Note on the Mechanism of the North Izu Earthquake of Nov. 26th, 1930 in Japan." See No. 1024 of this list.

1087. TERADA, Torahiko, "On the Curvature of Islands Arc and Its Relation to the Latitude," *Proceedings of the Imperial Academy*, **7**, No, 4, 143-145, 1 figure, Tokyo, April, 1931.

1088. TERADA, Torahiko, "On the Curvature of Islands Arc," *Bulletin of the Earthquake Research Institute, Tokyo Imperial University*, **9**, Part 2, 144-150, June, 1931.

1089. TERADA, Torahiko and MIYABE, Naomi, "On Heterogeneous Distribution of Houses Destroyed by Earthquake," *Proceedings of the Imperial Academy*, **7**, No. 4, 146-149, 1 figure, Tokyo, April, 1931.

1090. TSUBOI, Chuji, "A Note on the Results of the Repeated Precise Levellings across the Ito Seismic Region," *Proceedings of the Imperial Academy*, **7**, No. 4, 153-154, 2 figures, Tokyo, April, 1931.

1091. TSUBOI, Chuji, "Supplementary Note on the Areal Deformation of the Base Line Rhombus at Mitaka," *Proceedings of the Imperial Academy*, **7**, No. 4, 155-157, 3 figures, Tokyo, April, 1931.
See No. 893 of these lists.

1092. TSUBOI, Chuji, "Independent Relative Vertical Movements of Land Blocks as Revealed by Means of Repeated Precise Levellings along the Western Coast of Idu Peninsula," *Proceedings of the Imperial Academy*, **7**, No. 4, 158-160, 3 figures, Tokyo, April, 1931.

1093. TSUBOI, Chuji, "A Note on the Results of the Repeated Precise Levellings across the Ito Earthquake Area," *Bulletin of the Earthquake Research Institute, Tokyo Imperial University*, **9**, Part 2, 131-158, June, 1931.

——— TYRRELL, G. W. and WORDIE, J. M., "The Petrography of Jan Mayen" and "The Geology of Jan Mayen." See No. 1100 of this list.

1094. ULLER, Karl, "Die Entwicklung des Wellen-Begriffes, V," *Gerlands Beiträge zur Geophysik*, **29**, Heft 2, 252-266, Leipzig, 1931.

1095. VISSER, S. W.,

(1) "Aardbevingen in en om West-Java," *Natuurkundig Tijdschrift voor Nederlandsch Indië*, **79**, 181 Batavia, 1919.

(2) "Aardbevingen in Midden-en Oost-Java," *Verhandelingen Tweede Nederlandsch-Indisch Natuurwetenschappelijk Congres*, Bandoeng, 1922.

(3) "Inland and Submarine Epicentra of Sumatra and Java Earthquakes," *Koninklijk Magnetisch en Meteorologisch Observatorium te Batavia*, Verhandelingen No. 9, 14 pages, Batavia, 1922.

(4) "Over de waarneming van de stootrichting van aardbevingsschokken," *Natuurkundig Tijdschrift voor Nederlandsch Indië*, **83**, Batavia, 1923.

(5) "Over de plaatsbepaling van epicentra van aardbevingen" (with English summary), *Natuurkundig Tijdschrift voor Nederlandsch Indië*, **83**, Batavia, 1924.

(6) "On the Distribution of Earthquakes in the Netherlands East Indian Archipelago, II: 1920-1926, with a Discussion of Time Tables," *Koninklijk Magnetisch en Meteorologisch Observatorium te Batavia,* Verhandelingen No. 22, 116 pages, Batavia, 1930. H.P.B.

1096. VISSER, S. W., "Vulkanische verschijnselen en aardbevingen in den Oost-Indischen Archipel, waargenomen gedurende het jaar 1929," *Natuurkundig Tijdschrift voor Nederlandsch Indië,* 319-347, Batavia, 1930.

1097. VISSER, S. W., "Earthquakes and Tides," *Proceedings of the Koninklijke Akademie van Wetenschappen te Amsterdam,* **34,** No. 1, 6 pages in the reprint, Amsterdam, 1931. H.P.B.

The paper discusses the possibility of a correlation between earthquakes and the tides. It was suggested by a popular belief of natives on the south coast of Ceram (Moluccas) that earthquakes occur during ebb tide only. The conclusion is that such belief is without foundation in general, but certain limited cases are disclosed in which some correlation is found.

1098. WENNER, Frank, "Progress-reports on Development of Instruments,—Vertical Component Seismometer: Shaking-table: Accelerometer," *Transactions of the American Geophysical Union, Twelfth Annual Meeting, April 30 and May 1, 1931. Special Publication of the National Reserach Council, U.S.A.,* 71-72, Washington, 1931.

The second section of this paper—dealing with the Shaking-table—has been prepared with the collaboration of H. E. McComb.

1099. WILLIS, Bailey and WILLIS, Robin, "Geologic Structures" (Second Edition), McGraw-Hill Book Company, xv + 518 pages, 152 figures, 12 plates. Price $4.00. New York, 1929.

A lengthy review, signed R. T. C., appears on pages 664-666 of *Journal of Geology,* **38,** No. 7, Chicago, October-November, 1930.

—— WILLIS, Robin and WILLIS, Bailey, "Geologic Structures." See No. 1099 of this list.

1100. WORDIE, J. M. and TYRRELL, G. W., "The Geology of Jan Mayen" and "The Petrography of Jan Mayen" (by the respective authors), *Transactions of the Royal Society of Edinburgh,* **54,** Nos. 18 and 19, 741-765, 1926.

A review by Hans Reck, appears on pages 261-263, *Zeitschrift für Vulkanologie,* **13,** Heft 4, Berlin, April, 1931.

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