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. 7**

**JULY, AUGUST, SEPTEMBER, 1930**

BY

ERNEST A. HODGSON

---

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

*Price 25 cents.*

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. 7**

**JULY, AUGUST, SEPTEMBER, 1930**

BY

ERNEST A. HODGSON

---

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

# Bibliography of Seismology

**July, August, September, 1930**

---

601. ADAMS, L. H. and GIBSON, R. E., "The Elastic Properties of Certain Basic Rocks and Their Constituent Elements," *Proceedings of the National Academy of Sciences of the United States,* **15,** No. 9, 713-724, Washington, 1929.

The author's abstract reads: "We have measured directly, at pressures between 2,000 and 12,000 megabaryes, the cubic compressibility of the minerals labradorite, jadeite, grossularite and almandite, and of diabase rocks from Sudbury, Canada; Frederick, Maryland; and the Whin Sill in the North of England. By combining these mineral results with those already known, we are able to give a table of the compressibilities, at various pressures, of all the important constituents of basic rocks, to compare the compressibilities of the rocks with those of their constituent minerals, and to conclude that the compressibility calculated from the mineral content gives a limit to which that of the rocks approaches at high pressure. Our results demonstrate, furthermore, that at 15,000 megabaryes and 30°C. the *maximum* velocity of longitudinal waves through rocks of basaltic composition and mode is 7·4 kilometers per second. On the other hand, the compressibilities of garnet and jadeite, being found to be surprisingly low, lead to the conclusion that magmas of this composition, crystallized primarily as or subsequently metamorphosed to eclogites, may transmit longitudinal waves with velocities exceeding 8 kilometers per second. Bearing in mind that the pressures existing at 20, 40, and 60 kilometers below the surface of the earth are somewhat greater than 5, 10, and 15,000 megabaryes, respectively, we may readily see the connection between these observations and deductions concerning the composition of the interior of the earth. Indeed, the existing data, in our opinion, place the possible components of the earth, below 60 kilometers and above the core, in the following ascending order of probability: holocrystalline basalt, eclogite, peridotite."

602. AGAMENNONE, G., "Il 'memento' agli italiani in fatto di terremoti," *Latina Gens,* No. 7, 3-4, Rome, July 7, 1929. G.A.

603. AGAMENNONE, G., "Saremmo sulla via della previsione dei terremoti?" *Il Messaggero,* Rome, June 28, 1930. G.A.

604. ANTEVS, ERNST, "Maps of the Pleistocene Glaciations," *Bulletin of the Geological Society of America,* **40,** No. 4, 631-720, Washington, December, 1929.

— AYABE, Naoshi and NAGAOKA, Hantaro, "On a Silica-glass Pendulum." See No. 640 of this list.

605. BERLAGE, H. P., jun., "Näherungsformeln zur Berechnung der Amplituden der elastischen Wellen, die beim Durchgang einer gegebenen Welle durch eine Unstetigkeitsfläche entstehen," *Gerlands Beiträge zur Geophysik,* **26,** Heft 2, 131-140, Leipzig, 1930.

The author's English abstract reads: "K. Zoeppritz has worked out the extremely complicated relations between the amplitudes of the longitudinal and transversal reflected and refracted waves, generated at the passage of longitudinal and transversal seismic waves through a layer of discontinuity, in the abridged form of matrices.

"The formulae given below are easier to operate with, but claim to be exact only in cases of:

(1) reflection by a free surface (density of the second medium = 0)

(2) identity of the two media

(3) reflection by a solid boundary (density of the second medium being infinite)

(4) any given density of the media, if the angles of incidence of the primary wave are 0° or 90°.

"In every other case the formulae yield approximate values for the amplitudes of the secondary waves, with an error of probably no more than 0·1 of the amplitude of the incident wave.

"The ratio of the velocities of propagation of condensational and distortional waves has been supposed to amount to the square root of three. Thus liquid media have been ruled out.

"The formulae should be used only in cases when the denser medium possesses the greater velocities of propagation. They moreover do not extend to cases of total reflection.

"The solution of two practical problems closes the paper."

606. (1) Bois, Ch., "Chronique sismologique — tremblements de terre destructeurs du 1er septembre 1928 au 1er janvier 1929," *Matériaux pour l'Étude des Calamités*, No. 19, **3**, 243-246, Geneva, 1929.

606. (2) Bois, Ch., "Chronique sismologique—tremblements de terre destructeurs du 1er janvier 1929 au 1er avril 1929," *Matériaux pour l'Étude des Calamités*, No. 20, **4**, 345-347, Geneva, 1929.

607. Bowie, William, "The Scientific and Practical Value of Triangulation," *Journal of the Washington Academy of Sciences*, **20**, No. 4, 53-59, February 19, 1930.

608. Breyer, Hans, "Über die Elastizität von Gesteinen," *Zeitschrift für Geophysik*, **6**, Heft 2, 98-111, Göttingen, 1930.

609. Buwalda, John P., "Nature of the Late Movements on the Haywards Rift, Central California," *Bulletin of the Seismological Society of America*, **19**, No. 4, 187-199, two topographic maps, Stanford, December, 1929.

610. Byerly, Perry, "The Dispersion of Seismic Waves of the Love Type and the Thickness of the Surface Layer of the Earth under the Pacific," *Gerlands Beiträge zur Geophysik*, **26**, Heft 1, 27-33, Leipzig, 1930.

The author's abstract reads: "Observations made at the Berkeley seismographic station for eleven years have been studied and data for the dispersion of the first wave of the Love type under the Pacific obtained. If these observations be correlated with wave velocity, they point to a thickness of some 40 km. of the surface layer of the earth under the Pacific. If they be correlated with group velocity, they point to a thickness of some 20 km. I think that the former correlation is the better."

611. Byerly, Perry, "Love Waves and the Nature of the Motion at the Origin of the Chilean Earthquake of November 11, 1922," *American Journal of Science*, Fifth Series, No. 112, **19**, 274-282, New Haven, April, 1930. R.R.B.

— Day, Arthur L., "Progress in American Seismology." See pages 161-166 of the *Transactions of the American Geophysical Union*, listed as No. 614 in this Bibliography.

612. Dobbie, J. C., "The Ranges and Phase-displacements of the Earth and Ocean Tides. A New Investigation Based on an Experiment by A. A. Michelson and H. G. Gale," *Monthly Notices of the Royal Astronomical Society, Geophysical Supplement*, **2**, No. 5, 233-259, London, February, 1930.

613. DODWELL, D. F., "South Australian Earthquakes," *Proceedings of the Australasian Association for the Advancement of Science*, 416-423, Brisbane, 1910.

The paper describes the instrumental equipment available for a study of the seismicity of Southern Australia and lists the earthquakes registered 1904-1908. It is illustrated by means of five maps, five line cuts, and five half-tone reproductions from photographs.

614. FLEMING, J. A., et al., "Transactions of the American Geophysical Union, Tenth Annual Meeting, April 25 and 26, 1929: Eleventh Annual Meeting, May 1 and 2, 1930, Washington, D.C.," Special publication by National Research Council of the National Academy of Sciences, 314 pages, 105 illustrations, 24 tables, Washington, June, 1930.

615. FLEMING, Robins, "Wind Stresses in Buildings (with a Chapter on Earthquakes and Earthquake-resistance)," John Wiley and Sons, 193 pages, 6 by 9 inches. Price (cloth) $3.50. New York, 1930.

The publisher's abstract reads, in part, as follows: "The first three chapters are concerned with a general study of atmospheric circulation and the complicated reactions of wind, a classification of the winds, and a discussion of the causes and results of the more violent types of wind, hurricanes and tornadoes. The author presents a practical treatment of wind bracing in steel mill buildings, such as manufacturing plants, power houses, foundaries, train sheds and car barns, and armories, with a special discussion of hangars. An important section of the book is devoted to the determination of wind stresses in buildings of many stories..... Because of the universality of earthquakes and the damage and injury caused by them, a chapter on earthquakes and earthquake-resistance has been included."

The author is a structural engineer of the American Bridge Company, New York City. R.R.B. + J.A.P.

— GIBSON, R. E. and ADAMS, L. H., "The Elastic Properties of Certain Basic Rocks and Their Constituent Minerals." See No. 601 of this list.

616. GOLDSTEIN, S., "Tidal Motion in Rotating Elliptic Basins of Constant Depth," *Monthly Notices of the Royal Astronomical Society, Geophysical Supplement*, **2**, No. 4, 213-231, London, October, 1929,

617. GREGORY, J. W., "The Relative Influence of Denudation and Earth-Movements in Moulding the Surface of the Earth," *Scientia*, **40**, No. 174, 217-230, Milan, 1926.

618. GUTENBERG, B., "Hypotheses on the Development of the Earth," *Journal of the Washington Academy of Sciences*, **20**, No. 2, 17-25, January, 1930.

The text of an address given by the author before a combined meeting of the Geological Society and the Philosophical Society, in Washington, on October 23, 1929. See also No. 527 of this Bibliography.

619. GUTENBERG, B., "Die dynamische Vergrösserung von Schallregistrierinstrumenten für andauernde Sinuswellen," *Gerlands Beiträge zur Geophysik*, **26**, Heft 1, 34-36, Leipzig, 1930.

620. GUTENBERG, B., "Schwere und Druck in Erdinnern," *Gerlands Beiträge zur Geophysik*, **26**, Heft 1, 37-41, Leipzig, 1930.

621. GUTENBURG, B., "Der Aufbau des Untergrundes im Pazifischen Ozean," *Gerlands Beiträge zur Geophysik*, **26**, Heft 2, 156-157, Leipzig, 1930. B.G.

13092—2½

622. GUTENBERG, B., "Die Verteilung der Massen an der Erdoberfläche," *Gerlands Beiträge zur Geophysik*, **26**, Heft 2, 158-160, Leipzig, 1930.

The above short paper is addressed to Prof. L. Kober, with relation to his paper "Die Verteilung der Massen an der Erdoberfläche," which appeared in the same journal (**25**, Heft 2, 163-174, 1930) and which was reported as No. 540, in an earlier issue of this Bibliography, the author's English abstract being quoted at length. B.G.

623. GUTENBERG, B., "The Process of Formation of Seismic Surface Waves," *Bulletin of the Seismological Society of America*, **20**, No. 1, 11-14, Stanford, March, 1930.

The above is the English translation, prepared by Ernest A. Hodgson, of a manuscript with the title, "Die Ausbildung der seismischen Oberflächenwellen," which was prepared for presentation before the joint meeting of the Seismological Society of America, and of its Eastern Section, at Fordham University, New York, May, 1929. It was read at that meeting by Dr. J. B. Macelwane, S.J., then President of the Society.

The author sketches the observed characteristics of seismic surface waves. He states and exemplifies the law of the growth of periods for such waves as stated by Uller, An explanation of the great amplitudes in the case of certain periods is explained on the basis of group velocity effects. In closing, mention is made of those phases of the subject which now await combined investigation. The writer concludes with the statement that: "For this purpose the collaboration of investigators in all parts of the world is necessary. Moreover, the results gained hitherto may only be established on the basis of records from all parts of the world."

624. GUTENBERG, B., "Zur Frage der Erdbebenursachen," *Forschungen und Fortschritte*, **6**, 2 pages in reprint, with map of world showing location of larger earthquakes, Berlin, April, 1930. B.G.

625. GUTENBERG, B. and LANDSBERG, H., "Das Taunusbeben vom 22. Januar 1930," *Natur und Museum*, **60**, Heft 4, 6 pages in reprint, 1 map, Frankfurt a.M., April, 1930. Also, with the same title, and by the same authors, but at somewhat greater length, in *Gerlands Beiträge zur Geophysik*, **26**, Heft 2, 141-155, 4 maps, Leipzig, 1930.

The authors' English abstract in the last-named publication reads as follows: "On January 22nd, 1930, an earthquake took place in the western parts of the Taunus mountains. As to the macroseisms, it was found that the intensity **V** of the Mercalli-Sieberg scale was the highest one. The most-shocked district was a small area from the south of the Langenschwalbach nearly to the Lahn. The boundaries of the district in which the earthquake was felt are, to the south and west, the Rhine; in the north, the river Lahn was passed by about 20 kilometers—to Diez; from this town, the Lahn itself formed the boundary; in the east, the Idstein-ground was not reached. At the boundaries the diminishment of the intensity was extraordinary. Sounds were heard nearly in the same district in which the shock was felt. From some points, light phenomena were reported. The records showed that the focus was situated in the southeast of the shocked district, at a very slight depth." B.G.

626. HALL, Maxwell, "Earthquakes in Jamaica from 1688 to 1919," Jamaica Weather Service publication, 58 pages, map, Kingston, 1922.

627. HASEGAWA, M., "Die Wirkung der obersten Erdschicht auf die Anfangsbewegung einer Erdbebenwelle," *Zeitschrift für Geophysik*, **6**, Heft 2, 78-98, Göttingen, 1930.

— HECK, N. H., "The Earthquake, a Joint Problem of the Seismologist and Engineer." See pages 153-157 of the *Transactions of the American Geophysical Union*, listed as No. 614 in this Bibliography.

— HEILAND, C. A., WANTLAND, Dart, and MALKOVSKY, J. A., "Geophysical News." See No. 637 of this list.

— HODGSON, Ernest A., "The Seismicity of the Arctic." See pages 47-49 of the *Transactions of the American Geophysical Union*, listed as No. 614 in this Bibliography.

628. IMAMURA, Akitune, "On the Chronic Block-Movements in the Kyoto-Osaka District," *Japanese Journal of Astronomy and Geophysics*, **7**, No. 3 (Transactions and Abstracts), 93-101, Tokyo, 1930. R.R.B.

629. IMAMURA, Akitune, "On Changes of Topography, both Chronic and Acute, in the Southern Part of Sikoku," *Proceedings of the Imperial Academy*, **6**, No. 3, 101-104, Tokyo, 1930.

630. IMAMURA, Akitune, NASU, Nobuji, KISHINOUYE, Fuyuhiko, and YASUDA, Chuji, "On the Recent Ito Earthquakes," *Proceedings of the Imperial Academy*, **6**, No. 5, 190-193, Tokyo, May, 1930. A.I.

— KISHINOUYE, Fuyuhiko, YASUDA, Chuji, IMAMURA, Akitune, and NASU, Nobuji, "On the Recent Ito Earthquakes." See No. 630 of this list.

631. KÖHLER, R., "Harmonische Schwingungen des Untergrundes," *Zeitschrift für Geophysik*, **6**, Heft 2, 123-126, Göttingen, 1930.

632. KOLDERUP, Carl Fred., "Jordskjelv i Norge, 1926-1929," *Bergens Museums Arbok, Naturvidenskapelig rekke*, Nr. 6, 40 pages, 6 figures, 4 plates, Bergen, 1930.

— LANDSBERG, H. and GUTENBERG, B., "Das Taunusbeben vom 22. Januar 1930." See No. 625 of this list.

633. LEE, Frederick W., "Geophysical Abstracts," Department of Commerce, Bureau of Mines, Washington, D.C., No. 11 (Information Circular 6273), 27 pages, March, 1930: No. 12 (Information Circular 6287), 33 pages, April, 1930: No. 13 (Information Circular 6309), 25 pages, May, 1930: No. 14 (Information Circular 6324), 24 pages, June, 1930.

These monthly publications give asbtracts of current articles and publications dealing with applied geophysics. F.W.L.

— LEET, L. Don, "Earth Vibrations from Dynamite Blasts." See pages 49-62 of the *Transactions of the American Geophysical Union*, listed as No. 614 in this Bibliography.

634. LEVERETT, Frank, "Pleistocene Glaciations of the Northern Hemisphere," *Bulletin of the Geological Society of America*, **40**, No. 4, 745-760, Washington, December 31, 1929.

635. LINK, Theodore A., "Experiments Relating to Salt-Dome Structures," *Bulletin of the American Association of Petroleum Geologists*, **14**, No. 4, 483-508, 20 figures, 3 tables, Tulsa, April, 1930. T.A.L.

636. LIVLÄNDER, R., "Die kontinentalen Vershiebungen von Amerika und Madagaskar," *Zeitschrift für Geophysik*, **6**, Heft 3, 134-140, Leipzig, 1930.

— MACELWANE, James B., S. J., "Earthquake Surface-waves." See pages 41-43 of the *Transactions of the American Geophysical Union*, listed as No. 614 in this Bibliography.

637. MALKOVSKY, J. A., HEILAND, C. A., and WANTLAND, Dart, "Geophysical News and Review of Geophysical Literature," **2**, No. 2, 132 pages (mimeographed), Golden, Col., May 15, 1930.

Published by the Colorado School of Mines (Department of Geophysics), Golden Colorado. J.A.M.

— MCADIE, Alexander, "A Serviceable Scale for Earthquake-intensity." See pages 157-158 of the *Transactions of the American Geophysical Union*, listed as No. 614 in this Bibliography.

— MCCOMB, H. E., "A Tilt-compensation Seismometer." See pages 159-161 (four illustrations), of the *Transactions of the American Geophysical Union*, listed as No. 614 in this Bibliography.

638. MIHAILOVIC, J., "Annuaire séismique, Année VI, 1926: Phénomènes ressentis (macroséismes) sur le territoire du royaume des Serbes, Croates, et Slovènes," *Comité national du royaume des Serbes, Croates, et Slovènes (Union Géodésique et Géophysique internationale), Section de Séismologie*, Serie A., Observations, Fascicule 4, 93 pages, 1 map, Belgrade, 1928.

639. MIYABE, Naomi, "Deformation of Earthcrust in California," *Bulletin of the Earthquake Research Institute, Tokyo Imperial University*, **8**, Part 1, 45-59, 10 figures, March, 1930.

The author discusses the data through the re-triangulation of the western part of California subsequent to the earthquake of 1906, these data being obtained from the publication by Dr. Bowie, previously reported as No. 311 of this Bibliography.

— MIYABE, N. and TERADA, T., "Crustal Disturbance in the Kwanto Districts." See No. 671 of this list.

640. NAGAOKA, Hantaro and AYABE, Naoshi, "On a Silica-glass Pendulum," *Proceedings of the Imperial Academy*, **6**, No. 4, 158-160, 1 figure, Tokyo, April, 1930.

641. NAKAMURA, Saemontaro, "On the Diffraction in Artificial Shocks Caused by a Small Building," *Science Reports, Tohoku Imperial University*, Series 1, **18**, No. 3, 401-407, Sendai, October, 1929.

The author's abstract reads: "The geophysical laboratory of the Tohoku Imperial University was disturbed by artificial shocks which were caused by hammering in a nearby factory. The shocks were observed at several points in the building and also on the ground near it. As the periods of the shocks were about 0·07 seconds, their wavelength may probably have been several metres, which is nearly comparable in length to the dimensions of the building. The results of the observation show a slight diffraction of the shocks. A diffraction of the seismic waves with longer periods may be likewise expected about some isolated geological units such as isolated mountains, volcanoes, laccoliths, volcanic necks, etc., and also about isolated water masses." S.N.

— NASU, Nobuji, KISHINOUYE, Fuyuhiko, YASUDA, Chuji, and IMAMURA, Akitune, "On the Recent Ito Earthquakes." See No. 630 of this list.

642. NAVARRO NEUMANN, M. Ma. S., S.J., "Les preuves de la théorie wegenérienne du déplacement des continents sont-elles évidentes?" *Ciel et Terre*, **45**, Nos. 6-7, 195-202, Brussels, June-July, 1929. N.N.

643. (1) NAVARRO NEUMANN, M. Ma. S., S.J., "La Exposición Ibero-Americana de Sevilla," *Ibérica*, **33**, No. 806, 353-368, Barcelona, December, 1929.

643. (2) NAVARRO NEUMANN, M. Ma. S., S. J., "L'astronomie et la physique du globe à l'exposition Ibero-Americaine de Seville," *Ciel et Terre*, **46**, Nos. 1-2, 11-16, Brussels, January-February, 1930.

These two papers sketch the work in astronomy in the United States, and in meteorology and seismology at the Cartuja Observatory. An account is given of the royal visit to the Seismological Station at Cartuja. N.N.

644. (1) NAVARRO NEUMANN, M. Ma. S., S.J., "P. Francisco A. Tondorf, S.J.," *Ibérica*, **34**, No. 812, 82-83, Barcelona, January, 1930.

644. (2) NAVARRO NEUMANN, M. Ma. S., S.J., "Le P. François A. Tondorf, S.J.," *Ciel et Terre*, **46**, Nos. 1-2, 48, Brussels, January-February, 1930. N.N.

645. NEUMANN, Frank, "An Analysis of the S-wave," *Bulletin of the Seismological Society of America*, **20**, No. 1, 15-32, 12 text figures, Stanford, March, 1930.

This paper was prepared for presentation before the New York meeting of the Seismological Society of America, held jointly with that of its Eastern Section, at Fordham University, April 30-May 1, 1929.

— NEUMANN, Frank, "The Velocity of Surface-waves." See page 47 of the *Transactions of the American Geophysical Union*, listed as No. 614 in this Bibliography.

646. NEUNTEUFL, Josef, "Zur Bestimmung des Epizentrums eines Nahbebens," *Gerlands Beiträge zur Geophysik*, **26**, Heft 2, 189-198, Leipzig, 1930.

The author's English summary reads: "The method by A. Mohorovičić to find the epicentre of an earthquake by the construction of hyperbels gives only a criterium of the accuracy of the result if at least the diagrams of four stations are applied."

647. NICHOLSON, G. F., "Variations in Levels, 1919 to 1927, in Los Angeles Harbor," *Bulletin of the Seismological Society of America*, **19**, No. 4, 200-205, with map, Stanford, December, 1929.

An introductory note by H. O. Wood outlines the past and present, instrumental, facilities for determining whether a fault crossing the harbor is active.

— NISHIMURA, Genrokuro and SEZAWA, Katsutada, "On the Possibility of the Block Movements of the Earth Crust." See No. 661 of this list.

648. OLDHAM, R. D., "Earth Movements in the Delta of the Rhone," *Nature*, No. 3155, **125**, 601-604, London, April 19, 1930.

The paper deals with the movements of elevation and depression in the delta of the Rhone, within historic times. R.R.B.

649. ONO, A., "The Effect of Elasticity of the Clamped End of a Bar on the Frequency of the Lateral Vibration," *Proceedings of the Imperial Academy*, **6**, No. 3, 97-100, Tokyo, March, 1930.

650. PAIGE, Sidney, "The Earthquake at Cumana, Venezuela, January 17, 1929," *Bulletin of the Seismological Society of America*, **20**, No. 1, 1-10, Stanford, March, 1930.

The paper discusses the subject in the following order: The geological and geographical setting: The earthquake phenomena: The damage to strong structures and to weak ones: The distribution of damage: The cause of the earthquake: Reconstruction.

A map of the region is presented, together with 18 half-tone reproductions from photographs.

651. PROUDMAN, J., "The Forced Tides in an Ocean Bounded by a Complete Meridian on a Non-rotating Earth," *Monthly Notices of the Royal Astronomical Society, Geophysical Supplement*, **2**, No. 4, 209-213, London, October, 1929.

652. RANKINE, A. O., "New Seismograph for Geophysical Survey," *The Mining Magazine*, **42**, No. 3, 147-150, London, 1930.

A short abstract by Ayvazoglou appears in No. 14 of *Geophysical Abstracts*. (See No. 633 of this list.) F.W.L.

— REID, Harry Fielding, "The Forces and Movements at the Earthquake-focus." See pages 43-46 of the *Transactions of the American Geophysical Union*, listed as No. 614 in this Bibliography.

653. ROSENHEAD, L., "The Annual Variation of Latitude," *Monthly Notices of the Royal Astronomical Society, Geophysical Supplement*, **2**, No. 3, 140-170, London, May, 1929.

654. ROSENHEAD, L., "Tides on a Two-layer Earth," *Monthly Notices of the Royal Astronomical Society, Geophysical Supplement*, **2**, No. 4, 171-196, London, October, 1929.

655. ROTHÉ, E., "Rapport de la Section de Séismologie," *Compte rendu, Comité National Français de Géodésie et Géophysique*, Assemblée générale du 2 juillet 1928, Paris, 1930.

The complete publication consists of 58 pages. The report by Prof. Rothé occupies pages 8-16.

656. ROY, LOUIS, "La propagation des ondes sur les surfaces élastiques à trois paramètres," *Comptes rendus*, **190**, No. 23, 1332-1334, Paris, June 11, 1930.

657. RUEDEMANN, Rudolf, "Alternating Oscillatory Movement in the Chazy and Levis Troughs of the Appalachian Geosyncline," *Bulletin of the Geological Society of America*, **46**, No. 2, 409-416, Washington, June 30, 1929.

658. SCHÜNEMANN, H., "Die seismische Bodenunruhe in Hamburg und ihr Zusammenhang mit der Brandung," *Zeitschrift für Geophysik*, **6**, Heft 1, 32-41, 4 figures, Göttingen, 1930.

This paper discusses the data of the Dissertation by H. Mendel (reported as No. 146 in an earlier number of this Bibliography).

659. SCIENTIFIC AMERICAN, "Submarine Cables and Area of Recent Earthquake," *Scientific American*, 184, New York, March, 1930.

The short note, accompanying a so-called "map" of the floor of the Atlantic, states that the breaks in the cables range, roughly, in two lines 115 miles apart, and that the sea floor between them has "dropped as much as 1,710 feet, creating a submarine trough." The statement is grossly in error. Soundings of the sea floor by various agents, government and commercial, agree that no changes in depth have occurred which are of sufficient magnitude to be detected with certainty. The statement is credited to J. W. Gregory's article in *Nature* (reported as No. 523 of this Bibliography) but is a mistaken interpretation of his statement that Cabot Strait is a trough "up to 285 fathoms deep." He does not imply that the earthquake created this depth. E.A.H.

660. SEZAWA, Katsutada, "Possibility of the Free-oscillations of the Surface-layer Excited by the Seismic-waves," *Bulletin of the Earthquake Research Institute, Tokyo Imperial University*, **8**, Part 1, 1-11, 8 figures, March, 1930.

The author states: "In the present paper I have attempted to examine a simple case in which a dilational pulse of a purely plane type propagated vertically upwards in an elastic solid medium is partly transmitted through the bottom boundary of the superficial layer and partly reflected at this bottom as well as the surface boundaries of the same layer."

661. SEZAWA, Katsutada and NISHIMURA, Genrokuro, "On the Possibility of the Block Movements of the Earth Crust," *Bulletin of the Earthquake Research Institute Tokyo Imperial University*, **8**, Part 1, 13-43, 19 figures, March, 1930.

The résumé of the authors is, in part, as follows:

"1. The bodily movements of very rigid blocks of the earth crust are impossible. The idea of a mosaic work is not applicable to the actual earth crust where the elasticities or plasticities are very like to or less than that of the actual rocks and the solid friction at the surface of the separation of the blocks (if pre-existing) is very large in gravitating masses.

"2. The deformation of the surface of the earth crust must be curved, in general.....

"3. At the action of any extraordinary pressure unbalanced isostatically at the bottom of the so-called blocks, the sliding of the surface of the contact of these blocks can hardly take place and the surface displacement is very small and curved. The curvature of this surface movement partially conforms with the mode of the distribution of the unbalanced pressure at the bottom.

"4. As the ratio of the depth to the breadth of a block is increased the surface displacement diminishes abnormally and the impossibility of the sliding of the surface of the contact increases very rapidly.

"5. When the block is subjected to the unbalanced force acting horizontally at the surface of the contact, the sliding of the fault in the very vicinity of the surface becomes possible. The deep portion of the ground is not yet capable of sliding. Thus the evidence of the faults which are observed at the earthquake motion or in the slow deformation of the crust are of a superficial nature at the ground....

"6....."

662. SHAW, H., "A Field Test with a New Seismograph," *The Mining Magazine*, **42**, No. 4, 201-212, London, April, 1930.

An abstract by the author is reported in *Geophysical Abstracts*, No. 14. (See No. 633 of this list.) The abstract reads: "Tests with a new electrical seismograph devised by the Cambridge Instrument Co. were conducted over an area which is well known, as regards sub-surface structure, from a previous gravity survey and from bore-hole information.

The object of the investigation was to test the applicability of the seismic method to the location of simple structures and to ascertain the suitability of the Cambridge instrument for this purpose. The area is known to be traversed by a well-marked fault, the position, strike, and throw of which have already been determined fairly accurately, and in order to investigate this fault, three profiles were shot across it in a direction perpendicular to the strike. From an examination of the resulting time-distance curves, the position and throw of the fault are found to coincide very closely with the characteristics assumed from other data.

In addition to this, a profile was shot parallel to and on the upthrow side of the fault along a line passing through a bore-hole, in order to determine the depth below the surface of the limestone-drift interface. This determination of the depth differed from the bore-hole value by only 5 per cent." F.W.L.

663. SOKURYOBU, Rikuti, "Re-Survey of the Kwanto District after the Great Earthquake of 1923," *Bulletin of the Imperial Earthquake Investigation Committee*, **11**, No. 4, 1-80, 7 plates, Tokyo, 1930.

The text of the report occupies only pages 1-6. The tabular data is given in detail. The illustrations (charts, maps, etc.) are beautifully finished.

664. SORGE, Ernst, "Die Ersten Dickenmessungen des grönländischen Inlandeises," *Zeitschrift für Geophysik*, **6**, Heft 1, 22-31, Göttingen, 1930.

The paper gives the account of a German expedition to Greenland in August, 1929, for the purpose of measuring the thickness of the inland ice. A Wiechert seismograph was employed. Reflected waves were used in the investigation. A table shows depths varying from 330 metres to 1,200 metres.

665. SPITALER, R., "Der Einfluss der Achsenschwankungen der Erde auf die Temperaturanomalien," *Gerlands Beiträge zur Geophysik*, **25**, Heft 3-4, 429-441, Leipzig, 1930.

666. SPITALER, R., "Die Achsenschwankungen der Erde und ihre Folgen," *Gerlands Beiträge zur Geophysik*, **26**, Heft 1, 94-97, Leipzig, 1930.

667. TABER, Stephen. The kind collaboration of Dr. Taber has made possible the following complete list of his publications in seismology to date. Numbers in brackets indicate the location of a previous entry in this Bibliography, or, when the letters OS. are added, a previous entry in the earlier series which preceded it.

(1) "Some Local Effects of the San Francisco Earthquake," *Journal of Geology*, **14**, 303-315, 9 figures, Chicago, May, 1906.

(2) "The Mechanics of the California Earthquake of April 18th, 1906," Abstract: *Proceedings of the Philosophical Society, University of Virginia Publications*, **1**, page 33, Charlottesville, 1911.

(3) "The Importance of Displaced Objects in Studying the Character of Earthquake Motion in Megaseismic Areas," *Bulletin of the Seismological Society of America*, **1**, No. 4, 149-158, 1 figure, Stanford, December, 1911.

(4) "The South Carolina Earthquake of January 1, 1913," *Bulletin of the Seismological Society of America*, **3**, No. 1, 6-13, 1 figure, Stanford, March, 1913.

(5) "Earthquakes in Buckingham County, Virginia," *Bulletin of the Seismological Society of America*, **3**, No. 3, 124-133, 1 plate, 1 figure, Stanford, September, 1913.

(6) "Seismic Activity in the Atlantic Coastal Plain near Charleston, S.C.," *Bulletin of the Seismological Society of America*, **4**, No. 3, 108-160, 3 plates, 31 figures, Stanford, September, 1914.

(7) "Earthquakes in South Carolina during 1914," *Bulletin of the Seismological Society of America*, **5**, No. 2, 96-99, Stanford, June, 1915.

(8) "Discussion of Intensity of Earthquakes," *Bulletin of the Seismological Society of America*, **5**, No. 4, 181-186, Stanford, December, 1915.

(9) "The Earthquake in the Southern Appalachians, February 21, 1916," *Bulletin of the Seismological Society of America*, **6**, No. 4, 218-226, 1 map, Stanford, December, 1916.

(10) "Preliminary Report of the Seismological Commission to His Excellency, Arthur Yager, Governor of Porto Rico," *El Imparcial*, San Juan, P.R., December 9, 1918, and in other local papers. (Joint author with Harry Fielding Reid.)

(11) "Recent Earthquakes in Porto Rico," Abstract: *Bulletin of the Geological Society of America*, **30**, No. 1, 83-84, Washington, March, 1919. (Joint author with Harry Fielding Reid.)

(12) "The Porto Rico Earthquakes of October-November, 1918," *Bulletin of the Seismological Society of America*, **9**, No. 4, 95-127, 10 figures, 3 plates, Stanford, December, 1919. (No. 288-3A, *Bibliography of Seismology*) (Joint author with Harry Fielding Reid.)

(13) "The Porto Rico Earthquake of 1918: with Descriptions of Earlier Earthquakes," *Report of the Earthquake Investigation Commission*, Document No. 264, U.S. House of Representatives, 66th Congress, First Session, 74 pages, 8 figures, Washington, 1919. (No. 288-3B, *Bibliography of Seismology*) (Joint author with Harry Fielding Reid.)

(14) "The Virgin Islands Earthquakes of 1867-1868," *Bulletin of the Seismological Society of America*, **10**, No. 1, 9-30, 1 figure, 2 plates, Stanford, March, 1920. (No. 288-3C, *Bibliography of Seismology*) (Joint author with Harry Fielding Reid.)

(15) "Jamaica Earthquakes and the Bartlett Trough," *Bulletin of the Seismological Society of America*, **10**, No. 2, 55-89, 1 plate, Stanford, June, 1920. (No. 288-1, *Bibliography of Seismology*.)

(16) "The Inglewood Earthquake in Southern California, June 21, 1920," *Bulletin of the Seismological Society of America*, **10**, No. 3, 129-145, 8 plates, Stanford, September, 1920.

(17) "The Earthquake Problem in Southern California" (Address delivered at a meeting of the Southern California Section of the American Institute of Mining and Metallurgical Engineers, in Los Angeles, on September 3, 1920.) *Bulletin of the Seismological Society of America*, **10**, No. 4, 276-289, Stanford, December, 1920.

(18) "The Los Angeles Earthquakes of July, 1920," *Bulletin of the Seismological Society of America*, **11**, No. 1, 63-79, 1 plate, Stanford, March, 1921.

(19) "The Great Fault Troughs of the Antilles," Abstract: *Bulletin of the Geological Society of America*, **32**, No. 1, 47, Washington, March, 1921.

(20) "The Great Fault Troughs of the Antilles," *Journal of Geology*, **30**, No. 2, 89-114, 1 plate, 1 figure, Chicago, 1922. (No. 288-2, *Bibliography of Seismology*.)

(21) "The Active Fault Zones of the Greater Antilles," *Congrès Géologique International, Compte rendu*, XIII$^{e}$ Session, Belgique, 1922, 731-736, 1 figure, (1923). (No. 288-3, *Bibliography of Seismology*.)

(22) "The Seismic Belt in the Greater Antilles," *Bulletin of the Seismological Society of America*, **12**, No. 4, 199-219, 1 plate, Stanford, December, 1922. (No. 888, *Bibliography of Seismology OS.*).

(23) "Review: A Manual of Seismology" (by Charles Davison), *Bulletin of the Seismological Society of America*, **12**, No. 4, 241-244, Stanford, December, 1922.

(24) "Some Criteria Used in Recognizing Active Faults," *Bulletin of the Geological Society of America*, **34**, 661-668, 1 figure, Washington, December 30, 1923.

(25) "The Inglewood Fault Zone," *Bulletin of the Seismological Society of America*, **14**, No. 3, 197-199, Stanford, September, 1924.

(26) "Evidence on Basin Range Structure," *Science*, No. 1611, **62**, 436-437, New York, 1925.

(27) "Fault Troughs," *Journal of Geology*, **35**, No. 7, 577-606, 7 figures, Chicago, 1927. (No. 791, *Bibliography of Seismology OS.*)

(28) "Earthquake Hazard in the South Atlantic States," Abstract: *The Bibliographical Bulletin of the Eastern Section of the Seismological Society of America*, **3**, No. 2, 42-43, Ottawa, June 1, 1928. Re-published in the *Bulletin of the Seismological Society of America*, **18**, No. 2, 147-148, Stanford, June, 1928. (Presented at the Third Annual Meeting of the Eastern Section of the Seismological Society of America, at Charlottesville, May 1, 1928.)

(29) "Effect of Earthquakes on Artesian Waters," *Economic Geology*, **23**, No. 6, 696-697, New Haven, 1928. S.T.

668. TAMS, E., "Die Konstitution der Erdrinde," *Petermanns Mitteilungen*, Ergänzungsheft Nr. 209, 83-96, Gotha, 1930.

This paper, on advanced seismology and geophysics, is divided into the following subject divisions:

1. General survey: The Earth's Crust in its Relation to the Earth as a Whole.
2. The Character of the Constituents of the Earth's Crust.
3. Temperature Distribution: Radioactivity.
4. Surfaces of Discontinuity in the Earth's Crust: The Floors of the Oceans: The Roots of Mountains. E.T.

669. TERADA, T., "On the Relation between the Divergence of Horizontal Displacements of Trigonometrical Points and the Vertical Displacements of the Earth Crust," *Proceedings of the Imperial Academy*, **6**, No. 2, 53-55, Tokyo, February, 1930.

670. TERADA, T., "On the Nature of Destructive Earthquakes," *Bulletin of the Earthquake Research Institute, Tokyo Imperial University*, **8**, Part 1, 61-73, 4 figures, March, 1930.

671. TERADA, T. and MIYABE, N., "Crustal Disturbance in the Kwanto Districts," *Proceedings of the Imperial Academy*, **6**, No. 2, 49-52, 2 text figures, Tokyo, February, 1930

672. THOMSON, Andrew, "Earthquake Sounds Heard at Great Distances," *Nature*, No. 3131, **124**, 687-688, London, November 2, 1929.

Comments by F. J. W. Whipple immediately follow this account of the hearing of earthquake sounds at a distance of over 100 km. in the case of the New Zealand earthquake of June 17, 1929.

673. TSUBOI, Chuji, "Report on the Activity of the Earthquake Research Institute, Tokyo Imperial University, in the Latter Half of 1929," *Gerlands Beiträge zur Geophysik*, **26**, Heft 1, 111-122, Leipzig, 1930.

The paper deals with the following particular activities of the Institute:

1. Investigations on the Deformation of the Earth's Crust in the Tango District, Connected with the Tango Earthquake of 1927.
2. Eruption of Mount Komagatake.
3. Instrumental: In discussing this phase of the work, the author, describes the accelerometer designed by M. Ishimoto and R. Takahasi, and the tiltometer of M. Ishimoto.
4. Seismometrical studies.
5. Mathematical studies.
6. Geological studies.

674. TSUBOI, Chuji, "A Characteristic Mode of Displacements of Triangulation Points in the Tango District after the Tango Earthquake of 1927," *Proceedings of the Imperial Academy*, **6**, No. 2, 56-58, 2 text figures, Tokyo, February, 1930.

675. TURNER, H. H., "Seismological Investigation: Thirty-fourth Report of Committee on Seismology," British Association for the Advancement of Science, Report of the South Africa Meeting, 1929, Section A, 7 pages, Oxford, 1929.

676. TURNER, H. H., "International Seismological Summary for 1926," July, August, September, pages 173-308; October, November, December, pages 309-427, Oxford, 1930.

677. TURNER, H. H., "Discontinuities in the Variation of Latitude at Greenwich, 1900-27," *Monthly Notices of the Royal Astronomical Society, Geophysical Supplement*, **2**, No. 5, 259-272, London, February, 1930.

678. ULLER, Karl, "Die Entwicklung des Wellen-Begriffes, III.," *Gerlands Beiträge zur Geophysik*, **26**, Heft 2, 199-237, Leipzig, 1930.

A bibliography of 32 publications, on related subjects by the same author, is appended.

679. UMEMOTO, Toyokiti, "Results of the Repeated Levellings in the Vicinity of Oosaka," *Bulletin of the Earthquake Research Institute, Tokyo Imperial University*, **8**, Part 1, 85-89, 3 figures, March, 1930.

The paper is in Japanese with a brief introduction in English. The figures show the results of the work and are lettered in both Japanese and in English. The English introduction reads: "Since 1855, the precise levelling survey was repeated several times along a system of routes situated in the vicinity of Oosaka and extended to Ooto, province of Oomi. A comparison of the results obtained in different epochs reveals some remarkable features of the vertical displacement of the earth crust in this district, as may be seen from the curves given in the annexed figures."

680. UMEMOTO, Toyokiti, "On the Results of Precise Levellings in Osaka and Vicinity," *Japanese Journal of Astronomy and Geophysics*, **7**, No. 3 (Transactions and Abstracts), 83-91, Tokyo, 1930.

681. VAN DIJK, G., "De seismische storing van 2 April 1916," *Hemel en Dampkring* (Official Organ of the Nederlandsche Vereeniging voor Weeren Sterrenkunde), **14**, No. 10, 11 pages in reprint, DeBilt, February, 1917. G.v.D.

682. VAN DIJK, G., "Zeebevingen," *De Zee*, No. 4, 209-216, DeBilt, 1919. G.v.D.

683. VAN DIJK, G., "Ontploffingen en de voortplanting der beweging," *Hemel en Dampring*, **17**, No. 12, April; and **18**, No. 1, May; 12 pages in reprint, DeBilt, 1920. G.v.D.

684. VAN DIJK, G., "Planeten en aardbevingen," *Hemel en Dampkring*, **21**, No. 11, 345-350, DeBilt, November, 1923. G.v.D.

685. VAN DIJK, G., "De aardbeving in den nacht van 5 op 6 Januari 1926," *Hemel en Dampkring*, **24**, No. 3, 73-80, DeBilt, March, 1926. G.v.D.

686. VAN DIJK, G., "De aardbeving van 14 Januari 1928," *Hemel en Dampkring*, **26**, No. 2, 4 pages in reprint, DeBilt, February, 1928. G.v.D.

687. VAN DIJK, G., "Aardbeving in den nacht van 1 op 2 Mei 1928," *Hemel en Dampkring*, **26**, No. 6, 3 pages in reprint, DeBilt, June, 1928. G.v.D.

688. VAN DIJK, G., "Seismische Registreeringen te Heerlen," *Bulletin No. 4 of the Geological Bureau (Nederlandsche Mijngebied te Heerlen)*, 6 pages, 1 plate, DeBilt, 1928. G.v.D.

689. VAN DIJK, G., "Seismische Registreeringen te Heerlen, 1 April 1928-1 Mei 1929," *Bulletin No. 6 of the Geological Bureau (Nederlandsche Mijngebied te Heerlen)*, 135-137, 1 plate, DeBilt, 1929. G.v.D.

690. VAN DIJK, G., "Aardbevingen," *De Natur*, **49**; No. 3, 69-72; No. 4, 87-95, Utrecht, 1929. G.v.D.

691. VAN DIJK, G., "Seismologie—Erdbebenkunde—Seismology—Séismologie," Geologisch-Mijnbouwkundig Genootschap voor Nederland en Kolonien. Chapter on Seismology of the publication on "Nomenclature géologique," 167-182, DeBilt, 1929.

The publication of a glossary of seismological terms in four parallel columns—Dutch, German, English and French—with explanations of the terms in Dutch, is a service of outstanding value to seismologists. The terms are grouped as follows:

1. Aardbevingen—Erdbeben—Earthquakes—Tremblements de Terre.
2. Aardbevingsgolven—Erdbebenwellen—Seismic Waves—Ondes séismiques.
3. Seismografen—Seismographen—Seismographs—Séismographes.
4. Seismische Registreeringen—Seismische Registrierungen—Seismographical Records—Enregistrements séismiques.
5. Bepaling van het Epicentrum—Epizentralbestimmung—Determination of Epicentre—Determination de l'Épicentre. G.v.D.

692. VISSER, S. W., "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, 115 pages, 11 figures, 3 plates, 1930.

The Table of Contents is as follows:

Introduction:

Chapter I. Macroseismic records:
The records
The diligence of observers
Changes of seismicity
Distribution of earthquakes
Seismic character

Chapter II. Microseismic records:
Earthquakes of Western Java
Earthquakes in the other parts of the Archipelago
Results of microseismic records

Chapter III. Discussion of Time-tables:
Control of the tables, 1921
P-waves: S-waves: P′waves: PP: $\overline{P_cP_cS}$
$\overline{S_cP_cS}$: PS: PPS: $\overline{S_cP_c}\overline{P_cS}$: Long waves
Residual errors

Corrected Time-tables:

693. VON STEIN, Josef W., "Linemen of the Sea: When Transatlantic Cables are Broken, Men Must Be Sent to Splice Them," *Scientific American*, 448-450, New York, June, 1930.

A description of the methods followed in locating and repairing cables. The Grand Banks Earthquake of November 18, 1929, broke all the cables crossing a north-south line over 300 miles long. The repair work in connection with this earthquake was only just being completed at the time this article appeared in print.

— WANTLAND, Dart, MALKOVSKY, J. A., and HEILAND, C. A., "Geophysical News." See No. 637 of this list.

694. WHIPPLE, F. J. W., "The Great Siberian Meteor and the Waves, Seismic and Aerial, Which it Produced," *Quarterly Journal of the Royal Meteorological Society*, **56**, No. 236, 287-304, London, July, 1930. F.J.W.W.

695. WILLIS, Bailey, "Thomas Chrowder Chamberlin," *Bulletin of the Geological Society of America*, **40**, No. 1, 23-45, Washington, March, 30, 1929.

This biography of the late Prof. Chamberlin concludes with a full list of the papers published by him.

696. WILLIS, Bailey, "Continental Genesis," *Bulletin of the Geological Society of America*, **40**, No. 1, 281-336, 3 plates, Washington, March 30, 1929.

The above indicates the text of the Presidential Address read before the Geological Society of America at the Annual Meeting on December 26, 1928.

697. WILLIS, Bailey, "Metamorphic Orogeny," *Bulletin of the Geological Society of America*, **40**, No. 3, 557-590, Washington, September 30, 1929.

698. WOOD, Harry O., "Seismological Conference at Pasadena," *Bulletin of the Seismological Society of America*, **19**, No. 4, 228-234, Stanford, December, 1929.

The above article describes the activities of a conference held at Pasadena during the first half of October, 1929. Besides the members of the Advisory Committee in Seismology of the Carnegie Institution of Washington, the following well-known students of seismological and allied problems were invited and were in attendance, namely: Dr. L. H. Adams, Geophysical Laboratory, Washington, D.C.; Professor Perry Byerly, University of California, Berkeley, California; Professor Dr. Beno Gutenberg, University of Frankfurt (Frankfurt-am-Main); Dr. Harold Jeffreys, Saint John's College, Cambridge University, England; Professor James B. Macelwane, S.J., Saint Louis University; and Dr. Fred E. Wright, Geophysical Laboratory, Washington, D.C. The staff of the Seismological Laboratory of the California Institute of Technology at Pasadena were also present.

— WOOD, Harry O. (G. F. NICHOLSON), "Variations in Levels, 1919 to 1927, in Los Angeles Harbor." See No. 647 of this list.

699. YABE, Hisakatsu, "The Great Kwanto Earthquake of September 1, 1923, and the Geotectonic of the Meizoseismic Area," *Proceedings of the Imperial Academy*, **6**, No. 3, 105-108, Tokyo, March, 1930. R.R.B.

700. YAMAGUTI, Seiti, "On the Effect of Ocean Current, 'Kurosiwo,' upon Sea Level. Effect of Waves," *Bulletin of the Earthquake Research Institute, Tokyo Imperial University*, **8**, Part 1, 75-82, 5 figures, March, 1930.

— YASUDA, Chuji, IMAMURA, Akitune, NASU, Nobuji, and KISHINOUYE, Fuyuhiko, "On the Recent Ito Earthquakes." See No. 630 of this list.

## LIST OF COLLABORATORS

The appended initials are those used to indicate in each case the items contributed by the respective collaborator.

Agamennone, G., G.A.
Real Osservatorio Geofisico, Rocca di Papa, Rome, Italy.

Bodle, Ralph R., R.R.B.
United States Coast and Geodetic Survey, Washington, D.C., U.S.A.

Gutenberg, Beno, B.G.
Darmstadt, Germany.

Imamura, A., A.I.
Seismological Institute, Tokyo Imperial University, Tokyo, Japan.

Lee, Frederick W., F.W.L.
United States Bureau of Mines, Washington, D.C., U.S.A.

Link, T. A., T.A.L.
Imperial Oil Company, Calgary, Alberta.

Malkovsky, J. A., J.A.M.
Colorado School of Mines, Golden, Col., U.S.A.

Nakamura, Saemontaro, S.N.
Tohoku Imperial University, Sendai, Japan.

Navarro Neumann, M. Ma. S., S.J., N.N.
Cartuja, Grenada, Spain.

Pounder, J. A., J.A.P.
International Boundary Commission, Department of the Interior, Ottawa.

Taber, Stephen, S.T.
University of South Carolina, Columbia, S.C., U.S.A.

Tams, E., E.T.
Hauptstation für Erdbebenforschung, Hamburg 36, Germany.

van Dijk, G., G.v.D.
Koninklijk Nederlandsch Meteorologisch Instituut, DeBilt, Netherlands.

Whipple, F. J. W., F.J.W.W.
Kew Observatory, Richmond, Surrey, England.