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January, February, March, 1935

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—— BERGER, R. and JUNG, Karl, "Neuere Literatur über angewandte Geophysik." See No. 2549 of this list.

2510. BIOT, M., "Vibration of Buildings during Earthquakes," *Zeit. Angew. Math. Mech.*, Bd. 14, 213-223, Berlin, Aug., 1934.

2511. BODLE, Ralph R., "Earthquake Notes," Vol. 6, No. 3, 12 pp., 8 fig., Washington, Dec., 1934.

The above publication is the official organ of the Eastern Section of the Seismological Society of America. It is edited by Mr. Bodle (U.S. Coast and Geodetic Survey, Washington), to whom should be reported those items of news, likely to be of particular interest to seismologists, coming to the attention of those having like interests.

The present issue contains an illustrated article by N. H. Heck, entitled "On the Earthquake Strong-motion Program," followed by a short note by Frank Neumann on "Analyzing the Records." A new seismograph station is reported at State College, Pennsylvania, under the direct charge of Dr. H. Landsberg. The remaining items of news are grouped under the headings: Report of the Lisbon Meeting, Earthquake swarm, Magazine articles, Personalia, Radio talk, Meeting of the Seismological Society of America (April 13-14, '34), Seismology at the A.A.A.S. Meeting (Dec. 31-Jan. 1, 34-5), Epicentres.

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The authors' abstract reads as follows: "Laboratory measurements of the velocity of elastic waves in Amherst sandstone show that the bar velocity is dependent on the moisture content, the velocity decreasing as the moisture content is increased. Bar velocities ranging from 7,640 to 4,415 feet per second were observed. It is shown that the change in velocity is caused primarily by a change in the value of Young's modulus of the material. The suggestion is made that this phenomenon may have some bearing on the question of Gulf Coast reflection surveys."

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This invention relates to a method of generating seismic waves below the ground water level in the earth for the purpose of making subsurface geological explorations, said method characterized by causing a generator of seismic waves to be placed below the ground water level in the earth and causing said generator to operate in conjunction with seismic recording apparatus, receiving and recording said seismic waves and observing the results secured therefrom. F.W.L.

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2515. Chick, Alton C., "Discussion of Fundamental Factors Involved in the Underwriting of Earthquake Insurance," *Bul. S.S.A.*, Vol. 24, No. 4, 385-397, 1 fig., Stanford, Oct., 1934.

The above paper was presented at the ninth annual meeting of the Eastern Section of the Seismological Society of America, at New York, 1934. Copies of the reprint may be obtained from the author, care of the Manufacturers Mutual Fire Insurance Company, Providence, R.I., U.S.A. A.C.C.

—— Cohee, G. V., Shepard, F. P., and Trefethen, J. M., "The Origin of Georges Bank." See No. 2588 of this list.

2516. Cornish, Vaughan, "Ocean Waves and Kindred Geophysical Phenomena" (with additional notes by Harold Jeffreys), Cambridge University Press, 164 pp., 26 pl. Price 10s. net. Cambridge, 1934.

2517. Creskoff, Jacob J., "The Washington Monument. Is it Earthquake Proof? Is Spalling Preventable?" *Jour. Frank. Inst.*, Vol. 218, No. 5, 533-541, 1 fig., Philadelphia, Nov., 1934.

2518. CROSBY, I. B. and LOUGEE, R. J., "Glacial Marginal Shores and the Marine Limit in Massachusetts," *Bul. Geol. Soc. Amer.*, Vol. 45, No. 3, 441-462, Washington, June 30, 1934.

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(2) "The Sanriku (Japan) Earthquake Seawaves of 1933," *Nature,* No. 3395, Vol. 134, p. 820, London Nov. 24, 1934. F.D.H.

(3) "The Mino-Owari Earthquake of 1891," *Geol. Mag.*, No. 846, Vol. 71, 539-541, 1 map, 1 tab., London, Dec., 1934.

(4) "Periodic Variations in the Mean Focal Depth of Japanese Earthquakes," *Nature,* No. 3402, Vol. 135, 76-77, London, Jan. 12, 1935.

—— DYK, Karl, SWAINSON, O. W., and MCILWRAITH, Charles G., "The Velocity and Ray Paths of Sound Waves in Deep Sea Water." See No. 2592 of this list.

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A review signed B.H.K. appears on page 684 of *Nature,* No. 3392, Vol. 134, London, Nov. 3, 1934.

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(1) "Seismometrical Report of the Earthquake Research Institute, Tokyo Imperial University, 1934, Part 2, April 1-June 30, 1934," *Eq. Res. Inst.*, 9-14, 7 pl., tab., Tokyo, 1934.

(2) "Results of Recent Levellings and Triangulations in the Tohoku District," *Bul. Eq. Res. Inst.*, Vol. 12, Part 4, 857-859, 7 pl., Tokyo, Dec., 1934.

(3) "The Result of the Revision of the Precise Levelling along the Line from Kurozawaziri to Akita," *Ibid.*, p. 860, 1 pl.

—— FALCON, N. L. and HARRISON, J. V., "Collapse Structures." See No. 2532 of this list.

—— FAUST, L. Y. and WEATHERBY, B. B., "Influence of Geological Factors on Longitudinal Seismic Velocities." See No. 2603 of this list.

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—— FUKUTOMI, Takaharu and KAWASE, Ziro, "Tide and Earthquake or Volcanic Eruption." See No. 2545 of this list.

2524. GAMBURZEFF, G. A., "Seismograph with Elastically Mounted Movable Mass." Russian Pat., No. 107489, issued July, 1934.

This invention relates to a seismograph provided with an arrangement in which a filament is fixed in front of the opening of a case inside of which the movable mass is mounted elastically. The recording of the oscillations of the ground is achieved by means of the change in the resistance of the filament owing to its cooling by the air forced out of the opening by the mass. Claims allowed—1.

2525. GERLANDS BEITRÄGE ZUR GEOPHYSIK. Several papers on the subject of the shifting of the pole and others on *Polfluchtkraft*, all of at least secondary interest to seismologists, appear in *Gerlands Beiträge zur Geophysik*, Bd. 43, Heft 3, 1934, as follows:

(1) SCHWINNER, Robert, "Sind grosse Polverschiebung möglich?" pp. 296-308, 2 fig.

(2) MILANKOVITCH, M., "Sind grosse Polverschiebung möglich?" pp. 309-310.

The above are contributions to a published discussion by the two authors of the subject indicated.

(3) GRABOWSKI, L., "Zur Berechnung der Polfluchtkraft," pp. 311-324, 2 fig.

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(5) ERTEL, Hans, "Die Berechnung der Polfluchtkraft," pp. 327-330, 1 fig.

The last three papers are contributions to a published discussion of the subject indicated.

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2527. GIANELLA, Vincent P. and CALLAGHAN, Eugene, "The Cedar Mountain, Nevada, Earthquake of December 20, 1934," *Bul. S.S.A.*, Vol. 24, No. 4, 345-384, 16 fig., bib., Stanford, Oct., 1934.

The above paper is published by permission of the Director, United States Geological Survey. It deals authoritatively and in detail with the geological aspects of the above earthquake.

—— GLAZEBROOK, R. T., "Sir Alfred Ewing and his Cambridge Chair." See No. 2568 of this list.

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2531. HAHNKAMM, Erich, "Betrachtungen über ebene Pendel," *Zeit. Geoph.*, Jahr. 10, No. 5-6, 235-239, Braunschweig, 1934.

2532. HARRISON, J. V. and FALCON, N. L., "Collapse Structures," *Geol. Mag.*, No. 846, Vol. 71, 529-539, 5 fig., bib., London, Dec., 1934.

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2534. HECK, N. H.,

(1) "A New Map of Earthquake Distribution," *Geog. Rev.*, Vol. 125, No. 1, 125-130, 1 map, New York, Jan., 1935.

(2) "Principal Earthquakes of the Appalachian Mountain Region and the Atlantic Coastal Plain," Mim. pamph., 9 pp., presented before Sec. E, A.A.A.S., Pittsburgh meeting, Dec. 31, 1934. N.H.H.

—— HECK, N. H., "On the Earthquake Strong-motion Program." See pp. 1-7 (8 fig.) of *Earthquake Notes*, reported as No. 2511 of this list.

2535. HEILAND, C. A., "Certain Instrument Problems in Reflection Seismology," *Col. Sch. Mines Pub.*, No. 47-1, reprinted from *Trans. A.I.M.E.*, Vol. 110, 411-454, 19 fig., bib., Golden and New York, 1934. C.A.H.

The table of contents of this important paper deals with: I. Description of reflection equipments; A. Design features of present types, B. Reflection equipment designed by writer. II. Characteristics of reflection seismographs; A. Types of coupling in electromagnetic seismographs, B. Action of pickup, amplifier, and galvanometer, C. Combined action of pickups, amplifiers, and oscillographs, D. Static and dynamic constants, E. Desirable values for static and dynamic constants. III. Calibration of reflection apparatus; A. Dynamic tests without shaking table, B. Calibration methods, C. Various other tests.

2536. HEILAND, C. A., "Geophysics in the Nonmetallic Field," *Col. Sch. Mines Pub.*, No. 56, reprinted from *Trans. A.I.M.E.*, Vol. 110, 546-576, 6 fig., extensive bib., Golden and New York, 1934. C.A.H.

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2538. HONDA, H.,

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(2) "On the S_cS Waves and the Rigidity of the Earth's Core," *Ibid.*, 165-177, 7 fig., 8 tab.

(3) "On the Mechanism of Deep Earthquakes and the Stress in the Deep Layer of the Earth's Crust," *Ibid.*, 179-185, 6 fig.

Each of the above papers is of outstanding interest. In the second the author presents the evidence which he has compiled and which, in his opinion, supports the hypothesis that the core of the earth is liquid.

2539. HOPFNER, F., "Die Relativität der Undulationen," *Zeit. Geoph.*, Jahr. 10, Heft 7, 279-288, 2 fig., Braunschweig, 1934.

—— HOPFNER, F., "Physikalische Geodäsie." See No. 2556 (2) of this list.

—— HUGHSON, W. G. and MILLER, A. H., "The Isostatic Equilibrium of the Pacific Coast of Canada." See No. 2565 of this list.

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2541. IMAMURA, Akitune, "On Crustal Deformations in the Kii and Muroto Peninsulas," *Proc. Imp. Acad.*, Vol. 10, No. 8, 479-482, 1 fig., 2 tab., Tokyo, 1934. A.I.

—— IMAMURA, Hisasi, "The Strong Earthquake in Wakayama Prefecture on November 20, 1929." See No. 2545 of this list.

2542. INOUYE, Win, "Comparison of Earth Shakings Above-ground and Underground," *Bul. Eq. Res. Inst.*, Vol. 12, Part 4, 712-741, 36 fig., 3 tab., Tokyo, Dec., 1934.

The paper is in Japanese with a short *résumé* in English.

2543. INSTRUMENTS, "Reflection-method Geophysical Prospecting Equipment," Editorial note in above journal, Vol. 7, No. 8, p. 196, Pittsburg, 1934.

A brief review by W. Ayvazoglou appears on p. 1293 (item 2211) of *Geophysical Abstracts*, No. 68, reported as No. 2558 of this list. See also No. 2573 (1) of this list. F.W.L.

2544. ISHIMOTO, Mishio, "Analogie des secousses sismiques aux mouvements de l'eau dans un bassin," *Bul. Eq. Res. Inst.*, Vol. 12, Part 4, 706-711, 3 fig., Tokyo, Dec., 1934.

—— ISHIMOTO, Mishio, "Causes of Earthquakes as Considered by Japanese in Old Times." See No. 2545 of this list.

—— IWANISI, Tadakazu, "Land Creep in Kii Province" and "Earthquakes in Kii Province." See No. 2545 of this list.

2545. JAPANESE JOURNAL OF ASTRONOMY AND GEOPHYSICS.

On pp. (3)-(6) of Vol. XII, No. 1, of the above journal appear abstracts (in English) of papers which are themselves in Japanese and which appeared in Vol. 2, 1930, and Vol. 3, 1931, of the journal *Disin* (Earthquakes), published in Tokyo.

(1) IMAMURA, Hisasi, "The Strong Earthquake in Wakayama Prefecture on November 20, 1929," Vol. 2, 170-179.

(2) IWANISI, Tadakazu, "Land Creep in Kii Province," *Ibid.*, 632-640.

(3) ISHIMOTO, Mishio, "Causes of Earthquakes as Considered by Japanese in Old Times," Vol. 3, 39-44.

(4) MUSYA, Kinkiti, "Some Phenomena that Preceded the Yedo Earthquake of 1855," *Ibid.*, 89-97.

(5) KODAIRA, Takao, "The Strong Earthquake that Occurred in the Northern Part of Hirosima Prefecture in 1930," *Ibid.*, 155-166.

(6) IWANISI, Tadakazu, "Earthquakes in Kii Province," *Ibid.*, 257-270.

(7) NISINA, Nobuhiko and KOSIKAWA, Yosiaki, "Earthquake and Latitude Variation," *Ibid.*, 379-394.

(8) FUKUTOMI, Takaharu and KAWASE, Ziro, "Tide and Earthquake or Volcanic Eruption," *Ibid.*, 484-498.

(9) HAENO, Seizo, "Estimation of the Thickness of a Gravel Layer Underlying a River," *Ibid.*, 660-684.

(10) SUZUKI, Takeo, "Acceleration of Earthquake Motions Calculated from Seismograms," *Ibid.*, 719-735.

(11) NASU, Nobuji, "The Strong Earthquake on September 21, 1931, in Saitama Prefecture," *Ibid.*, 745-754.

2546. JONES, H. Spencer, "General Astronomy" (Second edition). Edward Arnold and Co., 437 pp. Price 12s. 6d. London, 1934.

The second chapter, pp. 9-29, particularly sections 13-16, is a discussion of interest to seismologists, the subject being, *The Earth*. On pp. 50-51 is given a discussion of the standard time used in different countries.

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2548. JUNG, Karl, "Mikroseismische Bodenunruhe und Brandung," *Forschungen und Fortschritte*, Jahr. 10, No. 35-36, 437-438, Berlin, Dec., 1934. K.J.

The article is a review of the more recent investigations carried out in Germany by Tams and others to determine the nature and extent of the relationship between surf and microseisms.

A paper with the above title appears also in *Zeit. Geoph.*, Jahr. 10, Heft 7, 325-329, 5 fig., Braunschweig, 1934. The paper was presented at the Pyrmont meeting (Sept., 1934) of the Deutsche Geophysikalische Gesellschaft.

2549. JUNG, Karl and BERGER, R., "Neuere Literatur über angewandte Geophysik," *Metall und Erz*, N.F. 22, Jahr. 31, Heft 23, 543-546, Halle (Saale), 1934. K.J.

The above bibliography is divided into sections, one of which is devoted to the papers on the seismic method of geophysical prospecting. There is also a list of recent patents in that field.

—— KANAI, Kiyoshi and SEZAWA, Katsutada,

(1) "Amplitudes of Dispersive Rayleigh-waves at Different Depths of a Body."

(2) "Some New Problems of Free Vibrations of a Structure."

(3) "Some New Problems of Forced Vibrations of a Structure."

See No. 2586 of this list.

2550. KATO, Y., "Seismic and Volcanic Activities and Changes in the Earth's Magnetic Field" (Second paper), *Jap. Jour. Ast. Geoph.*, Vol. 12, No. 1, 1-25, 35 fig., 26 tab., Tokyo, 1934.

The author concludes: "There is close connection between magnetic disturbances and earthquake or volcanic activity. The disturbance is most likely caused by changes in the magnetic properties of magma or rocks in the earth's crust. It is probable that the magnetic disturbance appears shortly before the occurrence of an earthquake or volcanic eruption." Y.K.

—— KAWASE, Ziro and FUKUTOMI, Takaharu, "Tide and Earthquake or Volcanic Eruption." See No. 2545 of this list.

2551. KAWASUMI, Hirosi, "Amplitude of Seismic Waves with the Structure of the Earth's Crust and Mechanisms of Their Origin" (Second Paper cont'd), *Bul. Eq. Res. Inst.*, Vol. 12, Part 4, 660-705, 15 fig., 10 tab., bib., Tokyo, Dec., 1934.

For the first part of this paper see No. 1343 of these lists; and for the first instalment of the second part see No. 2064. In the same issue of the *Bulletin* with the latest contribution listed here, pp. 854-856, appears a note entitled: "Supplemental Note and Corrigendum to my 'Study on the Propagation of Seismic Waves.'" This applies to part of that section listed as No. 2064.

2552. KING, L. V., "On the Acoustic Radiation Field of the Piezoelectric Oscillator and the Effect of Viscosity on Transmission, Parts I and II," *Can. Jour. Res.*, Vol. 11, Nos. 2 and 4, 135-155 and 484-488, Ottawa, 1934.

The author's abstract reads:

"Part I: The radiation field due to a circular disk oscillating with uniform amplitude in a closely fitting circular aperture surrounded by an infinite rigid flange has been studied in detail, the velocity potential being expressed as an infinite integral involving cylindrical coordinates. The procedure adopted may be used to study the effect of viscosity on the characteristics of the radiation field. While having little effect on the field in the neighbourhood of an oscillator generating waves in water, the viscosity has a marked effect on the range of distant transmission, which in consequence is appreciably affected by temperature. Of considerable practical importance is the existence of an optimum wave-length for constant output and a given distance of transmission. By means of a simple chart, it is possible to determine the optimum wave-length for a given transmitter when the level of reception for a given range is stated."

"Part II: Numerical data on the distance of transmission of sound in sea water from a 10-inch piezoelectric oscillator are discussed in the light of theoretical results obtained in a previous paper. It is shown how by the principle of similitude, the chart of transmission at optimum wave-length calculated for a 50-watt, 80 cm. oscillator can be used for a transmitter of any given diameter and output. A comparison with some experiments of Boyle's points to the fact that at supersonic frequencies, in the neighbourhood of 100,000 cycles, a considerably higher coefficient of viscosity than that obtained by flow methods must be used."

—— KODAIRA Takao, "The Strong Earthquake that Occurred in the Northern Part of Hirosima Prefecture in 1930." See No. 2545 of this list.

2553. Köhler, R., "Eigenschwingungen des Untergrundes, ihre Anregung und ihre seismische Bedeutung," *Nach. Ges. Wiss. Gött., M-p. Kl.*, Fachgruppe II, Neue Folge, Bd. 1, No. 2, 11-42, Göttingen, 1934.

The above is No. 15 of the series *Seis. Unter. Geoph. Inst. Gött.* An excellent summary, in English, by C. A. Silberrad appears in *Sc. Abs. A.*, No. 442, Vol. 37, 975-976, London, Oct. 25, 1934.

—— Kosikawa, Yosiaki and Nisina, Nobuhiko, "Earthquake and Latitude Variation." See No. 2545 of this list.

2554. Kromer, Clarence H., "Structural Problems in Connection with the Design of Earthquake-resistive School Buildings," *Bul. S.S.A.*, Vol. 24, No. 4, 404-418, 1 pl., Stanford, Oct., 1934.

The above paper was presented before the Seismological Society of America, April 14, 1934.

2555. Krumbach, Gerhard, "Über die Aufzeichnung von Fernbeben mit kurzperiodischen Seismometern," *Veröff. Jena*, Heft 23, 11-16, 3 fig., 2 tab., Leipzig, 1934. A.S.

2556. Lambert, Walter D.,

(1) "Note on the Reduction of Gravity Observations to Sea Level for the Purpose of Determining the Geoid," *Bul. Geod., I.U.G.G.*, No. 41, 26-33, Jan., Feb., Mar., 1934.

(2) Review of "Physikalische Geodäsie," by F. Hopfner, *Mathematik in Monographien und Lehrbüchern*, No. 15, Leipzig, Akademische Verlagsgesellschaft, 1933, ix + 434 pp. *Bul. Amer. Math. Soc.*, 644-645, Sept., 1934.

(3) Review of "Traité de Géodésie," by P. Tardi, Gauthier-Villars, 1934, xxx + 732 pp. Price 150 francs. *Ibid.*, 783-785, Nov., 1934. W.D.L.

2557. Lee, A. W., "A World-wide Survey of Microseismic Disurbances Recorded during January, 1930," *Meteor. Office Geoph. Mem.*, No. 62, 33 pp., 23 fig., num. tab., London, 1934.

The reprint containing the above paper only, may be obtained from H.M. Stationery Office, London, at 3s. 0d. net. E.T. + R.R.B.

2558. Lee, Frederick W., "Geophysical Abstracts," No. 67, 1266-1286, Nov.; No. 68, 1287-1309, Dec., Washington, 1934.

2559. Link, Theodore A. and Moore, P. D., "Structure of Turner Valley Gas and Oil Field, Alberta," *Bul. Amer. Ass. Pet. Geol.*, Vol. 18, No. 11, 1417-1453, 8 fig., Tulsa, Nov., 1934. T.A.L.

The refraction method of seismic prospecting was tried some years ago in Turner Valley and was not successful because of the very complicated structure. The authors of the above paper are more familiar with the geology of the valley than anyone else. They reveal conditions which would tax the resources of the best development of reflection prospecting to-day. At the same time the fact that the wells are, in general, very deep, would make a reasonably successful system of seismic prospecting very valuable.

—— LITTLEHALES, G. W., "A Chart for Solving Spherical Triangles." See No. 2605 of this list.

2560. LONGWELL, Chester R., "Proposed Tectonic Map of the United States," *Science*, No. 2080, Vol. 80, 427-428, New York, Nov. 9, 1934.

—— LOUGEE, R. J. and CROSBY, I. B., "Glacial Marginal Shores and the Marine Limit in Massachusetts." See No. 2518 of this list.

2561. MACELWANE, James B., S.J., "Keeping Tab on Earthquakes," *Saint Louis Globe-Democrat Sunday Magazine*, pp. 2 and 14, Saint Louis, Nov. 18, 1934. J.B.M.

The article is illustrated and is of a popular nature. It deals with the work of locating and studying earthquakes, particularly as regards the Geophysical Laboratory of Saint Louis University.

2562. MARTIN, H.,

(1) "Relaisuntersuchungen," *Phys. Zeit.*, Jahr. 35, Heft 16, 658-661, Leipzig, 1934.

(2) "Beiträge zum Amplitudenregistrierverfahren (Koinzidenzregistrierverfahren)," *Veröff. Jena*, Heft 23, 23-27, 1 fig., Leipzig, 1934. H.M.

—— MASUDA, K. and WADATI, K., "On the Travel Time of Earthquake Waves (Part VI)." See No. 2601 of this list.

2563. MCCOMB, H. E., "A Tilt-compensation Seismometer," *Proc. Fifth Pac. Sc. Cong.*, A7, No. 38, 2489-2494, 7 fig., Ottawa, 1934. H. E. McC.

—— MCILWRAITH, Charles G., DYK., Karl, and SWAINSON, O. W., "The Velocity and Ray Paths of Sound Waves in Deep Sea Water." See No. 2592 of this list.

2564. MEISSER, O.,

(1) "Zur photographischen Registrierung von Stationsseismometern," *Zeit. Geoph.*, Jahr. 10, Heft 5-6, 259-265, 7 fig., 1 tab., Braunschweig, 1934.

(2) "Gravitation," *Mitt., Jena*, Heft 6, Jena, 1934. Comprises pp. 310-317 (11 fig., bib.) of the *Handwörterbuch der Naturwissenschaften*, published by Gustav Fischer, Jena. It is a textbook exposition of the elementals of gravity measurements.

(3) "Experimentelle Untersuchungen an Quarzglaspendeln mit Quarzglasschneiden," *Veröff. Jena*, Heft 23, 17-22, 1 fig., 3 tab., Leipzig, 1934. O.M.

—— MEISSER, O. and SCHMÜCKLING, H., "Der Einfluss des Antriebs auf die Schwingungsdauer eines Pendels." See No. 2583 of this list.

2565. MILLER, A. H. and HUGHSON, W. G., "The Isostatic Equilibrium of the Pacific Coast of Canada," *Proc. Fifth Pac. Sc. Cong.*, A2, No. 4, 1169-1173, 2 fig., 2 tab., Ottawa, 1934.

The authors' summary states in part: "Geophysical data, which appear to be in a general way in accord with the geological evidence, indicate that the Pacific coast of Canada is in a condition of isostatic equilibrium. . . . . The gravity results are in somewhat better agreement with the Airy hypothesis."

— — MOORE, P. D. and LINK, Theodore A., "Structure of Turner Valley Gas and Oil Field, Alberta." See No. 2559 of this list.

—— MORRIS, Samuel B. and PEARCE, Cecil E., "A Concrete Gravity Dam for a Faulted Mountainous Area." See No. 2578 of this list.

—— MUSYA, Kinkiti, "Some Phenomena that Preceded the Yedo Earthquake of 1855." See No. 2545 of this list.

2566. NARYSKINA, E. (C. NARYCHKINA), "Sur les vibrations d'un demi-espace aux conditions initiales arbitraires," *Pub. Inst. Séis., Acad. Sc. URSS.*, No. 45, 71 pp., 7 fig., Leningrad, 1934. N.V.R.

—— NASU, Nobuji, "The Strong Earthquake on September 21, 1931, in Saitama Prefecture." See No. 2545 of this list.

2567. NATURE. The following short notes of interest to seismologists have appeared recently in Vol. 134 of the above publication:

(1) "Seismometric Reports on Tokyo Earthquakes," No. 3383, p. 329, London, Sept. 1, 1934. F.D.H.

(2) "Earthquakes of December 15," No. 3399, p. 963, Dec. 22, 1934.

(3) "Submarine Terraces around Japan," *Ibid.*, p. 976.

(4) "Pressure Waves from Explosions," *Ibid.*, 976-977.

2568. NATURE, "Sir Alfred Ewing, K.C.B., F.R.S.," *Nature*, No. 3404, Vol. 135, 137-140, London, Jan. 26, 1935.

An obituary notice in three sections: the first by T. Hudson Beare, the second by R. T. Glazebrook, and the third by Edgar C. Smith. The second note deals particularly with the subject: *Sir Alfred Ewing and his Cambridge Chair*. The third is entitled: *Sir Alfred Ewing and Naval Education*.

2569. NAVARRO NEUMANN, M. Ma. S., S.J., "La sismología: ojeda retrospectiva, recientes progressos." Reprint from *Ibérica*, Nos. 1044-45-46-48-49, pp. 237-240, 255-256, 270-272, 300-304, 317-319, bib., Barcelona, Nov.-Dec., 1934. N.N.

The article is a brief review of the state and progress of seismology since the beginning of the present century. The author discusses the contributions of the various countries and expresses his criticisms. He is particularly well qualified to write a paper of this nature as he was for more than a quarter of a century the Director of the station at Cartuja, Spain, now passed into other hands. He has also had practical experience in the construction of seismographs. E.A.H.

2570. NEUMANN, Frank, "Analysis of Strong Motion Seismograph Records of the Western Nevada Earthquake of January 30, 1934, with Description of a Method of Analyzing Seismograms by Precise Integration," *U.S.C.G.S. Pub.*, Strong Motion Report No. 4, 22 pp., Washington, Sept., 1934.

—— NEUMANN, Frank, "Analyzing the Records." See pp. 7-9 of *Earthquake Notes*, reported as No. 2511 of this list. A report is made also of the work done under the California strong-motion program, through which were obtained the records to which reference is made in the title of the paper.

—— NISINA, Nobuhiko and KOSIKAWA, Yosiaki, "Earthquake and Latitude Variation." See No. 2545 of this list.

5271. NORTH, F. J., "'The Anatomy of the Earth'—a Seventeenth-century Cosmography," *Geol. Mag.*, No. 846, Vol. 71, 541-547, London, Dec., 1934.

2572. NOVOTORZEV, V. I.,

(1) "Method of Successive Approximations Applied to the Study of Vibrations of Structures: the Method Extended to Longitudinal and Torsional Vibrations and to Vibrations of Spacial Systems," *Pub. Inst. Séis., Acad. Sc. URSS.*, No. 44, 69 pp., 24 fig., Leningrad, 1934.

(2) "Method of Successive Approximations Applied to the Study of Damped Vibrations of Structures: Forced Vibrations with Damping," *Ibid.*, No. 46, 27 pp., 11 fig., 10 tab.

Both the above papers are in the Russian language. N.V.R.

2573. OIL AND GAS JOURNAL. The following editorial notes in the above journal are reported as Items 2210 and 2233, respectively, of *Geoph. Abs.*, No. 68, reported as No. 2558 of this list. In each case abstracts by W. Ayvazoglou accompany the bibliographical data.

(1) "Outfit for Seismic Reflection Shooting used in Geophysical Prospecting," Vol. 33, No. 17, p. 44, Tulsa, 1934.

(2) "Work of Geophysical Prospecting Experiencing Rapid Growth," *Ibid.*, No. 16, p. 68. F.W.L.

2574. OKADA, T. *et al.*, "The Seismological Bulletin of the Central Meteorological Observatory for the Year 1933," *Cent. Met. Obser. Pub.*, 80 pp., num. fig., 4 pl., Tokyo, 1934.

The Director of the Central Meteorological Observatory has written the following Preface to the above publication: "Hitherto the Seismological Bulletin of the Central Meteorological Observatory of Japan for each year has been published in separate numbers, five to eight constituting one volume. Thus the completion of each volume took quite different intervals of time: some volumes took two years in completion while the others took three or more years. This way of publication has been found to be of no small inconvenience to the librarians concerned. It sems therefore advisable to alter the procedure of publication in a more suitable way.

"With the present volume it has been decided to publish one volume for each year in the same way as in publishing the annuals or year books of the meteorological observatories. Also it is intended to publish the notes and papers which directly treat the current earthquakes in this publication. The investigations and researches on the general seismology made by the members of this observatory will be published in the *Geoph. Mag.*"

The present volume deals, in order, with:

(1) Introduction.

(2) The Seismometrical Report of the C.M.O.

(3) The Seismic Activity in Japan in the Year 1933.

(4) Conspicuous Distant Earthquakes Observed in Japan in the Year 1933.

(5) Volcanic Activity in the Year 1933.

(6) List of the Meteorological Stations Equipped with Sensitive Seismographs.

2575. Otuka, Yanosuke, "Marine Pleistocene Terraces near Kusiro, Hokkaido," *Bul. Eq. Res. Inst.*, Vol. 12, Part 4, 798-803, 2 fig., Tokyo, Dec., 1934.

—— Owen, J. E., and Born, W. T., "Effect of Moisture upon Velocity of Elastic Waves in Amherst Sandstone." See No. 2512 of this list.

2576. Oxford University, "International Seismological Summary, April, May, June, 1930," 75-197, Oxford, 1934.

—— Partlo, F. L., and Service, Jerry H., "Seismic Refraction Methods as Applied to Shallow Overburdens." See No. 2585 of this list.

2577. Pastor, A. Rey, "Datos sismicos de la peninsula Iberica; 2° trimestre de 1934," *Ibérica*, No. 1048, Vol. 43, 3 pp. in reprint (Supl. p. xli), 2 maps, 1 tab., Barcelona, Dec. 1, 1934. A.R.P.

2578. Pearce, Cecil E. and Morris, Samuel B., "A Concrete Gravity Dam for a Faulted Mountainous Area," *Eng. N.-R.*, Vol. 113, No. 26, p. 823, New York, Dec. 27, 1934. R.R.B.

2579. Proviero, A., "Il dissincronismo in sismometria alle prove della piattaforma oscillante (per il case di $T>T_o$)," *Bol. Soc. Sis. Ital.*, Vol. 32, Fasc. 5-6, 7 pp., 10 fig., Rome, 1934. A.P.

2580. Pugh, W. E., "Certain Field Problems in Reflection Seismology," *Col. Sch. Mines Pub.*, No. 47-2, reprinted from *Trans. A.I.M.E.*, Vol. 110, 455-472, 3 fig., 1 tab., Golden and New York, 1934. C.A.H.

The paper carries a useful bibliography and presents the mathematical discussion for reflection phenomena for the case of a horizontal reflecting bed.

2581. Reich, H., "Angewandte Geophysik für Bergleute und Geologen" (Zweiter Teil), Akad. Verlags. m.b.H., 153 pp., 73 fig. Price RM 10.60 (paper). Leipzig, 1934.

A review by L. W. Blau appears on pp. 126-127 of *Bul. A.I.M.M.E.*, Vol. 19, No. 1, Tulsa, Jan., 1935.

2582. Repetti, W. C., S.J., "A Correction to Wichmann's Catalogue of East Indian Earthquakes," *Ger. Bei.*, Bd. 43, Heft 3, 286-288, bib., Leipzig, 1934.

2583. Schmücking, H. and Meisser, O., "Der Einfluss des Antriebs auf die Schwingungsdauer eines Pendels," *Veröff. Jena*, Heft 23, 70-74, 2 fig., Leipzig, 1934. A.S.

2584. SCIENCE NEWS-LETTER.

Brief notes of interest to seismologists have appeared in recent issues of Vol. 26 of the above publication as follows:

(1) "Amazing Landscape Lies Beneath the Pacific Ocean," (by F. P. Shepard), No. 710, p. 310, Washington, Nov. 17, 1934.

(2) "Time Signals Now Broadcast Twenty Times Each Day," *Ibid.*, p. 311.

(3) "Earthquake Shakes Bering Sea Bottom," *Ibid.*, p. 313.

(4) "Earth Sent Own Messages on Recent Earthquakes," *Ibid.*, No. 714, p. 376, Dec. 15, 1934.

(5) "Shifting Water of Ocean Tides Tilts Earth's Crust," *Ibid.*, No. 715, p. 392, Dec. 22, 1934.

Other notes appearing in Vol. 27 are:

(6) "Earthquake Waves Focus Near Earth's Opposite Side," No. 717, p. 8, Jan. 5, 1935.

(7) "Seismic Soundings Reveal Antarctic Ice Thickness," No. 718, p. 24, Jan. 12, 1935.

(8) "Three Earthquakes Usher in the New Year," *Ibid.*, p. 24.

(9) "Grand Canyon Region Shaken by Local Quake," No. 720, p. 27, Jan. 26, 1935.

2585. SERVICE, Jerry H. and PARTLO, F. L., "Seismic Refraction Methods as Applied to Shallow Overburdens," *Trans. Amer. Inst. Min. Met. Eng.*, Vol. 110, 473-492, New York, 1934.

The investigation was undertaken to develop a method for determining with reasonable accuracy depths of overburden of 100 ft. or less. Dynamite charges were fired at a series of points along a straight line. Travel times to a carbon button seismometer were measured by means of a modified General Radio oscillograph. Travel times were plotted against distance from charge to seismometer. From these graphs were calculated (1) depth to ledge, (2) slope of ledge surface, and (3) velocity in ledge. Diamond drill data were available for most of the locations, and the agreement between drill results and seismic results was considered satisfactory. A buried fault was also located successfully by the method. J.H.S.

2586. SEZAWA, Katsutada and KANAI, Kiyoshi,

(1) "Amplitudes of Dispersive Rayleigh-waves at Different Depths of a Body," *Bul. Eq. Res. Inst.*, Vol. 12, Part 4, 641-649, 8 fig., bib., Tokyo, Dec., 1934.

(2) "Some New Problems of Free Vibrations of a Structure," *Ibid.*, 804-822, 14 fig.

(3) "Some New Problems of Forced Vibrations of a Structure," *Ibid.*, 823-853, 12 fig.

2587. SHEPARD, F. P., "Detailed Surveys of Submarine Canyons," *Science*, No. 2079, Vol. 80, 410-411, 1 fig., New York, Nov. 2, 1934. See also No. 2584 (1) of this list.

2588. SHEPARD, F. P., TREFETHEN, J. M., and COHEE, G. V., "Origin of Georges Bank," *Bul. Geol. Soc. Amer.*, Vol. 45, No. 2, 281-302, 7 fig., Washington, Apr. 30, 1934.

2589. SIEBERG, A.,

(1) "Ein Beitrag zur Frage der Wirtschaftsgefährdung durch Erdbeben in Deutschland," *Veröff. Jena*, Heft 23, 1-10, 1 map, Leipzig, 1934.

(2) "Tätigkeitsbericht der Reichsanstalt für Erdbebenforschung für die Zeit vom 1. April 1933 bis zum 31 März 1934," *Ibid.*, Heft 24, 1-15, bib., Leipzig, 1934. A.S.

—— SMITH, Edgar C., "Sir Alfred Ewing and Naval Education." See No. 2568 of this list.

2590. SOBOLEFF, S.,

(1) "Théorie de la diffraction des ondes planes," *Pub. Inst. Séis., Acad. Sc. URSS.*, No. 41, 23 pp., 8 fig., 3 tab., 1 pl., Leningrad, 1934.

(2) "Sur l'intégration de l'équation d'ondes pour un milieu hétérogène," *Ibid.*, No. 42, 26 pp., Leningrad, 1934.

Both of the above papers are in Russian. N.V.R.

2591. SOLDÁN, Francisco Alayza Paz, "Temblores y terremotos," *Bol. Soc. Geog. Lima*, Tomo 51, No. 3, 243-261, Lima, Sept. 30, 1934.

The above is the first part of a discussion of the subject indicated. It is to be continued.

—— SUZUKI, Takeo, "Acceleration of Earthquake Motions Calculated from Seismograms." See No. 2545 of this list.

2592. SWAINSON, O. W., MCILWRAITH, Charles G., and DYK, Karl, "The Velocity and Ray Paths of Sound Waves in Deep Sea Water," *Pub. U.S.C.G.S.*, 44 pp., 13 fig., 4 pl., Washington, 1934.

The publication is planographed. The data are concisely but fully presented with the mathematical basis expounded, the actual records reproduced, and the readings tabulated. The authors' conclusions are:

"The first sound arriving at the near surface hydrophone from near surface bombs had been reflected from the bottom once for travel-times ranging from 11·6 to 28·2 seconds; for travel-times ranging from 28·3 to about 40 seconds the first arriving sound had been reflected twice from the bottom.

"The first sound arriving at the hydrophone at 300 fathoms depth from near surface bombs for travel-times ranging from 11·6 to 26·1 seconds had gone directly to the hydrophone after one reflection from the bottom. For a travel-time of 27·2 seconds the first unmistakable arrival had been reflected once from the bottom, then from the surface, before reaching the hydrophone.

"The first sound arriving at the hydrophone at 850 fathoms depth from near surface bombs for a travel-time of 17·2 seconds had gone directly to the hydrophone after one reflection from the bottom. For travel-times ranging from 18 to 28 seconds the first arriving sound had been reflected once from the bottom and then from the surface before reaching the hydrophone.

"The British Admiralty Tables of Velocities of Sound in Sea Water are probably in error by as much as 1 per cent.

"The average horizontal (apparent) velocity for travel-times of from 34·5 to 39·5 seconds is about 1484·5 m/s under the conditions of the experiment. The error is probably less than 5 m/s." J.H.H. + L.D.L.

2593. TAKAHASI, Ryutaro, "A New Extensometer for Measuring Crustal Deformation," *Bul. Eq. Res. Inst.*, Vol. 12, Part 4, 760-775, 10 fig., Tokyo, Dec., 1934.

—— TARDI, P., "Traité de Géodésie." See No. 2556 (3) of this list.

2594. TERADA, Torahiko, "On Bathymetrical Features of the Japan Sea," *Bul. Eq. Res. Inst.*, Vol. 12, Part 4, 650-656, 4 fig., 1 tab., Tokyo, Dec., 1934.

—— TREFETHEN, J. M., COHEE, G. V., and SHEPARD, F. P., "The Origin of Georges Bank." See No. 2588 of this list.

2595. TSUBOI, Chuji, "Notes on the Undulatory Deformation of the Earth's Crust," *Bul. Eq. Res. Inst.*, Vol. 12, Part 4, 657-659, 4 fig., Tokyo, Dec., 1934.

2596. ULLER, Karl, "Die Entwicklung des Wellen-Begriffes, VIII," *Ger. Bei.*, Bd. 43, Heft 3, 289-295, Leipzig, 1934.

2597. UREN, Lester C., "Petroleum Production Engineering" (2nd edition), Vol. 1 (Development). McGraw-Hill Book Co., 531 pp. Price $5. New York, 1934.

The section on seismic methods includes the use of the geophone in gathering subsurface data in wells. F.W.L.

2598. VAN EVERDINGEN, E., "Die Erdbeben in Noordbrabant von 20-28, November, 1932," *Pub. K. Neder. Met. Inst.*, No. 108; *Seismische Registrierungen in De Bilt, 1932*, No. 20, 44-52, 3 fig., De Bilt, 1934.

2599. VAN ORSTRAND, C. E., "Normal Geothermal Gradient in United States," *Bul. A.I.M.M.E.*, Vol. 19, No. 1, 78-115, 2 fig., num. tab., Tulsa, Jan., 1935.

The author's abstract reads as follows: "The objects in preparing this paper have been, first, to prepare a brief summary of the gradients deduced from recent geothermal surveys in the United States; and second, to discuss the data thus summarized from the standpoint of a normal geothermal gradient."

2600. VISSER, S. W., "On the Relation between Microseisms and Depressions in Western Europe and on the Ocean," *Proc. K. Akad. Weten. Amsterdam*, Vol. 37, No. 10, 11 pp. in reprint, 6 fig., bib., 1934. S.W.V.

2601. WADATI, K. and MASUDA, K., "On the Travel Time of Earthquake Waves (Part VI)," *Geoph. Mag.*, Vol. 8, No. 2, 187-194, 2 fig., 2 tab., Tokyo, Nov., 1934.

In this paper the authors attack the problem of determining the velocities in the core of the earth.

2602. WANNER, E., "Über die Mächtigkeit der Molasseschichten," *Viertel. Natur. Ges. Zürich*, Bd. 79, 341-361, 20 fig., 8 tab., Zürich, 1934. E.W.

The paper deals in turn with: "Makroseismisches Schüttergebiet und Seismogrammformen," "Dispersion der Oberflächenwellen und mittlere Mächtigkeit der Molasse," and "Mächtigkeit der Molasse unterhalb der Erdbebenwarte Zürich."

2603. WEATHERBY, B. B. and FAUST, L. Y., "Influence of Geological Factors on Longitudinal Seismic Velocities," *Bul. A.I.M.M.E.*, Vol. 19, No. 1, 1-8, 3 fig., 4 tab., Tulsa, Jan., 1935.

The data discussed were obtained from fifty wells located in eight states. A charge of dynamite was exploded in a hole 20-70 feet deep about 1,000 feet from a well. The vibrations were recorded on a geophone lowered into the well to a chosen depth.

2604. WHIPPLE, F. J. W. *et al.*, "Seismological Investigations," *Ann. Rep. Brit. Ass.*, Aberdeen Meeting, 1934, Section A, 5 pp. in reprint, London, 1934.

The report deals in order with the following topics: Organization, Travel-times of earthquake waves, International Seismological Summary, Constants of seismological observatories, Seismographs, Great earthquake in India, British earthquakes, Earthquake prediction, Periodicity of earthquakes, Accounts, etc.

Under the head of earthquake prediction it is reported that a Shortt clock at the Observatory at Manila has been observed to abruptly alter its rate by as much as a tenth of a second in twenty-four hours, three or four days before a local earthquake. After the earthquake the clock resumes a rate nearly that obtaining before the shock.

2605. WOOD, F. M., "Standard Nomographic Forms for Equations in Three Variables," *Can. Jour. Res.*, Vol. 12, No. 1, 14-40, Ottawa, Jan., 1935.

The author discusses the mathematical theory which forms the basis for the construction of nomographs. Several such charts are now in use in seismological work and others might be constructed for rapid approximate solutions of required equations.

In this connection, see p. 92 of *Popular Astronomy*, Vol. 43, No. 2, Northfield, Feb., 1935, for a chart prepared by Dr. G. W. Littlehales for solving spherical triangles (quoted by Harold D. Babcock in an article entitled "Astronomy without a Telescope").

2606. YAMAGUTI, Seiti,

(1) "Relation between Cyclone and Earthquake," *Bul. Eq. Res. Inst.*, Vol. 12, Part 4, 742-753, 13 fig., Tokyo, Dec., 1934.

(2) "On Time and Space Distribution of Earthquakes—A Supplementary Note," *Ibid.*, 754-759, 1 fig., 3 tab.

2607. YAMAZAKI, Hyoziro, "The Observation of the Tilting of the Earth Crust at the Toyooka Observatory," *Seis. Bul. Kobe*, Vol. 9, No. 4, 205-206, 2 pl., 1 map, 1 tab., Kobe, Oct., 1934.

The above paper reports the records for the year 1933, obtained on an Ishimoto tiltmeter installed in Toyooka Observatory which is situated only about twenty-two kilometers west of the epicentre of the great Tango earthquake of March 7, 1927. The graphical presentations of the tilting for the year are most interesting, especially the second plate. E.A.H.

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The initials appended to various items throughout the *Bibliography* indicate, in each case, the contribution by the respective collaborator.

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