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DEPARTMENT OF THE INTERIOR
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HON. CHARLES STEWART, *Minister*

W. W. CORY, C.M.G., *Deputy Minister*

PUBLICATIONS

OF THE

Dominion Observatory

OTTAWA

R. MELDRUM STEWART, *Director*

Vol. X

Bibliography of Seismology

No. 4

OCTOBER, NOVEMBER, DECEMBER, 1929

BY

ERNEST A. HODGSON.

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PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1930

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For an extended abstract by W. Ayvazoglou, see *Geophysical Abstracts* (Published by the United States Bureau of Mines), No. III (Circular 6154), pages 6-7.
303. AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS, "Structure of Typical American Oil Fields" (Volume II), American Association of Petroleum Geologists, 750 pages, 235 illustrations. Price (cloth) \$6 postpaid. Box 1852, Tulsa, Oklahoma, 1929.
Volume I was reported as No. 2 of these lists. The second volume will be ready in December, 1929.
304. AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS, "Geophysical Prospecting: Papers and Discussions Presented at Meetings Held at New York, February, 1928, and at Boston, August, 1928," Published by the Institute, 676 pages, illustrations, index. Price \$5. New York, 1928.
Besides the general discussion of other papers which touch indirectly on the seismic method, three important papers are given dealing with that method directly. These are as follows:—
Donald C. Barton: "Seismic Method of Mapping Geologic Structure," 572-624, 37 figures, 5 tables, bibliography.
C. A. Heiland: "Modern Instruments and Methods of Seismic Prospecting," 625-653, 13 figures, discussion.
Frank Rieber: "Adaptation of Elastic-wave Exploration to Unconsolidated Structures," 654-667, 12 figures.
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— BARTON, Donald C., "Seismic Method of Mapping Geologic Structure." See No. 304 of this list.
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The author's abstract reads, "With isostasy proved, we must go back one step further in the earth's geological history and try to unfold a rational hypothesis regarding the configuration of the earth's surface before the beginning of the sedimentary age. Undoubtedly, the earth's surface was irregular in the period prior to the present one, and, by a process of elimination, I have arrived at the conclusion that the only hypothesis regarding the origin of oceans and continents that is convincing is the one proposed by Osmond Fisher in his book entitled, 'Physics of the Earth's Crust,' which was published about 40 years ago."

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322. CRITIKOS, N. A., "Le tremblement de terre de la mer de Crète du 26 juin 1926," *Union géodésique et géophysique internationale, Section de Séismologie, Publications du Bureau central séismologique international, Série B, Monographies, Fascicule No. 3*, 75-82, Strasbourg, 1929.
323. CROSBY, Irving B., "Locating Deeply Buried Bedrock," *Engineering and Contracting*, **68**, No. 10, 429-430, Hammond, Ind., October, 1929. USCGS+R.R.B.
324. DALY, Reginald A., "The Effective Moduli of Elasticity in the Outer Earth-Shells" (Second Paper), *Gerlands Beiträge zur Geophysik*, **22**, Heft 1-2, 29-40, Leipzig, 1929.
The author's abstract reads, "All tests of the earth's mean rigidity refer to small strains. The corresponding stress-differences are relatively minute. Because the stresses are small, their persistence for limited periods of time does not betoken crystallinity for the earth's silicate shell as a whole. On the contrary this shell may be dominantly vitreous and at high temperature. The experimental proof of rigidity in molten silicates, by Feild and Royster, is emphasized. Though it is conceivable that hot glass has a finite elastic limit, explanation of the earth's behaviour under body forces seems to be best founded upon the hypothesis of elastico-viscosity for all the shells except that of the crust, assumed to be of the order of 60 kilometers in thickness. That the time of relaxation considerably exceeds the 14-month period of the variation of latitude is a fact which is illuminated by experiments on hot glass, made by Adams and Williamson. These investigators found that the time of relaxation of glass, at low stresses and at annealing temperatures varies as the square of the stress. Since the stress-differences set up during the 14-month Chandler period are much smaller than even tidal stress-differences, the time of relaxation for the former condition should be specially long. The corresponding viscosity of hot, vitreous material seems explicable by the earth's internal pressures, according to the principle illustrated by Bridgman's recent experiments on many liquids."
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331. GENTRY, Frank M., "The Internal Temperature of the Earth's Crust," *Science*, No. 1814, 70, 332-334, New York, October 4, 1929.
332. GUTENBERG, B., "Theorie der Erdbebenwellen," Gebrüder Borntraeger (Handbuch der Geophysik, 4, Lieferung 1), 298 pages, 146 text-figures, 85 tabulations. Price RM 30. Berlin, 1929.
- The Handbuch der Geophysik, published by Borntraeger is to be edited by Prof. Gutenberg. Lieferung 1 of Band 4, is the first section to appear. It is proposed to complete this Band and begin the issue of Band 6, at an early date. The above presentation, written by Gutenberg, is a most important contribution to seismological literature. His discussion of the theory of seismic waves is brought up to date including the contributions of Uller and Sezawa. The Lieferung is divided into three sections as follows: (1) Theorie der Erdbebenwellen, (2) Beobachtungen von Erdbebenwellen, (3) Die seismische Bodenunruhe.
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- The Annotated Bibliography of Economic Geology is compiled under the auspices of the National Research Council (Washington). The subscription price (for 1928 issue) is \$5. The Annotated Bibliography of Geophysical Prospecting, prepared by Dr. Heiland of the Colorado School of Mines, lists 224 items, giving for most of them an outline of the scope of the papers respectively designated.
- This bibliography meets a most definite demand for a comprehensive list of the growing numbers of papers dealing with geophysical prospecting. C.A.H.+O.P.R.O.+E.A.H.
- HEILAND, C. A., "Modern Instruments and Methods of Seismic Prospecting." See No. 304 of this list.
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335. HILLER, Wilhelm, "Die Herdform des Schwäbischen Bebens am 30. August 1928," *Beiträge zur Geophysik*, 22, Heft 1-2, 103-114, Leipzig, 1929.
- The author's abstract reads: "From the records obtained at six next and most favourably situated stations—the times of \bar{P} - and \bar{S} -wave have an accuracy of some tenths of seconds—results the focus cannot have the form of a "point," but must have a certain length. The form of a "point" would only be possible, if the azimuthal velocity of \bar{P} and \bar{S} was different; but that is not in accordance with former observations made at earthquakes in Southern Germany. The length of the focus-line was found to be about 19 kilometers, the breadth can be practically neglected; the depth of the focus lies between 10 and 25 kilometers. Also the form of the interior isoseists suggests a like focus-line."

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A review signed S. Ogura appears in the *Japanese Journal of Astronomy and Geophysics*, 7, No. 1 (4), Tokyo, 1929. The original paper is in Japanese, the review (presenting the more important data in concise form) is in English.

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338. IMAMURA, Akitune, "On the Chronic and Acute Earth-tiltings in the Kii Peninsula," *Japanese Journal of Astronomy and Geophysics*, 7, No. 1, 31-45, Tokyo, 1929.

The author introduces his paper thus: "As the writer has discussed elsewhere, the seismicity of the southern part of Central Japan has, during the last six hundred years, recurred with an average period of about one hundred and twenty-three years. Fully seventy-five years having now elapsed since the culmination of the last activity of 1854, and assuming that the cycle is to be repeated, the urgent need of taking advantage of the present for devising ways and means of meeting the contingency in order to render the occurrence comparatively harmless, can scarcely be gainsaid. A step in this direction lies in the careful and unrelaxing study of conditions as may be observed in the regions concerned, that is to say, of topographical changes going on as the result of earth-tiltings, both chronic and acute."

339. IMAMURA, Akitune, "Chronic Earth-tilting in the Kii Peninsula: An Indication of the Accumulation of Seismogenic Forces," *Proceedings of the Imperial Academy*, 5, No. 4, 161-163, Tokyo, April, 1929.

340. IMAMURA, Akitune, KISHINOUE, Fuyuhiko, and KODAIRA, Takeo, "The Effect of Superficial Sedimentary Layers upon the Transmission of Seismic Waves," *Proceedings of the Imperial Academy*, 5, No. 5, 206-209, 2 tables, 4 text figures, Tokyo, 1929.

The author examines the factor K of the empirical formula of Omori ($D = KT$) for near quakes, where D is the distance of the seismic focus from a station and T the duration of the preliminary tremors at the said station. He treats K as a function of the transit velocities of the dilatational and distortional waves (hence of the focal depth) and, assuming the crustal formation of Matuzawa for the Kwanto district, tabulates the values of K for values of D from 0 to 150 km. and for various focal depths up to 100 km.

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In Japanese with a one-page résumé in English, the first paragraph of which reads: "The present author investigated the statistical distribution of the altitudes of mountain ranges and the amounts of dislocations of the earth's surface and found some regularities existing among them. A brief summary of the results obtained is given in the following lines with some discussions."

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345. JACOBSEN, Lydik S., "Vibration Research at Stanford University," *Bulletin of the Seismological Society of America*, 19, No. 1, 1-27, Stanford, March, 1929.
346. JAGGAR, T. A. and FINCH, R. H., "Tilt Records for Thirteen Years at the Hawaiian Volcano Observatory," *Bulletin of the Seismological Society of America*, 19, No. 1, 38-51, Stanford, March, 1929.
- The authors terminate the paper with a summary of the conclusions, listed under nine divisions. It may be noted here that seasonal tilts, of twenty seconds or more in a half-year, vary with air temperature; that there is practically no correlation between tilt and rainfall; and that there is perfect correlation between Kilauea lava movement and Mauna Loa lava movement, whenever Kilauea lava pit is not sealed. The correlation between the tilting and the lava movements is traced in the concluding summary.
347. JÉLÉNKO, M., "Tremblements de terre de Bulgarie en 1928: Situation géologique des régions dévastées et dislocations diverses," *Comptes rendus de l'Académie des Sciences*, 186, No. 25, 1741-1743, Paris, 1928.
348. JOERG, Wolfgang L. G., "On the Proper Map for Determining the Location of Earthquakes," *Annals of the Association of American Geographers*, 2, 2 pages, 1 figure, 1 plate, 1913.
- The author advocates the use of a map of the world on the stereographic projection, with the station as the pole of projection.
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- An abstract appears in *Geologisches Zentralblatt*, 38, No. 2, 63, Leipzig, October 15, 1928. J.B.M.
- KEYS, D. A. and EVE, A. S., "Geophysical Methods of Prospecting: Demonstration and Discussion on Geophysical Methods of Prospecting." See No. 328 of this list.
- KEYS, D. A. and EVE, A. S., "Applied Geophysics in the Search for Minerals." See No. 329 of this list.
- KISHINOUE, Fuyuhiko, KODAIRA, Takeo, and IMAMURA, Akitune, "The Effect of Superficial Sedimentary Layers upon the Transmission of Seismic Waves." See No. 340 of this list.
350. KITHIL, Karl L., "Prospecting with Artificial Earthquakes," *Scientific American*, 508-511, illustrations, New York, June, 1929.
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- KODAIRA, Takeo, IMAMURA, Akitune, and KISHINOUE, Fuyuhiko, "The Effect of Superficial Sedimentary Layers upon the Transmission of Seismic Waves." See No. 340 of this list.

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354. LAMBERT, WALTER D., "The Importance from a Geophysical Point of View of a Knowledge of the Tides in the Open Sea," Reprinted from *Bulletin No. 11, de la Section d'Océanographie du Conseil international de Recherches*, 11 pages, Venezia, 1928.
- The author's introduction concludes as follows: "The purpose of this note, however, is not to insist on a knowledge of tides in midocean from the purely oceanographic point of view, but rather to emphasize the desirability of this knowledge for two geophysical purposes that are not primarily oceanographic at all, namely: (1) the problem of the earth tides and (2) the problem of tidal friction and the apparent secular acceleration of the moon. Furthermore one way is suggested in which some knowledge of tides at sea could be gained."
355. LAND SURVEY DEPARTMENT, IMPERIAL JAPANESE ARMY, "Revision of the Primary Trigonometrical Survey in Tango Earthquake Districts," *Bulletin of the Earthquake Research Institute, Tokyo Imperial University*, 7, Part 1, 187-191, June, 1929.
356. LEE, Frederick W., "Geophysical Abstracts," United States Bureau of Mines, Washington. No. 1 (Circular 6120), May, 1929; No. II (Circular 6133), May, 1929; No. III (Circular 6154), July, 1929.
- The publication appears as an "Information Circular" in mimeographed form. The reference to each item is, as a rule, unusually comprehensive and informing. The preface to the first issue is written by Scott Turner, Director of the Bureau of Mines. It reads as follows: "This paper is the first of a contemplated series which will contain abstracts of current articles and publications dealing with applied geophysics. The abstracts will be prepared, for the most part, by officials and engineers of mining and exploration companies, in cooperation with the United States Bureau of Mines. It is believed that useful and timely information dealing with the science of applied geophysics can thus be adequately presented. The bureau plans, if possible, to procure the original papers from which these abstracts are prepared and to assist those who may be interested in obtaining translations or photostat copies." I.B.C.
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358. MAHER, Thomas J., "The United States Coast and Geodetic Survey—Its Work in Collecting Earthquake Reports in the State of California," *Bulletin of the Seismological Society of America*, 19, No. 2, 77-79, Stanford, June, 1929.
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361. MAURAIN, Ch., "Les frémissements de la terre," *Science et Vie*, No. 112, 269, Paris, October, 1926.

362. MEISSER, O., "Beiträge zu einer experimentellen Seismik," *Veröffentlichungen der Reichsanstalt für Erdbebenforschung in Jena*, Heft 9, 77 pages, 68 text-figures, Jena, 1929.

The paper is, as indicated, one of the series of geophysical papers issued from Jena, under the general editorship of Prof. Hecker. The author first presents the theory underlying the propagation of earth waves for conditions such as would obtain in geophysical prospecting. He then deals with the instruments to be employed in seismic surveying, together with the evaluation of their records, and outlines methods to be followed. The many illustrations are beautifully clear. The presentation is orderly, detailed, and comprehensive.

363. MENGEL, Octave, "Étude de la séismotectonique des Pyrénées et des Alpes occidentales," *Union géodésique et géophysique internationale, Section de Séismologie, Publications du Bureau central séismologique international*, Série B, Monographies, Fascicule No. 3, 3-74, Strasbourg, 1929.

364. MIHAILOVIĆ, J., "Annuaire séismique," *Publications de l'Institut séismologique de l'Université de Beograd*, Série A (Observations), Fascicule 3, 71 pages, Belgrade, 1928.

— MILNER, H. B. and RAEBURN, C., "Alluvial Prospecting." See No. 374 of this list.

365. MIYABE, Naomi, "On the Fluctuation of the Zone of Macroseismic Activity in the Pacific Ocean," *Proceedings of the Imperial Academy*, 5, No. 6, 243-245, Tokyo, June, 1929.

— MIYABE, Naomi and TERADA, Torahiko, "Experimental Investigations of the Deformation of Sand Mass, Part III." See No. 388 of this list.

366. MYRBACH, O., "Die bebenauslösende Wirkung der Sonnenflecken, gezeigt an der sogenannten elfjährigen Periode," *Zeitschrift für Geophysik*, 4, Heft 7-8, 413-416, Göttingen, 1928.

367. NASU, Nobuji, "Further Study of the Aftershocks of the Tango Earthquake," *Bulletin of the Earthquake Research Institute, Tokyo Imperial University*, 7, Part 1, 133-152, June, 1929.

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— NISHIMURA, Genrokuro and SEZAWA, Katsutada, "Generation of Rayleigh-waves from an Internal Source of Multiplet Type." See No. 382 of this list.

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374. RAEBURN, C. and MILNER, H. B., "Alluvial Prospecting" (Foreword by J. D. Falconer), D. Van Nostrand and Co., 478 pages, 32 plates, 139 figures. Price \$14. London and New York, 1927.
- A brief review, signed W. A. W., appears on pages 95-96, *Journal of Geology*, 37, No. 1, Chicago, January-February, 1929.
375. RENIER, A., "Les tremblements de terre envisagés comme les manifestations les plus récentes de phénomènes de plissement du sol belge," *Comptes rendus des Congrès de l'Association française pour l'Avancement des Sciences, Liège*, 382, 1924.
- RIEBER, Frank, "Adaptation of Elastic-wave Exploration to Unconsolidated Structures." See No. 304 of this list.
376. ROTHÉ, E., "Les tremblements de terre récents et l'état actuel de la séismologie," *Scientia*, 37, No. 151, 87, Milan, 1925.
377. SCIENTIFIC AMERICAN, "Amateur Seismology," *Scientific American*, 141, No. 5, 411-413, New York, November, 1929.

The article serves to open a campaign to enlist the interest of the amateur scientist in the study of earth-tremors. It presents an outline of the field in which their co-operation would be particularly useful and describes a simple seismometer which has been designed by Dr. Jaggar of the Hawaiian Volcano Observatory, and which may be constructed for about twenty-five dollars.

378. SEIDL, Erich, "Ableitung der Knick- bzw. Biege-Form in Technik und Geologie aus ihren Elementen; Anwendung auf den Alpen-Bogen," *Gerlands Beiträge zur Geophysik*, 22, Heft 1-2, 175-202, Leipzig, 1929.

The author's abstract reads: "In some much-disputed areas of disturbance of the earth's crust the tectonic processes may be reduced to a simple form by comparing them with analogous forms of disturbance known to mechanics.

"In order to derive the flexure or bending forms in mechanics and geology from their elements, first of all the definitions of the forms of the disturbance resulting from the strain of thrust, tension, pressure, bending and flexing are given; the deformation being constant. The geological forms of disturbance—displacements, overthrust-faults, ditch-fractures, 'horste' and folds—are reduced to the above-mentioned mechanical forms of disturbance.

"The Alps are chosen as an example to show the importance of this geometrical method serving to explain mountain formation.

"The Alp-curve originates from flexure strain (seen in horizontal projection); in consequence of pressure west-east and vice-versa. On the concave (southern) side forms of excessive pressure predominate; on the convex (northern) side forms of disruption.

"The flexure of the Alps northward means thrust.

"The upheaval of the Alps, combined with the curve-formation, results from a strain caused by bending (seen in cross-section).

"The eruption of magma in the core zone of the Alps may be regarded from the point of view of a flow process."

379. SEZAWA, Katsutada, "Propagation of Rayleigh-waves in Two Dimensions," *Proceedings of the Imperial Academy of Japan*, 2, No. 7, 314-317, Tokyo, July, 1926
J.B.M.
380. SEZAWA, Katsutada, "The Tilting of the Surface of a Semi-infinite Solid due to Internal Nuclei of Strain," *Bulletin of the Earthquake Research Institute, Tokyo Imperial University*, 7, Part 1, 1-14, June, 1929.
381. SEZAWA, Katsutada, "Formation of Shallow-water Waves Due to Subaqueous Shocks," *Bulletin of the Earthquake Research Institute, Tokyo Imperial University*, 7, Part 1, 15-40, June, 1929.
The paper deals with the subject under four divisions as follows:—
Part I. Waves due to Bottom Pressure.
Part II. Waves due to Bottom Pressure in a Shallow-sea of Moderate Depth.
Part III. The Effect of the Inertia of the Subaqueous Medium.
Part IV. Waves due to Subaqueous Pressure at an Intermediate Depth.
382. SEZAWA, Katsutada and NISHIMURA, Genrokuro, "Generation of Rayleigh-waves from an Internal Source of Multiplet-type," *Bulletin of the Earthquake Research Institute, Tokyo Imperial University*, 7, Part 1, 41-64, June, 1929.
383. STINY, Josef, "Das Erdbeben von Schwadorf, N. Ö.," *Matériaux pour l'Étude des Calamités*, No. 18, 130-132, Geneva, July-September, 1928.
384. STÖLTING, W., "Kontinentalverschiebung und Gebirgsbildung," *Gerlands Beiträge zur Geophysik*, 22, Heft 1-2, 203-204, Leipzig, 1929.
385. TABER, Stephen, "Frost Heaving," *Journal of Geology*, 37, No. 5, 428-461, Chicago, July-August, 1929.
386. TAKAHASI, Ryûtarô, "Tilting Motion of the Earth Crust Caused by Secondary Undulations of Tides in a Bay," *Bulletin of the Earthquake Research Institute, Tokyo Imperial University*, 7, Part 1, 95-102, June, 1929.
- TAKAHASI, Ryûtarô and ISHIMOTO, Mishio, "Mesures des mouvements d'un bâtiment dans des conditions tranquilles." See No. 344 of this list.
387. TAMS, E., "Zur Auffindung des tungusischen Riesenmeteors vom 30. Juni 1908," *Zeitschrift der Gesellschaft für Erdkunde zu Berlin*, No. 3-4 (Kleine Mitteilungen), 143-145, 1929.
388. TERADA, Torahiko and MIYABE, Naomi, "Experimental Investigations of the Deformation of Sand Mass, Part III," *Bulletin of the Earthquake Research Institute, Tokyo Imperial University*, 7, Part 1, 65-93, June, 1929.
389. TSUBOI, Chûji, "Block Movements as Revealed by Means of Precise Levellings in Some Earthquake Districts of Japan," *Bulletin of the Earthquake Research Institute, Tokyo Imperial University*, 7, Part 1, 103-114, 4 coloured plates, June, 1929.
390. TURNER, H. H., "On a Method of Solving Spherical Triangles and Performing Other Astronomical Computations by Use of a Simple Table of Squares," *Monthly Notices of the Royal Astronomical Society*, 75, No. 7, 530-541, London, May, 1915.

The author says, "The following method has been found to facilitate the calculation of distances of seismological observing stations from a given epicentre, and seems to be capable of a wider extension." From time to time Prof. Turner has published lists of constants for various seismological stations to enable them to use the method outlined in this paper.

391. TURNER, H. H., "Note on the 240-Year Period in Chinese Earthquakes in the Light of Dr. Fotheringham's Paper," *Monthly Notices, Royal Astronomical Society*, **80**, No. 6, 617-619, London, April, 1920.
392. ULLER, Karl, "Indirekte Induktion elastischer Planwellen an der Grenze zweier fester, isotroper, schwereloser, und ruhender Mittel," *Gerlands Beiträge zur Geophysik*, **21**, Heft 2-3, 313-343, Leipzig, 1929.
393. WALKER, G. W., "Graphical Construction for the Epicentre of an Earthquake," *Meteorological Office Observatories, Geophysical Memoirs*, No. 3, 53-54, 1 plate, London, 1912.
394. WEICKMANN, L., "Der Umbau des Leipziger Seismographen und die in dem Jahren 1925, 1926 und 1927 aufgezeichneten Erdbeben," *Sächsischen Akademie der Wissenschaften zu Leipzig, Mathematisch-physikalische Klasse*, **80**, 385-496, 4 text-figures, 11 pages of reproduction of seismograms, 1929.
- The bulk of the book is taken up with the tabular report on the seismograms registered at the Geophysical Institute at Leipzig, for the period indicated.
395. WENNER, Frank, "A New Seismometer Equipped for Electro-magnetic Damping and Electromagnetic and Optical Magnification (Theory, General Design, and Preliminary Results)," *Bureau of Standards Journal of Research*, **2**, Research Paper No. 66, 963-999, Washington, 1929.
- The paper is also issued as a reprint in separate cover, and may be obtained from the Superintendent of Documents, Washington, at the nominal price of fifteen cents. The author describes the horizontal seismograph which he has designed and developed. The instrument is in many respects different from the Galitzin. The mass is about 500 grams, the magnification and its variation with the period of earth displacements, in the range from 2.5 to 60 seconds, is substantially the same as is given by a seismometer of the ordinary type (direct magnification) having a magnification for short-period displacements of 1,250, a period of 12.5 seconds and critical damping.
- The treatment of the theory is mathematical, and the application of the theory to the instrument is given in some detail. Examples of the beautiful records obtained are given in the illustrations.
396. WIECHERT, E., "Theorie der automatischen Seismographen," *Abhandlungen der Königlichen Gesellschaft der Wissenschaften zu Göttingen, Mathematisch-physikalische Klasse*, Neue Folge, **2**, No. 1, 128 pages, Berlin, 1903.
- This book presents a classic outline of the theory of seismographs.
397. WILLIS, Bailey, "Earthquake Conditions in Chile," *Carnegie Institution of Washington (Studies in Comparative Seismology)*, No. 382, 178 pages, numerous illustrations, tables, etc. Price \$5.50. Washington, 1929.
- The book has, as appendixes, articles by J. B. Macelwane, S.J., Perry Byerly, L. S. Vera, Johannes Felsch, and Henry S. Washington, dealing with various phases of the subject. The whole is a most comprehensive analysis of the seismicity of Chile, chiefly from the standpoint of the geologist, and includes a detailed investigation of the Atacama quake of November, 1922, as regards the field data.
398. YABE, Hisakatsu, "The Latest Land Connection of the Japanese Islands to the Asiatic Continent," *Proceedings of the Imperial Academy*, **5**, No. 4, 167-169, Tokyo, April, 1929.

399. YAMAGUTI, Seiti, "On the Effect of Cyclones upon Sea Level," *Bulletin of the Earthquake Research Institute, Tokyo Imperial University*, 7, Part 1, 115-132, June, 1929.
400. ZEITSCHRIFT FÜR GEOPHYSIK, "Seismische Meldungen im Anschluss an amerikanische Wettertelegramme," *Zeitschrift für Geophysik*, 5, Heft 1, 47-48, Göttingen, 1929.

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SUBJECT INDEX FOR THE YEAR 1929

The following index has been prepared, listing under one or more of fifty subject headings each of the items reported for the year 1929 (Publications of the Dominion Observatory, Volume X, Numbers 1, 2, 3, 4). It is proposed to issue a similar index with the last number of each ensuing year of the Bibliography.

The subject headings have been developed as the result of several years' experience and are considered to be fairly comprehensive. Following their arrangement in alphabetical order, they have, accordingly, been arbitrarily assigned order designations, consisting of a letter and a figure, or a letter and a figure followed by a period and subordinating figures.

These designations will be maintained in future issues. Additions will find their place, first alphabetically. Then, if they should appear to be subdivisions of an existing classification, the addition of a subordinating figure will serve to place them. If they are not subdivisions of an existing classification, they will be assigned the next free figure to precede the period.

Thus the previous arrangement may be maintained; future classifications will find their consecutive places. Furthermore, any numbers previously assigned to items in the earlier issues may be conveniently re-numbered in the case of further subdivision by the simple addition of a figure or figures. As each subject designation begins with a letter it cannot be confused with serial numbers of bibliographical entries. The letter also serves as an aid to memory in assigning the designations and in the use of the bibliography. To avoid confusion the digit 0 is never used in the subject designations.

- A1. Aids to Seismological Study: Nos. 37, 163, 179, 185, 275, 282(2), 390, 393.
See also M1 (Maps).
- B1. Building Construction: Nos. 39, 68, 151, 165, 168, 169, 183, 194, 319, 326, 327.
- C1. Catalogues of Earthquakes, Lists of Aftershocks, etc.: Nos. 29, 31, 44, 56, 73, 122, 153, 197, 220, 264(4), 281, 292, 310, 367.
See also R2 (Reports).
- C2. Causes of Earthquakes: Nos. 11, 12, 30(3), 57, 86, 99(1), 100, 113, 132, 136, 149(2), 157, 159(2), 301, 338, 339, 359, 371, 389.
See also R3 (Rotation Variation).
- C3. Cosmogony; Theoretical Discussions of Similar Nature; Continental Drift, etc.: Nos. 18, 34, 40, 41, 42, 43, 91, 138, 213, 307, 313, 384.
- C4. Cycles, Earthquake: Nos. 30(2), 30(3), 31, 54, 106, 108, 109, 149(1), 149(2), 186, 189, 231, 366, 391.
See also P5 (Prediction).
- D1. Dams and Earthquakes: Nos. 21, 201(1).
See also E2 (Engineering).
- D2. Deformations, Gradual, of the Earth's Crust: Nos. 4, 5, 25, 47, 52, 55, 82, 90, 93, 184, 203, 223, 238, 241, 255, 262, 296, 338, 339, 375, 384.
- D3. Descriptions, General, of Earthquakes in Canada or the United States: Nos. 60, 63, 155, 239, 308, 325.
- D4. Descriptions, General, of Earthquakes other than Those in Canada or the United States: Nos. 1, 35, 46, 48, 100, 105, 114, 128, 135, 137(3), 137(5), 154, 159(1), 159(3), 177, 180, 201(4), 201(5), 207, 237, 270, 271, 285, 291, 298, 322, 335, 383.
- E1. Effects of Earthquakes, on Buildings, Ground, etc.—Observed During or After the Disturbance: Nos. 35, 68, 82, 114, 115, 132, 134, 154, 183, 190, 242, 351, 371.
- E1. 1 Earthquake Sounds: Nos. 217(2), 351.
- E2. Engineering; Particular Applications to Seismology or of Seismology: Nos. 39, 68, 194.
See also B1 (Building Construction) and D1 (Dams).
- E3. Explosions, Studies of Wave Propagation from: Nos. 125, 222, 236.
See also S3 (Seismic Prospecting).
- F1. Foci, Depth of Earthquake: Nos. 20, 62, 74, 105, 116, 195, 209, 227, 266, 282(1), 341.
- G1. Geodesy and Surveying Applied to Seismology: Nos. 170, 190, 251, 311, 355, 369, 389.
- G2. Geography of Seismological Interest: No. 33.

- G3. Geology of Interest to Seismologists: Nos. 2, 4, 5, 6, 7, 8, 10, 26, 35, 41, 47, 51, 52, 61, 63, 80, 81, 84, 90, 117, 126, 150, 154, 203, 208, 211, 216, 250, 263, 288, 294, 296, 297, 298, 307, 315, 320, 343, 347, 374, 378, 398.
See also M1 (Maps).
- G3.1 Geology, Experimental; Geodynamics: Nos. 55, 188, 214, 388.
- H1. Historical Studies of Seismological Interest: No. 22.
- I1. Instruments; Seismographs and Accessories: Nos. 32, 45, 83, 99(2), 102, 111, 125, 131, 148, 156(2), 166, 167, 178, 181, 192, 193, 199, 204, 219, 235, 276, 337, 372, 373, 377, 395, 396.
- I2. Insurance and Earthquakes: Nos. 317, 327.
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- I3. Isostasy and Gravity; Papers of Interest to Seismologists: Nos. 12, 38, 51, 59, 261, 312.
- L1. Landslides, Mudflows, etc.: Nos. 8, 101.
- M1. Maps; Geological and Seismological: Nos. 216, 316, 348.
- M2. Materials of the Earth's Crust, Laboratory Tests of: Nos. 13, 14, 15, 248, 259(1), 324.
- M3. Mathematical Physics, as Applied to Seismological Problems: Nos. 50, 53, 96, 97, 98, 152, 172, 173, 174, 175, 176, 244, 259(1), 260, 277, 278, 289, 290, 293, 305, 306, 318, 332, 334, 340, 352, 379, 380, 381, 382, 392, 395, 396.
- M4. Microseisms: Nos. 28, 49, 73, 118, 119, 120, 121, 124, 140, 145, 146, 210, 249, 332, 353, 357, 361.
- O1. Obituaries: No. 201(6).
- O2. Oceanography; Charting, etc.: Nos. 82, 114, 123, 134, 288, 336.
- O3. Organizations for Seismological Investigations: Nos. 24, 30, 56, 67, 73, 76, 99, 123(2), 129, 142, 148, 156(1), 212, 218, 358, 376.
- O4. Origins of Earthquakes; Methods of Locating Epicentres and Results of That Work: Nos. 24, 37, 94, 95, 139, 141, 185, 191, 224(1), 245, 275, 342, 365, 393, 400.
- P1. Pacific, Problems of: Nos. 123, 129, 143, 160, 164, 206, 251, 255, 295(1), 365, 368.
See also V2 (Volcanoes).
- P2. Physics, Experimental, As Applied to Seismological Problems: Nos. 9, 32, 182, 194, 286.
- P3. Physics of the Earth, Density, Viscosity, Rigidity, Elasticity, Temperature, etc.: Nos. 26, 27, 30(1), 40, 41, 88, 92, 105, 176, 184, 200, 201(2), 229, 230, 232, 233, 246, 248, 293, 299, 300, 305, 306, 314, 324, 331, 334, 370.
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- P4. Popular Presentations of Various Phases of Seismology: Nos. 11, 12, 30, 33, 60, 67, 92, 99, 137, 201, 219, 221, 256, 271, 309, 310, 312, 361, 377.
- P5. Prediction of Earthquakes: Nos. 11, 30(2), 30(3), 107, 131, 133(1), 133(2), 217(1), 243(2).
See also C4 (Cycles).
- R1. Records, Evaluation of Earthquake: Nos. 3, 77, 158, 179, 199, 224, 228, 264(3), 268, 282(2), 332, 342.
See also T4 (Time-Distance Curves) and W1 (Wave Study).
- R2. Reports, Seismological; Regular Series: Nos. 66, 78, 79, 94, 95, 103, 130, 191, 196, 228, 309, 364, 394.
See also C1 (Catalogues).
- R3. Rotation Period of the Earth, Variations Therein; Wandering of the Pole; Variation of Latitude: Nos. 16, 71, 85, 86, 89, 133, 136, 147.
- S1. Scales, Earthquake: Nos. 75, 76, 225.

- S2. Seismicity of Particular Regions: Nos. 19, 29, 76, 87, 93, 122, 127, 137(4), 149(3), 149(4), 163, 171, 187, 202, 211, 212, 218, 221, 239, 252, 258, 267, 288, 292, 295(2), 321, 347, 363, 397.
See also C1 (Catalogues); D3 and D4 (Descriptions of Particular Earthquakes); M1 (Maps); O4 (Origins); and R2 (Reports).
- S3. Seismic Prospecting: Nos. 2, 23, 32, 45, 58, 64, 69, 102, 104, 105, 110, 125, 204, 205, 222, 235, 236, 302, 303, 304, 323, 328, 329, 330, 333, 337, 349, 350, 356, 362, 374.
See also E3 (Explosions).
- T1. Text-books; General Treatises on Seismology or its Applications: Nos. 104, 125, 304, 329, 332, 362, 374, 396.
- T2. Tidal Loading; Its Effects; Sea-level Pressure Changes, etc.: Nos. 159(2), 184, 259(1), 284, 301, 386, 399.
- T3. Tides, Earth: Nos. 107, 136, 176, 265, 354, 359.
- T4. Time-Distance Curves, Tables, etc.: Nos. 62, 105, 116, 123(3), 144, 185, 246, 266, 292.
- V1. Vibrations of the Ground, Buildings, etc., Caused by Non-seismic Disturbances Other Than Explosions—As Traffic, Machinery, Falling Weights, Meteors, Frost: Nos. 247, 257, 344, 345, 385, 387.
- V2. Volcanoes in Relation to Earthquakes: Nos. 19, 33, 201(3), 242, 243, 279, 280, 346, 360.
See also P1 (Pacific Problems).
- W1. Waves, Studies of Earthquake; Based on Observational Data, Velocity, Paths, Nature, etc.: Nos. 36, 62, 70, 98, 105, 123(3), 143, 144, 160, 161, 162, 185, 198, 206, 215, 226, 229, 230, 233, 234, 236, 240, 253, 254, 259(2), 268, 269, 272, 273, 274, 283, 287, 299, 300, 332, 335, 340, 342, 368.
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