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DEPARTMENT OF THE INTERIOR  
CANADA

HON. CHARLES STEWART, *Minister*

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

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PUBLICATIONS  
OF THE  
**Dominion Observatory**  
OTTAWA

R. MELDRUM STEWART, *Director*

Vol. X

**Bibliography of Seismology**

No. 5

JANUARY, FEBRUARY, MARCH, 1930

BY

ERNEST A. HODGSON

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OTTAWA  
F. A. ACLAND  
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# Bibliography of Seismology

January, February, March, 1930

With this issue, the Bibliography of Seismology enters the second year of publication under its present auspices. The valued co-operation of the Eastern Section—Seismological Society of America, of the United States Coast and Geodetic Survey, of the Jesuit Seismological Association, and of numerous individual collaborators is gratefully acknowledged. A list of collaborators is appended to this number.

It is hoped that this co-operation may be continued and extended. Forms have been prepared with a view of making it convenient to report bibliographical data. A supply of these will be mailed on request.

It is desirable that bibliographical items be reported as completely as possible. Abbreviations should be carefully avoided. A short abstract or review is particularly useful. The place of publication should be given. Collaborators will greatly assist the editor by filling out the forms in full, and by indicating clearly the accents required. Reviews should be comprehensive, but should rarely exceed 150 words.

— ADAMS, C. E., "The South Island Earthquake of June 17, 1929." See No. 423 of this list.

401. ADAMS, Oscar S., "The Bowie Method of Triangulation Adjustment," U.S. Department of Commerce, Coast and Geodetic Survey, Special Publication No. 159, 32 pages, diagrams, tables, and maps, Washington, 1930.

The above pamphlet may be obtained from the Superintendent of Documents, Washington, D.C., at the nominal price of ten cents. It deals with the application of the method to the first-order net in the western part of the United States.

402. AGAMENNONE, Giovanni, "Il periodi sismici Parmensi del 1834, 1835 e 1927-28," *Bollettino della Società Sismologica Italiana*, 28, Fascicoli 3-4, 101-105, Rome, 1928-29. J.B.M.

403. AMBRONN, Richard, "Einige allgemeine Bemerkungen zur systematischen Anwendung geophysikalischer Aufschlussarbeiten in der Praxis," *Allgemeine Österreichische Chemische und Technische Zeitung*, 34, No. 15, 109-111, 1926.

A review appears in *Physikalische Berichte*, 9, No. 13, 1269-1270, July, 1928.

J.B.M.

— ATUMI, Keiryō and MUTO, Katuhiko, "An Investigation into the Results of the New and Old Measurements of the Levelling Net in the Kwanto District." See No. 465 of this list.

404. AULT, J. P. and SOULE, F. M., "New Data on the Bottom Contour of the South Pacific Ocean from Soundings Taken on Board the *Carnegie*, October, 1928, to March, 1929," *Gerlands Beiträge zur Geophysik*, 23, Heft 1, 1-7, 6 figures, Leipzig, 1929.

On pages 8-9 of the same issue, Captain Ault presents a second short paper entitled, "Form of the Slope of Wake Island."

405. BARTON, Donald C., "New Seismic Method Said to Parallel Current Practice," *Engineering and Mining Journal*, **128**, No. 5, 180, New York, August 3, 1929.  
An abstract of this paper by Donald C. Barton appears in *Geophysical Abstracts*, No. 7, Washington, November, 1929, as follows: "This is a brief note calling attention to the fact that the 'new' seismograph method described by R. Ambronn in 'Modern Instruments for Seismic Prospecting,' *Engineering and Mining Journal*, Vol. 128, No. 3, July 30, 1929, pp. 93-99, is not new but parallels current American practice, and that Dr. Ambronn's paper totally ignores American practice of the past four years." F.W.L.
406. BARTON, Donald C., "Geophysical Methods of Prospecting, Principles and Recent Successes" (A review), *Bulletin of the American Association of Petroleum Geologists*, **13**, No. 10, 1402-1404, Tulsa, Okla., October, 1929.  
A detailed criticism of the book by Dr. C. A. Heiland (previously reported as No. 125 of these lists).
407. BATEMAN, H., "The Solution of the Integral Equation Connecting the Velocity of Propagation of an Earthquake-wave in the Interior of the Earth With the Times Which the Disturbance Takes to Travel to the Different Stations on the Earth's Surface," *Philosophical Magazine*, Series 6, **19**, 576-587, January-June, 1910.  
The results of this important paper are summarized by Jeffreys in his book, "The Earth." (See No. 440 of this list.) L.D.L.
408. (1) BELLUIGI, A., "Sullo smorzamento dei pendoli sismografici," *Bollettino della Società Sismologica Italiana*, **26**, Fascicoli 3-4, 69-81, Rome, 1926. J.B.M.
408. (2) BELLUIGI, A., "Sul problema delle coordinate spaziotemporali ipocentrali," *Bollettino della Società Sismologica Italiana*, **26**, Fascicoli 5-6, 111-124, Rome, 1926. J.B.M.
409. BERLOTY, R. P., S. J., "Le tremblement de terre de Palestine, 11 juillet 1927," *Annales de l'Observatoire de Ksara*, 62-94, 1927.
410. BOBILLIER, Carlos, "Boletin del Servicio Sismológico de la Universidad de Chile (Terremoto del 14 de Abril), año de 1927," No. 19, Santiago, 1929.  
With regard to the earthquake of April 14, there is given a list of damages which resulted; a value of 1.0 to 1.2 m/sec<sup>2</sup> as maximum acceleration at Santiago is indicated for the horizontal acceleration, and 0.16 m/sec<sup>2</sup> for the vertical acceleration. The determination of the epicentre and the interpretation of the data obtained is not made, the conclusions of F. Lünkenheimer at La Plata, and of P. A. Loos, at Mendoza being accepted. The annual list of quakes observed in Chile is given in the same form as in previous years, the only difference being that Greenwich Mean Civil Time is now used instead of Santiago Mean Time. F.L.
411. BOUTRY, Georges Albert, "Les Methodes Géophysiques de Prospection," *La Revue Pétrolière*, No. 325, 821-825, Paris, June 15, 1929.  
An abstract by W. Ayvazoglou appears on pages 29-30 of *Geophysical Abstracts*, No. 8 (Circular 6224, U.S. Bureau of Mines), December, 1929. The section which refers to the seismic method reads, "Examination of elastic anomalies; study of the velocity of propagation of shocks; measurement by sound; measurement by ultrasound." A lengthy bibliography is appended. F.W.L.
412. BOWIE, William, "Tilting of Mean Sea Level," *Gerlands Beiträge zur Geophysik*, **23**, Heft 2, 97-98, Leipzig, 1929.
413. BROCKAMP, B. and WÖLCKEN, K., "Bemerkungen zu den Beobachtungen bei Steinbruchsprengungen," *Zeitschrift für Geophysik*, **5**, Heft 3-4, 163-171, Göttingen, 1929. F.W.L.
- BUTCHER, H., MITCHELL, A. S., and FORD, C. R., "The South Island Earthquake of June 17, 1929." See No. 423 of this list.

414. CAVASINO, A., "Il terremoto nelle prealpi Carmiche orientali del 27 marzo 1928," *Bollettino della Società Sismologica Italiana*, 28, Fascicoli 3-4, 77-100, Rome, 1928-29. J.B.M.
415. CODD, L. W., "Wave Mechanics and the New Quantum Theory" (translation of the book: HAAS, Arthur, "Materiewellen und Quantenmechanik"), Constable and Co., 119 pages, Price 7 shillings 6 pence. London, 1928.  
Chapters I and II (pages 1-18) summarize briefly and clearly the features of Fermat's Principle, and a concept of group velocity with which students of seismology should be familiar. L.D.L.
416. CONRAD, V., "Erdbebenhäufigkeit und Sonnenaktivität," *Spitaler Festschrift, Erzgebirge-Zeitung*, 50, Heft 1-2, 19-22, Teplitz-Schönau, 1929.  
The frequency of earthquakes and the activity of the sun: The monthly frequency of near earthquakes ( $\Delta < 1000$  km.) registered instrumentally at Batavia (1910-1925 = 192 months) is correlated with the mean monthly sunspot-numbers given by Wolfer for the above-mentioned time. It is found that  $r = -0.045 \pm 0.049$  P.E. The earthquakes in the regentships of Batavia, Bantam, and Preanger, alone, give  $r = -0.190 \pm 0.047$  P.E. Therefore there is no correlation between earthquakes and sunspots in the Malayan Archipelago.  
Some authors state that the earthquakes are especially frequent if the relative numbers of sunspots are growing, or if the sunspots pass the meridian of the sun opposite to the earth's region in question. This case was also examined by methods of the theory of probability and it was found that: The number of earthquakes which happen in times of growing relative sunspot-numbers is quite equal to the number mathematically expected for the case where the earthquakes are distributed over the time at random. V.C.
417. DANUSSO, Arturo, "Sulla statica delle costruzioni asismiche," *Seminario Matematico e Fisico di Milano*, 2, No. 6, 1929.  
The paper deals with the forced vibrations of a vertical bar, direction-fixed at the base and carrying either concentrated or uniformly distributed loads, when subjected to any given arbitrary vibratory motion. R.R.M.
418. DARLINGTON, Tom, "Geological Exploration with Dynamite," *Explosives Engineer*, 6, No. 9, 329-332, September, 1928. J.B.M.
419. DAVISON, Charles, "Notes on Some Seismological Terms," *Bulletin of the Seismological Society of America*, 14, No. 1, 26-37, Stanford, March, 1924.  
This paper is a useful reference to the origin and meaning of seismological terms.
420. DAVISON, Charles, "On the 42-Minute Period in the Frequency of the Aftershocks of Earthquakes," *Philosophical Magazine*, 8, No. 53, 801-812, London, December, 1929.  
The author introduces the paper as follows, "The time taken by an earthquake-wave to travel from a focus near the surface to its antipodes is almost exactly 21 minutes. As the crust within and near the focus is for some days in a highly sensitive condition, it is possible that the return-pulsation may affect the frequency of the after-shocks, and my object in this paper is to show that a 42-minute periodicity does govern their occurrence."
421. DECARVALHO, Anselmo Ferraz, "Estudo actual dos tremores de terra," *O Instituto Coimbra*, 72, No. 1, 1-50, 1925.  
An abstract appears in *Physikalische Berichte*, 9, No. 13, 1254, Braunschweig, July, 1928. The paper is a brief summary of the subject with particular reference to Portugal. J.B.M.
422. (1) FESSENDEN, Reginald A., "Patent 1,167,366 Dynamo Electric Machinery," United States Patent Office, Washington, 1916.  
The above patent covers the vibrator used by the inventor for sonic depth measurements.

422. (2) FESSENDEN, Reginald A., "Patent 1,240,328, Method and Apparatus for Locating Ore Bodies," United States Patent Office, Washington, 1917.  
This method makes use of vibrators, installed in bore holes filled with water, as the source of oscillations of the frequency of sound.
423. FORD, C. R., BUTCHER, H., and MITCHELL, A. S., "The South Island Earthquake of June 17, 1929." (Report of the New Zealand Institute of Architects Investigation Committee), 36 pages, fully illustrated, Wellington, N.Z., 1929.  
The Committee was accompanied in its investigations by Dr. C. E. Adams, Government Seismologist. A.S.M.
424. FUJIWARA, L. and TAKAYAMA, T., "On the Possibility of Finding Stresses Acting on and Displacements of the Earthcrust from its Surface Form," *Bulletin of the Earthquake Research Institute, Tokyo Imperial University*, 7, Part 3, 523-530, December, 1929.  
The paper is in Japanese with an abstract in English. The concluding paragraph reads: "From these (investigations) it seems like that the mere form of land and sea can, to some extent, indicate the stress, acting on or the displacement of the crust. So the authors point out more examples of the vortical form of coast lines and in one of them is obtained a good concordance of the sense of stress inferred from their point of view with that from geological point of view by Dr. Ehara on the southwestern part of Sikoku."
425. GESZTI, Josef, "Zur Frage der Entstehung der Kontinente und Ozeane," *Gerlands Beiträge zur Geophysik*, 22, Heft 4, 353-384, Leipzig, 1929.
426. GRIFFITH, Lloyd, "Preparedness of the Oil Companies for a Major Disaster in the Los Angeles Basin," *Bulletin of the Seismological Society of America*, 19, No. 3, 156-161, Stanford, September, 1929.  
Paper presented before the Seismological Society of America, at Berkeley, California, on June 20, 1929.
427. GUTENBERG, B., "Neue Methoden zur Bestimmung der Herdtiefe von Erdbeben aus Aufzeichnungen an herdnahe gelegenen Stationen," *Zeitschrift für angewandte Geophysik*, 1, Heft 3, 65-75, Berlin, 1923. J.B.M.
428. GUTENBERG, B., "Das Innere der Erde," *Berichte der Senckenbergischen Naturforschenden Gesellschaft*, No. 56, 33, 1926.  
An abstract appears in *Geologisches Zentralblatt*, 40, No. 1, 17, September, 1929. J.B.M.
429. GUTENBERG, B., "Lehrbuch der Geophysik," Gebrüder Borntraeger, 1017 pages, 412 illustrations, 2 plates. Price 72 M. (unbound) or 80 M. (bound). Berlin, 1929.  
This text-book has been prepared by the author named with the collaboration of Prof. A. Born (Berlin), Prof. E. A. Ansel (Freiburg i.B.), Prof. A. Sieberg (Jena), Prof. J. Bartels (Eberswalde), Prof. J. Weickmann (Leipzig), Prof. F. Linke (Frankfurt a.M.), Prof. A. Wegener (Graz), and Prof. H. Benndorf (Graz).  
It treats of the subject of geophysics under the following general headings (1) The Growth of the Earth and its Structure, (2) Gravity and Isostasy, (3) The Mechanism of Movement of the Earth's Crust, (4) Water, Ice, Wind, as Greater Geological Factors, (5) Volcanism, (6) Earthquakes-Geology, (7) The Physics of Earthquake Study, (8) Water-waves and Tides, (9) Movements of the Earth's Axis, (10) Terrestrial Magnetism and Electricity, and the Polar Light, (11) The physical Properties of the Earth's Structure, (12) Geophysical Prospecting Methods, (13) The Structure of the Atmosphere, (14) Optics of the Atmosphere, (15) The Electrical Properties of the Atmosphere, (16) Mechanics and Thermodynamics of the Atmosphere, (17) Geophysics and Life. A tabulation of "Geophysical Constants," is appended.  
The book appeared as a series of five "Lieferungen," which were sold at reduced subscription prices. These subscription prices are now cancelled. The book is sold only as a single volume at the prices quoted. G.B.

430. GUTENBERG, B., "Das Rheinlandbeben vom 13. Dezember 1928," *Gerlands Beiträge zur Geophysik*, **23**, Heft 1, 22-34, Leipzig, 1929.

The author's abstract reads: The focus of the Rheinland earthquake of 1928, December 28, is situated, according to the registrations, about one to two kilometers southeast of Rödigen, the most shaken place. The longitudinal waves were propagated in the three upper layers with the velocities 5.6 km./sec. (with respect to Göttingen perhaps 6.0?), 6.7, and 8.2 km./sec., respectively. The  $P_N$ -waves arrived at the stations two to three seconds before they were to be expected in the light of the other European earthquakes studied. It may perhaps be supposed that the corresponding discontinuity is situated a little less deep in West-Germany. Values of greater precision could not be established, because stations near to the epicentre are wanting, so that the calculation of the depth was not possible. The registrations of Heerlen, near the epicentre, yield a value for the depth of focus of thirty kilometers.

431. GUTENBERG, B., "Veränderungen der Erdkruste," *Senckenbergische Naturforschende Gesellschaft*, **59**, Heft 10, 477-487, Frankfurt a.M., October, 1929. B.G.

432. GUTENBERG, B., "Die Erdbeben im Lichte der physikalischen Erdgeschichte," *Scientia*, Series II, **46**, No. CCXII-12, 375-384, Milan, December, 1929.

A translation into French, by M. Marcel Thiers, of l'École Polytechnique, Paris, appears in the same issue on pages 139-148 (of the supplement section), with the title, "Les tremblements de terre d'après l'histoire physique de la terre." B.G.

433. GUZZANTI, C., "L'eruzione dell'Etna ed i fenomeni sismici," *Dal Bollettino dell'Accademia Gioenia di Scienze Naturali in Catania*, Fascicolo 59, Mineo, November 15, 1928. C.G.

434. HARDING, C. R., "Location and Design of Southern Pacific Company's Suisun Bay Bridge as Affected by Consideration of Earthquakes," *Bulletin of the Seismological Society of America*, **19**, No. 3, 162-166, Stanford, September, 1929.

Paper presented before the Seismological Society of America, at Berkeley, California, June 20, 1929.

435. HECK, N. H., "Earthquake Investigation in the United States." (Revised, 1929), U.S. Department of Commerce, Coast and Geodetic Survey, Serial No. 456. Price 10 cents, from the Superintendent of Documents, Washington, 1929.

A pamphlet of 21 pages, outlining the reasons for earthquake investigation, the earthquake history of the United States and dependencies by sections, and the present status of earthquake investigations therein. N.H.H.

436. IMAMURA, Akitune, "On the Earth-vibrations Induced in Some Localities at the Arrival of Seismic Waves," *Bulletin of the Earthquake Research Institute, Tokyo Imperial University*, **7**, Part 3, 489-494, December, 1929.

The paper is in Japanese with an abstract in English. The experiments which are here reported indicate that small earth-vibrations of a period ranging from 0.2 to 0.4 sec. are induced in a relatively thin surface layer by the arrival of the seismic waves.

437. IMPERIAL JAPANESE ARMY, LAND SURVEY DEPARTMENT, "Revision of the Secondary Trigonometrical Survey in the Tango District," *Bulletin of the Earthquake Research Institute, Tokyo Imperial University*, **7**, Part 2, 381-389, 1 plate, September, 1929.

The article, written in Japanese, carries the following abstract in English: "The result of revision of the primary trigonometrical survey in Tango and the other districts was already published in Vol. VII, part 1 of this Bulletin. The results of the survey which was carried out later with respect to the secondary trigonometrical points are now given in the tables and the annexed plate.

The assumption regarding the two fixed stations is the same as in the previous case." The abstract gives also the probable errors of the results of calculations.



438. ISHIMOTO, Mishio and TAKAHASI, Rutaro, "Construction d'un accéléromètre-enregistreur dans le but de mesurer les mouvements des automobiles, des trains, etc.," *Bulletin of the Earthquake Research Institute, Tokyo Imperial University*, 7, Part 3, 571-585, December, 1929.

The paper is in Japanese with the following summary in French: "Un accéléromètre comportant deux bourrelets de caoutchouc est construit dans les conditions suivantes:—

- |  |                       |
|--|-----------------------|
| (1) masse du poids.....                                    | 15.2 kg.              |
| (2) période propre.....                                    | 0.03 sec.             |
| (3) amplification du déplacement de la masse de l'appareil | 50                    |
| (4) amortissement.....                                     | amortisseur à air.    |
| (5) sensibilité.....                                       | 1 cm. correspond à g. |

Les étalonnages de l'appareil sont exécutés dans des conditions statiques et dynamiques: et les résultats obtenus coïncident bien avec les valeurs théoriques. Dans des enregistrements obtenus sur une automobile, on distingue d'une part les vibrations caractéristiques de la voiture, d'autre part les conditions superficielles de la route."

439. ISHII, Eikitu, "Comparison of the Results of the Third and Fourth Precise Levellings in the Region Disturbed by the Tango Earthquake," *Bulletin of the Earthquake Research Institute, Tokyo Imperial University*, 7, Part 3, 587-588, December, 1929.

The paper is but a brief summary, in English and in Japanese, of the information given by a map and a graphical representation of a comparison of the results given by the third and the fourth re-levellings.

440. JEFFREYS, Harold, "The Earth: Its Origin, History, and Physical Constitution," Cambridge University Press, 346 pages, 3 plates, 16 figures, index. Price, \$5.50. Cambridge, 1928.

The above issue is the second edition of this valuable work. The chapters on seismology (VI and VII) have been considerably revised.

441. JONES, William R., "Early Geophysical Prospecting," *The Mining Magazine*, 40, No. 5, 269-272, London, May, 1929; and 40, No. 6, 348-351, London, June, 1929.

An abstract of this paper by Donald C. Barton appears in *Geophysical Abstracts*, No. 4 and No. 7, Washington, 1929, from which the following extracts are taken: "This paper gives a historical résumé of the British pioneers in early geophysical prospecting. . . . Mallet was the father of the seismic method of geophysical prospecting with his observations on difference of velocity of different formations and the use of explosions to produce elastic earth waves before 1851. Nöggerath in 1846 and J. F. Schmidt in 1858 proved the correctness of Mallet's theories . . . . (He made) laboratory determinations of the compressibility and modulus of elasticity of different rocks. His study included that of anisotropism. Milne, at the end of the century, modified some of Mallet's deductions and as far back as 1885 experimented with elastic earth waves produced by falling bodies. . . . "

F.W.L.

442. LAMBERT, Walter D., "Earth Tides," *Travaux de la Section de Géodésie de l'Union géodésique et géophysique internationale, Rapports généraux, établis à l'Occasion de la troisième Assemblée générale, Prague, 29 août—10 septembre 1927 (Rapport sur les marées de l'écorce terrestre)*, 16 pages.

The paper, undertaken by the author as the "Rapporteur" on this subject, appointed by the above organization, first outlines the investigations carried out by those attacking the subject from various angles. He then deals with the nature of the quantities  $h$ ,  $k$ , and  $l$ , used by geophysicists in the study of this problem, and the best means of determining their values. The question of the effect of local geologic conditions on observed tides is then considered. Finally, the conflicting conclusions of Stoneley and of Jeffreys, as to the nature of the earth's core, receive attention. The paper concludes with a number of recommendations.

443. LEE, Frederick W., "Geophysical Abstracts," Department of Commerce, Bureau of Mines, Washington. No. 4 (Circular 6164), August, 1929; No. 5 (Circular 6175), September, 1929; No. 6 (Circular 6203), November, 1929; No. 7 (Circular 6209), November, 1929; No. 8 (Circular 6224), December, 1929; No. 9 (Circular 6233), January, 1930.

These publications appear as Information Circulars, giving abstracts of current articles and publications dealing with applied geophysics. F.W.L.

444. LEE, Frederick W., In "Geophysical Abstracts," No. 6 (Circular 6203, U.S. Bureau of Mines), Washington, November, 1929 (see No. 443 of this list, next above); a long list is compiled of United States patents granted in respect of various geophysical instruments or methods. Those dealing with the seismic method (no less than 26) are found on pages 3-10.

The number of the patent, the date of its being granted, the descriptive title, the name of the patentee, a brief outline of the scope of the patent, and the number of claims allowed is given in each case.

The compilation is a most useful one as outlining the history and present trend of the art.

445. LEUCHS, K., "Erdkruste und Erdinneres," *Berichte der Senckenbergischen Naturforschenden Gesellschaft*, No. 56, 44, 1926.

An abstract appears in *Geologisches Zentralblatt*, 40, No. 1, 17, September, 1929.

J.B.M.

446. LIECHTI, P., "Eine neue Hochfrequenzmethode zur Registrierung von Bodenerschütterungen," *Gerlands Beiträge zur Geophysik*, 23, Heft 2, 213-228, 11 figures, Leipzig, 1929.

The author's English abstract reads: "The construction and working of a new electric ground-vibrationmeter are described. It consists of a high-frequency tube transmitter inductively coupled to an absorbing circuit, the capacity of which is performed as a mercury condenser. The mercury's surface then acts as a free vibrative membrane. The enclosed diagrams show the superposition of the ground vibrations to those of the free membrane. The new apparatus is very simple as in regard to its construction as to its use and may easily be transported. Its high sensitivity can still be increased by stages of low-frequency amplification." A bibliography of seventeen items is appended.

447. LITERARY DIGEST, "What New Zealand Learned from Its Worst Quake," *Literary Digest*, pages 28 and 30, New York, October 19, 1929.

A useful index to the outstanding features of the earthquake of June 17, 1929, as gleaned from the press of New Zealand.

448. LOGAN, Jack, "Geophysics Reveal Vast Petroleum Deposits in Coast Region," *The Oil Weekly*, 51, No. 9, 40-50, Houston, Texas, November 16, 1928.

An abstract of this paper, by W. Ayvazoglou, appears in *Geophysical Abstracts*, No. 7, Washington, November, 1929. F.W.L.

449. LÚNKENHEIMER, Federico, "Elementos nuevos para la determinación de los epicentros," *Observatorio Astronómico, La Plata, Contribuciones Geofísicas*, 2, No. 5, 147-250, 1928.

The seismological stations being situated in both hemispheres and with great epicentral distances sometimes involved, the values of  $d$  and  $r$  (as used in the stereographic projection method of determining epicentres) become so great, at times, that it is practically impossible to apply the method. In order to overcome these difficulties, the author puts the centre of projection on the equator, using, instead of the geographical co-ordinates  $\phi$  and  $\lambda$ , the values  $h$  (altitude) and  $a$  (azimuth). The relations between the two kinds of co-ordinates are, in this case, very simple. Numerous tables are given in order to make the application of the method an easy one. F.L.

450. LÚNKENHEIMER, Federico, "Resultados sismométricos del año 1926," *Observatorio Astrónomico, La Plata, Contribuciones Geofísicas*, 3, No. 1, 1-84, 1929.

Some improvements having been made in the instruments, the number of annual observations has increased to 154. For all cases, where it was possible, epicentres have been calculated as in former years.

Of special interest is the Argentine quake of February 9, to which the author had previously (two years ago) made reference, in "Resultados Sismométricos, 1906-1922," page 165, supposing an extremely great depth of focus. It is worth mentioning that Mr. Turner, in "The International Seismological Summary for 1926," although calculating an epicentre rather east from that given by the author, also finds this exceptionally great depth.

F.L.

451. MACELWANE, J. B., S.J., "New Evidence for a Sharply Bounded and Very Rigid Core in the Earth," *Bulletin of the American Physical Society*, 1, 4, Minneapolis, February 21, 1925. Reprinted in *Proceedings of the American Physical Society*, 25, 721, Minneapolis, May, 1925.

J.B.M.

452. MACELWANE, J. B., S.J., "Some Seismographic Problems and Our Present Knowledge," *Bulletin of the Seismological Society of America*, 19, No. 3, 135-142, Stanford, September, 1929.

The paper reports the Presidential address delivered before the joint meeting of The Seismological Society of America and of its Eastern Section, which was held at Fordham University, New York City, April 30-May 1, 1929. A bibliography of thirty-six items is appended.

453. MAINKA, C., "Über das Amplitudenverhältnis bei Rayleighschen Oberflächenwellen," *Physikalische Zeitschrift*, 16, 117-121, Leipzig, 1915.

L.D.L.

454. MALAMPHY, Mark C., "The Seismograph in the Gulf Coast," *The Oil Weekly*, 52, No. 5, 31-34, January 18, 1929.

An abstract of this paper by Kenneth Hartley appears in *Geophysical Abstracts* (Published by United States Bureau of Mines), No. 1, Washington, May, 1929, and a shorter reference in the same publication, No. 2, Washington, May, 1929, has also been prepared by Donald C. Barton.

F.W.L.

455. MALAMPHY, Mark C., "Factors in Design of Portable Field Seismograph," *The Oil Weekly*, 53, No. 1, 28-30, 84-94, March 22, 1929.

An abstract of this paper by Donald C. Barton appears in *Geophysical Abstracts*, No. 4, Washington, August, 1929, as follows: "Field seismographs are of two types, 'mechanical' seismographs in which there is mechanical magnification of the movement of the heavy mass, and 'electric' seismographs in which the movement of the heavy mass is transformed into an electrical impulse which is then amplified. The following factors in the design of the seismograph equipment are discussed: Weight of equipment including carrying cases, over-all dimensions, transportation equipment, sensitivity (amplification) of seismograph, frequency (selectivity) characteristics, damping of recording apparatus, timing system, simplicity of adjustments and operation, sensitivity of seismograph of blastophone to sound and receive air waves, accessibility of all instruments for adjustment repair or replacement of parts, provision for development of records in the field, method of transmitting the exact instant of the shot, radio equipment, and power supply for electrical equipment. This is an interesting and reliable account of many details of the art of seismic prospecting."

456. MALAMPHY, Mark C., "A Seismic Method of Determining the Deviation of Drill Holes," *The Oil Weekly*, 53, No. 6, 31-32, 70-80, Houston, Texas, April 26, 1929.

An abstract of this paper by Donald C. Barton appears in *Geophysical Abstracts*, No. 4, Washington, August, 1929, as follows: "The position of the bottom of a well may be determined by dropping the detector of an electric-type seismograph to the bottom of the well and exploding small charges of dynamite at a certain pattern of locations. Formulas for the computation of the position of the bottom of the hole from the results are given. The charges of dynamite required are small and the time necessary to make the survey is

less than a day. The cost of the determination is low. The greatest difficulty will be in applying the method in an area where the beds dip steeply. The use of several detectors suspended at different depths will allow simultaneous determination of position of well hole at as many points. No mention is made of the actual application by the Geophysical Research Corporation." F.W.L.

457. MALKOVSKY, J. A. and WANTLAND, Dart, "Geophysical News and Review of Geophysical Literature," Department of Geophysics, Colorado School of Mines, 2, No. 1, 1-50, Golden, Colorado, November 15, 1929.

The publication is a review in abstract form of the more important papers dealing with geophysics. J.A.M.

458. MARTEL, R. R., "The Effects of Earthquakes on Buildings with a Flexible First Story," *Bulletin of the Seismological Society of America*, 19, No. 3, 167-178, Stanford, September, 1929.

Paper presented before the Seismological Society of America, at Berkeley, California, on June 20, 1929.

459. MATUZAWA, Takeo, YAMADA, Kunitika, and SUZUKI, Takeo, "On the Forerunners of Earthquake Motions" (Second Paper), *Bulletin of the Earthquake Research Institute, Tokyo Imperial University*, 7, Part 2, 241-260, 11 figures, September, 1929.

460. McCOMB, H. E., "A New Method of Marking Time on Magnetograms," *Terrestrial Magnetism and Atmospheric Electricity*, 33, No. 3, 159-161, Baltimore, September, 1928.

This method might be equally successful for the registration of time on seismograms. H.E.McC.

461. MITCHELL, A. S., "Building Construction Lessons of the Earthquake," *The Journal of the New Zealand Institute of Architects*, 8, No. 4, 83-87, Wellington, N.Z., October, 1929.

The paper describes the damage caused by the New Zealand earthquake of June 17, 1929. The results, as observed, are classified according as they affected (1) Timber Structures, (2) "Deconcrete," (3) Stone Structures, (4) Brick-walled Structures, (5) Plain Concrete, (6) Reinforced Concrete, (7) Structural Steel and Reinforced Concrete Buildings, (8) Reinforced Concrete with Floors, etc. Integral, etc. A.S.M.

- MITCHELL, A. S., FORD, C. R., and BUTCHER, H., "The South Island Earthquake of June 17, 1929." See No. 423 of this list.

462. MIYABE, Naomi, "Die Schankungen der makroseismischen Tätigkeitszonen um den Pazifischen Ozean," *Bulletin of the Earthquake Research Institute, Tokyo Imperial University*, 7, Part 2, 261-268, September, 1929.

A short summary of the foregoing was given in *Proceedings of the Imperial Academy*, 5, page 243, 1929.

- MIYABE, Naomi and TERADA, Torahiko, "Deformation of the Earth Crust in Kwansai Districts and its Relation to the Orographic Feature." See No. 491 of this list.

463. MORRIS, S. B. and PEARCE, C. E., "Design of Gravity Dam in San Gabriel Canyon to Resist Earthquakes," *Bulletin of the Seismological Society of America*, 19, No. 3, 143-155 Stanford, September, 1929.

Paper presented before the Seismological Society of America at Berkeley, California, June 20, 1929.

464. MOTHES, H., "Neue Ergebnisse der Eisseismik," *Zeitschrift für Geophysik*, 5, Heft 3-4, 120-145, Gottingen, 1929.

The following abstract is condensed from that given in *Geophysical Abstracts*, No. 9, Washington, January, 1930: In July and August, 1928, artificial seismic waves were produced in Hintereisferner by explosions, were measured optically by means of a vertical

- seismograph at distances of 180 to 600 metres, and the value for the velocity of wave propagation in ice determined. In 25 cases reflections of longitudinal waves at the lower boundary surface of the ice, which served for the determination of the thickness of the ice, could be registered. F.W.L.
465. MUTO, Katuhiko and ATUMI, Keiryō, "An Investigation into the Results of the New and Old Measurements of the Levelling Net in the Kwanto District," *Bulletin of the Earthquake Research Institute, Tokyo Imperial University*, 7, Part 3, 495-522, December, 1929.
- The paper is in Japanese, with an abstract in English. The conclusions are:—
- "(1) When the land upheaved or depressed, the crustal surface splits into a mosaic of blocks; it appears that the surface crust is not perfectly elastic.
- (2) The distance between each tectonic line is generally equal.
- (3) The block which suffered a large vertical displacement generally made a large tilting.
- (4) In Tokyo-Okitu-Kohu levelling circuit, the same blocks were active through both periods before and after the earthquake, but the sense of tilting before the earthquake was opposite to that after it.
- (5) On the approach of the earthquake, the tilting movement of certain blocks in Tokyo was accelerated considerably."
466. NAKANO, H., "Love Waves in Cylindrical Co-ordinates," *Geophysical Magazine*, 2, No. 1, 37-52, Tokyo, March, 1929. J.B.M.
467. NAVARRO NEUMANN, M. Ma. S., S.J., "Sur quelques contributions de la géologie à la sismologie et de la sismologie à géologie," *Comptes rendus, XIV Congrès géologique international*, 1926.
- A 6-page reprint, issued by Graficas Reunidas, S.A., Madrid, 1929, presents the above paper as a separate. N.N.
468. NAVARRO NEUMANN, M. Ma. S., S.J., "El XI Congreso de La Asociación Española y Portuguesa para el Progreso de las Ciencias," *Ibérica*, No. 684, 7 pages (in the reprint), Barcelona, June 25, 1927. N.N.
469. NAVARRO NEUMANN, M. Ma. S., S.J., "Estado actual de la determinación de los epicentros," *Ibérica*, No. 784, Barcelona, June 29, 1929. N.N.
470. NEUMANN, Frank, "Seismological Report, January, February, March, 1927," United States Department of Commerce, Coast and Geodetic Survey, Serial No. 463, 81 pages, Washington, 1929. F.N.
471. NIKIFOROV, P. M., "Seismic Experiments with Explosions; Preliminary Note," *Comptes rendus de l'Académie des Sciences de l'U.S.S.R.*, Series A, 189-190, Leningrad, October, 1926.
- The following abstract is by E. U. Von Buelow, and appears in *Geophysical Abstracts* (Published by the United States Bureau of Mines), No. 2, (Circular 6133), page 20: "The author briefly reports experiments employing (1) a vertical seismograph of B. B. Galitzin, slightly changed for this special work; (2) the horizontal seismograph by Wiechert-Mintrop; (3) a small horizontal seismograph of their own design. Problems studied are defined, results obtained will be given in a separate paper at an early date." F.W.L.
- NISHIMURA, Genrokuro and SEZAWA, Katsutada, "The Displacement Independent of the Dilatation and the Rotation in a Solid Body." See No. 482 of this list.
472. NISHKIAN, L. H., "Design of Tall Buildings for Resistance to Earthquake Stresses," *The Architect and Engineer*, 88, 73, March, San Francisco, 1927. R.R.M.
473. (1) ODDONE, Emilio "L'organizzazione sismica ed i recenti studi sismologici nelle nazioni a noi confinanti: Jugoslavia, Svizzera, Francia, e Austria," *Bollettino della Società Sismologica Italiana*, 26, Fascicoli 5-6, 139-151, Rome, 1926. J.B.M.

473. (2) ODDONE, Emilio, "Paragone e studio dei moti sismici gravitazionali e proiettivi di eguale velocita," *Bollettino della Società Sismologica Italiana*, 27, Fascicolo 2 41-85, Rome, 1927. J.B.M.
473. (3) ODDONE, Emilio, "I lavori della sezione sismologica alla terza assemblea generale dell'Unione Geodetico-Geofisica Internazionale in Praga dal 3 al 10 Settembre 1927," *Bollettino della Società Sismologica Italiana*, 27, Fascicoli 5-6, 141-158, Rome, 1927. J.B.M.
- PEARCE, C. E. and MORRIS, S. B., "Design of Gravity Dam in San Gabriel Canyon to Resist Earthquakes." See No. 463 of this list.
474. PROVIERO, A., "Per impedire o moderare qualche incendio nei terremoti disastrosi," *Bollettino della Società Sismologica Italiana*, 26, Fascicoli 1-2, 47-48, Rome, 1926. J.B.M.
475. RAIKO, N. V. The following twenty reviews have been furnished by Dr. N. V. Raïko, of the Physico-Mathematical Institute, Academy of Sciences, Leningrad, U.S.S.R. In view of the fact that each reference indicates an article which appeared in the Russian language, it has seemed best to group them, the items appearing in the group in the alphabetical order of the authors' names. E.A.H.
- (1) ABDALIAN, S., "The Great Earthquake in Armenia," *Messenger of Knowledge (Vestnik Znania)*, No. 19, 1177-1182, with 2 charts, 1927.  
The author gives a descriptive account of the earthquake of October 22, 1926, by which the town of Leninakan (formerly Alexandropol) was destroyed. A chart of isoseists is appended to the paper.
- (2) CHEKANINSKI, I., "On Seismic Phenomena in the Government of Semipalatinsk from 1760 to 1927" (Historical Reference), *Bulletin of the Semipalatinsk Section of the Russian Geographical Society*, 16, 14-72, 1927.  
The above is a catalogue compiled from data obtained from non-instrumental observations.
- (3) DOBROVOLSKI, "Lessons of Leninakan: Methods of Investigating the Rigidity of Buildings Exposed to Earthquakes," *The Constructive Industry (Stroitel'naya Promyshlennost)*, 5, No. 3, 171-174, 13 figures, March, 1927.
- (4) ISHEVSKI, M., "The Problem of Earthquake-proof Construction: Estimates for and Structure of Buildings in Localities Exposed to Earthquakes," *The Constructive Industry (Stroitel'naya Promyshlennost)*, 5, No. 9, 623-626, 8 drawings, September, 1927.
- (5) ISHEVSKI, M., "Estimates and Structure of Buildings in Localities Subject to Earthquakes," *The Constructive Industry (Stroitel'naya Promyshlennost)*, 5, No. 10, 676-681, October, 1927.  
The author discusses in general terms the measures to be taken in erecting dwelling houses, warehouses, or small household and industrial buildings in localities subject to earthquakes. In conclusion he insists on the necessity for more accurately registering earthquakes in other regions of U.S.S.R. where they are likely to prove a menace.
- (6) JAROSLAVZEW, T. N., "The Determination of the Time and of the Epicentre of the Kuban Earthquake of April 19, 1926," *Transactions of the Kuban Agricultural Institute*, 4, 97-99, 1926.

According to the method of isoseists the author gives  $\varphi = 45^{\circ} 30'$  N. and  $\lambda = 39^{\circ} 01'$  E., whilst, according to data of the seismic stations of Pulkovo, Sverdlovsk, and Tifis, these values have been computed as follows:— $\varphi = 45^{\circ} 30'$  N., and  $\lambda = 39^{\circ} 07'$  E. For "O" he finds the value  $7^{\text{h}} 49^{\text{m}} 51^{\text{s}}$ .

- (7) KELDYSCH, W., "The Necessity of Providing for Rigidity in Beamless Bracings," *The Constructive Industry (Stroitel'naya Promyshlennost)*, 5, No. 3, 209-211, March, 1927.

The author makes some objections to the paper by Prof. A. Loleyt (No. 14, below).

- (8) KRYNIN, D., "Lessons of Leninakan: On the Rôle of Foundation Soil of Buildings During Earthquakes," *The Constructive Industry (Stroitel'naya Promyshlennost)*, 5, No. 4, 255-256, April, 1927.

The author makes an attempt to clear up the question as to the influence of soil condition on the rigidity of buildings in seismic regions. In particular, he points out that during the earthquake in Leninakan (1926), the buildings which stood on sandy ground were less injured than those on clay or volcanic tuff. The author attributes the comparative damage as being due to the nature of the foundation soil.

(These findings are quite contrary to the general experience elsewhere. It would be interesting to learn the reconciling factor. E.A.H.)

- (9) LAZAREFF, P. P., "Researches in Practical Seismometry: I. On some Problems of Applying the Seismic Method to Investigations of the Depth of Rocks," *The Journal of Applied Physics*, 3, No. 2, 231-236, 1926.

A general theory of phenomena observed in applying the seismometric method for determining the depth of strata mineral deposits, trending either parallel to the earth's surface, or at a small angle.

- (10) LAZAREFF, P. P., "Researches in Practical Seismometry: II. On the Application of the Seismograph for Determining the Depth of Mineral Deposits Bordered by Planes," *The Journal of Applied Physics*, 3, No. 2, 237-238, 1926.

The author discusses theoretical data regarding the self-registering seismometer, as being an apparatus recording vibrations which reach it, either in a direct way from the seat of explosion, or after having been reflected by an ore-body.

- (11) LAZAREFF, P. P., "Researches in Practical Seismometry: III. On the Application of Helmholtz's Method to the Investigation of Stratified Geological Structures," *The Journal of Applied Physics*, 3, No. 3-4, 289-298, 1926.

In the present article the author endeavours to develop and generalize the method of Mintrop regarding the investigation of mineral deposits by means of artificial explosions.

- (12) LAZAREFF, P. P., "Researches in Practical Seismometry: IV. A General Theory of a Combined Gravimetric and Seismic Method of Investigating Venal Deposit Representing an Infinite Cylinder Disposed Parallel to the Plane of the Earth's Surface," *The Journal of Applied Physics*, 3, No. 3-4, 299-302, 1926.

In this article the author discusses in principle the question of the investigation of venal deposits, which, in the general case, consist of cylindrical bodies of an infinite or commensurate dimension.

- (13) LEBEDEW, P. I., "The Earthquake of Leninakan (Alexandropol) in Connection with the Question of the Seismicity of Armenia," *Nature (Priroda)*, 16, No. 3, 171-188, 5 drawings, 1927.

A description of the earthquake of October 22, 1926, with reference to geology.

- (14) LOLEYT, A. T., "Necessity for Providing for Rigidity in Beamless Bracing (from Experience of the Earthquake at Leninakan)," *The Constructive Industry (Stroitel'naya Promyshlennost)*, 4 No. 11, 825-828, November, 1926.

The author compares the formulæ proposed by himself for computing beamless bracings with the formulæ of American and German norms, and arrives at the conclusion that his formulæ provide adequately for the rigidity of such bracings. He offers as supporting evidence the fact that a factory, so constructed, survived the earthquake of October 22, 1926, in Leninakan, with practically no damage.

- (15) LOLEYT, A. T., "About the Paper by Prof. W. Keldysch" (No. 8 above), *The Constructive Industry (Stroitel'naya Promyshlennost)*, 5, No. 3, 211-212, March, 1927.

Polemics of the author with Prof. W. Keldysch, regarding the paper listed just above as No. 14.

- (16) LOLEYT, A. T., "How to Put the Problem," *The Constructive Industry (Stroitel'naya Promyshlennost)*, 5, No. 10, 673-676, 3 drawings, October, 1927.

The author outlines the problem of earthquake-proof construction.

- (17) NEKRASOW, W., "Competition of Designs for the Reconstruction of Leninakan," *The Constructive Industry (Stroitel'naya Promyshlennost)*, 5, No. 10, 681-682, October, 1927.

The author gives an account of the results of the competition of designs for one-storied and two-storied dwelling houses (earthquake-proof constructions), to be erected in Leninakan (formerly Alexandropol, Caucasus) after the earthquake of October, 1926.

- (18) RAÏKO, N. V. "Supplementary Materials Relating to the Earthquakes Which Occurred in the Region of the Caucasian Mineral Sources," *Les travaux de l'Institut Balnéologique aux eaux minérales du Caucase (Pjatigorsk)*, 4, 160-162, 1927.

Supplementary notes to the paper by the same author, entitled, "Materials for the Compilation of a Catalogue of Earthquakes Which Have Occurred in the Region of the Caucasian Mineral Sources," in the same journal, 3, p. 233.

- (19) TATARINOW, E., "Future Structural Methods in the Crimea in Connection with Landslips and Earthquakes," *The Constructive Industry (Stroitel'naya Promyshlennost)*, 5, No. 10, 669-673, 2 drawings, October, 1927.

The author insists upon the necessity of considering the houses in the Crimea from the point of view of dangers due to landslips and earthquakes, and proposes an approximate scheme of constructive methods to form a basis for future earthquake-proof construction in this region.

- (20) ZABOROVSKI, A. I., "A Contribution to the Theory of Curves Showing the Time of Wave Propagation," *The Journal of Applied Physics*, 3, No. 3-4, 303-309, 1926.

476. RANKINE, A. O., "Seismic Methods in Geophysics," *The Mining Magazine*, 40, No. 5, 311-314, London, May, 1929.

A mathematical explanation of the seismic method of prospecting.

F.W.L.

477. SCHMIDT, Wilhelm, "Nomographische Tafel zur Auswertung von Bebenogrammen," *Gerlands Beiträge zur Geophysik*, 12, Heft 2 (Kleine Mitteilungen), 114-117 1 plate, Leipzig, 1913.

478. SCRASE, F. J., "The Thermal and Elastic Properties of Elinvar: a Study of an Elinvar Spring in the Galitzin Vertical Seismograph at Kew Observatory," *Journal of Scientific Instruments*, 6, No. 12, 385-392, December, 1929.

The author's abstract reads: "A serious defect of the Galitzin vertical seismograph is the drift of the pendulum which is caused by the effect of temperature changes on the elasticity coefficient of the steel spiral spring. In order to overcome this disadvantage an elinvar spring was recently fitted to the vertical seismograph at Kew Observatory. After loading the spring, the 'creep' remained appreciable for several months. Moreover, the rate of 'creep' was dependent on the temperature. After making due allowance for these effects it was found that the temperature coefficient of the elastic constant of the elinvar spring was about one-tenth of that of the steel spring."

F.J.W.W.



479. SEZAWA, Katsutada, "Periodic Rayleigh-waves Caused by an Arbitrary Disturbance," *Bulletin of the Earthquake Research Institute, Tokyo Imperial University*, 7, Part 2, 193-206, September, 1929.

The author's summary is as follows:—

"(1) In spite of the application of a single disturbance at the origin of a semi-infinite body of a certain dispersive nature, the generated surface waves are of a harmonic type.

(2) The leading part of the train of these waves is propagated with the velocity of a special Rayleigh-type wave.

(3) The periods of the successive oscillations of the harmonic displacements are of a gradually increasing nature.

(4) The amplitudes of the successive oscillations are, in the case of two dimensions, of a gradually decreasing character, while in the three dimensional problem they are more quickly decreasing.

(5) The order of the length of the periods depends on the dispersive nature of the body, i.e. the elasticities, the effective thickness of the layer and some dispersive constants.

(6) In certain dispersive waves there are abnormal regions of the earthquake movements at certain periodic distances from the epicentre."

480. SEZAWA, Katsutada, "Generation of Rayleigh-waves from a Sheet of Internal Sources," *Bulletin of the Earthquake Research Institute, Tokyo Imperial University*, 7, Part 3, 417-435, December, 1929.

481. SEZAWA, Katsutada, "Propagation of Love-waves on a Spherical Surface and Allied Problems," *Bulletin of the Earthquake Research Institute, Tokyo Imperial University*, 7, Part 3, 437-455, December, 1929.

The author's summary reads as follows:—

"(1) Long Love-waves having azimuthal distribution on a spherical surface have the large colatitudinal component of displacement, besides the ordinary azimuthal component, and this colatitudinal component cannot disappear even at the equatorial circle.

(2) The vertical component is not existent from the start.

(3) The velocity of the propagation of Love-waves on a spherical surface is approximately equal to that on a plane surface, even though the waves are relatively long.

(4) The dispersion of Love-waves is possible also on a spherical surface.

(5) The growth of Love-waves towards the antipode is also possible.

(6) The azimuthal variation of displacement of Love-waves is maintained towards the antipode.

(7) In considering the neighbourhood of the origin, the waves become quiescent as the waves are propagated towards infinity. When the waves are generated from an internal source, the displacement at the free surface conspires with the modes of the oscillations at the origin.

(8) In this case the azimuthal variation of the azimuthal displacement at the surface conforms for all radial distances with the type of the oscillations of the internal source. . . . "

482. SEZAWA, Katsutada and NISIMURA, Genrokuro, "The Displacement Independent of the Dilatation and the Rotation in a Solid Body," *Bulletin of the Earthquake Research Institute, Tokyo Imperial University*, 7, Part 3, 389-416, December, 1929.

483. SHALEM, Nathan, "Il recente terremoto in Palestina (luglio 1927)," *Bollettino della Società Sismologica Italiana*, 27, Fascicoli 5-6, 169-183, Rome, 1927. J.B.M.

484. SHAPLEY, Harlow, "Urges Laboratory Deep in the Earth," *New York Times*, p. 14, November 27, 1929.

The article reports a lecture delivered by Professor Shapley before the American Geographical Society in New York, in which he urges the desirability of a series of laboratories, established, primarily for scientific purposes, at various depths in a great vertical shaft.

An abstract by W. Ayvazoglou appears in *Geophysical Abstracts*, No. 8 (Circular 6224, U.S. Bureau of Mines), 32-33, December, 1929. F.W.L.

485. SNYDER, C. H., "Earthquakes and Building Codes," *Engineering News-Record*, **98**, 995, New York, June 16, 1927. R.R.M.
- SOULE, F. M. and AULT, J. P., "New Data on the Bottom Contour of the South Pacific Ocean from Soundings Taken on Board the *Carnegie*, October, 1928, to March, 1929." See No. 404 of this list.
486. STONELEY, R., "A Rayleigh-wave Problem," *Proceedings of the Leeds Philosophical and Literary Society*, **1**, Part 6, 217-225, April, 1928.  
An abstract by the author appears in *Science Abstracts*, **31**, Part 10, No. 370, 742-743, London, October 25, 1928. L.D.L.
487. SUYEHIRO, Kyoji, "On the Nature of Earthquakes Studied by Means of the Seismic Wave Analyser," *Bulletin of the Earthquake Research Institute, Tokyo Imperial University*, **7**, Part 3, 467-470, December, 1929.  
The author makes use of his set of seismographs of different period (the seismic wave analyser) to study the records of sixteen earthquakes with nearby epicentres, for the purpose of determining the form of the epicentre and the focal depth. He estimates the depth by the duration of the preliminary tremor, finding foci for the sixteen earthquakes ranging in depth from twenty-five to ninety-five kilometers.
- SUZUKI, Takeo, MATUZAWA, Takeo, and YAMADA, Kunitika, "On the Forerunners of Earthquake Motions" (Second Paper). See No. 459 of this list.
488. TADA, Fumio, "Recent Deformation of the Shimagahara Land Block in Prov. Iga as Determined by Tracing the Vertical Change of River Courses," *Bulletin of the Earthquake Research Institute, Tokyo Imperial University*, **7**, Part 3, 531-554, tables, maps, and diagrams, December, 1929.  
The paper is in Japanese with an abstract in English.
- TAKAHASI, Rutaro and ISHIMOTO, Mishio, "Construction d'un accéléromètre-enregistreur dans le but de mesurer les mouvements des automobiles, des trains, etc." See No. 438 of this list.
- TAKAYAMA, T. and FUJIWHARA, L., "On the Possibility of Finding Stresses Acting on and Displacements of the Earthcrust from its Surface Form." See No. 424 of this list.
489. TAMS, E., "Einige neue Seismogramme aus der Hauptstation für Erdbebenforschung am Physikalischen Staats-laboratorium zu Hamburg," *Verhandlungen des Naturwissenschaften Vereins zu Hamburg*, Folge XVII, No. 3, 16 pages, 3 figures, 3 plates, 1909.
490. TERADA, Torahiko, "On the Form of Volcanoes," *Bulletin of the Earthquake Research Institute, Tokyo Imperial University*, **7**, Part 2, 207-221, September, 1929.  
The author's summary is as follows:—  
"(A) The circumferential zone of depression at the foot of some volcanoes may probably be due to the yielding of the earth crust by the load of the mountain. This suggests a possible way of the 'hardness test' of the earth crust.  
(B) Some volcano in the middle of a large area of depression, on the one hand, and some lake situated at the centre of an extensive area of elevation, on the other hand, seem to be genetically correlated to each other in opposite senses."
491. TERADA, Torahiko and MIYABE, Naomi, "Deformation of the Earth Crust in Kwansai Districts and its Relation to the Orographic Feature," *Bulletin of the Earthquake Research Institute, Tokyo Imperial University*, **7**, Part 2, 223-240, 2 figures, September, 1929.

492. (1) TURNER, H. H., "The International Seismological Summary for 1925, October, November, December," University Observatory, 253-324, Oxford, 1929.
492. (2) TURNER, H. H., "The International Seismological Summary for 1926, January, February, March," University Observatory, 1-88, Oxford, 1929.
492. (3) TURNER, H. H., "The International Seismological Summary for 1926, April, May, June," University Observatory, 89-172, Oxford, 1929. H.H.T.
493. (1) ULLER, Karl, "Zurückwerfung und Brechung elastischer Wellen," *Verhandlungen der Deutschen physikalischen Gesellschaft*, 16, p. 835, Berlin, 1914.
493. (2) ULLER, Karl, "Grundlegung der Kinematik einer physikalischen Welle von elementarer Schwingungsform: I," *Physikalische Zeitschrift*, 17, 168-172, Leipzig, 1916.
493. (3) ULLER, Karl, "Wellen-induktion," *Gerlands Beiträge zur Geophysik*, 19, p. 134, Leipzig, 1928. L.D.L.
494. ULLER, Karl "Die Front- und Rückengeschwindigkeit von Verzerrungswellen in festen, schweren Körpern," *Gerlands Beiträge zur Geophysik*, 15, 219-238, Leipzig, 1926. J.B.M.
495. WADATI, K., "Shallow and Deep Earthquakes (Second Paper)," *Geophysical Magazine*, 2, No. 1, 1-37, Tokyo, March, 1929. J.B.M.
496. WANNER, E., "Beiträge zur Geographie der Erdbeben," *Gerlands Beiträge zur Geophysik*, 23, Heft 3, 334-348, Leipzig, 1929. E.W.
- WANTLAND, Dart and MALKOVSKY, J. A., "Geophysical News and Review of Geophysical Literature." See No. 457 of this list. J.A.M.
497. WIECHERT, E., "Seismische Beobachtungen von Steinbruchsprengungen," *Zeitschrift für Geophysik*, 5, No. 3-4, 159-162, Göttingen, 1929.  
This deals with seismic observations in connection with blasting in quarries with the idea of studying the uppermost layer of the earth's crust. F.W.L.
- WÖLCKEN, K. and BROCKAMP, B., 'Bemerkungen zu den Beobachtungen bei Steinbruchsprengungen.' See No. 413 of this list.
498. WOODS, Thos. S., "Earthquake Map of the East Coast of North America, Cape Hatteras to Belle Isle, Including the Region Shaken by the Tremor of November 18, 1929," Based on U.S.N. Hydrographic Office Chart No. 1412. The chart is accompanied by a page of descriptive matter dealing with the information indicated on the map. Map and description are furnished by the compiler at a price of one dollar. May be obtained from Thos. S. Woods, 60 Congress Street Boston, Mass.
- For many years Mr. Woods has been collecting evidence for the purpose of testing a theory that great fault-breaks occur in the earth, cutting "the earth's crust into a series of blocks, which, from time to time warp and tilt, with resultant edge grinding, after the manner of ice cakes in a mill-pond broken up by rising water."
- The information on the map has been compiled largely from the viewpoint of this theory. T.S.W.
- YAMADA, Kunitika, SUZUKI, Takeo, and MATUZAWA Takeo, "On the Forerunners of Earthquake Motions" (Second Paper). See No. 459 of this list.

499. YAMAGUTI, S., "Abnormal Rise of Sea Level in the Japan Sea Coast, on January 2, 1929," *Bulletin of the Earthquake Research Institute, Tokyo Imperial University*, 7, Part 3, 555-569, December, 1929.

The paper is in Japanese, with a lengthy abstract in English, which concludes thus, "It will be seen that the effect of waves due to the cyclonic winds must be considered as one of the important factors governing the variations of sea level. The cyclonic effects investigated in the previous reports seem, therefore, to be intimately connected with this effect of waves, though it is not clear whether the latter effect covers the entire amount of the former effects."

500. ZANON, P. F. S., "Il sismografo 'Agamennone' a pendoli orizzontali modificato," *Bollettino della Società Sismologica Italiana*, 26, Fascicoli 5-6, 153-165, Rome, 1926.

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