

JUN 30 1933

DEPARTMENT OF THE INTERIOR
CANADA

HON. THOMAS G. MURPHY, *Minister*

H. H. ROWATT, *Deputy Minister*

PUBLICATIONS
OF THE
Dominion Observatory
OTTAWA

R. MELDRUM STEWART, *Director*

Vol. X

Bibliography of Seismology

No. 17

JANUARY, FEBRUARY, MARCH, 1933

BY

ERNEST A. HODGSON

OTTAWA
J. O. PATENAUDE, ACTING KING'S PRINTER
1933

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— ABE, Noboru and HATAI, Shinkishi, "The Responses of the Catfish, *Parasilurus Asotus*, to Earthquakes." See No. 1621 of this list.

1601. (1) AGAMENNONE, G., "Tremblement de terre de la mer Adriatique du soir du 9 août 1895," *Bulletin Météorologique et Séismologique de l'Observatoire Imperiale de Constantinople, Partie séismologique pour l'an 1896*, p. 51, Constantinople, 1896.

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1602. AGAMENNONE, G., "Sur l'histoire du pendule horizontal en Italie," *Ciel et Terre*, 30, Nos. 3-4, 5 pages in reprint, Brussels, November, 1932. G.A.

1603. ALCOCK, F. J. and MILLER, A. H., "Plumb-line Deflections and Gravity Anomalies in Gaspé Peninsula and their Significance," *Transactions of the Royal Society of Canada, Third Series*, 26, Section IV, 321-333, Ottawa, 1932.

The above paper is of seismological interest since the phenomena there discussed are closely related with the possibilities of present-day movements of the peninsula and hence with earthquakes. It is pointed out that "though uplift has taken place, the topography of the Gaspé coast is still, however, a drowned one; elevation has been insufficient to offset the glacial submergence." The gravity anomalies indicate that Gaspé is not compensated locally.

1604. ALLEN, T. L., "Use of Record Character in Interpreting Results and Its Effect on Depth Calculation in Refraction Work," *Bulletin of the American Association of Petroleum Geologists*, 16, No. 12, 1212-1220, 2 figures, 4 plates, Tulsa, December, 1932.

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1607. BERLOTY, B., S.J., "Annales de l'Observatoire de Ksara, 1926," Published in mimeographed form, bound in cover, 30 pages, Ksara, 1932.

Pages 24-30 are devoted to a discussion of particular earthquakes. In connection with the earthquake of March 18, 1926, which centred in the Mediterranean southeast of the island of Rhodes, a sketch map is provided.

1608. BLAU, L. W., "Papers on Applied Geophysics," *Bulletin of the American Association of Petroleum Geologists*, 17, No. 1, 87-91, Tulsa, January, 1933.

This short note offers a well-merited criticism of the nature of much of the literature on applied geophysics.

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The above pamphlet is issued from the office of the editor, R. R. Bodle, at the U.S. Coast and Geodetic Survey, Washington. Items of interest to members of the Eastern Section are announced through this publication.

R.R.B.

1610. BORNITZ, G., "Über die Ausbreitung der von Groskolbenmaschinen erzeugten Bodenschwingungen in der Tiefe." J. Springer, 44 pages, 5 plates. Price RM 15. Berlin, 1931.

The publication is reviewed by Berg on page 158 of *Zeitschrift für Praktische Geologie*, 40, Heft 10, Halle (Saale), October, 1932. A free English rendering of the review may be given as follows:—

While engaged in seismic prospecting in Texas and Louisiana, the author observed rhythmic earth tremors which were caused by heavy reciprocating machinery. These vibrations, long since the subject of study in machine technique, are here discussed from the standpoint of the mining industry, since the chief phase of the investigation is the depth to which the vibrations penetrate.

It was found that the depth of penetration is much greater than had been anticipated. The discontinuity at the contact of the coal and the tertiary deposits was found to distinctly affect the propagation of the tremors.

The study is thus of interest in the field of seismic prospecting. It sheds light, too, on the problem of "Erschütterungsschiesen" in coal mines, and compares mining disasters and earthquakes.

1611. BREWSTER, Frank, TORREY, Paul D., and THOMPSON, John A., "Prospecting for Natural Gas in New York State," *Mining and Metallurgy*, No. 307, 13, 316-318, New York, 1932.

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The above is a somewhat abridged version of the presidential address of the author, delivered before the Geological Society of America at the Cambridge meeting on December 28, 1932. The concluding paragraph reads: "We have briefly surveyed an old problem, weighted, as few others are, with fundamental meaning for geology. A problem it will long remain. Cosmogonic theory, seismological results, study of thermal gradients and of isostatic adjustment, like the multitude of facts of tectonics and petrology, all seem to support a thesis: Our planet is still too hot to crystallize at

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any depth greater than about 80 kilometers or 50 miles. But the support is not proof, nor is any theory of the earth to be absolutely demonstrated. As usual in the leading questions of science, we are pragmatists and search for the theory that works best. The thin-crust theory appears to work best. Yet the chief reason for putting it in the foreground is the fact that it can guide to fruitful research in the future. As never before, the geologist realizes the meaning of the ancient maxim 'deep calleth unto deep,' the need of seeking in the shells and core of the earth explanation for the dramatic changes registered in its relief and visible rocks."

1614. DEGOLYER, E., "Choice of Geophysical Methods in Prospecting for Oil Deposits," *Transactions of the American Institute of Mining and Metallurgical Engineers, Geophysical Prospecting, 1932*, 9-23, New York, 1932.
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1616. EWING, Maurice and LEET, L. Don, "Comparison of Two Methods for Interpreting of Seismic Time-distance Graphs Which Are Smooth Curves," *Transactions of the American Institute of Mining and Metallurgical Engineers, Geophysical Prospecting, 1932*, 263-270, New York, 1932. See also No. 1315 of these lists.
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This short report lists the personnel of the institute, outlines the work which has been done in their various fields of activity for the dates indicated, and reports the publications issued.

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1625. HEILAND, C. A., "A New Geophone," *Transactions of the American Institute of Mining and Metallurgical Engineers, Geophysical Prospecting*, 1932, 237-244, New York, 1932. See also No. 845 of these lists.

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The probability method developed by L. Geiger, for determining the position of an earthquake epicentre from arrival times only, presupposes a travel time curve to which no errors are to be ascribed for the purposes of the calculation. The method thus finds its most satisfactory application in the case of data from observing stations at a fair distance from the epicentre. The present paper deals with two modifications of the Geiger method. Both restrict the data to those furnished by stations of epicentral distance within that range for which the arrival time curve of the longitudinal wave may be considered rectilinear.

The first bases the location, partly on arrival times, partly on macroseismic data. The second is based wholly on the microseismic observations. Each yields a value for the velocity of the longitudinal wave in the sub-continental layer. Neither can be used to determine the time at the origin.

It is to be observed that the Geiger method does *not* determine time at the origin although it has regularly been applied as though it does. This point is further discussed in the paper by the same author, reported as No. 1627 of this list.

The illustrations given are from the writer's investigations of the records of the Tango earthquake, Japan, March 7, 1927. The paper is not, however, intended as a discussion of all the factors involved in the determination of that epicentre.

1627. HODGSON, Ernest A., "Epicentral Time and Surface Structure Determined for the Tango Earthquake, Japan, March 7, 1927," *Bulletin of the Seismological Society of America*, 22, No. 4, 270-287, bibliography, Stanford, December, 1932.

The paper presents the data fixing the epicentral time and position of the above earthquake. The depth of focus is found to be 12 km. The Mohorovičić discontinuity, so called, is shown to lie at a depth of only 16 km. in Japan. The velocity of the compressional wave above that discontinuity has the unusually high average value of 6.3 km./sec., the velocity for the same wave below the discontinuity being 7.75 km./sec. The determination of epicentral time permits the author to fix the axis of abscissæ for the *P*-curve which he deduced from the data of the same earthquake and reported in an earlier paper in the same *Bulletin* (No. 1327 of these lists). The *P*-curve, so adjusted, is published in mimeographed form (see No. 1628 of this list). The velocity of the compressional wave about the inner edge of the mantle at its contact with the core was found to be 12.4 km./sec., but the data supporting this deduction, though quite well defined, are meagre.

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The pamphlet presents the tabulation of the *P* and *S* curves and the differenced values *S-P* at intervals of tenths of degrees epicentral distance. The pamphlet is available on request addressed to the Director, Dominion Observatory, Ottawa, Canada.
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1634. ISHIMOTO, Mishio, "Echelle d'intensité sismique et accélération maxima," *Bulletin of the Earthquake Research Institute*, 10, Part 3, 614-626, 1 figure, 8 tables, Tokyo, September, 1932.
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The author's summary reads: "By means of the tensor analysis, coupled with the first fundamental theorem on the invariants of orthogonal transformations, expressions, independent of the particular type of co-ordinates used, are derived for Hooke's law in elasticity theory and for the constitutive relations in electromagnetic theory. It is shown that these two laws are but special cases of a more general physical law connecting, in a linear way, the components of two tensors having physical significance. It is to be noted that in the case of Hooke's law for a transversely isotropic medium, six independent coefficients of elasticity are involved instead of five found in the corresponding classical expressions."

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The authors resolve, by an appropriate method, the initial phase of a seismogram into its sinusoidal damped components. J.C.

1642. LABROUSTE, Mme. Y., "Remarques sur la méthode des projections en séismologie (applications)," *65^e Congrès des Sociétés Savantes*, No. 62, 515-524, Paris, 1932.

The author substitutes, for the movements registered on the seismogram, their projections in a chosen direction. For example, one application of the method demonstrates that the tangential projections of the phases *P* and *PR*₁ disappear completely. J.C.

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1647. MARTIN, H., "Untersuchungen über die Schutzwirkung eines Grabens gegen Erschütterungen," *Die Schalltechnik*, Jahrgang 1932, 2 pages in reprint, 4 illustrations, 1932.
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The author's résumé reads: "Die von S. L. Sobolev entwickelte Methode wird zum lösen des folgenden Problems angewandt. Ein fester elastischer Halbraum grenzt längs der Ebene mit einer elastischen kompressiblen Flüssigkeit, die die andere Hälfte des Raumes ausfüllt. Senkrecht zur trennungsgrenze wirkt eine gegebene Kraft. Es handelt sich darum die Varschiebung der Teilchen in beiden Halbräumen befindlichen Medien festzustellen." J.C.
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"When an earthquake focus is abnormally deep, phases additional to those associated with normal earthquakes are produced by reflexions at points comparatively near the epicentre . . . the surface waves are feebly developed . . . the preliminary phases are comparatively prominent.

"Most of the records examined show these characteristics remarkably well . . . The focal depth has been estimated as 300 km. below the earth's surface.

"The time-distance observations of the phases have been compared with the calculated curves based on the Zoeppritz-Turner tables . . . and with Jeffrey's revised tables . . .

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LIST OF COLLABORATORS

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

- | | |
|--|--------|
| Agamennone, G.,
Real Osservatorio Geofisico,
Rocca di Papa, Rome, Italy. | G.A. |
| Bodle, Ralph R.,
Editor, <i>Earthquake Notes</i> ,
United States Coast and Geodetic Survey,
Washington, D.C., U.S.A. | R.R.B. |
| Coulomb, J.,
Institut de Physique du Globe,
Puy-de-Dôme, France. | J.C. |
| Doxsee, W. W.,
Dominion Observatory, Ottawa, Canada. | W.W.D. |
| Hiller, William,
Württembergisches Statistisches Landsamt,
Stuttgart, Germany. | W.H. |
| Imamura, Akitune,
Tokyo Imperial University,
Tokyo, Japan. | A.I. |
| Lee, Frederick W.,
Editor, <i>Geophysical Abstracts</i> ,
United States Department of Mines,
Washington, D.C., U.S.A. | F.W.L. |
| Low, E. J.,
Instruments Ltd., Ottawa, Canada. | E.J.L. |
| Mitchell, A. S.,
13 Grey St., Wellington, New Zealand. | A.S.M. |
| Muskat, Morris,
Gulf Research Laboratory,
Pittsburgh, Penn., U.S.A. | M.M. |
| Slichter, L. B.,
Massachusetts Institute of Technology,
Cambridge, Mass., U.S.A. | L.B.S. |

